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QUESTIONS

EMPIRIQUES ET
FORMALISATION EN SYNTAXE
ET SEMANTIQUE 7
Travaux présentés à CSSP 2007

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Avant-propos / *Foreword*

Les articles regroupés dans ce volume ont tous été présentés au cours de la septième édition de CSSP, colloque de syntaxe et de sémantique qui s'est tenu à Paris en octobre 2007. Comme lors des précédentes éditions, le comité scientifique a sélectionné des travaux en syntaxe et en sémantique alliant à la fois le souci des problèmes empiriques et la recherche d'une présentation des données de langue dans un cadre formel et explicite. Les éditeurs souhaitent remercier les membres du comité scientifique de CSSP (en dehors des éditeurs eux-mêmes, Claire Beyssade, Francis Corblin, Danièle Godard, Jean-Marie Marandin et Alda Mari) pour leur aide dans la préparation de ce volume, et en particulier pour le travail de relecture auquel ils ont accepté de participer.

The articles collected in this volume have all been presented at the seventh edition of CSSP, the Conference on Syntax and Semantics that was held in Paris in October 2007. As for the previous editions, the scientific committee has selected papers on syntax and semantics that combine the study of an empirical problem with a presentation in a formal and explicit framework. The editors wish to thank the members of the CSSP scientific committee (apart from the editors themselves, Claire Beyssade, Francis Corblin, Danièle Godard, Jean-Marie Marandin and Alda Mari) for their help in the preparation of this book, and in particular for accepting to participate in the reviewing process.

Olivier Bonami & Patricia Cabredo Hofherr

Dutch modal complement ellipsis

Lobke Aelbrecht*

1 Introduction

Contrary to what has been claimed in the literature (by Lobeck 1995, among others), Dutch displays a limited kind of verb phrase ellipsis: the infinitival complement of deontic modal verbs can be left out, as in (1). I will call this phenomenon ‘modal complement ellipsis’ or MCE.

- (1) A: Wie wast er vanavond af? — B: Ik kan niet.
who washes there tonight off — I can not
Who is doing the dishes tonight? — I can’t. [Dutch]¹

A phenomenon like this can be analyzed in at least three possible ways. We can see it as deletion of a fully specified verb phrase, as has been claimed to be the case in English VP ellipsis (VPE; cf. Ross 1969; Johnson 1996, 2001; Merchant 2001, 2007); or as involving a null verbal proform (see Lobeck 1995, Depiante 2000). Or, more radically, we could claim that the modal does not have a complement at all, i.e. that it can be used intransitively (cf. Napoli 1985).

Although reminiscent of VP ellipsis in English, the Dutch data differ from the English counterpart. More importantly, they differ from English VPE when it comes to certain arguments in favour of a deletion approach. For instance, they do not allow for A'-extraction out of the ellipsis site. Therefore, at first sight it seems that the Dutch MCE ellipsis site does not contain any syntactic structure, unlike in English, and that these data have to be analyzed in a different way. However, a closer look reveals that there must indeed be a syntactic VP structure in Dutch MCE: A-extraction out of the ellipsis site, for instance, is allowed in both Dutch and English. In this paper I argue that Dutch MCE involves deletion of a fully specified structure, just like English. The contrast between the languages is derived from the difference in licensing head and ellipsis site. I claim that the ellipsis site is sent off to Spell-Out for non-pronunciation (see Gengel 2007) when the licenser is merged. In other words, to escape ellipsis a phrase has to

*I would like to thank several people for their helpful comments and their support: Marijke De Belder, Ryan Bochnak, Anneleen Vanden Boer, Patricia Cabredo Hofherr, Guglielmo Cinque, Karen De Clercq, Anne Dagnac, Antonio Fábregas, Anastasia Giannakidou, Bettina Gruber, Dany Jaspers, Chris Kennedy, Ezra Keshet, Peter Klecha, Alice Lemieux, Yaron McNabb, Jason Merchant, Johan Rooryck, Jasmin Urban, Jeroen van Craenenboeck and Guido Vanden Wyngaerd. Many thanks also to the audiences of the CSSP conference in Paris (October 2007) and of the LSA conference in Chicago (January 2008) for their many useful questions and remarks.

¹In what follows, all the non-English examples are in Dutch.

move out of the ellipsis site before the licensor is merged. Therefore, a landing site has to be available in an intermediate position that is higher than the ellipsis site but lower than the licensor. In Dutch ellipsis of the verb phrase is licensed by the modal head V^0 , which selects a TP complement, and the ellipsis site is VoiceP. This means that the only projection between the two is TP, and only A-movement is allowed to [Spec,TP]. Therefore, all constituents normally undergoing A'-movement are stuck in the ellipsis site from the moment the modal is merged. In English, on the other hand, VPE is licensed by T^0 and vP is the constituent which gets elided. This means that the phase head Voice⁰ (see Baltin 2007), which is in between the licensing head and the ellipsis site in this case, can attract all constituents with unvalued features to the phase edge prior to the merger of the ellipsis-licensing head, allowing them to escape deletion.

In the next section I will go into some basic properties of Dutch MCE and compare it to English VPE. I show that this kind of ellipsis differs from English in some crucial aspects. Nevertheless, I argue for a deletion approach in both cases. In section 3 I discuss the analysis of Dutch MCE in detail and section 4 does the same for English VPE, demonstrating how the analysis presented here accounts for the contrast between the two languages. Finally, in section 5 I conclude.

2 Dutch modal complement ellipsis (MCE): Basic data

2.1 Introduction

Although VP ellipsis (VPE) has been attested in several languages, its distribution is still considered rather limited compared to wide-spread types of ellipsis such as sluicing. German and Dutch, for instance, have been claimed not to have VPE. Contrary to this claim, however, I argue that Dutch does display a limited kind of verb phrase ellipsis in the complement of deontic modal verbs, as in (2).²

²Modal verbs can be interpreted in two ways: epistemic and deontic. In the epistemic reading the modal modifies a whole proposition, i.e. it expresses the possibility or necessity of the proposition's truth.

- (i) Mina must be home by now.
EPISTEMIC: It is necessarily the case that Mina is home now.

The deontic interpretation, on the other hand, expresses a relation of, for instance, permission or obligation with a goal, mostly the subject.

- (ii) Mina must be in the office at nine.
DEONTIC: Mina has the obligation to be in the office at nine.

It seems that when the infinitival complement of the modal is elided, only the former reading is allowed, as is shown in (iii). I will, however, not go into this contrast between epistemic and deontic modals here.

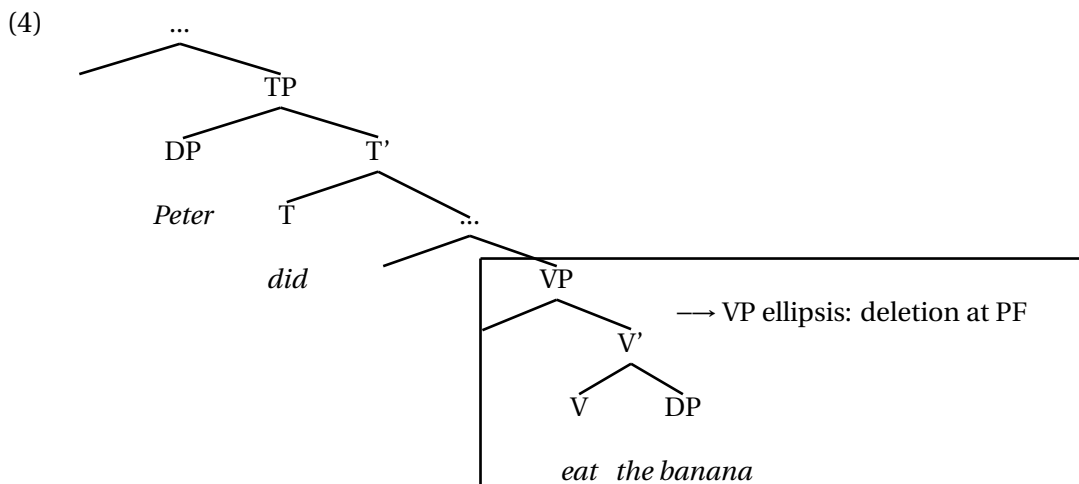
- (iii) a. A: Komt Thomas ook naar je lezing? — B: Hij moet.
comes Thomas also to your talk - he has.to
Is Thomas coming to your talk too? — He has to. = deontic
- b. A: Zou Klaas nu op zijn bureau zijn? — B: *Hij moet wel. Hij werkt altijd op zaterdag.
would Klaas now on his office be - he must PRT he works always on Saturday
INTENDED READING: It is necessarily the case that he is in his office. = epistemic

- (2) A: Wie wast er vanavond af? — B: Ik kan niet.
 who washes there tonight off I can not
 Who is doing the dishes tonight? — I can't.

In this example the answer given by B should be interpreted as *I can't do the dishes tonight*, but the verb phrase *do the dishes tonight* is left out. As is clear from the translation, the Dutch example is reminiscent of VP ellipsis as we see it in English. Therefore we might suspect that both constructions receive a parallel analysis. Let us therefore briefly look at how English VP ellipsis is derived. In the example in (3), the verb phrase *eat the banana* is not pronounced in the second conjunct, but it can still be interpreted because it has a local antecedent in the first conjunct.

- (3) Mina didn't eat the banana, but Peter did [~~eat the banana~~].

VP ellipsis (VPE) is a widely discussed phenomenon, especially for English. Throughout the literature it has been claimed to involve deletion of a fully specified structure (Ross 1969, Johnson 1996, 2001 Merchant 2001, 2007, 2008a,b).³ The tree structure in (4) illustrates that, syntactically, the whole verb phrase is present. The only difference with the non-elliptical counterpart is that it does not get a phonological representation, i.e. it is specified for non-pronunciation at PF.⁴ There are several arguments in favour of this deletion account, one of the most important ones being extraction, such as wh-extraction or pseudo-gapping.



As we will see in the next subsection, however, comparing English VPE and Dutch MCE makes certain differences apparent, suggesting that the two phenomena should be analyzed differently.

³Other analyses of English VPE which have been argued for in the literature, involve a null proform instead of a full structure (see Lobeck (1995), among others).

⁴Earlier I have hinted at an analysis deleting vP and most recent analyses of (English) VPE also claim that it is vP rather than VP which is elided (Merchant 2007, Johnson 2001). The tree structure in (4) displays deletion of VP for the sake of simplicity.

2.2 Comparison to English VPE

2.2.1 Differences

In this part of the paper I will compare Dutch MCE to English VPE, and we will see first of all that Dutch MCE has a much more restricted distribution than English VPE. However, I will focus especially on a second difference, namely extraction properties, as extraction is an argument brought forward in favour of the deletion account for English VPE. I show that English, but not Dutch, allows for object extraction out of the ellipsis site. Such a movement operation is possible only if there is a syntactic position which the object can move out of. It will soon become clear that a deletion analysis such as the one existing for English is not straightforwardly available for Dutch MCE.

First of all, Dutch MCE is more restricted than English VPE. English VPE is allowed with all kinds of verbs and auxiliaries, while Dutch only licenses deletion of the infinitival complement of deontic modal verbs, as is shown in (5).

- (5) a. * Kim ging naar Italië, maar Tom deed niet.
 Kim went to Italy but Tom did not
 Kim went to Italy, but Tom didn't.
- b. * Lara zal er niet zijn vanavond, maar ik zal.
 Lara will there not be tonight but I will
 Lara won't be there tonight, but I will.
- c. * Thomas is niet gearresteerd, maar Jonas is.
 Thomas is not arrested but Jonas is
 Thomas is not arrested, but Jonas is.
- d. * Jessica heeft gebeld gisteren, maar Sofie heeft niet.
 Jessica has called yesterday but Sofie has not
 Jessica has called yesterday, but Sofie hasn't.
- e. Je mag me wel helpen, maar je moet niet.
 You may me PRT help but you must not
 You are allowed to help me, but you don't have to.

A second difference between English and Dutch is an essential one for the “deletion versus proform” discussion. It involves several kinds of object extraction out of the ellipsis site and extraction has always been seen as one of the main arguments for a deletion account of English VPE. In English, phrases which are base-generated inside the verb phrase can survive the ellipsis, i.e. can be extracted out of it prior to ellipsis if they need to be. Therefore, the ellipsis site must contain enough syntactic structure to host the trace of this movement. First, I look at extraction of *wh*-objects, and then we go into pseudogapping, which involves movement of a remnant constituent out of the ellipsis site. Finally, I show that object scrambling, which is normally allowed in Dutch, is excluded in MCE.

As can be seen in (6), English allows for extraction of a *wh*-object out of the VP.

- (6) I don't know who Mina should invite, but I know who she shouldn't.

A sentence such as this one can easily be analyzed as in (7): the *wh*-phrase *who* moves from its base-generation position out of the ellipsis site to end up in [Spec, CP], prior

to deletion of the verb phrase. In order for this to be possible, however, the ellipsis site has to contain enough syntactic structure to host the trace of the wh-phrase.

- (7) I don't know who Mina should invite, but I know who she shouldn't [_{VP} ~~invite~~ ~~who~~].

In Dutch MCE, on the other hand, wh-extraction of objects is not allowed, as is illustrated in (8).

- (8) *Ik weet niet wie Katrien moet uitnodigen, maar ik weet wie ze niet moet.
I know not who Katrien must invite but I know who she not must
INTENDED READING: I don't know who Katrien should invite, but I know who she shouldn't.

A second instance of object extraction out of the ellipsis site is pseudogapping. The English sentence in (9) can be analyzed as involving movement of the object out of the vP. What kind of movement exactly moves the object out has been subject to debate, but that is irrelevant for the argument here. After the movement the vP gets elided, as in (10). Pseudogapping is therefore considered a special kind of VPE (for the different analyses, see Jayaseelan 1990; Johnson 1996; Lasnik 1999a,b, 2001; Takahashi 2004).

- (9) Mina can roll up a newspaper and Peter can a magazine.
(10) Mina can roll up a newspaper and Peter can a magazine [_{VP} ~~roll up~~ ~~a magazine~~].

Again, Dutch differs from English: Dutch MCE does not display pseudogapping. The object cannot move out of the ellipsis site prior to deletion, as (11) shows.

- (11) *Katrien kan het brood gaan kopen en Bert kan de melk.
Katrien can the bread go buy and Bert can the milk
INTENDED READING: ...and Bert can go buy the milk.

A last case of object extraction involves object scrambling, a phenomenon that occurs in Dutch, but not in English. In non-elliptical sentences Dutch definite objects, including pronouns such as *je* 'you' in (12), obligatorily scramble across negation and other adverbs.

- (12) a. *Ik wil [je helpen], maar ik kan niet [je helpen].
I want you help but I can not you help
b. Ik wil [je helpen], maar ik kan je niet [t_{je} helpen].
I want you help but I can you not help
I want to help you, but I cannot help you.

However, when the infinitival complement of the modal is missing, the object cannot appear, even though the negation, which would normally follow it, is still pronounced. This is illustrated in (13).

- (13) Ik wil je helpen, maar ik kan (*je) niet.
I want you help but I can you not
I want to help you, but I cannot.

All in all, we can conclude that object extraction out of an elided Dutch verb phrase is impossible. As extraction is one of the main arguments in favour of PF-deletion of a full structure, an analysis along these lines might not apply to Dutch. The next section shows, however, that subject extraction out of the Dutch MCE ellipsis site is possible, a fact that disrupts the clear pattern leading towards a proform analysis.

2.2.2 Subject extraction: In favour of a deletion analysis

As was said before, when looking at ellipsis cases there are at least three possible ways to go: deletion of a fully-fledged syntactic structure, a null proform or no complement at all. A central argument to decide between these options concerns the possibility of extraction out of the ellipsis site. If such an extraction is allowed, there must be enough syntactic structure present to host the trace; if extraction is impossible, this can be attributed to the lack of internal syntactic structure, i.e. the presence of a proform, or the absence of any complement. This test has led to a deletion account for English VPE (Merchant 2007, 2008a), pseudogapping (Jayaseelan 1990; Johnson 1996; Lasnik 1999a,b, 2001; Takahashi 2004), stripping (Merchant 2003) and sluicing (Ross 1969, Merchant 2001), for instance, and to a proform analysis of Null Complement Anaphora (Depiante 2000). Dutch MCE, however, disrupts this simple picture. It was shown above that objects cannot be extracted out of the ellipsis site, but we will see now that subjects can.

It turns out that Dutch MCE, although it does not allow objects to move out of the ellipsis site, does let subjects escape deletion, as (14) and (15) illustrate.

- (14) a. A: Niet iedereen mocht de koning een hand geven.
 not everyone was.allowed the king a hand give
 Not everyone was allowed to give the king a hand.
 B: Oh? Wie mocht (er) dan niet?
 oh who was.allowed there then not
 Oh? So who wasn't allowed to?
- b. A: Niet iedereen moet werken. — B: Oh, wie moet (er) dan niet?
 not everyone must work oh who must there then not
 Not everyone had to work. — Oh, who didn't have to?
- (15) a. A: Niet alle blokken mochten vallen.
 not all cubes were.allowed.to fall
 B: Oh? Welke mochten (er) dan niet?
 oh which were.allowed.to there then not
 Not all cubes were allowed to fall? — Oh? Which weren't allowed to?
- b. Deze broek moet vandaag niet gewassen worden, maar die rok moet wel
 this pants must today not washed become but that skirt must PRT
 These pants don't need to be washed today, but that skirt does.

I subscribe to the VP-internal subject hypothesis, which implies that the subject is base-generated inside the vP of the verb selecting it as its — external or internal — argument. In (14a) the subject is the external argument of the ditransitive verb *geven*

'give', while (14b) extracts the external argument of an unergative verb *werken* 'work' out of the elided verb phrase. The sentences in (15a) and (15b), with unaccusatives and passives, are even more interesting because here the derived subject is extracted from the complement position of the verb, i.e. from the same position we could not move an object out of earlier.

These examples do indeed involve movement out of the ellipsis site. Following Barbiers (1995) and Wurmbrand (1999, 2003) I assume that deontic modals are not control verbs, but raising verbs, just like epistemic ones. They do not assign an Agent θ -role to their subject.

There are some diagnostic tests for the raising versus control distinction. Firstly, raising verbs can have inanimate subjects, because they do not assign an Agent θ -role to it, as in (16a). The control example in (16b), on the other hand, is ungrammatical.

- (16) a. De auto lijkt gewassen te zijn.
 the car seems washed to be
 The car seems to be washed.
 b. * De auto probeert gewassen te worden.
 the car tries washed to become

Secondly, raising verbs allow impersonal passive, unlike control verbs (cf. (17)).

- (17) a. Er lijkt gedanst te worden.
 there seems danced to become
 There seems to be dancing going on.
 b. * Er probeert gedanst te worden.
 there tries danced to become

Thirdly, only raising modals can occur with weather expletives as their subject:

- (18) a. Het lijkt te regenen.
 it seems to rain
 It seems to be raining.
 * Het probeert te regenen.
 it tries to rain

Comparing deontic modals to raising and control verbs, we see that they pattern with the former and not with latter. They allow inanimate subjects when their complement is passive, they allow impersonal passives and weather expletive subjects:

- (19) De auto kan/ moet/ mag gewassen worden.
 the car can must is.allowed.to washed become
 The car can/has to/may be washed.
 (20) Er kan/ moet/ mag gedanst worden.
 there can must is.allowed.to danced become
 Someone can/must/may dance.
 (21) Het moet/ kan/ mag regenen.
 it must can is.allowed.to rain
 It must/can/may rain.

Therefore I analyze modals as raising verbs that select a non-finite TP complement.⁵ A simple sentence such as the one in (22) thus gets a tree structure as in (23).

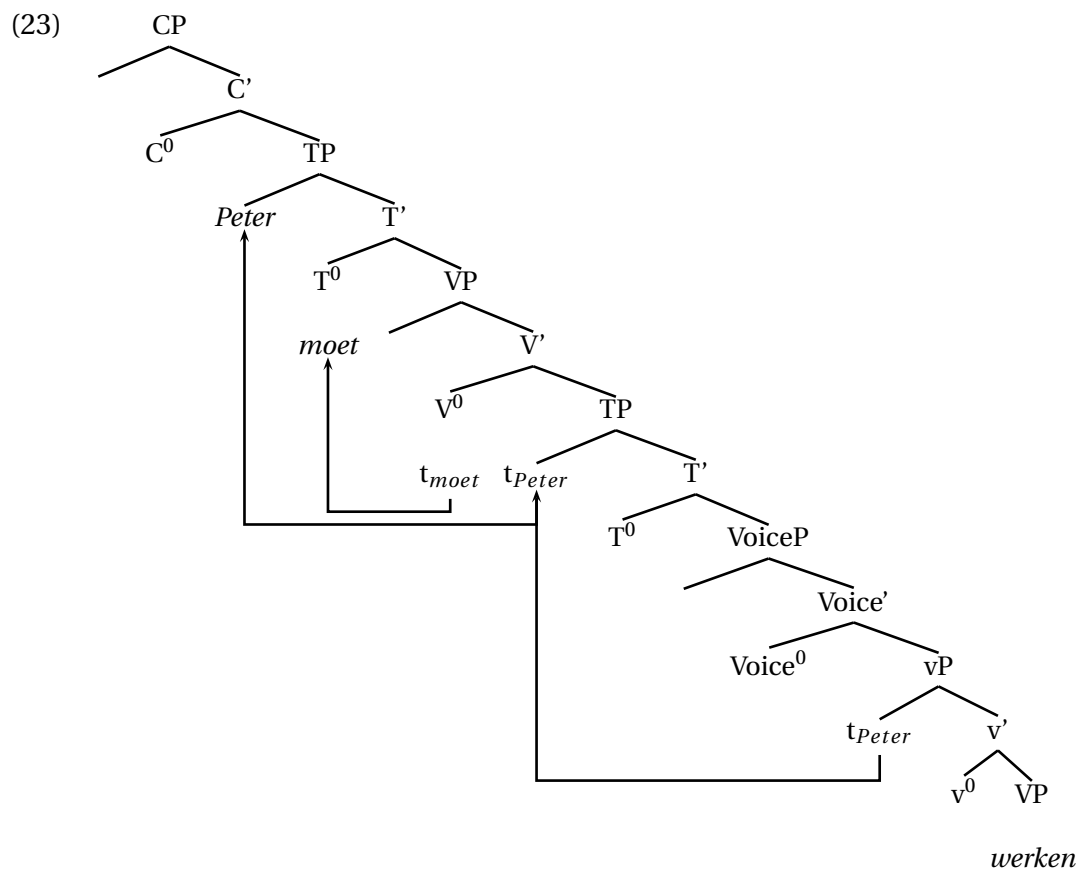
- (22) Peter moet werken.
Peter has.to work

⁵There are two arguments for the claim that modals select a TP complement and not a VP or vP complement. First, the complement can contain time modification different from that in the matrix clause.

- (i) Gisteren moest ik volgende week komen en nu zijn de plannen alweer veranderd
yesterday must.PAST I next week come and now are the plans again changed
Yesterday I had to come next week and today the plans have changed again.

Secondly, Dutch has one modal *hoeven* 'need' that behaves exactly like the other modals except in that it combines with a to-infinitive and that it is an Negative Polarity Item (NPI), as you can see in (ii).

- (ii) a. De auto hoeft niet gewassen te worden.
the car needs not washed to become
The car doesn't need to be washed.
b. Er hoeft niet gedanst te worden.
there needs not danced to become
There doesn't have to be someone dancing.
c. Het hoeft niet te regenen.
it needs not to rain
It doesn't have to rain.
d. Je mag komen, maar je hoeft niet.
you are.allowed.to come but you need not
You're allowed to come, but you don't have to.



In this tree structure the modal V^0 *moet* selects the TP complement *Peter werken*. The external argument of the unergative verb *werken* ‘work’ moves from its base position in [Spec,vP] through the specifier position of the embedded TP to the surface subject position.⁶ This means that the subject moves from inside the verb phrase. In the case of MCE, as in (24), this means that the subject is extracted out of the ellipsis site.

- (24) Mina moet werken vanavond, maar Peter moet niet [t_{Peter} ~~werken~~].
 Mina must work tonight but Peter must not work
 Mina has to work tonight, but Peter doesn’t have to.

2.3 Summary

So far we have seen that Dutch MCE provides us with a paradox: it differs from English VPE in not allowing object extraction, which is an argument against a deletion account. Subject extraction, however, is allowed, even when the subject is the internal argument of the embedded infinitive, leading us to suspect that there is indeed syntactic structure to host the trace of this movement.

The claim I make in this paper is that Dutch MCE does involve deletion of a fully-fledged verb phrase. Why object extraction is not allowed I will show to be due to another factor. In the next section I explain how ellipsis works exactly and then I apply

⁶I have also indicated the V-to-T movement that the modal verb undergoes, but this movement is irrelevant for the discussion presented here.

this analysis to Dutch MCE. Section 4 takes us back to English and shows how VPE is derived. The details of these analyses will explain the differences between both languages.

3 Dutch modal complement ellipsis: Analysis

3.1 The mechanism behind ellipsis

Before I can present the actual analysis for Dutch MCE, I have to elaborate more on how ellipsis works, i.e. what I see as the mechanisms behind ellipsis in the Minimalist framework. The core ingredients of my analysis are the following:

- (25) Licensing of ellipsis
- (1) Ellipsis is triggered by a checking relation between the ellipsis site XP and the licensing head L^0 .⁷
 - (2) There is a feature [E] which occurs in X^0 and marks XP for non-pronunciation at PF (parallel to Merchant's 2001 [E]-feature).
 - (3) When L^0 is merged, [E] is checked via Agree, sending XP off to Spell-Out and hence deletion takes place.
 - (4) As a result, the ellipsis site is no longer accessible for any syntactic operations.

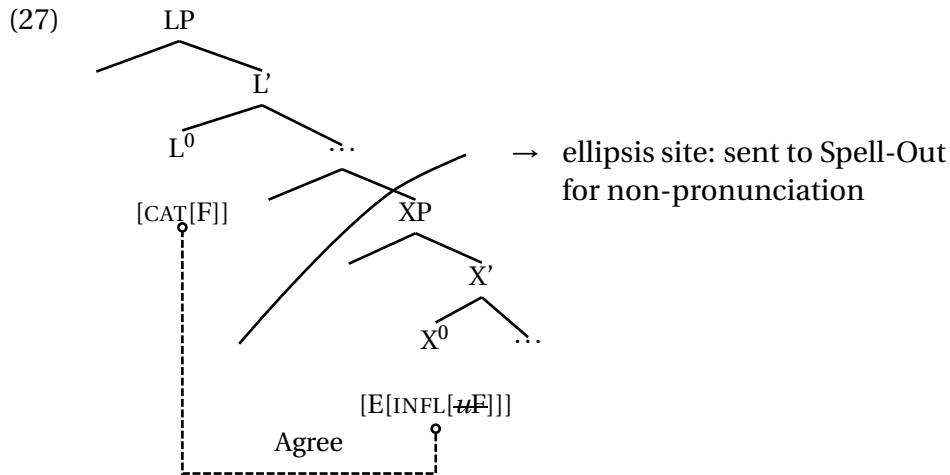
An important question we have to ask here is: what is the nature of this [E]-feature?⁸ As said above, the [E]-feature is parallel to the ellipsis feature introduced in Merchant (2001) and further developed in Merchant (2004). Now, Merchant's [E]-feature has a specific syntax. I also claim this to be the case for this [E]-feature: it is a feature that can only occur on a specific head X^0 — the head of the constituent that will be elided. It also has uninterpretable inflectional (INFL) features that can be checked against the category (CAT) features F of another specific head L^0 , the head licensing the ellipsis. In (26) I show what the lexical entry of such an [E]-feature would look like.

- (26) The syntax of E^0
- $$E \begin{bmatrix} \text{INFL} & [uF] \\ \text{SEL} & [X] \end{bmatrix}$$

How this licensing process works is illustrated in the schematic tree structure below. (In the trees that follow, the ellipsis site is marked by a curved line.)

⁷It has been shown in Lobeck (1995) that only certain heads can license ellipsis.

⁸We could see [E] as a feature with several subfeatures, or as the name we give to a certain bundle of co-occurring features. This bundle can only merge with a specific head it is specified for (parallel to Merchant 2001) and when it occurs on this head, this implies that this whole phrase is spelled out as null. How exactly this can be implemented I defer to further research.



One of the immediate consequences of ellipsis licensing via Agree is that the licensing head and the ellipsis site do not have to be adjacent, i.e. they do not have to be in a head-complement relation, whereas this is required in Merchant's analysis. That this is a welcome consequence can be shown for English VPE. For a sentence such as the one in (28) it has been assumed that the head that licenses the ellipsis is the finite auxiliary in T^0 , *should* (see Zagona 1982, 1988; Martin 1992, 1996 and Lobeck 1995).

- (28) I wasn't thinking about that.
 - Well, you SHOULD have been [~~thinking about that~~].

This licensor is obviously not in a head-complement relation with the elided constituent. It is separated from the ellipsis site by *have been*. In an account where the licensing is done via Agree this is not a problem.

The aspect that will be of most importance in this paper, however, concerns what is stated in the fourth point, repeated in (29).

- (29) As a result [of the checking relation], the ellipsis site is no longer accessible for any syntactic operations.

This point makes a very clear prediction: if the ellipsis site is not available for syntax anymore after the licensing head has been merged, nothing can move out of the elided constituent anymore. In other words, the projections between the licensing head and the ellipsis site play a crucial role in determining the extraction possibilities: only phrases that move to a position in between, or to the specifier of the licensing head, can survive the ellipsis. Movement out of the ellipsis site to a position higher than LP is not allowed.

So far I have simply presented the mechanisms I claim are operative in licensing ellipsis: the ellipsis site bears an ellipsis feature with an uninterpretable INFL and the CAT-features on the licensing head can check this via Agree. Due to this checking the ellipsis site is sent off to Spell-Out and is therefore no longer accessible to syntax. Differences in licensing head and ellipsis site, depending on the language and the type of ellipsis, therefore imply differences in extraction possibilities. The next subsection illustrates this effect for Dutch modal complement ellipsis.

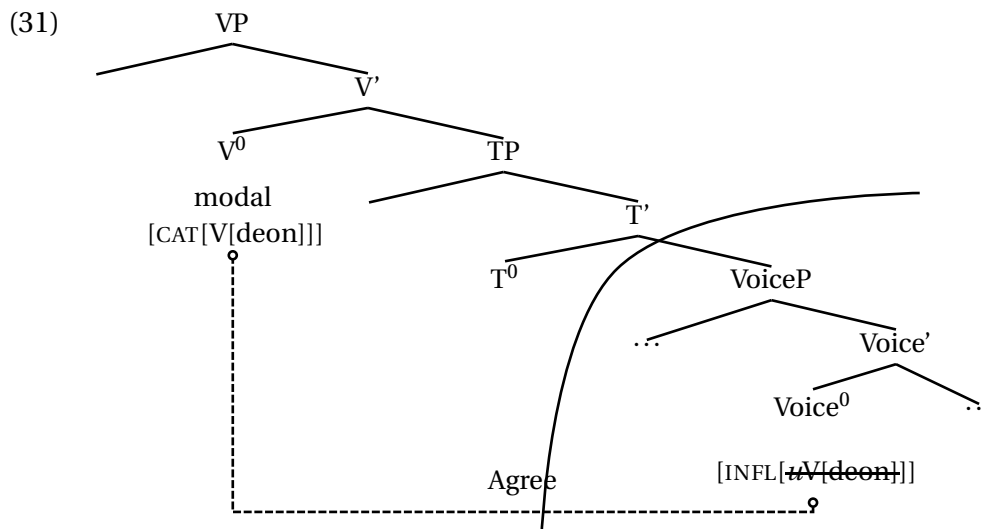
3.2 Licensing Dutch MCE

Recall the discussion in 2.2 above about the properties of Dutch MCE: object movement out of the ellipsis site is degraded, while subjects can be extracted without any problem. We will see in this subsection that applying the analysis of ellipsis presented here to Dutch MCE provides us with a straightforward account of this extraction puzzle.

What varies across languages and ellipsis types is the specification of the [E]-feature, namely which is the head X^0 it selects and which head can act as the licensing head checking the INFL value. I suggest that for Dutch MCE the modal V^0 -head is the licensing head, since only (deontic) modals license ellipsis of their infinitival complement. As for the ellipsis site itself, Dutch MCE elides VoiceP, as I will show below. This means [E] for Dutch MCE has the lexical entry in (30).

$$(30) \quad E_{MCE} \left[\begin{array}{l} \text{INFL} \quad [uV[\text{deon}]] \\ \text{SEL} \quad [\text{Voice}] \end{array} \right]$$

The tree in (31) illustrates how the ellipsis is licensed given what has just been said: when the licensing modal is merged, the [E]-feature gets checked against the category features on V^0 . Consequently, VoiceP gets sent off to Spell-Out and is thus no longer visible for syntax. Note that I distinguish Voice^0 from v^0 here (see Merchant 2007, 2008a; Baltin 2007) and that I consider Voice^0 to be the clause-internal phase head rather than v^0 (see Baltin 2007).



Recall that Dutch MCE disrupted the simple extraction pattern: object extraction out of the ellipsis site is not allowed, while subject extraction is. The relevant examples are repeated in (32).

- (32) a. *Ik weet niet wie Katrien moet uitnodigen, maar ik weet wie ze niet
 I know not who Katrien must invite but I know who she not
 moet.
 must
 INTENDED READING: I don't know who Katrien should invite, but I know
 who she shouldn't.

- b. Deze broek moet vandaag niet gewassen worden, maar die rok moet
 this pants must today not washed become but that skirt must
 wel.

PRT

These pants don't need to be washed today, but that skirt does.

Now that we have seen how the ellipsis mechanism works and how it can be applied to Dutch MCE, we can look at some examples to see whether these extraction facts come out right. First, I demonstrate that subject extraction is correctly predicted to be allowed in this system. Next, the *wh*-object extraction data are shown to fall out of the analysis. Finally, I take a closer look at object scrambling and explain why it is illicit when the infinitival complement is elided.

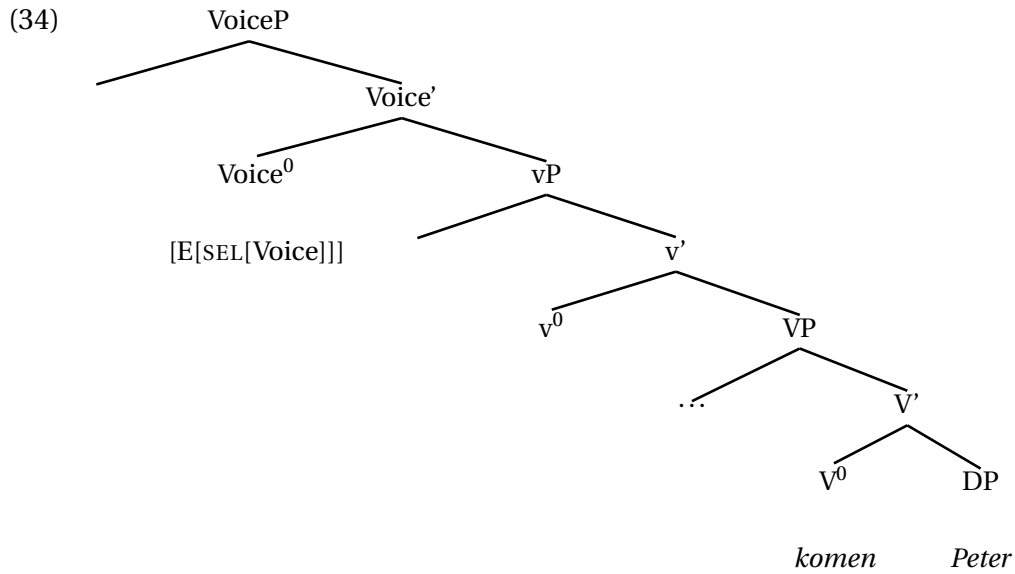
3.3 Subject extraction is allowed

We have seen above that modals are raising verbs, which means that the subject is base-generated in a position below the modal. When the embedded verb is a transitive or unergative verb, the subject is base-generated in [Spec,vP] inside the embedded TP. When the embedded clause contains an unaccusative verb or is passive, on the other hand, the subject is base-generated in the complement position of the main verb. Because it is even more obvious that the subject is extracted out of the ellipsis site in the latter cases, I take a sentence with an unaccusative verb and go over the derivation step by step.

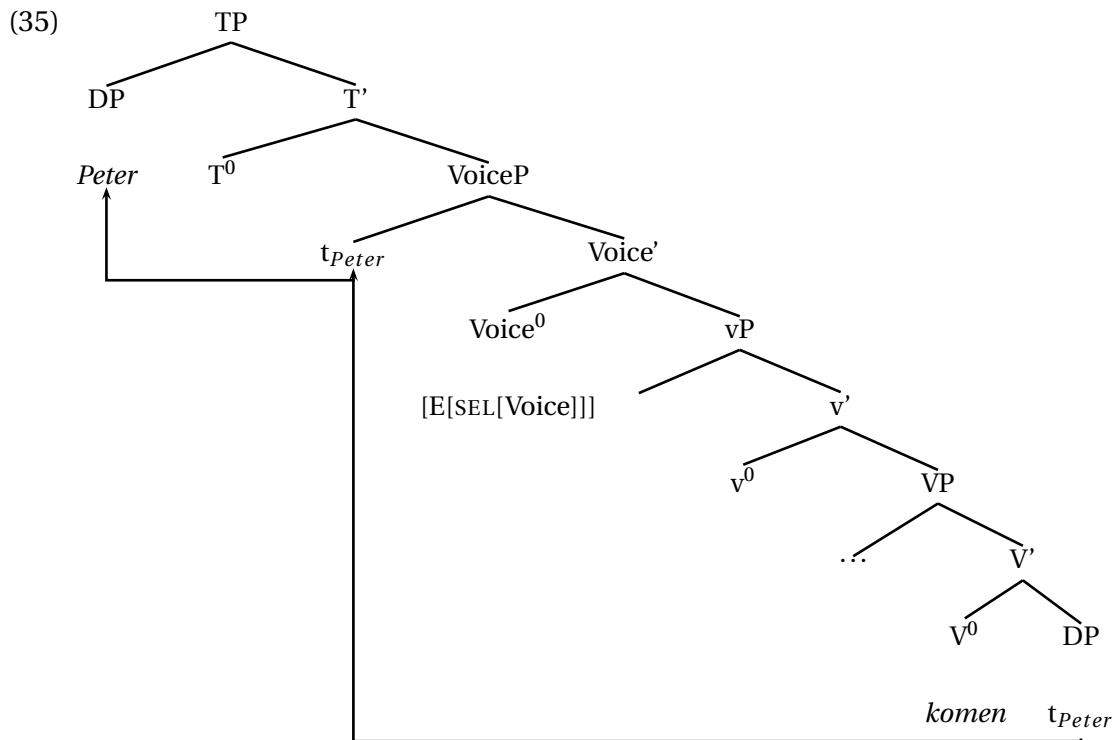
- (33) Mina kan komen, maar Peter kan niet.
 Mina can come but Peter can not
 Mina can come, but Peter can't.

In the first step we generate VoiceP, since it is not until we get to Voice⁰ that the derivation deviates from the derivation of a non-elliptical sentence. In the tree structure in (34) we can see that the derived subject *Peter* is base-generated in the complement position of main verb *komen* 'come' and that Voice⁰ bears an [E]-feature.⁹

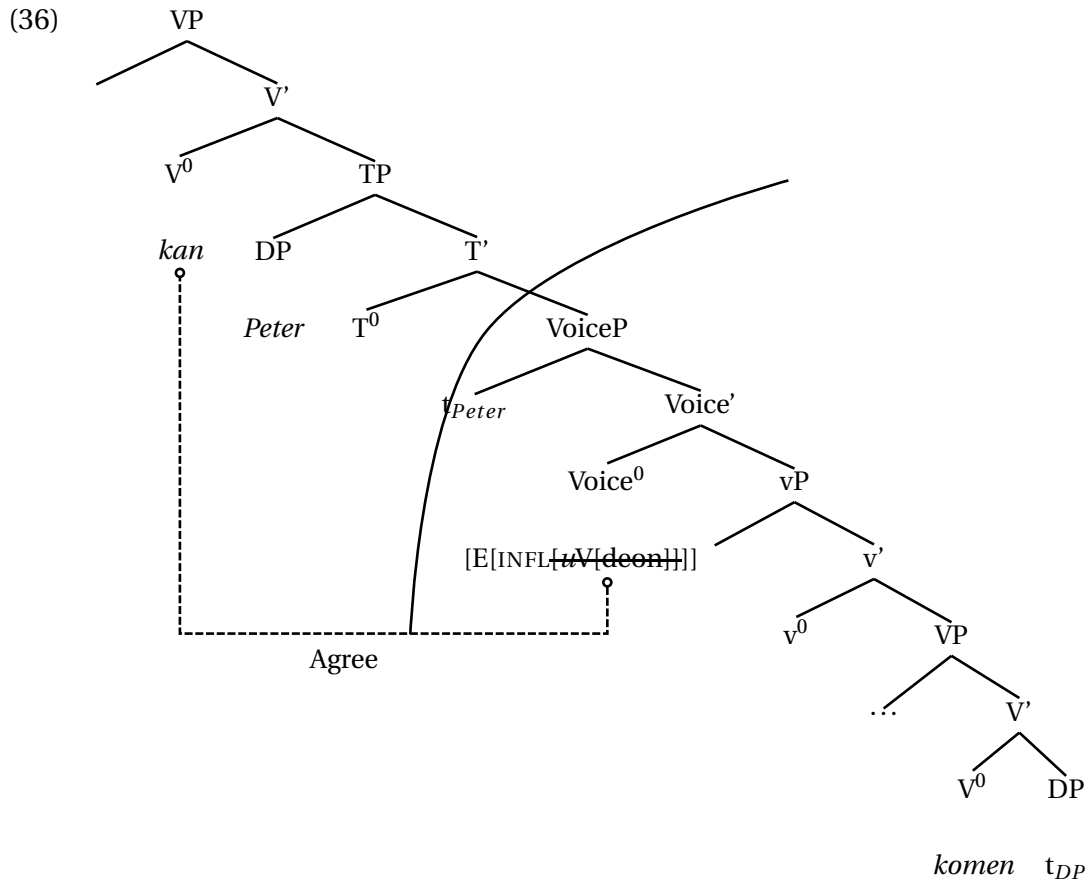
⁹Since Voice⁰ is a phase head, it attracts all the constituents bearing uninterpretable or unvalued features to its specifier, in order to save them from being sent off to Spell-Out already. Consequently, it attracts the subject, which has an unvalued CASE-feature, to its specifier position. This movement could be considered improper movement, however: the subject moves to an A'-position, but still has to move to an A-position later in the derivation for its CASE-feature to be valued. One could claim, on the other hand, that movement to the edge of a phase in order to be able to check A-features — i.e. the features triggering A-movement — later on is not considered A'-movement. Only if a phrase would move to an A'-position to check an A'-feature — where [EPP] does not denote an A'-feature — and move to an A-position afterwards would it be considered improper movement.



A second step in the derivation merges T^0 and the TP projection. As we can see in (35), the subject *Peter* moves to [Spec,TP] (via [Spec,VoiceP], see footnote 9) because of an [EPP] feature on T^0 which requires the specifier position of T^0 to be filled.



Finally, the licensing head V^0 is merged. The uninterpretable INFL of the ellipsis feature on Voice^0 is checked against the category feature of V^0 via Agree, and VoiceP is sent off to Spell-Out for non-pronunciation and is hence no longer available for syntactic operations.



Note that from its position in [Spec,TP] the subject is free to undergo further operations. It can either end up in the specifier of the higher TP (subject raising, as in (37)) or move further on to [Spec,CP], in case the subject is a wh-phrase, cf. (38). In other words, this analysis shows how A- and A'-extraction of the subject are allowed in Dutch MCE.

(37) Mina kan komen, maar **Peter** kan niet.
 Mina can come but Peter can not
 Mina can come, but Peter can't.

(38) Ik weet wie er niet mocht komen en **wie** er wel
 I know who there not was.allowed.to come and who there AFF
 mocht.
 was.allowed.to
 I know who was allowed to come and who wasn't.

3.4 Wh-object extraction is ungrammatical

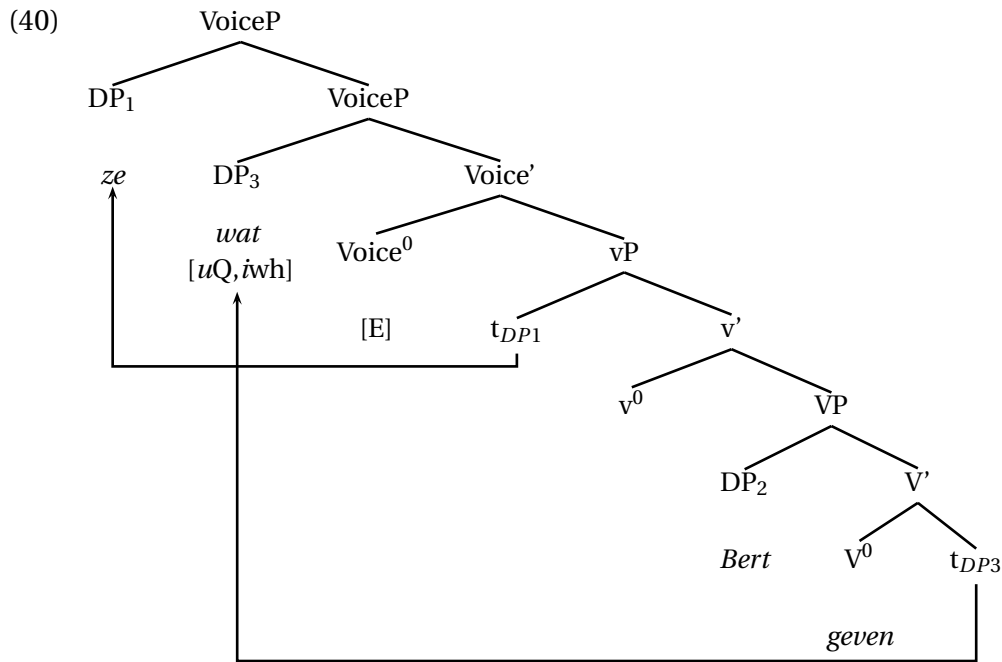
Contrary to the subjects, objects are not allowed to extract out of the ellipsis site, as is repeated in (39) for a wh-object. I will demonstrate how my account predicts this by going over the derivation of the ungrammatical elliptical sentence step by step.

(39) A: Wat gaat Katrien Bert geven?
 what goes Katrien Bert give

B: Dat weet ik niet. **Wat** moet ze *(Bert geven)?
 that know I not what should she Bert give

INTENDED READING: What should she give Bert?

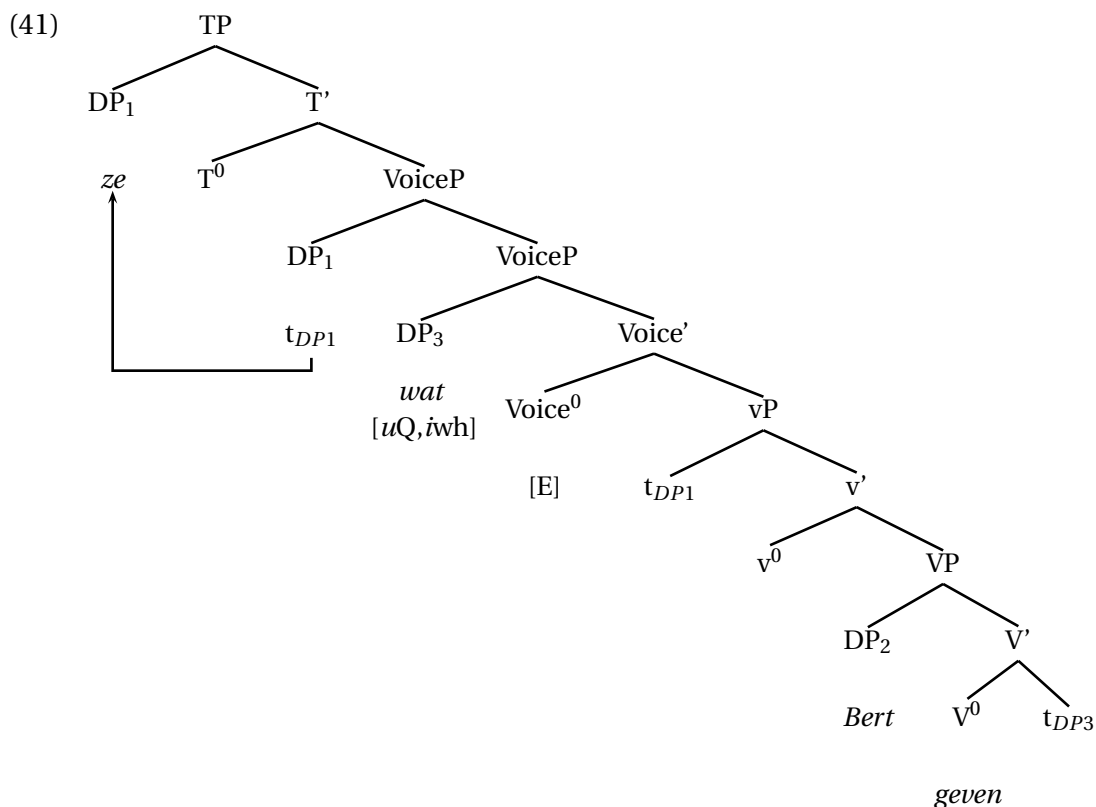
Firstly, we start out from VoiceP again. As before, the head Voice⁰ bears the [E]-feature. Because both the subject and the wh-object still bear unchecked uninterpretable features — an unvalued Case-feature in the case of the subject and a Q-feature in the object's — they both move to the phase edge [Spec, VoiceP] in order to escape being sent off to Spell-Out before the features get valued.¹⁰



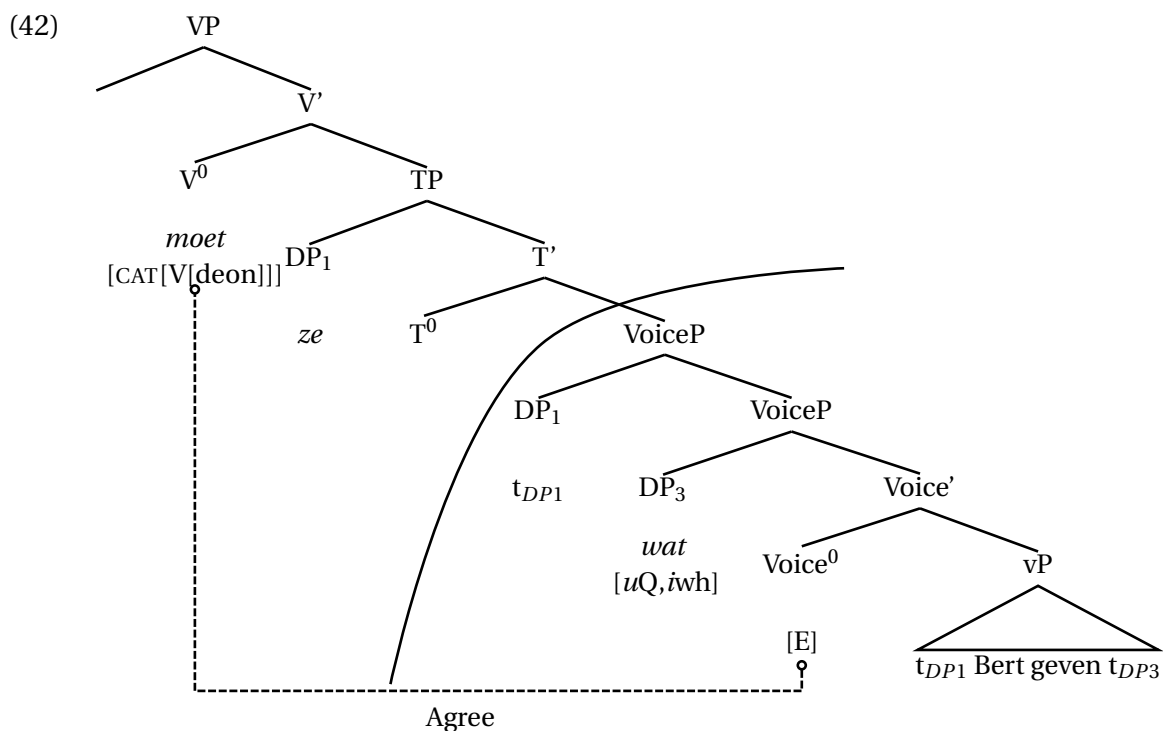
Next, we merge T⁰ and project TP as in (41). The subject *ze* she' moves to [Spec, TP], to check the [EPP]-feature on the T⁰ head.¹¹

¹⁰In the tree structures I only show what is relevant for the derivation later.

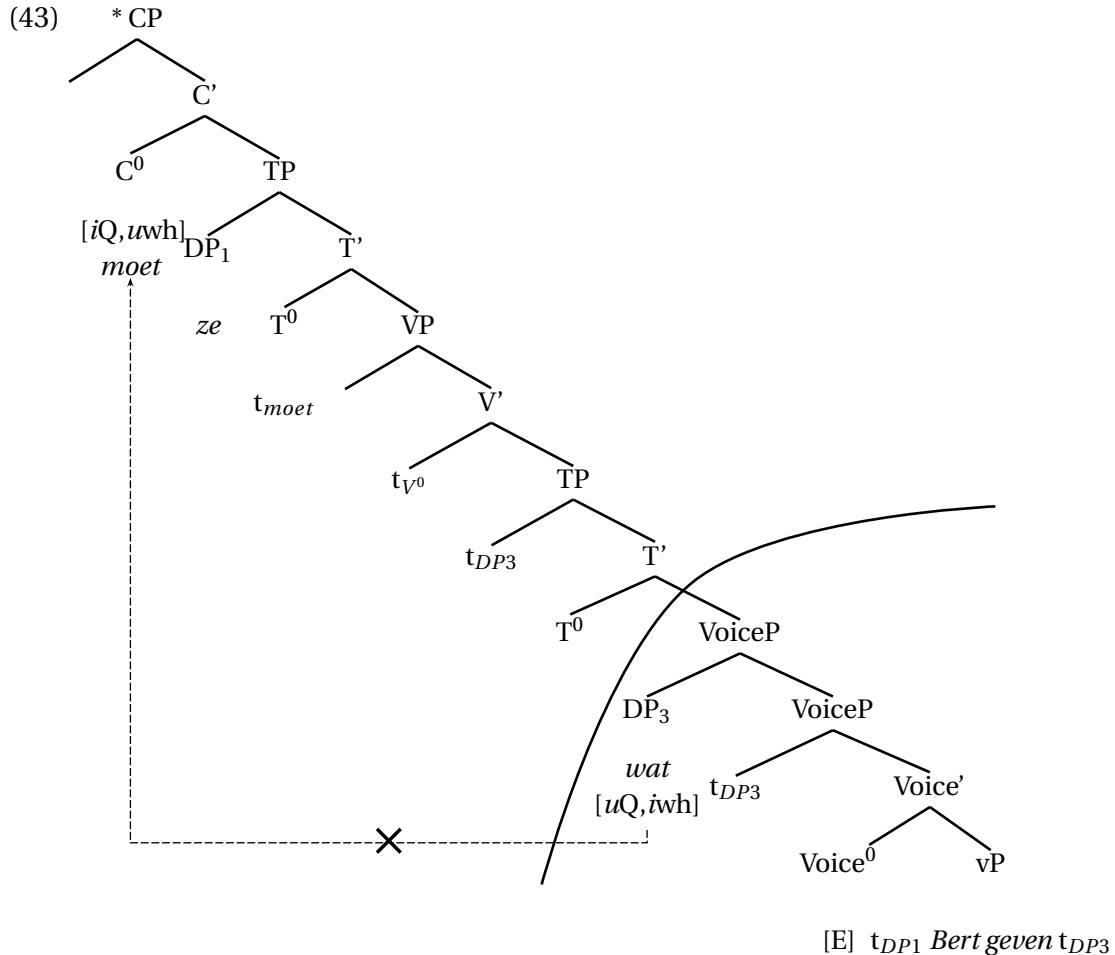
¹¹One could say that both object and subject are equidistant with respect to T⁰ and that T⁰ could just as well attract the object to its Spec (thanks to Patricia Cabredo Hofherr for pointing this out to me). A tentative explanation for this would be that the [EPP]-feature on T⁰ opts for the subject because that still has an unvalued [Case]-feature, unlike the object.



The next step is the merger of the licensing modal head V^0 , bearing the right category features to Agree with [E] and consequently, VoiceP is sent off to Spell-Out for non-pronunciation. The wh-object, which has moved as far as [Spec, VoiceP] but not further, is therefore stuck in the ellipsis site, unlike the subject, which moved to [Spec, TP] prior to merger of the licensing head.



Finally, we merge the TP and the CP projection. C^0 bears an uninterpretable $[wh]$ -feature that cannot be checked. In non-elliptical sentences it would attract the wh-object, but in this case it cannot, for the object is elided. Furthermore, the $[uQ]$ -feature on the object also remains unchecked. As a result the derivation crashes.¹²



This subsection has shown us why wh-object extraction out of the ellipsis site is disallowed in Dutch modal complement ellipsis. Next I will illustrate how this account also correctly blocks object scrambling.

3.4.1 Object scrambling is ungrammatical

As we have seen above, Dutch MCE does not allow the definite object to scramble across negation, as in (44). I claim that this is because object scrambling is from a position inside the ellipsis site to a position outside the ellipsis site, but this movement would take place after the merger of the licensing head.

- (44) Ik wil je helpen, maar ik zal (*je) niet kunnen.
 I want you help but I will you not can
 I want to help you, but I will not be able to.

¹²As can be seen in the tree structure in (43), the modal first moves to T^0 to pick up Tense and then further moves on to C^0 . The subject, in turn, moves to the higher $[Spec, TP]$ to get its Case-feature valued. Both of these movement operations are rather irrelevant to the analysis, however.

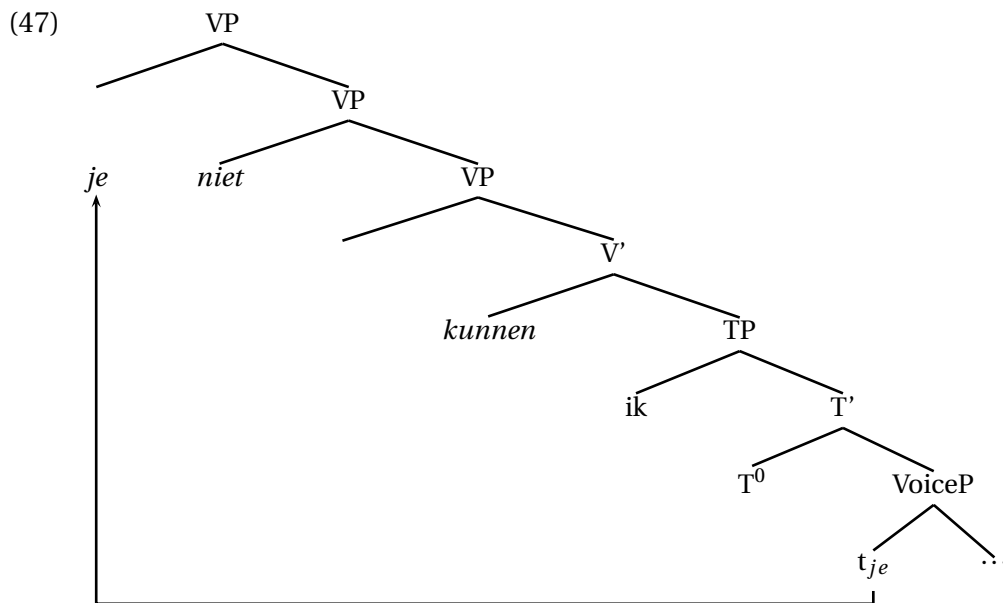
In Dutch non-elliptical sentences a definite object scrambles from [Spec, VoiceP] to a position in the higher clause, higher than the modal.¹³ Evidence for such a claim comes from a combination of data. First of all, a definite object obligatorily precedes negation in non-elliptical sentences, as in shown for the pronoun *je* 'you' in (45).

- (45) *Ik wil je helpen, maar ik zal <je> niet <*> je> kunnen helpen.*
 I want you help but I will you not you can help
 I want to help you, but I will not be able to help you.

Secondly, the meaning of the example in (46) tells us that negation scopes in the higher clause. It cannot get the interpretation where the negation is inside the scope of the modal, inside the embedded infinitive clause.

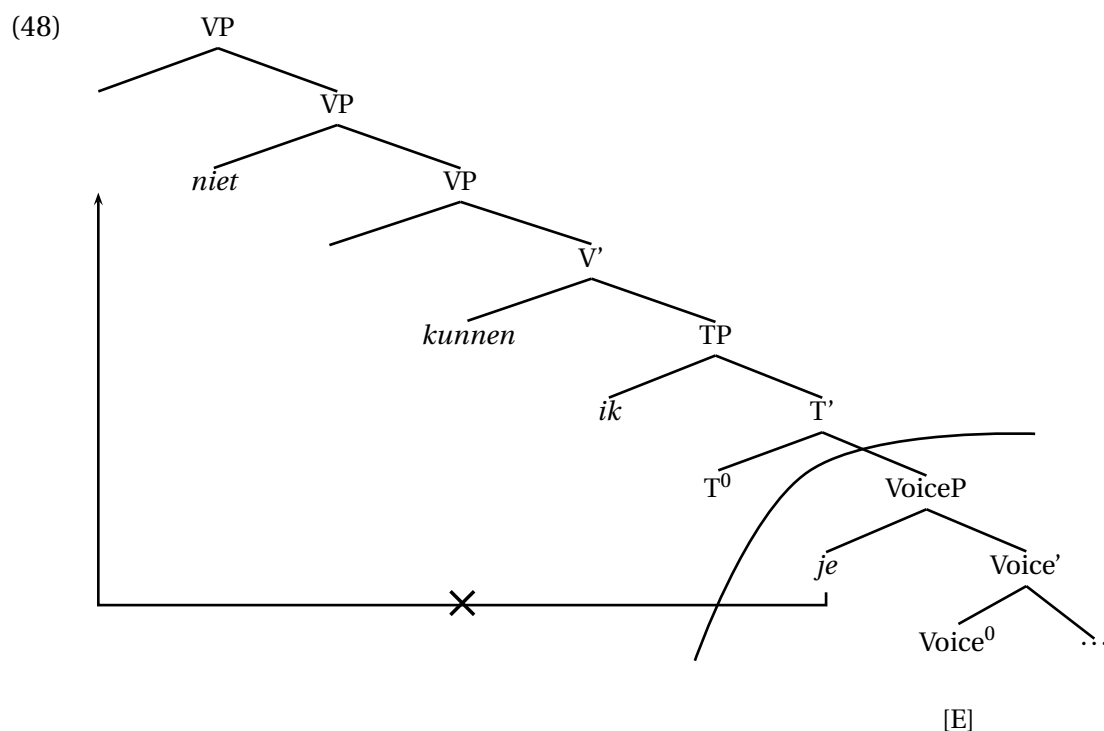
- (46) *Ik zal je niet kunnen helpen.*
 I will you not can help
 = I will not be able to help you
 ≠ I will be able not to help you.

This means that object scrambling takes the object to a position in the higher clause as well. For convenience's sake, I adjoined both the scrambled object and the negation to VP in the tree below, leaving aside their exact position. Crucially, they both occur higher than the modal's base-generation position, as is shown in (47).



In the elliptical sentence in (44) this means that ellipsis takes place before the object can move out of the ellipsis site.

¹³The exact reason for this movement could have to do with some [topic]-feature on the definite object, but that is immaterial to the analysis in this paper.



Summing up, I have demonstrated how the account presented here explains the contrast between subjects and objects regarding modal complement ellipsis in Dutch. Only subjects survive Dutch MCE, because they move out of the ellipsis site to a position between the ellipsis site and the ellipsis licensing head. Since objects do not have any position to move to prior to the merger of the ellipsis licensing head, they are stuck in the ellipsis site and do not get pronounced.

4 English VP ellipsis: Analysis

The previous section was dealing with ellipsis of a verbal phrase in Dutch. The phenomenon of VP ellipsis (VPE) is, however, much more widely discussed for English. A typical VPE example is the sentence in (49): the verb phrase *go to Italy* is not pronounced in the second conjunct because it has a local antecedent in the first conjunct.

(49) Kim didn't go to Italy, but Tom did.

We have seen above that there are certain differences between English VPE and the Dutch counterpart eliding infinitival complements of modals, but the one that concerns us here is extraction. In English VPE, both objects and subjects can be extracted out of the ellipsis site (cf. Schuyler 2002, Merchant 2008b). The sentence in (50a) displays movement of a *wh*-object out of the ellipsis site, while the pseudogapping in (50b) is considered to involve extraction of the object remnant out of the verb phrase prior to deletion. Just like Dutch, English also allows subjects to extract, as is illustrated in (51a) for unaccusatives and in (51b) for passives.

- (50) a. What is Tom going to buy? – I don't know. **What** should he [~~buy *t* *what*]~~?
 b. Mina rolled up a newspaper and Tom did **a magazine** [~~roll up *t* *a magazine*]~~

- (51) a. I know Peter can't come to my talk, but **who** can [~~come t_{who} to my talk~~]?
 b. Mina wasn't arrested, but **she** should be [~~arrested t_{Mina}~~].

If we want to apply the analysis put forward for Dutch MCE to English VPE, we should be able to account for these differences. First of all we have to determine what is the head licensing VPE in English and which part of the sentence exactly gets deleted. I assume that the head licensing English VPE is the modal or auxiliary in T⁰ (see Zagona 1982, 1988; Lobeck 1995; Johnson 2001) and that v⁰ is the head bearing the [E]-feature (see Merchant 2007, 2008a). The lexical entry for English VPE [E] is given in (52).

$$(52) E_{VPE} \begin{bmatrix} \text{INFL} & [uT] \\ \text{SEL} & [v] \end{bmatrix}$$

Next, I present the evidence for these differences from the analysis for Dutch. In Dutch MCE the licensing head is a modal too, but there the modal is not in T⁰; rather, it is a V⁰ head selecting a TP complement. This explains why only modals can license Dutch MCE, and not auxiliaries. The claim that English modals, on the other hand, are T⁰ heads, just like temporal auxiliaries, however, is not new. They behave differently from Dutch modals (see IJbema 2002, Wurmbrand 2003). Firstly, unlike Dutch modals, English modals lack inflection. In (53a/b) we see that Dutch modals make a distinction between singular and plural inflection on the finite modal verb, just like regular verbs. English modals, on the other hand, do not display person inflection: there is no form **musts* for the third person singular, for instance. The sentences in (54) show that Dutch modals occur in the past tense and have a past participle, unlike their English counterparts, and (55) contains a modal infinitive in Dutch, while English modals do not occur in the infinitive.

- (53) a. Ik/ Jij/ Hij **moet** naar de supermarkt gaan.
 I you he must to the supermarket go
 b. Wij/ Jullie/ Zij **moeten** naar de supermarkt gaan.
 we you.pl they must to the supermarket go
 I/You/He/We/They must go to the supermarket.
- (54) a. Hij **mocht** niet buiten spelen.
 he may.PAST not outside play
 He was not allowed to play outside.
 b. Hij heeft dat nooit **gekund**.
 he has that never can.PST PRTC
 He was never able to do that.
- (55) Hij zal niet **mogen** komen.
 he will not may.INF come
 He won't be allowed to come.

Secondly, English modals cannot be stacked, while Dutch modals can, witness (56).

- (56) Hij **kan** niet **willen mogen** komen.
 he can not want may come
 It is possible that he doesn't want to be allowed to come.

Thirdly, deontic modals in Dutch can take DP complements (see Barbiers 1995). English modals, on the other hand, cannot, as is clear from the translation in (57).

- (57) Hij **mag** een koekje.
 he may a cookie
 He is allowed to have a cookie.

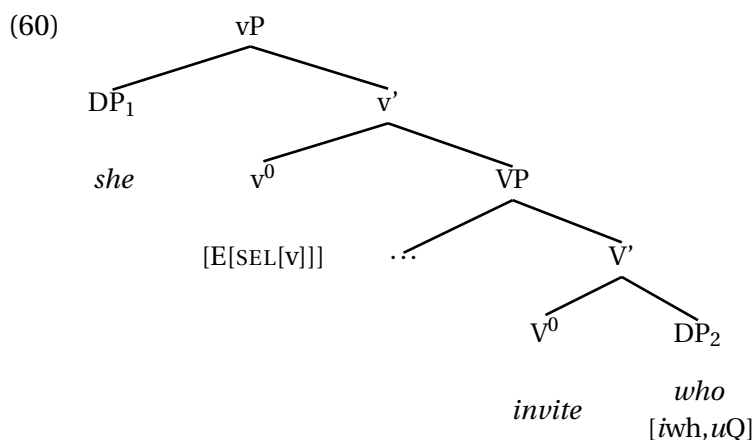
These facts provide evidence for the claim that English and Dutch modals are not base-generated in the same position. English modals are T^0 heads, while Dutch modals are V^0 heads. Thus, the VPE ellipsis licensing head is T^0 in English. Now I will show that English VPE also differs from Dutch MCE in the constituent it elides. English VPE involves deletion of a smaller part of the sentence: it deletes vP (see Merchant 2007, 2008a,b) instead of VoiceP. Empirical evidence is provided by sentences with a passive auxiliary. This passive auxiliary is deleted in Dutch, but not (necessarily) so in English.

- (58) a. Deze broek wordt best niet gewassen, maar die rok mag wel (*
 this pants become best not washed but that skirt may PRT
 worden).
 become
 These pants don't have to be washed, but this skirt can be washed.
 b. The trash is taken out whenever it is apparent that it should be.

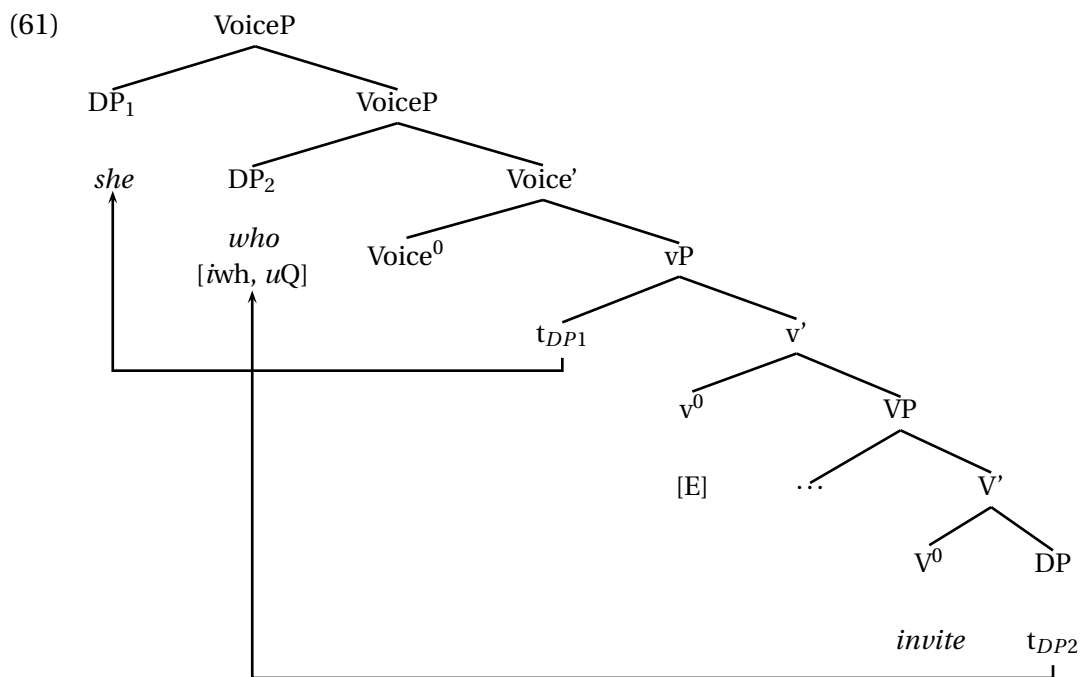
Now, how do these differences explain the difference in extraction possibilities between English and Dutch? Let us go over the derivation of the sentence in (59) with wh-object movement out of the ellipsis site.

- (59) I don't know who Mina shouldn't invite, but I know who she should [_{vP} ~~invite~~ ~~who~~].

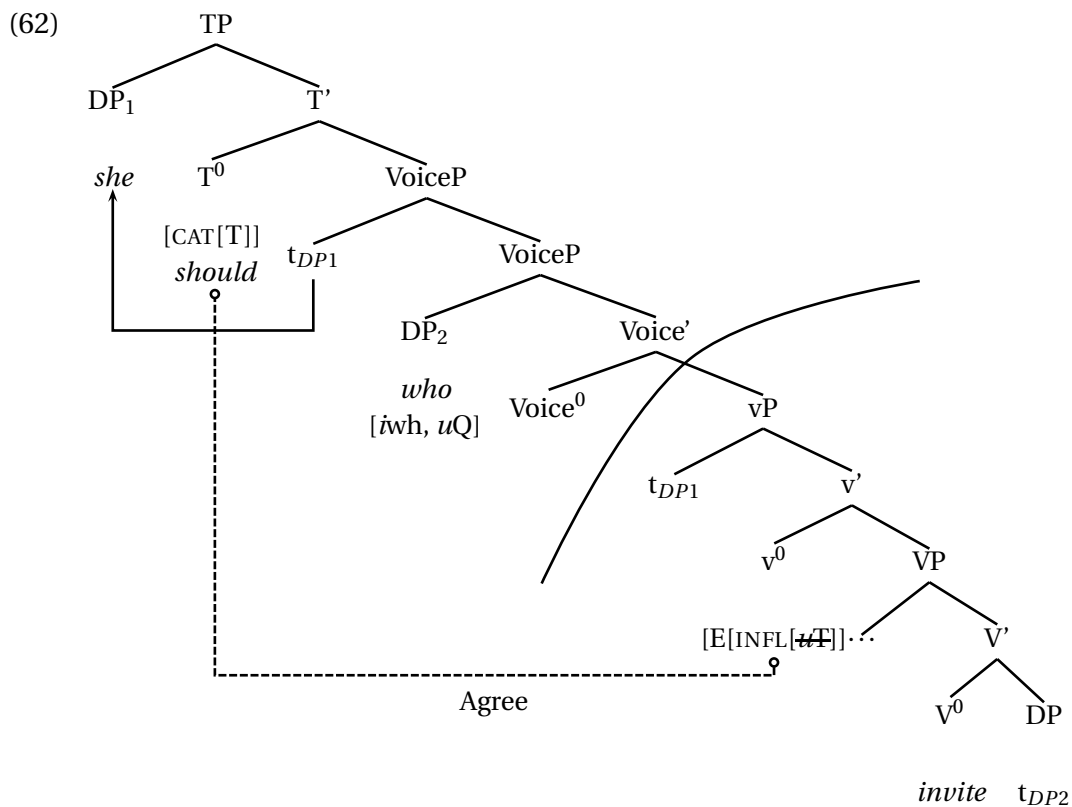
We start out from the derivation of vP this time, because this is the constituent which is elided in English VPE. As illustrated in the tree structure in (60), v^0 is the head bearing an [E]-feature.



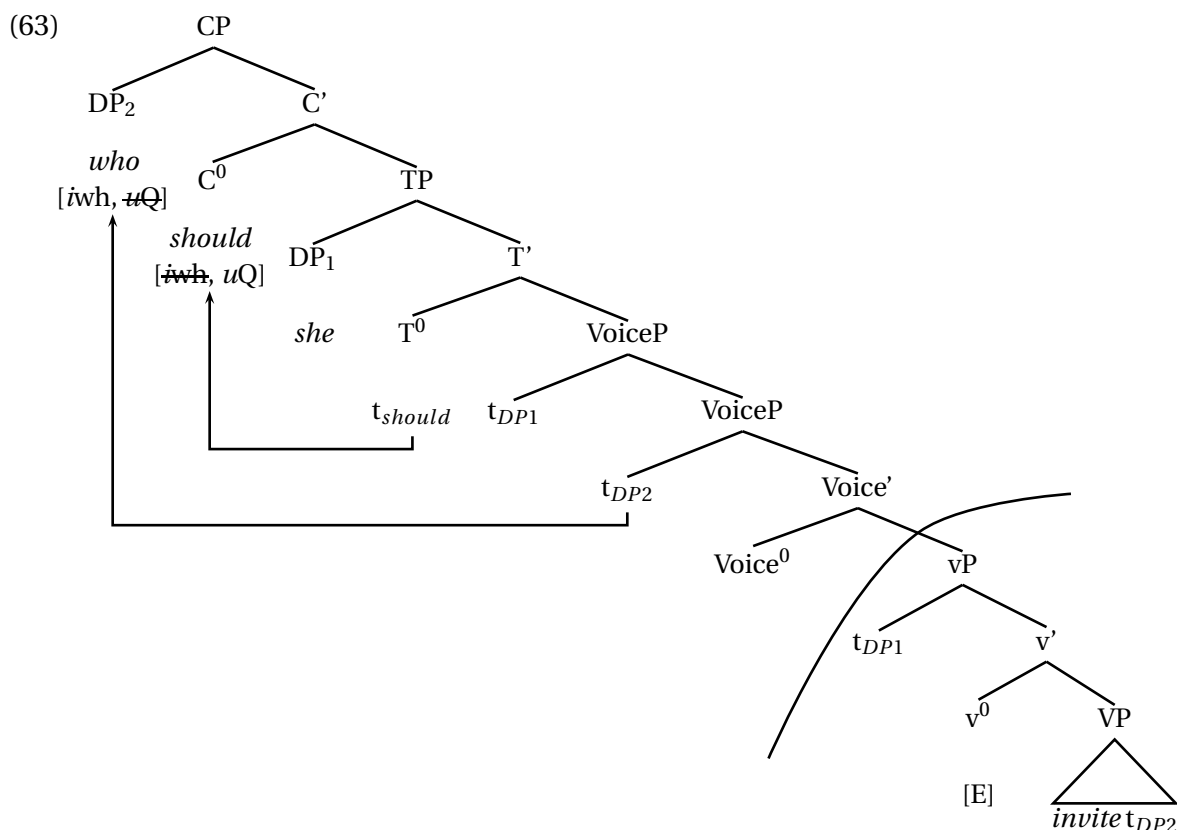
The next step in the derivation is merger of the phase head Voice^0 and the projection of VoiceP. Because Voice^0 is a phase head it attracts the subject and the wh-object to the phase edge, as in (61).



Then we merge the T^0 head, which licenses the ellipsis. The subject moves to [Spec,TP] to get its Case feature valued and to check off the uninterpretable $[\phi]$ -features on T^0 . The [E]-feature on v^0 is also checked against the category feature on T^0 and consequently the little vP is sent off to Spell-Out, marked for non-pronunciation.



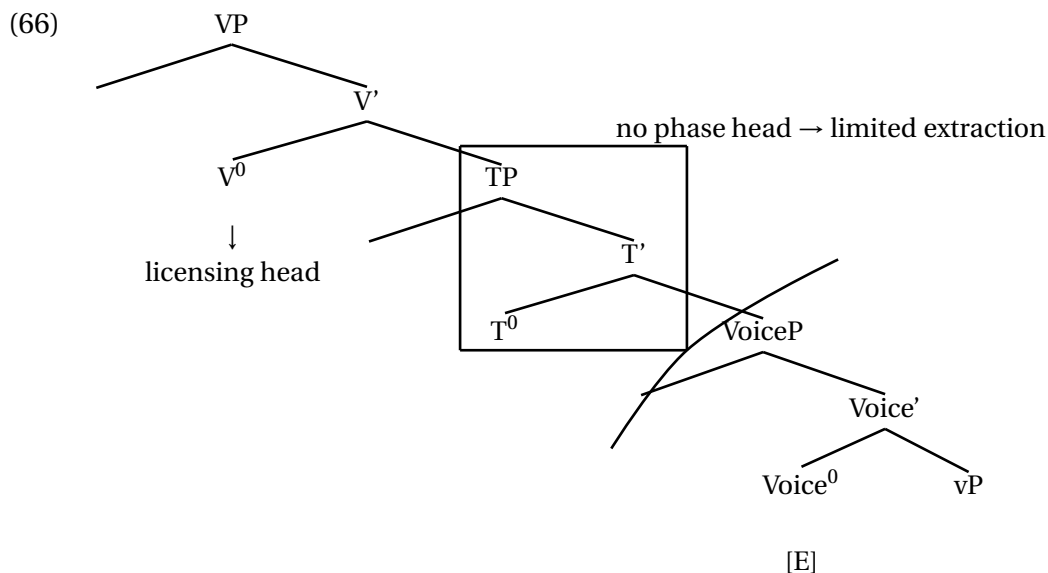
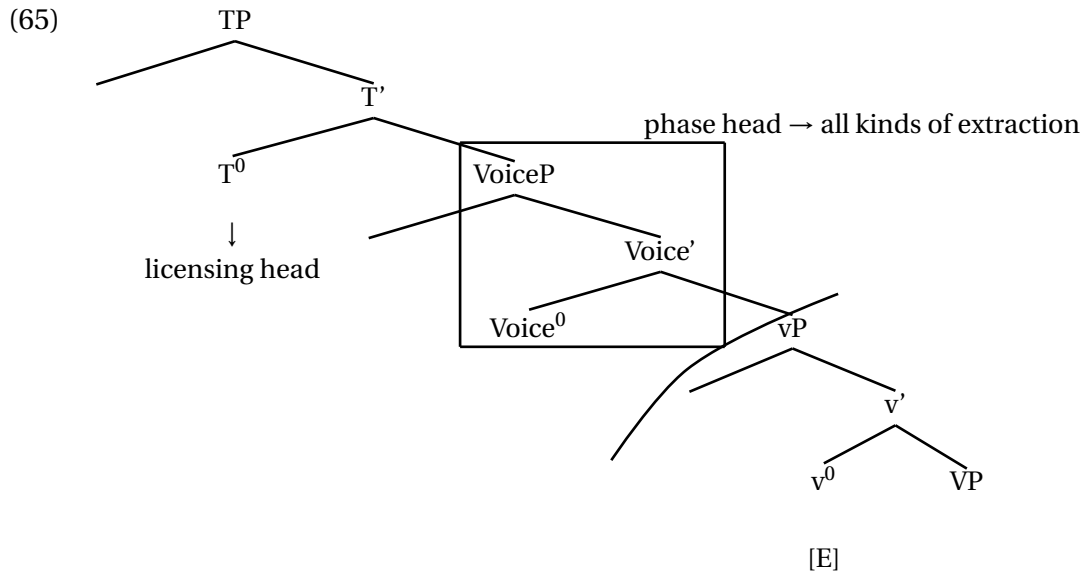
Finally, the C^0 head is merged, projecting the CP. As you can see in (63), the *wh*-object moves from the phase edge [Spec, VoiceP] to [Spec, CP] to check C^0 's [*uwh*] and to get its own [*uQ*] feature checked. The finite verb *should* moves to C^0 and as a result we get the grammatical sentence in (64).¹⁴



(64) (I don't know who Mina shouldn't invite, but I know) who she should.

Summing up, we have seen that in English both subjects and objects can survive VP ellipsis because they can move out of the ellipsis site to the clause internal phase edge [Spec, VoiceP] prior to merger of the ellipsis licensing head T^0 . In this analysis the projections between the licensing head and the constituent that is elided play a crucial role when it comes to determining what can be extracted out of the ellipsis site and what cannot. We predict to see the same pattern as in English every time when there is a phase head intervening: all constituents that move in non-elliptical sentences also move in ellipsis, as in (65). In cases similar to Dutch MCE, on the other hand, we expect only limited extraction. Only constituents moving to [Spec, TP] or adjoining to TP can survive the ellipsis (cf. (66)).

¹⁴I leave out the derivation of the rest of the sentence, because it is irrelevant for the analysis of ellipsis.



5 Conclusion

In this paper I argued for a deletion account of Dutch modal complement ellipsis (MCE). This phenomenon, in which the infinitival complements of deontic modal verbs are missing, looks very similar to verb phrase ellipsis in English. The fact that it does not allow objects to extract out of the ellipsis site, however, at first sight seemed to hint at a proform analysis instead of the deletion approach taken for English VPE in the literature. A closer look showed that MCE disrupts the simple pattern of "extraction means deletion; non-extraction means proform": unlike objects, subjects can be extracted.

I claim that Dutch MCE does indeed involve deletion of a full verb structure and that the illicitness of object extraction is due to the fact that Dutch does not provide an escape hatch for objects prior to the merger of the licensing head, unlike English. More in general, I claim that ellipsis is triggered by an Agree relation between the licensing head and an [E]-feature on the head of the ellipsis site. From the moment this Agree

relation is established, the ellipsis site is sent off to Spell-Out, not to be pronounced but to be deleted at PF due to the [E]-feature. Any constituent that has not moved out of the ellipsis site before this point in the derivation is deleted with the rest of the verb phrase. This means that the projections between the ellipsis site and the licensing head play a crucial role: if a phrase moves to a position on one of the intervening projections, it survives the ellipsis; if not, it is elided. In this paper I have demonstrated that this derives the extraction differences between English and Dutch. Dutch only provides an escape hatch for the subject, as the only intervening projection is TP, while in English anything can get out, for there is a phase head Voice⁰ between the licensing head and the elided vP. Further research will hopefully show that this licensing of ellipsis can be applied to other elliptical constructions as well, so that we can come to a unified treatment of ellipsis in terms of deletion instead of the division between proforms and deletion approaches.

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Resolving similarity in embedded contexts

Ana Arregui

1 Introduction

It is widely accepted that in evaluating counterfactual conditionals we consider what happens in circumstances that are similar to the actual world. In this paper I discuss evidence in favor of an analysis of counterfactuals that links the resolution of similarity to the interpretation of tense.

(Arregui, 2005, 2007a, 2008) presented an analysis of counterfactuals that characterized them as predicates of past features of the world (predicates of a past *situation*). It was argued that only similarity with respect to the relevant past features counts. Since counterfactuals were characterized as a case of modal predication about a (past) part of the world, I will refer to this as the *de re* analysis.

The *de re* analysis links the resolution of similarity directly to the interpretation of tense. My objective in this paper is to discuss novel data that shows that the interpretation of tense in counterfactuals affects our evaluation of similarity. We will compare the evaluation of counterfactuals embedded in relative clauses (in which the embedded tense is free) with counterfactuals embedded in the complement of propositional attitude verbs (in which the embedded tense is bound). As we will see, the free vs. bound distinction has consequences for the evaluation of similarity. We will use examples with quantified subjects to detect variation in the resolution of similarity.

The paper is structured as follows. In Section 2, I will present the *de re* analysis of counterfactuals. My goal is to spell out the main ideas, and prepare the ground for the discussion of embedded contexts. Readers are referred to (Arregui, 2005, 2007a, 2008) for further details and justification. According to the *de re* analysis, the interpretation of counterfactuals only requires that we worry about similarity with respect to *certain* features of the actual world. Instead of global similarity, as sponsored by the classical Lewis-Stalnaker style analysis, the *de re* analysis favors local similarity, and ties it to the resolution of tense. This paper is concerned with the latter claim. The argument will be constructed as follows. In Section 3 we will examine examples originating in the sequence of tense literature in which the interpretation of embedded tenses has been claimed to vary: relative clauses vs. complement clauses. In Section 4 we will observe that different options are available for the interpretation of embedded counterfactuals, depending on whether tense is interpreted as free or bound. That is, similarity in counterfactuals is evaluated differently depending on whether they are embedded in relative clauses or in the complement of propositional attitude verbs. The correlation between the interpretation of tense and the resolution of similarity will be taken as evidence in favor of a semantics that ties the resolution of similarity to tense, and thus in

favor of the *de re* analysis.

2 A *de re* analysis

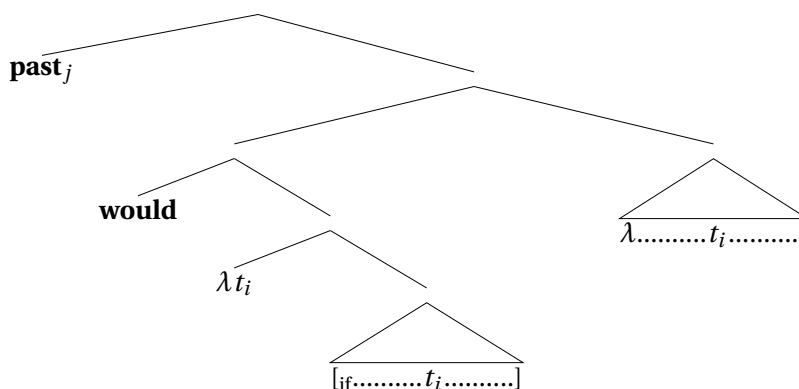
In (Arregui, 2005, 2007a, 2008) I proposed an analysis according to which counterfactuals are interpreted as making *de re* predications about past features of the world. In this section I will (briefly) present the proposal, and some of my basic assumptions. This will serve as the basis for the argumentation in Section 4.

As a preliminary clarification, let me note that my interest here is with the interpretation of past tense morphology in counterfactuals, and I will not discuss the differences between simple *would* and *would have* counterfactuals. For a discussion of the role of *have*, the reader is referred to (Arregui, 2005, 2007b), as well as (Ippolito, 2003, 2006; Condoravdi, 2002; Iatridou, 2000; Ogihara, 2000), among others.

2.1 Structural preliminaries

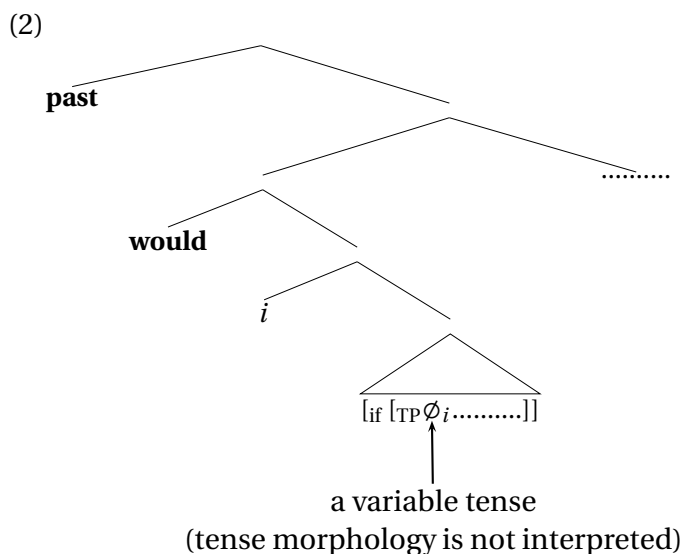
In this section, I will present some of my basic assumptions. For the sake of concreteness, I will adopt a simplified syntactic structure for counterfactuals, as well as simplified assumptions regarding the interaction between the if-clause and the matrix clause. I will treat counterfactuals as modal claims c-commanded by a past tense. The modal itself takes two arguments: the if-clause serves as restrictor, and the main clause as nuclear scope (for a more thorough discussion of syntactic matters, the reader is referred to Bhatt and Pancheva (2006); Iatridou (2000), etc; for accounts that address the dynamic nature of the interaction between the if-clause and the matrix, the reader is referred to Kratzer (1991); Fintel (1994), among others):

- (1) Structure for *would*-conditionals:



I would like to highlight the following points: (a) In (1) a past tense c-commands the entire counterfactual construction, regardless of whether we are dealing with simple *would* or *would-have* counterfactuals (see Arregui, 2005, 2007b, for discussion). The idea that (some) counterfactuals are conditionals in the scope of a past tense can be traced back to the work of Thomason and Gupta (1980), and similar ideas have been examined in more recent literature (among others Iatridou, 2000; Ogihara, 2000; Condoravdi, 2002; Ippolito, 2003). It has been observed that the tense morphology we observe in the antecedent clause of counterfactuals (the *if-clause*) is often incompatible with a

deictic interpretation (among others Dudman, 1984). The structure in (1) provides an explanation for the apparent disparity, since the structure predicts that a sequence of tense interpretation will be available for tense in this context. Given (1), the past morphology in the if-clause can be analyzed as indicating agreement with the higher past tense and need not carry deictic past information. A snap-shot of the relevant details is provided in (2), and the mechanisms of sequence of tense will be discussed more generally in Section 3 (following Kratzer, 1998).



(b) The modal combines with two properties of times, one corresponding to the matrix clause, and the other to the if-clause. In the analysis that will be discussed here, the modal will be responsible for fixing the temporal parameter of its arguments (for views according to which modals are responsible for shifting the evaluation time of their embedded clauses away from the speech time, the reader is referred to Enç (1996); Condoravdi (2002), among others).

2.2 A *de re* proposal in the framework of situation semantics

The proposal examined in this paper assigns a crucial role to tense in managing similarity in counterfactuals. Theories of tense often deal with issues related to temporal interpretation without making specific ontological commitments (they are not necessary). However, in assigning tense a role in the evaluation of similarity, we will adopt a particular view regarding the ontology underlying its interpretation. In the proposal examined here, tenses will be treated as referential expressions (following a tradition that includes (Partee, 1973; Abusch, 1988, 1996; Heim, 1994; Kratzer, 1998)) and they will be taken to refer in the domain of possible situations (as presented in (Kratzer, 1989, 2002, 2006)).

In a Kratzer-style situations framework, situations are parts of worlds (where worlds themselves are characterized as ‘maximal situations’). Given a Lewis-style perspective on possible worlds, situations are at most part of one world. The ‘mereological’ part-of relation will be indicated with the symbol $<_k$. With a ‘situations treatment’ of referential tenses, tenses have both a temporal and a modal dimension: they identify parts within a world (in other words, features of a world). Under a situations analysis, a (real)

deictic past tense has the interpretation below (analyzing tense features as presupposition triggers, along the lines of Heim (1994)):

- (3) $\llbracket \text{past}_i \rrbracket^g = g(i) = s_i$, where s_i is presupposed to precede the speech event.

The analysis of counterfactuals that will be examined here appeals not only to the part-of relation described above $<_k$, but also to a *modal* part of relation (represented here with $<$). Having adopted a referential analysis of tense, it will be necessary to identify the situation referent of past tense in counterfactuals within situations and worlds different from the actual world. Given a Lewis-style perspective, cross-world identification of situations (and indeed, any individual!) take place via counterparts. Appealing to counterparts, we can say that a situation in the actual world is part-of (in the modal sense) of another world (or of a situation in another world) iff the actual world situation has a counterpart in the other world:

- (4) $s < s'$ iff s has a counterpart in s' (Arregui, 2007a, 2008)
(where counterpart relations are established via contextually salient parameters of similarity)

With these ideas in place, we can now proceed to discuss the interpretation of the modal, but we'll take a preliminary step. In the analysis examined here, the modal is responsible both for shifting the reference time of its argument clauses, and for quantifying over antecedent situations. For the sake of simplicity, I will spell out the temporal shift separately:

- (5) Where $\llbracket \text{if-clause} \rrbracket$ = a property of situations p , the future shifted proposition p^* identified by the modal to serve as the antecedent proposition will be:
 $p^* = \lambda s \exists s' : s' < s \wedge s' \text{ is non-past} \wedge p(s') = 1$.

Having established this background, we can now turn to the *de re* analysis of the modal. According to the proposal in (6) (Arregui, 2007a, 2008), the arguments of the modal include two propositions and a situation. The situation is the denotation of the matrix past tense, and functions as the *res* of the counterfactual predicate:

- (6) Given two propositions p^* and q^* and a past situation s in w ,
 $\llbracket \text{would}_L \rrbracket^{w,g}(p^*)(q^*)(s) = 1$ iff
 $\{s'_L : s < s'_L \wedge p^*(s'_L) = 1\} \subseteq \{s'_L : \exists s''_L : s'_L < s''_L \wedge q^*(s''_L) = 1\}$,
where s_L is a situation that satisfies the set of laws L salient in the context.

Before discussing (6) in detail, let us make one observation about the laws (L) (I simply note this point here, it is discussed more extensively in (Arregui, 2007a)). The truth value of counterfactuals is usually resolved on the basis of both facts in the actual world and laws in the actual world (see for example (Lewis, 1979) for an early discussion of their relative importance). The analysis in (6) treats the modal as introducing a free resource variable responsible for invoking relevant laws (making use of ideas in (Fintel, 1994)), thus ensuring that quantification is restricted by whatever subset of the laws is contextually relevant. The proposal examined here thus separates the two factors that traditionally have played a role in resolving similarity: the *modal* is responsible for appealing to the salient (relevant) laws, and *past tense* is responsible for invoking the facts.

According to the proposal in (6), *would* takes as arguments two propositions and a past situation. In the structure in (1), past tense contributes the past situation that is the *res* of predication. The counterfactual is about that past situation. Given (6), the counterfactual will be true iff all (law-like) situations that contain a counterpart of that past actual world situation in which the antecedent is true can be extended (modally) to situations in which the consequent is true.

The proposal in (6), together with the structure in (1), gives past tense an important role to play. Past tense is responsible for identifying the features of the world that matter for evaluating similarity. In other words, past tense identifies the situation that is the *res* of predication (the situation that supports the truth of the counterfactual). We can see the proposal in (6) at work by examining an example:

(7) *An example*

[[If it had rained, I would have gotten wet]]^{w,g} = 1 iff
 $\{s'_L : s < s'_L \wedge \text{it has rained in } s'_L\} \subseteq \{s'_L : \exists s''_L : s'_L < s''_L \wedge \text{I have gotten wet in } s''_L\}$

We will first worry about the antecedent proposition. As we saw in (5), *would* in (7) sets the temporal parameter of the antecedent clause to some non-past time. But if we set the result state introduced by the perfect *had rained* at some non-past time (for example, the utterance time), we will allow the raining event to be located before the speech time (thus giving the impression that the antecedent clause is set in the past!) (for a discussion of the temporal effects of the perfect in antecedent clauses, the reader is referred to (Arregui, 2007b; Ippolito, 2003, 2006, , among others)).

Let us now consider the *res* situation in (7). Suppose that I was in an open field, and had no umbrella or protective cover. In such circumstances we might be willing to grant that (7) is true. And the *de re* semantics makes correct predictions: suppose that past tense refers to the past situation of me being unprotected in the field, it will be the case that all lawlike situations that include a counterpart of this situation in which it has rained will have lawlike modal extensions in which I have gotten wet.

We will make correct predictions for (7) when tense refers to the situation that I was uncovered in the open field. But we might worry. What if tense had referred to another situation (the situation of there being a big cow next to me, for example)? Then the counterfactual would have come out false (there is no law-like link between cows, it raining, and me getting wet). The only response to this concern is to say that when we interpret a counterfactual, we try to resolve the denotation of past tense in a way that makes the sentence true. This is a general strategy for referential expressions, and is part of our cooperative attitude when talking to each other.

The analysis in (6) locates the relevance of actual world features in the resolution of tense. A counterfactual will come out as true or false depending on the interpretation of tense (and the laws). In the next section we will take a short detour to consider examples showing that we have intuitions about the situations that support the truth of counterfactuals (the situations that are the *res* of counterfactual predicates). This is encouraging, as it lends plausibility to the *de re* analysis. The examples in question will be sentences in which counterfactuals are embedded under the verb *to know* (this matter is discussed also in (Arregui, 2007a, 2008)).

2.3 Motivating the view: intuitions on ‘aboutness’ in counterfactuals.

In this section we will be concerned with the conditions in which we are ready to claim that somebody *knows* a counterfactual. We will be interested in the analysis of knowledge put forward in Kratzer (2002). Kratzer characterizes knowledge as justified true belief, and avoids the well-know problem posed by Gettier-examples by requiring that belief be *de re* about facts (the pertinent situations in the world). Since in Kratzer’s proposal knowledge of a proposition requires acquaintance with situations that support the truth of the proposition, knowledge contexts will provide good settings to test our intuitions regarding the situations that support the truth of counterfactuals.

Here is Kratzer’s characterization of *know*:

- (8) *S knows p* iff (Kratzer 2002)
- a. There is a fact *f* that exemplifies *p*
 - b. *S* believes *p de re* of *f*, and
 - c. *S* can rule out relevant possible alternatives of *f* that do not exemplify *p*.

The requirement that knowledge include *de re* belief of the world-features responsible for the truth of the embedded proposition avoids the problems posed by *Gettier*-scenarios. To see how this works, consider the example in (9):

- (9) Smith knows that either Jones owns a Ford or Brown is in Barcelona.

As Gettier famously pointed out, examples like (9) can prove challenging for an analysis of knowledge as justified true belief. Suppose that Smith knows that Jones used to own a Ford, and has recently seen Jones driving around in a Ford, and so justifiably believes that Jones owns a Ford. Suppose also that Smith has no idea as to where Brown is. Smith’s belief state is such that he believes that *either Jones owns a Ford or Brown is in Barcelona*. Now, in Gettier’s story, it turns out that Jones had sold his Ford, and was driving around in a friend’s car, and accidentally Brown happens to be in Barcelona. So Smith believes a true proposition, and is justified in believing that proposition. However, we would not accept, in this context, that Smith *knows* the proposition.

Kratzer’s analysis of *know* avoids the problem posed by Gettier contexts by requiring that knowledge include *de re* belief about a situation that supports the truth of the believed proposition.¹ Our judgments regarding knowledge attribution are thus expected to be sensitive to the situations that support the truth of propositions, and we can now use Gettier contexts to test our intuitions for the case of counterfactuals. Consider (10) in a Gettier context (11):

- (10) Smith knows that if Nixon had pushed the button, there would have been a nuclear holocaust.

¹Kratzer requires *de re* belief about facts, where facts are characterized as follows: *If s is a possible situation and p is a proposition, then s is a fact exemplifying p iff for all s' such that s' < s and p is not true in s', there is an s'' such that s' < s'' < s and s'' is a minimal situation in which p is true. (A minimal situation in which p is true is a situation that has no proper parts in which p is true.)* (Kratzer, 2002, : 660)

- (11) *Gettier context*: at some point in the past, the button had been connected to an A-set of missiles, and if those had been launched, there would have been a nuclear holocaust. Smith knew this. But at some later point, there was a change of strategy, and the button was disconnected from the A-missiles and connected to a B-set of missiles. If those had been launched, there would have been a nuclear holocaust. Smith never found out that the wiring had been changed.

In the scenario described in (11), we would be unwilling to grant that Smith knows that if Nixon had pushed the button, there would have been a nuclear holocaust. We can explain this with Kratzer's proposal by showing that in this context Smith is not properly acquainted with the features of the world that support the truth of the embedded clause (i.e. Smith is not acquainted *de re* with the relevant situation). The example allows us to see that we have clear intuitions about what features of the world are responsible for the truth of the counterfactual, and lends plausibility to a view according to which tense makes reference to such features.

The observation that we have intuitions about the situations that support the truth of counterfactuals is encouraging, but does not in itself justify a *de re* analysis. The fact that there are situations that support the truth of counterfactuals does not itself guarantee that we make reference to such situations when uttering a counterfactual. To argue that tense makes reference to such situations, I will present examples in which differences in the interpretation of tense correlate with differences in the interpretation of counterfactuals. We will begin by examining the various interpretations available to tense.

3 Deictic vs. bound variable tenses: evidence from sequence of tense literature

In this paper I have adopted a referential theory of tense. A referential approach to tense was originally defended by Partee (1973), who noted that tenses could function a lot like pronouns, and receive free referential interpretations, anaphoric interpretations and bound variable interpretations. Various presentations of this view can be found in the literature (Heim, 1994; Kratzer, 1998; von Stechow, 1995; Kusumoto, 2005, etc.). Here I will follow Kratzer (1998) in distinguishing between deictic tenses and variable tenses. Illustrations are provided in (12):

- (12) *A referential theory of tense*
- a. $\llbracket \text{past} \rrbracket^{g,c}$ is only defined if c provides an interval t that precedes t_0 .
If defined, then $\llbracket \text{past} \rrbracket^{g,c} = t$.
 - b. $\llbracket \emptyset_n \rrbracket^{g,c} = g(\emptyset_n)$ (Kratzer, 1998)

According to Kratzer (1998) (and Heim, 1994), a deictic past tense carries the presupposition that the temporal entity it refers to is past (12a). A variable tense carries no presuppositions, and will be interpreted simply in reference to a variable assignment (12b). With this analysis, deictic past tenses (tenses in which morphological features carry semantic information) refer to salient past entities. Variable tenses can be interpreted either as free or bound. If free, they will refer to salient entities. If bound, they will give rise to the bound-variable reading of tense.

Kratzer's proposal for the interpretation of tense is set within a larger framework designed to provide an account for sequence of tense phenomena and *de se* beliefs, in parallelism with the interpretation of pronouns (we have simplified the presentation here). 'Sequence of tense' is a descriptive terms used in the literature to identify cases in which tense morphology appears to be semantically vacuous, lacking the temporal information associated with real, deictic past tenses (we will examine examples in Sections 3.1 and 3.2). Various analysis of sequence of tense phenomena have been provided (Abusch, 1988; Ogihara, 1989; von Stechow, 1995; Kusumoto, 2005, among others). According to Kratzer (and others), sequence of tense phenomena arise because not all instances of past tense morphology correspond to deictic past tenses. In the right environment, past tense morphology can show up as an instance of *agreement*, and carry no semantic import. In such contexts, we will find a variable tense.

Kratzer's analysis of sequence of tense phenomena makes use of both free and bound variable interpretations for variable tenses. Kratzer shows that we can understand the restrictions on the temporal interpretations available to tenses in different types of embedded clauses by observing that some of those tenses are free and others are bound. This will be discussed in the next two sections.

3.1 Tenses in relative clauses

It has been observed that tenses in relative clauses can be interpreted independently (Ogihara, 1989, , etc.). An illustration is provided in (13):

- (13) He married a woman who went to Harvard. (Ogihara, 1989)

The sentence in (13) does not impose an order between the time of the marriage and the time at which the woman studies in Harvard. This can be captured in a referential theory of tense with an analysis in which the relative clause tense (RC-tense) is a deictic past tense, and is simply ordered with respect to the speech time. If both tenses are deictic, they are only ordered with respect to the speech time, and no order is impose amongst them.

Given the aspectual classes involved in (13), it is difficult to imagine that the RC-tense could be interpreted as a variable tense, coindexed with the matrix. It is easier to access this option with stative relative clauses, as in (14). Here, the RC-tense could easily correspond to a variable tense that picks up a salient referent from the context, and thus ends up being anaphoric to the matrix tense:

- (14) John bought a fish that was still alive. (Ogihara, 1989)

As a variable tense, the RC-tense pronoun carries no restrictions. It surfaces with past tense morphology because it agrees with the matrix past tense. A variable tense in the relative clause would make (14) an example of a sequence of tense phenomena. Alternatively, the RC-tense could be a real deictic tense. As such, it could co-refer with the matrix past or be independent.

The alternative interpretations for the RC-tense discussed above are presented below, as conceived by Kratzer (1998):

- (15) a. [_{TP} past₁ [John buys a fish that₂ [_{TP} \emptyset_1 [_{t₂} be still alive]]]]].

- b. [_{TP} past₁ [John buys a fish that₂ [_{TP} past_{1/3} [_t₂ be still alive]]]]. (Kratzer, 1998)

In (15a), the RC-tense in (14) is analyzed as a variable. It is interpreted by the variable assignment, and is anaphoric to the salient matrix past tense. In (15b), the RC-tense in (14) is analyzed as a deictic past tense. The referent picked out by the tense pronoun must precede the speech time, and can be co-referential with the matrix past tense, or not.

To see another illustration of the variable tense (clearly) at work, consider (16):

- (16) John said he would buy a fish that was still alive. (Kratzer, 1998)

In (16) the RC-tense picks out a temporal entity that is future with respect to the speech time. This tense carries no deictic past features. Yet, it surfaces with past morphology because of agreement with a higher past tense.

The important conclusion to be drawn from this section is that tenses in relative clauses are not bound. Whether they are deictic or variable tenses, they are interpreted referentially, picking out temporal entities.

3.2 Tenses in complement clauses

Tenses in complement clauses also exhibit sequence of tense phenomena. An illustration is provided in (17):

- (17) John decided a week ago that in ten days he would say to his mother that they were having their last meal together. (Abusch, 1988)

Even though there is past tense morphology in the most deeply embedded tense, the time corresponding to the meal is understood to follow the speech time. Past morphology on the VP *were having their last meal together* is semantically vacuous. In this example, tense on *was* can only be a variable tense, surfacing with past morphology as a consequence of agreement.

Though tenses in the complement clause of attitude verbs can be interpreted as variable tenses, they cannot be interpreted independently of the matrix tense (that is, they cannot be *free* variable tenses). To see this, consider (18):

- (18) John thought that the fish was still alive.

The interpretation of the embedded tense in (18) is restricted. The sentence can only mean that John thought in the past that the fish was still alive at that past time when he was thinking (or at an earlier time). (18) cannot report a past thought about a future state of the fish. This restriction on the interpretation of the embedded tense has been targeted by Abusch's upper limit constraint (presented by Kratzer as in (19)):

- (19) *Abusch's Constraint* ('Upper Limit' Constraint)

In attitude contexts, the highest tense is controlled by the matrix tense.

If we think of the upper limit constraint as a descriptive generalization, it simply claims that the interpretation of tenses in the complement clause of attitude verbs are 'bounded' by the time of the matrix event.

The proposal in (Kratzer, 1998) provides an account of the semantics of complement clauses that allows us to make sense of Abusch's generalization. Making use of observations and proposals by Cresswell and von Stechow (1982) and von Stechow (1995), Kratzer generalizes a *de se* account of beliefs to temporal cases. Under a temporal *de se* analysis, the complement clauses of propositional attitude verbs denote properties of times. In the example in (20a), this will be the property of times true of times at which the fish was still alive:

- (20) a. John thought that the fish was still alive
 b. $[_{TP} \text{past}_1 [\text{John thought that}_1 [_{TP} \emptyset_1 \text{the fish was still alive}]]]$. (Kratzer, 1998)

Using the concept of *self-ascription* to simplify the presentation, we can understand that the attitude verb in (20a) requires that the subject self-ascribe the relevant property at the time identified by the matrix tense. This will mean that in the past, John self-ascribed the property of being at a time in which the fish was still alive (he 'self-located' as being at a time with that property). As was pointed out by von Stechow (1995), the link between the evaluation time of the embedded property and the time corresponding to the subject's *now* allows the upper limit constraint (*Abusch's constraint*) to be derived from the semantics of the embedding verb.

The analysis of sequence of tense in the complement of attitude verbs, and the explanation of the upper limit constraint presented above, appeal to a bound variable interpretation of the embedded tense. As a variable, tense in the embedded clause does not carry deictic presuppositions, and the embedded morphology simply reflects agreement with higher tenses.

In this section we have examined arguments from the sequence of tense literature that point to a difference in the interpretation of tenses embedded in relative clauses and tenses embedded in the complement of attitude verbs. In the first we observe a free interpretation, and in the latter a bound variable interpretation. The discussion of tense in the sequence of tense literature is made without major ontological commitments regarding the nature of temporal entities. In the next section we will see that with the situations interpretation of a referential theory of tense presented in Section 2, the differences we have observed between bound and free tenses permit the *de re* analysis to make correct predictions regarding the resolution of similarity in embedded counterfactuals. We will examine counterfactuals in both relative and complement clauses in the scope of quantified subjects.

4 Relating the interpretation of similarity to the interpretation of tense

As we noted in Section 2.3, the fact that the truth of a counterfactual depends on what is happening in part of the world (situation) does not in itself justify an analysis according to which some expression makes reference to that part of the world (situation) (as an analogy, the fact that a specific individual may be responsible for the truth of the sentence *A man smiled* does not justify the claim that some constituent in the sentence refers to that man). In this section we will provide support for the *de re* analysis by examining examples in which the variation in the interpretation of tense that we

observed in Section 3 correlates with variation in the evaluation of similarity. We will be interested in counterfactuals embedded in relative clauses and in the complement of attitude verbs. We will use sentences with quantified subjects as a tool to detect variation in the evaluation of similarity.

To see how the argument will proceed, consider again the denotation for the modal proposed by the *de re* analysis, and compare it with a Lewis-Stalnaker style denotation:

(21) *De re* proposal

$\llbracket \text{if } p, \text{ would } q \rrbracket = 1$ iff

$\{s'_L : s < s'_L \wedge p(s'_L) = 1\} \subseteq \{s'_L : \exists s''_L : s'_L < s''_L \wedge q(s''_L) = 1\}$,

where p and q are propositions, s is a past situation in the actual world, and s_L is a situation that satisfies the set of laws L salient in the context.

(22) $\llbracket \text{if } p, \text{ would } q \rrbracket = 1$ iff

(a Lewis-Stalnaker style analysis)

$\{w : S(w_0)(p)(w)\} \subseteq \{w : q(w)\}$

where p and q are propositions, w_0 is the actual world, and S is a contextually given similarity relation.

According to (21), quantification will take place over situations that are similar to the actual world with respect to s , where s is the denotation of past tense. The prediction is that variations in the interpretation of past tense could affect how we identify s , and thus affect also the evaluation of similarity. According to (22), however, similarity is calculated globally by salient a similarity relation. Crucially, this view does not tie similarity to tense.

4.1 Counterfactuals in the complement of propositional attitude verbs

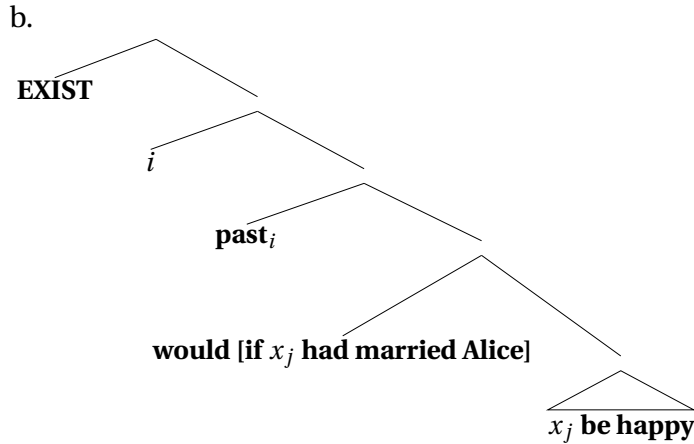
Let us begin by examining the interpretation of counterfactuals in the complement of propositional attitude verbs. Consider the counterfactual in (23a), uttered in the scenario described below:

(23) *Scenario*: John and Jack both wanted to marry Alice. She was wealthy and beautiful. John believed that money would have made him happy, and Jack believed that beauty would have made him happy.

a. Both men believed that if they had married Alice, they would have been happy.

Given the context provided in (23), it is clear that the men had, intuitively, different reasons for reaching the conclusion that marriage with Alice would have made them happy. The analysis of counterfactuals provided in (6) can be straightforwardly related to an analysis of the propositional attitude verb in a manner that predicts this result. A proposal for the denotation of the embedded clause is given in (24):

(24) a. [believed that if they had married Alice, they would have been happy]



The proposal in (24) includes an index binding the pronoun introduced by tense. With this analysis, tense in the complement clause is actually a bound-variable tense, and the temporal location of the embedded clause will be decided by the embedding verb (as discussed in Section 3.2). Tense morphology on the embedded verb is past in agreement with the c-commanding past tense in the matrix verb. The embedded tense does not carry deictic presuppositions.

As we noted in Section 3.2, tenses in the complement clauses of attitude verbs are bound. The index i in (24b) binds the embedded tense, resulting in a property of situations (proposition) that is true of situations that support the truth of the counterfactual. These are situations such that all the lawlike situations that include them (modally) in which the antecedent is true are also situations in which the consequent is true. This proposition itself is not a good argument for belief. Generalizing a *de se* semantics for belief, *believe* relates a proposition and an individual, resulting in truth when the individual self-ascribes the property of living in a world in which the proposition is true. The problem is that an individual can believe a counterfactual without it being the case that his/her belief worlds themselves support the truth of the counterfactual (typically, the belief worlds will be ‘too big’, and include features that are incompatible with the antecedent). It does not seem correct to claim that the proposition generated by abstracting over the denotation of *past* is itself true of the belief worlds of the subject. What seems correct is to say that there is some situation in the belief worlds of the subject in which (of which) such proposition is true. The role of the EXIST predicate is thus to mediate between the property of situations generated by abstracting over tense and the world-level property of situations that is suitable as an object of belief. EXIST thus maps properties of situations that may be smaller than worlds to properties of situations that are true of worlds.² The latter will constitute an adequate object for *believe*. Here I am proposing that mediation between the two is carried out via existential quantification:

- (25) a. $\llbracket \text{EXIST} \rrbracket(p) = \lambda w \exists s [s < w \wedge p(s) = 1]$
 b. $\lambda w \exists s [s < w \wedge \{s'_L : s < s'_L \wedge g(j) \text{ married Alice in } s'_L\} \subseteq$

² The EXIST operator is somewhat reminiscent of an aspectual operator, as characterized by Kratzer (1998), following Klein (1994). Aspectual operators map properties of events to properties of times, quantifying over event arguments. The EXIST operator maps properties of ‘small’ situations to properties of worlds, quantifying over the small situations. The investigation of such parallelisms remains for future research.

$$\{s'_L : \exists s''_L : s'_L < s''_L \wedge g(j) \text{ is happy in } s''_L\}$$

Given the proposal in (25a), the complement of *believe* in (24a) will be the proposition in (25b). This is the proposition true in a world iff there exists a situation that supports the truth of the counterfactual. This proposition can be an adequate argument for believe: an individual can be said to believe a counterfactual if s/he self-ascribes the property of living in a world in which there exists a situation that supports the truth of the counterfactual.

The semantics in (25b) makes correct predictions for examples with quantified subjects, like (24). The sentence will be true iff it is the case that for each man x , x self-ascribes the property of living in a world in which the proposition in (25b) is true. This allows each man to believe the counterfactual for ‘different reasons’, since the situation that supports the truth of the counterfactual can vary from one man to the other.

A global similarity analysis is at a disadvantage with examples in which counterfactuals are embedded under quantifiers. According to the global similarity analysis, a counterfactual invokes a contextually salient measure of similarity. There is no room here for variation under a quantificational subject. To see the difficulties that can arise with a single measure of similarity, consider the example in (26):

- (26) John is well informed, and believes that Verdi was Italian and Bizet was French. Jack however, believes that Verdi and Bizet were twins, and that both were French.
- a. Both men believe that if Bizet had been Italian, Verdi and Bizet would have been compatriots.

Our intuitions tell us that the counterfactual in (26a) is (or can be) true. Again, the men have arrived at their beliefs for, intuitively, different reasons. As we have seen, this can be captured with the analysis in (25), since the choice of *res* situation will be allowed to vary with the men (the situation that Verdi was Italian for John and the situation that Verdi and Bizet were twins for Jack). A single, contextually salient, measure of similarity, however, would get us into trouble. For suppose that context is such that similarity with respect to nationality is given paramount importance (S). Then, (26a) will be true iff for each man it is the case that for all of his belief-worlds, the most S-similar worlds in which Bizet was Italian are also worlds in which Verdi and Bizet were compatriots. For John this will not be problematic. Given that he believes that Verdi was Italian, and S prioritizes nationality, in the most similar worlds in which Bizet was Italian, Verdi will have been Italian too, and therefore Verdi and Bizet will be compatriots. But in the case of Jack, we will obtain wrong results. Jack believes that Verdi and Bizet were twins, and that they were both French. If Jack has come to believe that *if Bizet had been Italian, Verdi and Bizet would have been compatriots*, it can only be because similarity ignores the facts regarding Verdi’s nationality (according to Jack!), and prioritizes the fact that they were twins. We will not predict that both men believe the counterfactual if similarity is resolved assigning the same weight to the facts regarding Bizet and Verdi’s nationalities in both cases. But if there is a single, contextually given similarity relation, it is not clear why similarity would care about Verdi’s nationality when looking for the antecedent worlds relevant for John’s belief, and not care about Verdi’s nationality when looking for the antecedent worlds relevant to Jack’s beliefs.

The conclusion we draw from the discussion above is that a single notion of similarity will not give us correct results in examples like (26), in which the men can be

said to hold the belief for different reasons. The existential quantifier over situations in (25) makes better predictions here, supporting the *de re* proposal. Notice that it would not really help the global similarity view to change the contextually given similarity relation for an existentially quantified one, and thus allow for distribution under quantified subjects:

- (27) a. Both men believe that if Bizet had been Italian, Verdi and Bizet would have been compatriots.
 b. Where S is a contextually supplied similarity relation, A is the antecedent proposition, and C the consequent proposition,
 $\lambda w \exists S \{w' : S(w)(A)(w') = 1\} \subseteq \{w' : C(w') = 1\}$

With an existential quantifier over the similarity relation, the truth of a counterfactual would require that all worlds that are similar to the evaluation world in some respect in which the antecedent is true should also be worlds in which the consequent is true. This appears to be too strong, since the domain of quantification will now include many more worlds than are actually relevant. And as we will see in the next section, existential quantification over the similarity relation would also be problematic in other examples.

As a final remark in this section, I will point to a source of concern. The proposal in (25) ties the truth of the belief of a counterfactual to the existence of a situation that supports the counterfactual. This ‘existential’ semantics predicts that conjunctions like (28) can be true:

- (28) Sara believes that if New York were in Georgia, New York would be in the south, and that if New York were in Georgia, Georgia would be in the north.

This is because, if Sara’s geographical beliefs are accurate, there will be a situation in Sara’s belief worlds that supports the truth of the counterfactual that *if New York were in Georgia, New York would be in the south*. This is the situation of Georgia being in the south. There will also be a situation that supports the truth of the counterfactual that *if New York were in Georgia, Georgia would be in the north*. This is the situation that New York is in the north. Maybe we can explain the oddness of this example by claiming that if we have to resolve the reference of two tense pronouns with the same antecedent, it is just pragmatically difficult to assign them different interpretations. Typically, the utterance of (28) will be understood in a context in which one of the situations has become more important, and this will make it difficult to shift the referent of the second tense pronoun. However, this is speculative, and the topic requires further research. It is worth pointing out, however, that while the proposal in (25) predicts that (28) can be true, it does not make the same prediction for (29):

- (29) Sara believes that if New York were in Georgia, New York would be in the south and Georgia would be in the north.

Whatever may be Sara’s beliefs about the location of New York and Georgia, there won’t be a situation in Sara’s belief worlds that supports the truth of the counterfactual that *if New York were in Georgia, New York would be in the south and Georgia would be in the north*.

4.2 Counterfactuals in relative clauses

In this section we will examine the interpretation of counterfactuals in relative clauses. As we noted in Section 3.1, tenses in relative clauses have been claimed to be free, referring to some contextually salient entity (in our situations framework, a contextually salient situation). Given the *de re* analysis, the proposal that tenses in relative clauses are free makes different predictions for the resolution of similarity in counterfactuals in relative clauses embedded under quantifiers as opposed to complement clauses embedded under quantifiers. These predictions appear to be confirmed. Consider the example in (30):

- (30) At the party, John met Jane and Jim met Joan. Jane and Joan had both been in the space program at NASA, though some years apart. They were both expelled.
- a. #At that party, both men met a woman who would have been the first woman in space if she hadn't been expelled from NASA.

The counterfactual in (28a) is odd in the context provided above. It clearly isn't because of the fact that there were different women involved, since a sentence of the form *At the party, both men met a woman who ate a lot of cheese* would be perfectly fine if they met different women. Neither can we attribute the oddness of (30a) to the fact that there cannot be two different women of whom the counterfactual would be true. Suppose that Jane had been chosen by NASA to be the first woman in space, but something went wrong and she was expelled from the program. In such circumstances, (31) would have been true:

- (31) If Jane hadn't been expelled from NASA, she would have been the first woman in space.

Imagine now that after Jane was expelled, NASA selected Joan to be the first woman in space. But again, something went wrong and Joan was expelled. (32) would also have been true:

- (32) If Joan hadn't been expelled from NASA, she would have been the first woman in space.

The *de re* analysis of counterfactuals, together with the observation that tenses in relative clauses remain free, correctly predicts that even if (31) and (32) are true, (30a) will be odd. To see this, consider the interpretation of the generalized quantifier *a woman who would have been the first woman in space if she hadn't been expelled from NASA*:

- (33) $\lambda P \exists x [x \text{ is a woman} \wedge$
 $\{s'_L : s < s_L \wedge x \text{ has not been expelled from NASA in } s'_L\} \subseteq$
 $\{s'_L : \exists s''_L : s'_L < s''_L \wedge x \text{ is the first woman in space in } s''_L\} \wedge P(x) = 1]$
 where $\llbracket \text{past} \rrbracket^{w,s}$ in the embedded counterfactual is s .

!!! I suspect it should be $s < s'_L$ instead of $s < s_L$ in the first set description.

As we see in (33), *a woman* introduces existential quantification over women, but the interpretation of tense is referential (this is a relative clause with a free tense pronoun). This means that tense will refer to a salient situation. When *a woman* is interpreted in the scope of the quantifier *both men*, it will be possible to vary the women

that each men met (the existential will distribute), but it won't be possible to vary the situations referred to by tense. This means that in order for (30a) to be true, there would have to be a situation in the world that supports the truth of both counterfactuals in (31) and (32). And this cannot happen. For suppose we consider a situation that supports the truth of (31). This would be a situation in which Jane was chosen by NASA to be the first woman in space. This situation will not make the second counterfactual true: in the situations in which Joan is not expelled from NASA and Jane has been chosen to be the first woman in space, Joan will not be the first woman in space (and vice versa).

In (27) we considered and discarded the possibility of allowing the similarity relation associated with the counterfactual to be existentially quantified over. Let us note that such a view would make incorrect predictions for the case of relative clauses:

- (34) $\lambda P \exists x [x \text{ is a woman} \wedge$
 $\exists S \{w' : S(w_0)(x \text{ is not expelled from NASA})(w') = 1\} \subseteq$
 $\{w' : x \text{ is the first woman in space in } w'\} \wedge P(x) = 1]$
 where w_0 in the actual world.

In (34) I have presented the denotation for the generalized quantifier *a woman who would have been the first woman in space if she had not been expelled by NASA*, allowing existential quantification over the similarity relation associated with the counterfactual. This treatment of similarity would allow the similarity relation to vary with the choice of men when the relative clause is interpreted in the scope of the quantifier *both men*. Given our judgments, this would be a mistake.

For the sake of completeness, further examples following this pattern are provided below:

- (35) a. #Both women drove a car that would have won the race if it hadn't broken down.
 b. #Both professors had a student who would have discovered DNA if she had persevered.

5 Conclusion

In this paper we have examined examples in which counterfactual conditionals are embedded in relative clauses and in the complement clauses of attitude verbs. We have used examples with quantified subjects to test the options available for the interpretation of similarity. We have observed that our evaluation of similarity varies depending on whether counterfactuals are found contexts in which embedded tenses are bound and the *res* situation is existentially quantified over (attitude complements), or in contexts in which embedded tenses are free (relative clauses) and the *res* situation is identified deictically. The presence of quantified subjects has allowed us to detect the variation.

The conclusion is that the interpretation of tense affects the evaluation of similarity. This is straightforwardly accounted for by an analysis of counterfactuals that links the resolution of tense to the resolution of similarity. For this reason, counterfactuals in embedded contexts provide support for the *de re* analysis of counterfactuals.

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Adverbs in restricted configurations

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1 Introduction

The research on deadjectival adverbs – or more precisely *-ly*-type adverbs (henceforth LTAS) – has been mainly devoted to the study of LTAS that modify verbs and propositions, but little has been said about adverbs that modify adjectives. In (1) we see a list of interesting examples:

- (1) *extremely* tall, *endlessly* frustrating, *colossally* stupid, *deeply* talented, *widely* successful, *ridiculously* expensive.

In this paper I focus on LTAS that modify adjectives in the configuration illustrated in (2) and (3). The cases in (2-a), (2-b) and (3-a) are *wh*-exclamative constructions and the ones in (2-c) and (3-b) correspond to result clause constructions.

- (2) English
- You would never believe *how extremely tall* Pau is.
 - How colossally stupid* this joke is!
 - This job is *so endlessly frustrating*, that I am thinking of quitting.
- (3) Catalan
- Que extremadament alt* que és en Pau!
'How extremely tall Pau is!'
 - En Pau és *tan extremadament alt* que arriba al sostre.
'Pau is so extremely tall that he reaches the ceiling.'

By using both English and Catalan as my object language, I want to show that only a limited set of LTAS can occupy this position and I will be able to propose a classification of these adverbs that hinges on the kind of modification that they impose on the adjective. What I claim exactly is that only some of the available LTAS may behave as predicate modifiers. The rest are interpretable inasmuch they are treated as non-restrictive modifiers and, thus, as side comments by the speaker.

The organization of the paper is as follows: I first give some background information regarding to the relevant constructions and present the assumptions I make in order to understand what the problem is. In the third section I establish the two main

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issues that need to be addressed: are adverbs like *extremely* in *so extremely tall* predicate modifiers?, and do the rest of adverbs that appear in this position behave just like *extremely*? Section four is devoted to the proposal, which makes clear how restrictive and non-restrictive modifiers are semantically composed. The last section of the paper summarizes the findings of the paper and highlights the questions that still need to be answered.

2 Previous assumptions

In order to evaluate the interesting puzzles that arise w.r.t. LTAs preceded by *so/how* in *wh*-exclamatives and result clause constructions,¹ let us first introduce the relevant data from Catalan. In the following examples we can see two instances of *wh*-exclamative. In (4-a) the *wh*-phrase is a DegP, whereas in (4-b), the *wh*-phrase is a DP.

- (4) a. Que alt que és en Pau!
 how tall that is the P.
 ‘How tall Pau is!’
 b. Quin pastís **tan** bo que ha preparat en Ferran!
 what cake so good that AUX prepared the Ferran
 ‘What a nice cake Ferran made!’

In the former example, the degree head *que*² (‘how’) includes a [+wh] feature and that is why the entire DegP moves to the left periphery, whereas in the latter case, the indefinite *quin* (‘what’) holds this feature and the entire DP moves to CP.³ It is interesting to note that the DP introduced by *quin* includes a DegP headed by *tan* (‘so’) (i.e., *tan bo* ‘so good’), which is not necessarily present in *wh*-exclamatives, but which I assume is inferred from context when it is absent (in line with Castroviejo (2007), I take *wh*-exclamatives to be degree constructions, where the speaker exhibits his/her attitude towards a degree, even if it is not explicitly spelled out).

¹By *result clause construction* I mean the degree construction that includes a matrix clause with a degree phrase headed by *so* that selects for a *that*-clause. I refer the reader to Meier (2003) for a complete description and analysis.

²Not to mistake with the homophone complementizer *que* (‘that’), which shows a drastically different distribution, as becomes obvious from the data that are presented. Admittedly, there is another type of exclamative clause in Catalan which is introduced by the complementizer *que*, but which does not involve *wh*-movement or degree modification by a degree word, and which cannot include an LTA (and thus it is not relevant for this paper). The first example below has a similar counterpart in French (but not in Spanish), and the second one is quite idiosyncratic among the Romance languages. See Villalba (2003) for an analysis.

- (i) a. Que és alt en Pau!
 that is tall the P.
 ‘How tall Pau is!’
 b. Que n’és d’alt en Pau!
 that CL.is of tall the P.
 ‘How tall Pau is!’

³Remarkably, both types of *wh*-exclamative in Spanish are introduced by the *wh*-word *qué*, but in Catalan they are morphologically distinct. In fact, the *wh*-word *quin*, which heads a DP, is reminiscent of the indefinite quantifier *un* (‘a’) preceded by the [+wh] feature *qu-*.

Moving on to result clause constructions, observe that they include the degree word *tan* ('so'), which takes as input a gradable adjective:

- (5) En Pau és **tan** alt que arriba al sostre.
'Pau is so tall that he reaches the ceiling.'

Notice that in both (5) and (4-b) we find the same degree head, namely *tan* ('so'). These examples contrast with (4-a), since its degree head is *que* ('how') and not *tan* ('so'), but I will assume along the lines of Castroviejo (2006) that *que* and *tan* share a number of characteristics: they are both measure phrases (in Kennedy and McNally (2005b)'s terminology) that take a gradable adjective and return a property of individuals (i.e., they are of type $\langle\langle e, d \rangle, \langle e, t \rangle\rangle$), they have the same degree semantics and they have the same syntactic structure within DegP. Of course, they involve some different properties (e.g., *que* triggers movement, a DegP headed by *que* can stand alone as a matrix *wh*-exclamative), but I assume these differences derive from the fact that *que* includes a [+wh] feature.

In the following example, we observe that both degree words precede the gradable adjective *alt* ('tall') and between the degree word and the adjective the LTA *extremadament* ('extremely') may occur.

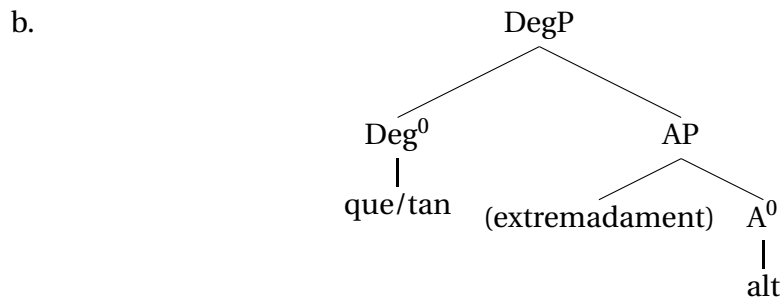
- (6) a. Quin noi [tan (extremadament) alt]!
'What an (extremely) tall boy!
b. [Que (extremadament) alt] que és aquest noi!
'How (extremely) tall this boy is!
c. En Pau és [tan (extremadament) alt] que arriba al sostre.
'Pau is so (extremely) tall that he reaches the ceiling.'

I posit that the examples above should be analyzed as in (7). Observe that in (7-a) we have an entire DP whose head noun selects for a DegP headed by *tan*, whereas in (7-b) we only have a DegP. Most importantly, the structures of both DegPs are identical.

- (7) a.
-
- ```

graph TD
 DP --> D0[D0]
 DP --> NP[NP]
 D0 --> quin[quin]
 NP --> N0[N0]
 NP --> DegP1[DegP]
 N0 --> noi[noi]
 DegP1 --> Deg01[Deg0]
 DegP1 --> AP1[AP]
 Deg01 --> tan[tan]
 AP1 --> ext[extremadament]
 AP1 --> A01[A0]
 A01 --> alt[alt]

```



As far as the degree semantics, observe that when we merge *so* or *tan* with a gradable adjective, it is always the case that the degree indicated is high. Consider (8) as an illustration of this phenomenon.

- (8) a. No et creuries mai quin pastís tan bo que ha preparat en Ferran. #Era tirant a bo.  
 ‘You wouldn’t believe what a nice cake Ferran made. It was almost nice.’  
 b. #En Pau és tan alt que pot passar per la porta.  
 ‘Pau is so tall that he can go through the door.’

Note that in (8-a), the degree of niceness of the cake needs to be high, because the follow-up of the first sentence cannot refer to a degree of niceness that does not reach a high level. The follow-up would be felicitous if we had *molt* (‘very’) instead. Likewise, the sentence in (8-b) is infelicitous, because – if we use common knowledge to state a standard of highness for doors – to be able to go through them does not imply to be tall to a high degree. Interestingly enough, this property of the degree word does not extend to other similar degree constructions, such as the ones that contain *too* and *enough* (cf. Meier 2003 and Hacquard 2004):

- (9) a. Pau is tall enough to go through the door.  
 b. Pau is too tall to go through the door.

If we add to this that the appearances of *tan* and *so* in contexts other than exclamatives and result clause constructions also involve high degree ((10)), we can assume that high degree is part of the semantics of the degree word itself.

- (10) a. #If Pau is so tall, he can go through the door.  
 b. Pau is not so tall. Actually, he can go through the door.

My assumption (cf. also Castroviejo 2006) is that all instances of *tan* (i.e., the ones in (8) and (10)) and *que* are translated as a function from measure functions (i.e., gradable adjectives) to properties of individuals ((11-b)). Crucially, the denotation of the degree word contains the functor TAN ((11-a)). This functor establishes a relation between a reference degree ( $d_R$ ) and a standard degree ( $d_S$ ) such that the former must be as least as high as the latter. As we see in (11-b), the reference degree in (11-a) is obtained by applying a measure function to an individual (e.g., the degree of tallness of individual  $x$ ) and the standard degree corresponds to a contextually determined degree that is high (represented as  $d_i$ ).

- (11) a.  $\llbracket \text{TAN}(d_R)(d_S) \rrbracket = 1$  iff  $d_R \geq d_S$



(Adapted from the definition of AS in Kennedy 1999)

- b.  $\lambda G_{\langle e, d \rangle} \lambda x [\text{TAN}(G(x))(d_i)]$

In a nutshell, (11-b) makes sure that the degree words *tan* and *que* translate as functions that take a gradable adjective and an individual and come out true, only if the degree to which this individual is ADJ<sup>4</sup> is at least as high as a contextually determined standard degree that is high.

For the sake of simplicity, I propose to use the following paraphrases, which will be enlightening enough to evaluate the problem we deal with in this article.<sup>5</sup> In particular, (13-a) corresponds to the exclamative in (12-a) and (13-b) corresponds to the result clause construction in (12-b).

- (12) a. Que alt que és en Pau!  
‘How tall Pau is!’  
b. En Pau és tan alt que arriba al sostre.  
‘Pau is so tall that he reaches the ceiling.’
- (13) a. Pau is *d*-tall, and  $d \geq$  the degree of tallness that it takes for the speaker to have an emotional attitude.  
b. Pau is *d*-tall, and  $d \geq$  the degree of tallness that it takes for Pau to reach the ceiling.

Observe that the preceding rough paraphrases treat *wh*-exclamatives and result clause constructions in a parallel fashion, except for the fact that the latter spell out the consequence of the individual having a high degree of ADJ-ness by means of a declarative clause and the former do not. Instead, I take intonation in *wh*-exclamatives to convey that the degree of ADJ-ness of a gradable adjective is high enough to provoke an attitude in the speaker. Hence, abstracting away from obvious differences between these two types of constructions (which perform different speech acts), we can use parallel paraphrases that help us capture how LTAs are semantically composed in these configurations.

### 3 The plot

In this section I present the main puzzle concerning the interpretation of LTAs in the configuration depicted above. Specifically, the puzzle consists of two problems: On the one hand, an adverb like *extremely* does not seem to behave like a predicate modifier and, on the other hand, there are LTAs like *ethically* and *intelligently* that do not behave like *extremely* in the very same configuration.

<sup>4</sup>I take ADJ to be a placeholder for any adjective meaning.

<sup>5</sup>Since it is not relevant for my purposes here, I disregard the fact that in result clause constructions, the actuality of the proposition expressed by the *that*-clause is implicated. For a discussion, see Meier (2003) and Hacquard (2004).

### 3.1 Problem A: is *extremely* a predicate modifier?

In cases like (14), *extremely* behaves like a predicate modifier in the sense that it is a property of a property. Or, given my previous assumptions, it is a kind of predicate that takes a measure function and returns another measure function (i.e.,  $\langle \langle e, d \rangle, \langle e, d \rangle \rangle$ ).

(14) Pau is extremely tall.

In this case, Pau's tallness is described as extreme.<sup>6</sup>

Let us now take a look at the examples we want to analyze (repeated here from (3)).

- (15) a. Que **extremadament** alt que és en Pau!  
'How extremely tall Pau is!'  
b. En Pau és tan **extremadament** alt que arriba al sostre.  
'Pau is so extremely tall that he reaches the ceiling.'

In what follows I would like to show, by means of a series of tests, that when we find an LTA like *extremely* in a *wh*-exclamative or a result clause construction, we do not obtain the intended meaning by intersecting the LTA and the adjective.

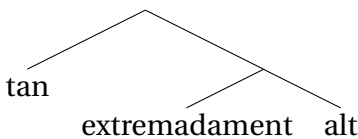

#### 3.1.1 Paraphrase

The first test consists in a paraphrase of the sort proposed in (13), which leads us to find out how the LTA needs combine in order to obtain the intended meaning:

- (16) a. #Pau is *d*-[extremely tall], and  $d \geq$  the degree that it takes for Pau to reach the ceiling.  
b. Pau is *d*-tall,  $d \geq$  the degree that it takes for Pau to reach the ceiling and *d* is described by the speaker as extreme.

Interestingly, (16-a), which would be the expected result if we treated the LTA as a predicate modifier, does not usually correspond to (15-b). Note that accepting (16-a) would presuppose the existence of a standard degree of being extremely tall which is surpassed by Paul's degree of tallness. I take this interpretation as not the most salient one when uttering (15-b).

The following tree represents the composition processes of (16-a) and (16-b), respectively:

- (17) a. 
- b. 

<sup>6</sup>I leave for future research the issue of whether the output of the function should be another measure function that merges afterwards with POS (i.e., the silent measure phrase that establishes a contextual standard of being ADJ-NESS, of type  $\langle \langle e, d \rangle, \langle e, t \rangle \rangle$ . Cf. von Stechow (1984a)) or whether the output is a property of type  $\langle e, t \rangle$ .

Note that in (17-a) the LTA is first composed with the adjective and then, the resulting gradable expression merges with the degree word *tan*. In contrast, in (17-b), the LTA is not part of the composition process. The adjective combines with *tan* and the LTA modifies the adjective in a separate domain.

### 3.1.2 Change of degree operator in exclamatives

The second test has to do with another degree *wh*-word that may introduce *wh*-exclamatives in Catalan, namely *com*, which should also be translated in English as ‘how’. Even if they involve different syntactic structures (e.g., in this other *wh*-exclamative the AP is stranded while the degree word moves to CP), *wh*-exclamative introduced by *que* and *com* have the same felicity conditions and they both update the common ground by exclusively contributing the speaker’s emotional attitude towards a degree (cf. Castroviejo 2006). That is, we could utter the sentences in (18) in the very same situations.

- (18) a. Que alt que és en Pau!  
           ‘How tall Pau is!’  
       b. Com és d’alt en Pau!  
           ‘How tall Pau is!’

However, once we add *extremely* as an adjective modifier, example (19-a) is acceptable (as we have seen so far), but example (19-b) is unacceptable or, more precisely, it has the unlikely interpretation in (16-a).

- (19) a. Que extremadament alt que és en Pau!  
           ‘How extremely tall Pau is!’  
       b. #Com és d’extremadament alt en Pau!  
           ‘How extremely tall Pau is!’

### 3.1.3 Other degree operators

Likewise, if we use any other degree word in either declarative or interrogative contexts, the most salient interpretation is the awkward one.

- (20) a. #Pau is more extremely tall than Marc.  
       b. #Marc is less extremely tall than Pau.  
       c. #Pau is too extremely tall.  
       d. #Pau is extremely tall enough.  
       e. #How extremely tall is Pau?

To recap, except for the cases in which *how* introduces a *wh*-exclamative, and in all occurrences of *so* in English and *tan* and *que* in Catalan, whenever an LTA modifies an adjective, the LTA does not behave like a predicate modifier.

## 3.2 Problem B: why doesn’t *ethically* behave like *extremely*?

In spite of the evidence provided in the previous section, here I want to show that the interim conclusion above is not completely true. Interestingly, the set of LTAs that may

occupy the position we have been considering in this paper is not uniform. There are LTAs like *ethically* that may follow *so*, *tan*, *how* and *que* and, yet, the interpretation of [so/how Adv Adj] is not like the one in the preceding examples. Below is the relevant pair of sentences:

- (21) a. Que dubtós que és l'assumpte!  
'How dubious the matter is!'  
b. Que èticament dubtós que és l'assumpte!  
'How ethically dubious the matter is!'

Let us now run the same tests that have been applied to *extremely* to understand in what ways the class of *extremely* and that of *ethically* differ.

### 3.2.1 Paraphrase

Starting with the paraphrase test, example (22-a)– and not (22-b) – describes the intended meaning in (21-b).

- (22) a. The matter is *d*-[ethically dubious], and  $d \geq$  the degree of *being ethically dubious* that it takes for the speaker to have an emotional attitude.  
b. #The matter is *d*-dubious,  $d \geq$  the degree of *being dubious* that it takes for the speaker to have an emotional attitude and *d* is described by the speaker as ethical.

Observe that the contrast between the two possibilities is reversed. Whereas in (16) the paraphrase in (16-a) is unlikely, here the intended meaning is the one in which the LTA first combines with the adjective (i.e., [ethically dubious]), and it merges later with *que* (or *tan*, *how* or *so*).

With respect to (22-b), the paraphrase is clearly unacceptable because a degree cannot be described as being ethical. However, it is interesting to realize that even if we paraphrase (21-b) by saying “and the doubt is described by the speaker as being ethical”, the result is not the one we want. Crucially, we have no reasons to compose *ethically* and *dubious* in a separate semantic domain. Also, we do not have any motivation to consider this claim the speaker's judgement, because *ethically* is not speaker-oriented. To see it more clearly, consider a result clause construction, where the speaker's attitude is not at stake as it is in *wh*-exclamative clauses.

- (23) This matter is so ethically dubious that nobody wants to get involved in it.

What we can observe in the sentence above is that *ethically* is not an evaluative adverb that describes the speaker's attitude towards the degree of being dubious. In fact, if the speaker wants to introduce his/her attitude towards a degree, s/he can employ focus on *so* or even use the LTA *extremely* as in *so extremely ethically dubious*.

### 3.2.2 Change of degree operator in exclamatives

As far as the use of *com* goes, we may build an example like (24-b) and we obtain the same meaning as the one paraphrased in (22-a).

- (24) a. Com és de dubtós l'assumpte!  
 how is of dubious the matter  
 'How dubious the matter is!'  
 b. Com és d'èticament dubtós l'assumpte!  
 'How ethically dubious the matter is!'

### 3.2.3 Other degree operators

Finally, as expected, the following combinations of degree word, LTA and adjective are acceptable (of course, we have to assume that there are different degrees of being ethically dubious).

- (25) a. This matter is more ethically dubious than the other.  
 b. This matter is less ethically dubious than the other.  
 c. This matter is too ethically dubious.  
 d. This matter is ethically dubious enough.  
 e. How ethically dubious is it?

Summing up, we have shown that *extremely* and *ethically* exhibit the opposite results to the proposed tests. That is, even if they are LTAs and may occur preceded by *how*, *so*, *que* and *tan* and preceding an adjective, they present different modes of composition.

## 3.3 Problem C: how is *intelligently* different from the other two?

Last but not least, we can have examples like (26), where the corresponding result clause construction or *wh*-exclamative without the LTA is not possible:

- (26) a. \*Aquesta cuina està tan dissenyada que sembla la cuina del futur.  
 'This kitchen is so designed that it looks like the kitchen of the future.'  
 b. Aquesta cuina està tan intel·ligentment dissenyada que sembla la cuina del futur.'  
 'This kitchen is so intelligently designed that it looks like the kitchen of the future.'

Let us see what results we obtain when we run all the tests.

### 3.3.1 Paraphrase

Interestingly, at first sight *intelligently* patterns with *ethically*, because the paraphrase in (27-a) is plausible, whereas the one in (27-b) is unacceptable:

- (27) a. This kitchen is *d*-[intelligently designed], and  $d \geq$  the degree of *being intelligently designed* that it takes for a kitchen to look like the kitchen of the future.  
 b. \*This kitchen is *d*-[designed], and  $d \geq$  the degree of *being designed* that it takes for a kitchen to look like the kitchen of the future, and *d* is described by the speaker as intelligent.

We will see shortly that (27-a) is not the exact mode of composition we want to obtain. To see it, we need to go over the rest of the tests. As for (27-b), however, it should be pointed out that the reason why it is unacceptable is that the predicate modified by the LTA is not gradable, which makes it impossible for us to paraphrase the meaning of (26-b) by saying that its degree of ADJ-ness is high. So in a way, the paraphrase does not only give out an implausible interpretation but, rather, it is plainly unacceptable.

### 3.3.2 Change of degree operator in exclamatives

The results from the second test are not without interest, either:

- (28) a. \*Com està de dissenyada aquesta cuina!  
           how is of designed this kitchen  
       b. \*Com està d'intel·ligentment dissenyada aquesta cuina!  
           how is of intelligently designed this kitchen

Sentence (28-a) has the interpretation in which a kitchen can be more or less designed; that is, the semantic pitfall is the same as in (26-a).<sup>7</sup> The same applies to (28-b), which is unacceptable unless we assume there is a certain degree for a kitchen of being intelligently designed.<sup>8</sup>

### 3.3.3 Other degree operators

To conclude, all the other relevant degree operators are able to modify the degree expression.

- (29) a. This kitchen is more intelligently designed than mine.  
       b. This kitchen is less intelligently designed than mine.  
       c. This kitchen is too intelligently designed.  
       d. This kitchen is intelligently enough designed / is designed intelligently enough.  
       e. How intelligently designed is this kitchen?

Before closing this section, notice the double possibility in (29-d), which does not parallel the same example with *ethically* above (cf. (25-d)); that is, the corresponding option *This kitchen is intelligently designed enough* is marginal. I will show in subsequent

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<sup>7</sup>Crucially, there is a big difference between (28-a) – the counterpart of (18-b) and (24-a) – and the sentence below (without *de* 'of' preceding the participle):

- (i) Com està dissenyada aquesta cuina!  
       'How this kitchen is designed!'

*Com* merges with a non-gradable predicate and, then, it modifies the predicate's event argument. In other words, in the sentence above, the speaker has an emotional attitude towards the way the kitchen has been designed. For instance, it may be very modern, very ugly or very old-fashioned.

<sup>8</sup>Interestingly, the construction below, which has a slightly different syntax, is less marginal for reasons that require further research.

- (i) Com d'intel·ligentment dissenyada està la cuina!  
       'How intelligently designed this kitchen is!'

sections that this is a relevant fact about the mode of composition of LTAs such as *intelligently* in this configuration.

Very briefly, we have observed that *extremely*, *ethically* and *intelligently* do not have the same properties when they modify an adjective in *wh*-exclamatives and result clause constructions. From now on, I will focus on the analysis of the first class of LTAs, which are the most likely to occur in such constructions, and I will just sketch an account for problems B and C later on.

## 4 Analysis

In a nutshell, I will argue that LTAs of the *extremely* class are non-restrictive modifiers, that is they represent a side comment by the speaker, and, crucially, they do not merge with the adjective in the same domain of meaning as the rest of the descriptive content of the sentence. With respect to the *ethically* class, I will show that, as domain adverbials, these modifiers do not take gradable adjectives as input, but rather they restrict the events referred to by the (gradable) predicate; and, finally, it will become clear that LTAs like *intelligently* – and not the combination of Adv and Adj – are modified by the degree words *so*, *how*, *tan* and *que* by virtue of the fact that these LTAs derive from a gradable adjective (i.e., *intelligent*).

### 4.1 Non-restrictive modifiers

#### 4.1.1 The direct antecedents

Building on the idea that certain lexical items are not part of the main sentential content, Potts (2005)<sup>9</sup> argues that epithets (like *damn* in *damn machine*) and non-restrictive relative clauses are conventional implicatures (Grice, 1989).<sup>10</sup> This thesis is taken up by Morzycki (2008), who expands the idea to account for adjectives and adverbs that have a non-restrictive interpretation.

Below are the paraphrases Morzycki presents as evidence of the difference between the two interpretation of modifiers in non-parenthetical positions. In these examples it becomes clear that both adjectives and adverbs in non-parenthetical positions can be interpreted either restrictively or non-restrictively, and what these two concepts refer to:

- (30) Every *unsuitable* word was deleted. (Larson and Marušič, 2004)
- a. Restrictive: every word that was unsuitable was deleted.
  - b. Non-restrictive: every word was deleted; they were unsuitable.
- (31) The Titanic('s) *rapidly* sinking caused great loss of life. (Peterson, 1997)
- a. Restrictive: The Titanic's sinking being rapid caused great loss of life.
  - b. Non-restrictive: The Titanic's sinking, which was rapid, caused great loss of life.

<sup>9</sup>But see also before him Bartsch (1976); Bellert (1977); Bach (1999) and Jayez and Rossari (2004), who make similar proposals w.r.t. the contribution of parentheticals.

<sup>10</sup>All along the article I take for granted that expressive meaning is (conventionally) implicated meaning and I use the term *expressive domain* and *implicated domain* of meaning interchangeably.

Morzycki concentrates on the non-restrictive interpretation of these modifiers and proposes the following more fine-grained paraphrase of (30-b), where  $C$  refers to the context:

- (32) a. Every unsuitable word $_C$  was deleted.  
 b. ‘Every word $_C$  was deleted. The words $_C$  were unsuitable.’  
 c. ‘For every word  $x$  in  $C$ ,  $x$  was deleted, and the sum of all words in  $C$  was unsuitable.’

He also proposes a rule, namely the Expressive Predicate Modification Rule (which derives predicate modification in the expressive domain), and represents (30-b) by means of a tree that contains the descriptive meaning above the bullet and the conventionally implicated meaning below it.

$$(33) \quad \begin{array}{c} \lambda x.word(x) \wedge x \in C : \langle e^a, t^a \rangle \\ \bullet \\ unsuitable(\sup(\lambda y.words(y) \wedge y \in C)) : t^c \\ \diagdown \quad \diagup \\ unsuitable : \langle e^a, t^a \rangle \quad \lambda x.word(x) \wedge x \in C : \langle e^a, t^a \rangle \end{array}$$

In a different theoretical framework, Bonami and Godard (2008) show how evaluative adverbs like *malheureusement* (‘unfortunately’) do not contribute to the same domain as assertions. Specifically, they are lexically determined to have a special pragmatic behavior according to which the speaker uttering *malheureusement p* is committed to *evaluative p*, but this expression is never part of the *question under discussion*. This contribution to discourse differs drastically from an assertive speech act, where *p* needs to be accepted by the rest of the discourse participants before it becomes part of the common ground.

Along these lines, I will argue that *extremely* can be interpreted as an evaluative (or rather an expressive) and therefore it can be interpreted in a separate domain of meaning; that is, it can be viewed as a non-restrictive modifier.

#### 4.1.2 *Extremely* as a non-restrictive modifier

If we want to treat *extremely* as contributing to the conventional implicature domain, we expect the combination of the LTA and the adjective to represent a side comment (or *ancillary commitment*, as Bonami and Godard (2008) put it) of the speaker. Consequently, the meaning conveyed is speaker-oriented (or more precisely, judge-dependent, as in Potts (2007)) and it cannot be contradicted in the same manner as asserted meaning. Let us provide some arguments in favor of these claims.<sup>11</sup>

<sup>11</sup>J.M. Marandin (p.c.) commented on the possible inappropriateness of claiming that matrix exclamatives, which are said to be expressive constructions (cf. Castroviejo 2006), also include non-restrictive modifiers that are viewed as expressives. Even though it does not seem extremely problematic to assume that elements that belong to the implicated domain of meaning also include items that generate conventional implicatures, I believe this is a very good point and I agree that the design of such a possibility has to be considered in depth.



First, we see that we cannot deny the contribution of the LTA by the same means as regular asserted meaning. Compare (34-a) and (34-b):

- (34) a. A: Pau is tall. B: No, this is not true. Pau is extremely tall.  
 b. A: Pau is so tall that he reaches the ceiling. B: # No, this is not true. Pau is so extremely tall that he reaches the ceiling. [With a neutral intonation]

We observe in (34-a) that the addressee rejects (or rather *qualifies*) A's assertion by uttering that Pau is not only tall, but rather he is extremely tall. This is possible because *extremely* is composed here in the descriptive domain of meaning. However, this is not the case in (34-b). We cannot understand that B's contribution is a rejection of the asserted meaning provided by A, since the content that is supposed to qualify A's utterance (i.e., *extremely tall*) is not asserted, but implicated.

Likewise, if we look at the following example, we realize that the two sentences do not contradict each other, because the contribution of *extremely* does not have an effect on the assertive domain.

- (35) Pau is so tall that he reaches the ceiling. Kareem is so extremely tall that he reaches the ceiling, too, though Kareem isn't as tall as Pau.

It is interesting to note that the fact that we add *extremely* modifying *tall* in the result clause construction does not necessarily make Kareem taller than Pau. The fact that the speaker believes Kareem to be extremely tall is a side comment that has no direct repercussion on the asserted content. It only informs the discourse participants that the speaker is emotional about Kareem's tallness.

Building on this previous idea, let us show that all the LTAs that may be side comments express the speaker's emotional attitude. That is, non-restrictive modifiers behave like expressives.

- (36) a. En Pau és tan extremadament alt que arriba al sostre.  
 'Pau is so extremely tall that he reaches the ceiling.'  
 b. En Bill Gates és tan fastigosament ric que ja no sap què més comprar.  
 'Bill Gates is so disgustingly rich that he doesn't know what else to buy.'  
 c. En Hoynes està tan rotundament equivocac que no pot enganyar a ningú.  
 'Hoynes is so absolutely wrong that he cannot fool anybody.'

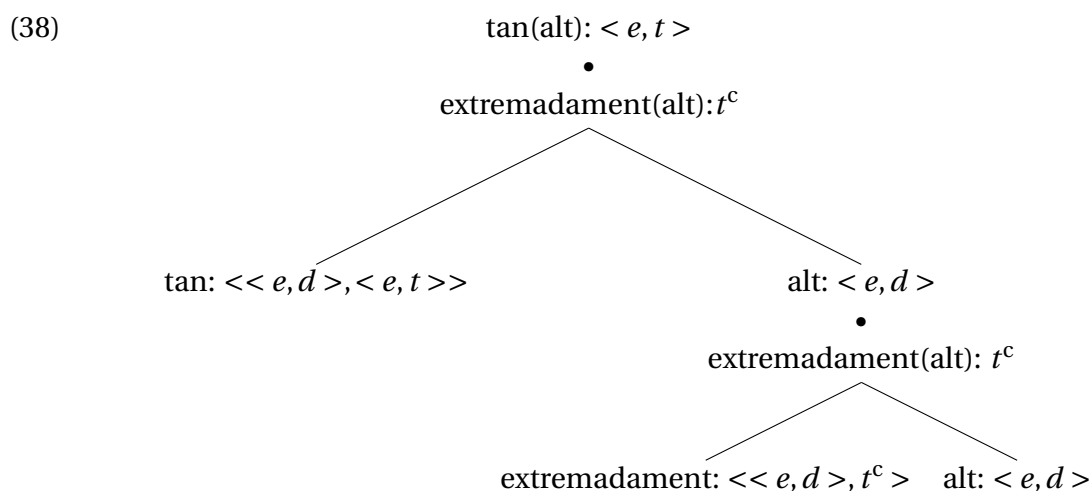
Notably, in (36-a) the speaker is amazed at Pau's degree of tallness, in (36-b) s/he is upset about Bill Gates's richness, and in (36-c) s/he is indignant at how wrong Hoynes is. To prove that this emotional attitude is an ancillary commitment, observe that it cannot be denied, because it is an entailment:

- (37) Pau is so extremely tall that he reaches the ceiling, # but his tallness doesn't impress me / # but I'm not touched by his tallness.

To conclude this section, let us make a final relevant clarification. Contrary to what is claimed for evaluatives (and for conventional implicatures more generally), I argue that *extremely* can be interpreted non-restrictively as a last resort operation. That is, just like any other predicative adverb (or just like *unsuitable* in (30)), *extremely* enters the derivation with the two options, i.e., in principle, it should be able to be interpreted

restrictively or non-restrictively. However, in the structures we have been considering, where *so* and Adj combine, the restrictive modification does not provide the intended meaning (recall the paraphrase in (16-a)). Therefore, the only manner in which this combination of words can make sense is by interpreting the LTA as composing with the adjective in a separate domain of meaning. This is possible because ancillary commitments are speaker-oriented and can be analyzed separately from the regular descriptive meaning.

In the following tree I represent the semantic composition of the DegP *tan extremadamente alt* ('so extremely tall'):



Differently from Morzycki (2008), I do not make use of the Expressive Predicate Modification rule. Very simply, I understand that *extremely* modifies *tall* at the implicated domain. As we can see, the measure function *tall* is used as input for another function in both the descriptive and the expressive domain, as expected, and because in the implicated domain we cannot find open functions, the output of the modifier *extremely* is a truth value.<sup>12</sup>

#### 4.1.3 The class of non-restrictive modifiers

So far I have only taken *extremely* as an example of a non-restrictive modifier, so it is time we considered the entire class of these items. Characteristically, they are interpreted as intensifiers because of their conveying an emotional attitude by the speaker (cf. Castells 2005, p. 112). Also, it is relevant that the adjective they precede is gradable (it must merge with the degree word *so*, *how*, *tan* or *que*), but they need not be. On the other hand, they are not a uniform class w.r.t. their semantic type. All they have in common is that, even if they can usually be interpreted restrictively, in the structures we are considering they are most of the time interpreted non-restrictively by virtue of the fact that they can convey the speaker's emotional attitude.

Among them, we find *extremely*, whose adjective describes a degree of ADJ-ness as being extreme. Also, the so-called *attitude toward degree modifiers* (cf. Katz 2005), such as *surprisingly* (e.g., *surprisingly full*), *frustratingly* (e.g., *frustratingly late*), *strangely*

<sup>12</sup>Naturally, it would be desirable to propose a uniform analysis for *extremely* in all domains of interpretation, but how this should work out requires further research.

(e.g., in *strangely familiar*) or *insanely* (e.g., in *insanely insecure*).<sup>13</sup> Finally, we include LTAs that are preposed to verbs (when they occur as verb modifiers). In such cases, they behave as intensifiers (cf. Bolinger 1972). For instance: *definitely smart, literally beautiful, absolutely right, positively impressed*.

#### 4.1.4 Advantages of the proposal

Aside from being able to account for the puzzles presented in the previous sections and to present another context in which modifiers are interpreted non-restrictively, I would like to highlight a few advantages derived from this analysis. First of all, we can straightforwardly explain the contrast presented by Elliott (1974):<sup>14</sup>

- (39) a. How very/unbelievably/extremely long he can stay under water!  
 b. \*How slightly/fairly/reasonably long he can stay under water!

So far, this contrast had been used as evidence to argue that exclamation indicates extreme degree, but there was no account for the puzzle. In my analysis, I can give two possible reasons as for why (39-b) is awkward. On the one hand, if the LTAs *slightly, fairly* and *reasonably* are interpreted restrictively, then we obtain a combination of Adv and Adj that is not a measure function; in other words, the following sentences are equally odd:

- (40) a. #He can stay more slightly long under water.  
 b. #He can stay fairly long enough under water.  
 c. #How reasonably long can he stay under water?

On the other hand, if these adverbs are interpreted non-restrictively, then we obtain a contradiction between the high degree that results from [*tan/que, so/how* Adj] and the attitude that underlies the use of these adverbs. This contradiction is paraphrased below:

- (41) He can stay under water *d*-long,  $d \geq$  the degree that it takes for the speaker to have an emotional attitude, # and the speaker describes *d* as slight/fair/reasonable.

Another advantage of the present proposal is that we can provide a simple account for a very relevant contrast pointed out by Zanuttini and Portner (2003), to which they give a rather complex explanation.<sup>15</sup>

<sup>13</sup>According to Katz (2005), the example in (i-a) should have the paraphrase in (i-b).

- (i) a. The pool is surprisingly full.  
 b. It is surprising that the pool is as full as it is and it'd be surprising were it fuller.

<sup>14</sup>I respect Elliott's star on (39-b), even though the clash in this sentence has to do with the semantics; no syntactic principle seems to be violated.

<sup>15</sup>According to Zanuttini and Portner (2003), in cases like (42-b), there is an incompatibility between the speaker's lack of knowledge asserted by the predicate and the factive presupposition introduced by the *wh*-exclamative. Specifically, when we have an attitude verb that takes a presupposed clause – i.e., the *wh*-exclamative–, the subject believes what the clause presupposes. Importantly, even the negative predicate inherits the presupposition. In the case at hand, there is a presupposition according to which

- (42) a. I know how extremely tall Pau is.  
 b. \*I don't know how extremely tall Pau is.  
 c. He doesn't know how extremely tall Pau is.  
 d. I didn't know how extremely tall Pau was.

Observe that if the verb *know* is on the first person of the present tense, it can introduce an embedded *wh*-exclamative.<sup>16</sup> All other things being equal, if the verb is negated, then the predicate cannot introduce an exclamative ((42-b)). However, if the subject is a third person ((42-d)) or the verb is in the past tense ((42-d)), then we do find an embedded *wh*-exclamative. My interpretation of these facts involve two important assumptions:

- To be able to analyze an LTA non-restrictively in these configurations, it must be implied that the speaker is committed to the descriptive content of the clause (i.e., s/he must be able to answer the question *how ADJ is x?*). The speaker cannot evaluate a property about which s/he has doubts.
- Non-restrictive modifiers of the *extremely* class are not lexically identified as conventional implicatures. If the context does not provide the appropriate conditions (cf. the condition above), then they are interpreted restrictively and this yields an awkward interpretation along the lines of (16-a).

Given the preceding assumptions, let us try to explain the contrasts. First, if the verb is on the first person of the present tense, then the subject is identified with the speaker. Knowledgeability (i.e., the implication that the speaker knows how tall Pau is) makes it possible for *extremely* to be interpreted non-restrictively. If, on the other hand, the speaker denies his/her own knowledge, s/he cannot express an emotional attitude caused by Pau's degree of ADJ-ness. Hence the awkwardness of (42-b). But if the verb is on the third person, then the subject is not identified with the speaker. Moreover, the focalization of the negation of someone else's lack of knowledge can be understood as the implication that the speaker does know Pau's degree of ADJ-ness. This, allows again the presence of *extremely* interpreted non-restrictively ((42-c)). Finally, if the verb is on the past tense, the negation of the past tense triggers the implication that at the present tense the speaker already knows Pau's degree of ADJ-ness and, thus, s/he can introduce expressive meaning ((42-d)).

I will close this section by mentioning one last generalization derived from the present account, namely that the non-restrictive interpretation of these adverbs also involves a very strict syntactic configuration. Specifically, the degree word must trigger pied-piping of the AP and the adverb must be deadjectival, that is, of the *-ly* type

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the speaker believes that Pau is – roughly – tall to an extreme degree. However, the predicate asserts that the speaker does not know that Pau is extremely tall. Zanuttini and Portner appeal to this contradiction to explain the inacceptability of (42-b). The acceptable (42-c) and (42-d) do not incur this contradiction because it is not asserted that the speaker does not know how tall Pau is. Note that this would not disallow \**John wonders how extremely tall Pau is*, which they explain by an independent reason.

<sup>16</sup>According to Elliott (1974); Grimshaw (1979); Gutiérrez-Rexach (1996) and Zanuttini and Portner (2003), the presence of the adverb is the identifier of the *wh*-clause as an embedded exclamative in English. Bear in mind that in embedded contexts, *wh*-interrogatives and *wh*-exclamatives have the same word order.

in English and of the *-ment* type in Catalan. The first condition makes it possible for the degree word and the LTA to both merge with the adjective, even if this happens in different levels of meaning. If there is no pied-piping, then the adjective and the LTA first merge and the resulting gradable expression combines afterwards with the degree word, which would give us interpretation in (16-a) above. The second constraint is responsible for the fact that the degree of ADJ-ness is described as ADJ (e.g., extreme, surprising, etc.). If these two syntactic conditions are not met, then we do not obtain the non-restrictive interpretation of the LTA. We can see below some interesting consequences of this generalization.

First, we begin to understand why the Catalan counterpart of (43-a) is grammatically unacceptable ((43-b)).

- (43) a. How very tall he is!  
 b. \*Que molt alt que és!

Since *molt* ('very'), even if it is an intensifier, is not an LTA, it cannot occur in this position. It follows that we may have to interpret *very* as an LTA that means *truly*. It is thus possible that *very*'s intensifier meaning stems from its being a preposed LTA (cf. Bolinger 1972).

Analogously follows the contrast in (44):

- (44) a. El llenguatge de la pel·lícula era tan excessivament formal que ningú la va entendre.  
 'The language of the movie was so excessively formal that nobody understood it.'  
 b. \*El llenguatge de la pel·lícula era tan massa formal que ningú la va entendre.  
 'The language of the movie was so too formal that nobody understood it.'

Even if *excessivament* ('excessively') and *massa* ('too') are semantically almost indistinguishable, only the former is able to stand in this configuration.

Second, it seems that we can establish an analogy between *extremely* modifying an adjective in result clause constructions and *wh*-exclamatives, and LTAs that occur as premodifiers of verbs, all of which are interpreted non-restrictively and must have deadjectival morphology (cf. Bolinger 1972, p. 259):

- (45) a. He laboriously slaved at the task.  
 b. \*He hard slaved at the task.

In the examples above, as in the contrast depicted in (44), the LTA, but not the almost synonym non-deadjectival adverb, is able to stay in this position.

And third, it is borne out that the *wh*-exclamatives that are not introduced by a degree word that involves pied piping of the AP, cannot include adverbs like *extremely* modifying the gradable adjective. This is true for the type of *wh*-exclamatives in Catalan introduced by *com* ('how') ((46-a)) and generally for exclamatives in French ((46-b)), where this possibility is banned or marginal (or acceptable with the interpretation in (16-a)).

- (46) a. #Com és d'extremadament alt! (Catalan)  
 'How extremely tall he is!'

- b. #Comme il est extrêmement grand! (French)  
 ‘How extremely tall he is!’

This does not entail, of course, that the presence of such a syntactic structure allows for the presence of *extremely*. It is a necessary but not sufficient condition that needs to be checked cross-linguistically.

## 4.2 Restrictive but not intersective modifiers

In the following two subsections I move on to the slightly less common LTAs that may occur in *wh*-exclamatives and result clause constructions in English and Catalan modifying an adjective.

Let us start with *ethically*. Interestingly, if we want to maintain the measure function analysis of gradable adjectives, we are inclined to propose the simplified analysis below, where we assume that *ethically* takes as input a measure function and it returns a measure function:

$$(47) \quad \begin{array}{c} \text{tan}(\text{\`eticament}(\text{dubtós})): \langle e, t \rangle \\ \lambda x[\text{TAN}((\text{ethically}(\text{dubious}))(x))(d_i)] \end{array}$$

$$\begin{array}{cc} \text{tan}: \langle \langle e, d \rangle, \langle e, t \rangle \rangle & \text{\`eticament}(\text{dubtós}): \langle e, d \rangle \\ \lambda G \lambda x[\text{TAN}(G(x))(d_i)] & G: \lambda z.(\text{ethically}(\text{dubious}))(z) \end{array}$$

Notice that the semantic composition above is identical to the one without the adverb ((48)), except for the fact that instead of considering the gradable adjective *dubious*, we have another measure function, namely *ethically dubious*.

$$(48) \quad \begin{array}{c} \text{tan}(\text{dubtós}): \langle e, t \rangle \\ \lambda x[\text{TAN}(\text{dubious}(x))(d_i)] \end{array}$$

$$\begin{array}{cc} \text{tan}: \langle \langle e, d \rangle, \langle e, t \rangle \rangle & \text{dubtós}: \langle e, d \rangle \\ \lambda G \lambda x[\text{TAN}(G(x))(d_i)] & G: \lambda z.\text{dubious}(z) \end{array}$$

Nevertheless, *ethical* has a wider syntactic distribution and also combines with verbs, which suggests that the analysis above is too simple. Let us just sketch an alternative which, in fact, would lead us to give up on the measure function analysis of gradable adjectives. My claim is that *ethically* restricts one of the arguments of *dubious*, and the resulting gradable expression merges with the degree word *so*, *how*, *tan*, *que*. Consequently, we cannot understand the adjective *dubious* as being of type  $\langle e, d \rangle$ , but rather a relation between an individual, a degree and an additional variable – i.e., the one that is bound by *ethically*.

First of all, we should consider other instances of this type of modification. For example, *genetically weak*, *personally disappointing*, *sexually ambiguous*, *politically correct* or *economically harmful*. In all these cases, the adjective is gradable, but the LTA

is not.<sup>17</sup> These LTAs are reminiscent of the so-called *domain adverbials* (Ernst 2002), which also include *mathematically, economically, morphologically, telepathically* and *politically*.

In Ernst (2002)'s account, the sentences in (49) represent the *pure domain* reading of such adverbs,<sup>18</sup> which amounts to saying that the adverb restricts the set of events to the subset characterized as being in a particular domain. To illustrate it with Ernst (2002)'s examples, in (49-a) there is a set of painful events that fall into the political domain (i.e., from all the possible painful events related to all possible domains, we only take into account the ones related to politics). Also, in (49-b), there is a set of developing events that becomes restricted to only the economical domain, so the sentence does not say anything about political development, for instance.

- (49) a. These budget cuts will be painful politically.  
b. Some Asian countries have developed economically only recently.

In an analogous fashion to (49-a), we can say about (50) that there is a set of dubious events and we restrict ourselves to the ones in the ethical domain. In other words, the matter might not be *legally* dubious at all.

- (50) Aquest assumpte és tan èticament dubtós que ningú no s'hi vol embolicar.  
'This matter is so ethically dubious that nobody wants to get involved in it.'

According to the way Ernst approaches domain adverbials, *ethically* should be viewed as event internal. This means that it modifies one of the arguments of the verb at L-syntax. It is restrictive, but not strictly speaking intersective.<sup>19</sup>

This analysis according to which *ethically* only takes as input one of the arguments of the adjective is not only insightful w.r.t. the semantics of the modification (we do not mean that the adjective *dubious* is ethical, but rather we mean that we restrict ourselves to the dubious events that concern the ethical domain). Also, if we assume that the LTA may bind this variable at a distance,<sup>20</sup> we can derive the wide distribu-

<sup>17</sup>Note that these [Adv Adj] combinations have an [Adj N] counterpart where Adj is a relational adjective (e.g., *ethical doubt, genetic weakness, sexual ambiguity*, etc.). Interestingly, in such configurations, the Adj is claimed to modify only one of the arguments of N (cf. McNally and Boleda 2004).

<sup>18</sup>There is also a *means* reading, which does not concern us here. Below are his (6.11a) and (6.11b) examples:

- (i) a. They classified all the examples morphologically.  
b. The aliens expressed themselves telepathically.

<sup>19</sup>Specifically, he claims that it represents

a restriction on a contextual variable  $c^*$ , which in turn restricts the range of events for the basic event variable via the covert predicate UNDER ( $e, c^*$ ) in VP.

Below is the representation for the example (49-a):

- (i) [<sub>E</sub> [<sub>E</sub> PAINFUL ( $e$ ) & Agt( $e, b$ ) & UNDER ( $e, c^*$ )] & CR (POLITICAL,  $c^*$ )]

In the DRT simplified formula above, CR(POLITICAL,  $c^*$ ) is the representation of the political domain restriction on the conditions  $c^*$  and UNDER ( $e, c^*$ ) – which is part of the translation of every predicate – expresses that the painful events are considered under circumstances  $c^*$ .

<sup>20</sup>In Ernst (2002)'s account, the decisive factor is the low occurrence of UNDER ( $e, c^*$ ). Domain adver-

tion of these adverbials. That is, aside from preposed to the adjective, we usually find them clause initially and postposed to the adjective without a change in the truth-conditional meaning of the sentence, so (51) could be uttered felicitously in the same situations as (50).

- (51) a. Èticament, aquest assumpte és tan dubtós que ningú no s'hi vol embolicar.  
'Ethically, this matter is so dubious that nobody wants to get involved in it.'
- b. Aquest assumpte és tan dubtós èticament que ningú no s'hi vol embolicar.  
'(lit.) This matter is so dubious ethically that nobody wants to get involved with it.'

Of course, in order to derive the compositional semantics of [*tan/que, so/how Adv Adj*], we need the following assumptions:

- Adjectives like *dubious* are of type  $\langle z, \langle d, \langle e, t \rangle \rangle \rangle$ , where  $z$  is this dimension that can be bound by the adverb.
- Domain adverbials are functions of the sort  $\lambda z.ADV(z)$ .
- There is a lexical rule that makes sure that whenever a domain adverbial combines with an adjective, the adverb modifies  $z$  and the resulting predicate is a relation between individuals and degrees (i.e.,  $\langle d, \langle e, t \rangle \rangle$ ), which can merge with a degree word.

I leave the further considerations regarding the consequences of these claims for future research. What is relevant for the purposes of this paper is that *ethically dubious* should be seen as a gradable expression that can merge with the degree word *tan, so, que, how*. *Ethically* is not a regular intersective predicate, because it does not take the entire adjective as input, but only one of its arguments. However, it is restrictive and it composes semantically in the descriptive domain of meaning.

### 4.3 Modified modifiers

The last type I am concerned with is that of LTAs like *intelligently* in phrases like *so intelligently designed*. Characteristically, these LTAs are gradable and they modify a participle, as in *beautifully phrased, badly injured, slowly cooked, gently stirred* or *genuinely surprised*.

With respect to these [*Adv Adj*] combinations I will claim that only the adjective is the argument of the degree word *so, how, tan, que*. More specifically, I propose a derivation along the following lines:

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bials only spell out the specification of the domain and can restrict  $c^*$  from different positions unproblematically without changing the truth conditions of the sentence. Hence the above VP and VP-adjoined occurrences of *symbolically* in (i) are formalized as in (ii):

- (i) They (symbolically) could (symbolically) have (symbolically) been cutting an old umbilical cord (symbolically).
- (ii) a. CR (SYMBOLIC,  $c^*$ ) ... [<sub>E</sub> F(e) ... & UNDER(e,  $c^*$ )]  
 b. ... [<sub>E</sub>' [<sub>E</sub> F(e) ... & UNDER(e,  $c^*$ )] & CR (SYMBOLIC,  $c^*$ )]



$$\begin{array}{c}
 (52) \quad \text{tan(intelligentment): } \langle e, t \rangle \\
 \quad \quad \lambda e[\text{TAN(intelligent}(e))(d_i)] \\
 \quad \quad \swarrow \quad \searrow \\
 \text{tan: } \langle \langle e, d \rangle, \langle e, t \rangle \rangle \quad \text{intelligentment: } \langle e, d \rangle \\
 \lambda G \lambda x_e[\text{TAN}(G(x))(d_i)] \quad G: \lambda z_e.\text{intelligent}(z)
 \end{array}$$

Note that I treat *intelligently* as a measure function just like the adjective it is derived from (cf. Ernst 2002). However, instead of taking as input an individual of type  $x$ , it takes an eventive-type individual (i.e., of type  $e$ ).

Now, if we understand that some adjectives include an event argument (cf. Larson 1998), we may accept the translations  $T$  in (53) for the phrase *intelligently designed*, where the participle also has an individual argument that corresponds to the theme of the event.

$$\begin{array}{l}
 (53) \quad \text{a. } T(\text{designed}) = \lambda z_e \lambda x[\text{designed}(x, z)] \\
 \quad \quad \text{b. } T(\text{intelligently}) = \lambda y_e[\text{intelligent}(y)] \\
 \quad \quad \text{c. } T(\text{intelligently designed}) = \lambda z_e \lambda x[\text{designed}(x, z) \ \& \ \text{intelligent}(z)]
 \end{array}$$

Nevertheless, since we have seen that the degree word modifies only the adverb in the combination [Adv Adj], we need a modified version of the proposal above, namely (54).

$$(54) \quad T(\text{so intelligently designed}) = \lambda z_e \lambda x[\text{designed}(x, z) \ \& \ \text{so} - \text{intelligent}(z)]$$

This explains the puzzles in (55)–(56) and (57)–(58).

- $$\begin{array}{l}
 (55) \quad \text{a. intelligently enough designed} \\
 \quad \quad \text{b. designed intelligently enough} \\
 \quad \quad \text{c. *intelligently designed enough} \\
 (56) \quad \text{a. *ethically enough dubious} \\
 \quad \quad \text{b. *dubious ethically enough} \\
 \quad \quad \text{c. ethically dubious enough}
 \end{array}$$

Above, we compare the possible placement of the degree word *enough* depending on whether the adverb is *intelligently* ((55)) or our previous case, *ethically* ((56)). It is clear from the sentences in (55) that the degree word must follow the adverb, but it cannot directly modify the participle, which is the opposite restriction that applies to the adverb in (56), where Adv and Adj do form a unit before they merge with the degree word.

Also, observe that in (57), the adverb itself can be modified by a degree word, but this is not the case for most participles that can be modified by adverbs like *intelligently*.

- $$\begin{array}{l}
 (57) \quad \text{a. intelligently designed: very intelligently, *very designed} \\
 \quad \quad \text{b. beautifully phrased: more beautifully, *more phrased}
 \end{array}$$

Certainly, some participles can be modified (cf. Kennedy and McNally 2005). However, in the depicted configuration, the degree word does not modify the degree argument of the participle, as (58) shows:

- (58) This meat is so slowly cooked that it tastes wonderfully. Fortunately it is not too cooked.

What the previous example shows is that the high degree of being ADV V-ed does not entail a high degree of being V-ed. Precisely, the meat is cooked very slowly, but its degree of being cooked must not be high.

Therefore, *intelligently designed* is another case of modification that does not involve a semantic composition in a separate domain of meaning (as was the case with *extremely tall*) but it is not comparable to *ethically dubious*, either, because the former LTA is gradable and thus it can combine with the degree word before merging with the adjective (in fact, the past participial), whereas the latter LTA restricts an argument of the adjective it merges with before combining with the degree word.

## 5 Concluding remarks

In this paper I have addressed two basic problems in the interpretation of adverbs that modify adjectives in *wh*-exclamatives and result clause constructions in Catalan and English. The first problem is the acknowledgment that, unexpectedly enough, adverbs that in other contexts behave like predicate modifiers, like *extremely* in *extremely tall*, do not seem to be interpreted in the same fashion when they are preceded by the degree words *so*, *how*, *tan*, *que* and they precede a gradable adjective. The second problem that I have considered is the fact that, aside from adverbs that indicate the speaker's attitude like *extremely*, there are some other deadjectival adverbs that may occupy this position, even if they do not form a homogeneous class.

Below is a summary of my main conclusions:

- Between *tan/que*, *so/how* and an adjective we can find a restrictive modifier only if it merges with the adjective to obtain a gradable expression that can be modified by the degree word.
- Also, an LTA may be interpreted in the regular descriptive domain of meaning if it is modified by *tan/que*, *so/how*, and [*tan/que*, *so/how*+Adv] modify a past participle.
- When by performing the semantic compositions above we do not obtain the desired meaning, then it is possible to interpret the LTA non-restrictively only if: (a) the LTA can convey an emotional attitude by the speaker, and (b) the adjective is gradable.
- Unlike regular conventional implicatures triggered by evaluatives, LTAs like *extremely* are interpreted non-restrictively as a last-resort operation (i.e., as a way of obtaining a meaningful interpretation out of the DegP), and this is possible because this class of adverbs can convey an emotional attitude by the speaker.

To conclude, the topics touched upon in this paper suggest some interesting lines of research. To begin with, we still need to learn and explore in depth what kind of operations happen in the expressive domain of meaning and in what way it is analogous

to the descriptive dimension. For instance, it would be desirable to find out how different sources of expressive meaning (e.g., a parenthetical and an epithet) interact when they co-occur in a construction.

Moreover, it would be convenient to build a full compositional semantics for the cases like *so ethically dubious* and *so intelligently designed*. Starting from here, we might find additional arguments for or against the measure function analysis of gradable adjectives.

In this paper I hope to have successfully shown that adverbs that modify adjectives should be taken into account seriously, because they are able to raise many interesting questions, most of which still await an answer.

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# Rescuing Existential Free Choice Items in Episodic Sentences

Jinyoung Choi & Maribel Romero

## 1 FCIs and episodic sentences

Free Choice Items (FCIs) are known to be ungrammatical in episodic sentences, whereas they can occur in generic sentences. For instance, English FCI *any* is not licensed in the episodic sentence (1), but is perfectly fine in the generic sentence (2).

- (1) \*Anyone contributed to the fund. (Dayal, 1998)  
(2) Any bird flies.

Interestingly, if a relative clause is added, the grammaticality status of (1) is ameliorated, as shown in (3). This kind of amending strategy was dubbed SUBTRIGGERING by LeGrand (1975) and received a full attention in Dayal (1998). Rescuing by subtriggering is considered as a typical characteristic of (some type of) FCIs in languages like English (see Dayal 1995, 1998).

- (3) Anyone who heard the news contributed to the fund.

Note here that this subtriggering strategy does not work for all types of FCIs. Chierchia (2005) points out that, in Italian, subtriggering rescues the universal type of FCI *qualsiasi*, but not the existential counterpart *uno qualsiasi*. The same contrast holds for other Romance languages like Spanish: adding a relative clause improves the universal FCI *cualquier* in (4), but not the existential FCI *un N cualquiera* in (5).<sup>1,2</sup>

- (4) a. \*Ayer Juan tropezó con cualquier objeto.  
Yesterday Juan stumbled with CUALQUIER object  
'Yesterday Juan stumbled against any object.'

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<sup>1</sup>As we will see (section 6), the rescuing effect of subtriggering consists of turning the episodic sentence into a semi-generic one, which in Spanish is typically accompanied by switching from perfective to imperfective aspect in the verb (Quer 2000, Menéndez-Benito 2005). The point we want to make here is that subtriggering and the concomitant verbal aspect change rescue the universal FCI in (4b) but not the existential FCI in (5b).

<sup>2</sup>The following abbreviations are used in this paper: NOM (nominative), ACC (accusative), LOC (locative), TOP (topic), GEN (generic), NEG (negation), PAST (past tense), REL (relative clause marker), DEC (declarative ending), PERF (perfective), IMPERF (imperfective), SUBJ (subjunctive), and IND (indicative).

- b. Ayer Juan tropezó / tropezaba con cualquier objeto que  
 Yesterday Juan stumbled<sub>PERF</sub> / stumbled<sub>IMPERF</sub> with CUALQUIER object that  
 no estuviese en su sitio.  
 not was<sub>SUBJ</sub> in its place  
 ‘Yesterday Juan stumbled against any object that wasn’t in its place.’
- (5) a. ??? Ayer Juan tropezó con un objeto cualquiera.  
 Yesterday Juan stumbled with AN object CUALQUIERA  
 ‘Yesterday Juan stumbled against any<sub>∃</sub> / a random object.’
- b. ??? Ayer Juan tropezó / tropezaba con un objeto  
 Yesterday Juan stumbled<sub>PERF</sub> / stumbled<sub>IMPERF</sub> with AN object  
cualquier que no estuviese (/estaba) en su sitio.  
 CUALQUIERA that not was<sub>SUBJ</sub> (/was<sub>IND</sub>) in its place  
 ‘Yesterday Juan stumbled against any<sub>∃</sub> / a random object that wasn’t in its  
 place.’

Choi (2007) makes a similar observation for Korean. An episodic sentence with a FC item with universal reading, which is very marginal if uttered out of the blue, is rescued by subtriggering. This is shown in (6) with FCI *wh-(N)-na* under its universal reading. In contrast, the existential FCI *amwu-(N)-na* in (7) as well as the existential reading of *wh-(N)-na* in (6) remain ungrammatical regardless of the presence of subtriggering.<sup>3</sup>

- (6) a. \*John-un nwukwu-hako-na macuchi-ess-ta.  
 J.-TOP WHO-with-OR run.into-PAST-DEC  
 ‘(Lit.) John ran into anyone.’ (Choi, 2007)
- b. John-un ke-ipkwu-lo tuleo-nun nwukwu-hako-na<sub>∃/\*∃</sub>  
 J.-TOP the-entrance-by enter-REL WHO-with-OR<sub>∃/\*∃</sub>  
 macuchi-ess-ta.  
 encountered  
 ‘(Lit.) John ran into anyone who was coming in by the entrance.’
- (7) a. \*John-un AMWU-HAKO-NA macuchi-ess-ta.  
 J.-TOP AMWU-with-OR run.into-PAST-DEC  
 ‘(Lit.) John ran into anyone<sub>∃</sub> / a random person.’ (Choi, 2007)
- b. \*John-un ke-ipkwu-lo tuleo-nun amwu-hako-na macuchi-ess-ta.  
 J.-TOP the-entrance-by enter-REL AMWU-with-OR encountered  
 ‘(Lit.) John ran into anyone<sub>∃</sub> / a random person who was coming in by the  
 entrance.’

In this paper, we present the novel observation that a strategy different from subtriggering is used to rescue the so-called existential type of FCIs such as Spanish *un N cualquiera* and Korean *amwu-(N)-na*. The new strategy is identified as “agentivity” (cf. Lee 1999, Choi 2005). Then we turn to Korean FCIs in more detail as a case study. Following Choi (2007), we will see that the transparent morphology of Korean FCIs identifies the particle *-na*, and not Domain Widening (Kadmon and Landman 1993), as the

<sup>3</sup>Though not essential to this paper, we will have something to say about why, unlike *amwu-(N)-na*, *wh-(N)-na* can have both a universal and an existential reading in rescued episodic sentences. See sections 4.2 and 6.2.

source of free choiceness in these items. Based on the semantic contribution of *-na*, we propose a unified analysis of the two rescuing strategies –subtriggering and agentivity– in connection with the licensing environments and quantificational force of the Korean FCIs. Finally, we briefly return to Spanish and apply the same analysis.

## 2 The new rescuing strategy: Agentivity

Consider sentence (8). Although (8) describes an episodic event, it allows *amwu-(N)-na* to occur in it. Recall that, in contrast to (8), *amwu-(N)-na* is deviant in (7a). The difference between (7a) and (8) is whether or not those sentences contain a volitional agent. That is, sentence (8), where the agent John is present, licenses *amwu-(N)-na*, while sentence (7a), where there is no agent, disallows *amwu-(N)-na*. A similar improvement is registered for *wh-(N)-na* in (9) under its existential reading.

(8) John-un amwu-chaek-ina cip-ese ku-uy-ey olienoh-ass-ta.  
 J.-TOP AMWU-book-OR take-and the-top-LOC put-PAST-DEC  
 ‘(Lit.) John took a random book and put it on the top (of the pile).’

(9) ?John-un enu-chayk-ina cip-ese cong-i-uy-ey noh-ass-ta.  
 J.-TOP WH-book-OR pick-and paper-top-LOC put-PAST-DEC  
 ‘(Lit.) John took a random book and put it on the pile of paper.’

The existential type of FCI in Spanish *un N cualquiera* displays the same behavior. In contrast to the ungrammaticality of (5a), *un N cualquiera* is grammatical in (10) with the help of agentivity in the sentence.

(10) Juan necesitaba un pisapapeles, de modo que cogió un libro cualquiera  
 Juan needed a paperweight, of way that he-took A book CUALQUIERA  
 de la estantería y lo puso encima de la pila.  
 from the shelf and it he-put on-top of the pile  
 ‘John needed a paperweight, so he took a random book from the shelf and put it on top of the pile.’

Note importantly that what plays a role here is not syntactic subject-hood but semantic agentivity of the sentence. According to the literature on argument structure (e.g., Pustejovsky 1995), not all subjects are agents, as illustrated in (4)-(7), and not all agents appear in the subject position, as shown in (11). Observe in (11) that *amwu-(N)-na* can be licensed by the agent in the postpositional phrase of (11). This sentence shows us that the crucial part in rescuing *amwu-(N)-na* is semantic agentivity, not syntactic subject-hood.

(11) amwu-na John-eykey mac-ass-ta.  
 AMWU-OR John-by hit-PAST-DEC  
 ‘(Lit.) Anyone was hit by John.’

From this, we conclude that the so-called existential type of FCIs (i.e., Korean *amwu-(N)-na*, the existential reading of Korean *wh-(N)-na*, and Spanish *un N cualquiera*) can improve when they occur under the scope of a volitional agent.

### 3 Korean Free Choice Items: A Case Study

So far, we have seen that the so-called universal type of FCIs can be licensed in an episodic sentence with the help of subtriggering and that the so-called existential type of FCIs improve with the help of agentivity. In this paper, we will make a unified analysis of the two rescuing strategies by first investigating Korean FCIs as a case study. We will argue that the particle *-na* in *wh*-(N)-*na* and *amwu*-(N)-*na* triggers a presupposition of counterfactual variation parallel to *-ever* in *-ever* Free Relatives (FRs) in von Stechow (2000). This presupposition cannot be satisfied in an episodic sentence, and this renders both types of FCIs unacceptable in episodic environments. However, subtriggering and agentivity help make the presupposition of *-na* felicitous, albeit in different ways and with different results: subtriggering rescues only FCIs with universal force (*wh*-(N)-*na*) and agentivity amends FCIs with existential force (*amwu*-(N)-*na* and *wh*-(N)-*na*).

Korean PSIs are composed of one of the two indefinite roots, *amwu*- and *wh*-, and one of the three particles, *-to* ‘also/even’, *-lato* ‘even’, and *-na* ‘or’. A common noun can be inserted between the indefinite root and the particle. Thus, the possible ways of combination result in the following six items, all of which correspond to English *any*.

#### (12) Formation of Korean polarity sensitive items

| Ind roots        | <i>-to</i> ‘also/even’      | <i>-lato</i> ‘even’           | <i>-na</i> ‘or’             |
|------------------|-----------------------------|-------------------------------|-----------------------------|
| Particles        |                             |                               |                             |
| <i>Amwu</i> -(N) | <i>Amwu</i> -(N)- <i>to</i> | <i>Amwu</i> -(N)- <i>lato</i> | <i>Amwu</i> -(N)- <i>na</i> |
| <i>Wh</i> -(N)   | <i>Wh</i> -(N)- <i>to</i>   | <i>Wh</i> -(N)- <i>lato</i>   | <i>Wh</i> -(N)- <i>na</i>   |

The licensing environments of the PSIs are shown roughly in Table (13) and Table (14). The environments in the tables are divided into four sub-groups. The first group is episodic negation. The second group consists of downward entailing (DE) contexts such as the antecedent of a conditional and the restrictor of a universal quantifier. Episodic negation does not belong to this group although it is also downward-entailing. The third group includes so-called FC contexts where FCIs typically appear across languages, such as generic contexts, possibility modal and necessity modal contexts, and imperatives. The last group contains affirmative episodic sentences.

#### (13) Licensing environments of *amwu*-PSIs

| <i>Amwu</i> -PSIs           | <i>amwu</i> -(N)- <i>na</i> | <i>amwu</i> -(N)- <i>to</i> | <i>amwu</i> -(N)- <i>lato</i> |
|-----------------------------|-----------------------------|-----------------------------|-------------------------------|
| Contexts                    |                             |                             |                               |
| Negative episodic           | */√                         | √                           | *                             |
| DE contexts other than neg. | √                           | *                           | √                             |
| FC contexts                 | √                           | *                           | √                             |
| Affirmative episodic        | */√                         | *                           | *                             |

#### (14) Licensing environments of *wh*-PSIs

| <i>Wh</i> -PSIs             | <i>wh</i> -(N)- <i>na</i> | <i>wh</i> -(N)- <i>to</i> | <i>wh</i> -(N)- <i>lato</i> |
|-----------------------------|---------------------------|---------------------------|-----------------------------|
| Contexts                    |                           |                           |                             |
| Negative episodic           | */√                       | √                         | *                           |
| DE contexts other than neg. | √                         | *                         | √                           |
| FC contexts                 | √                         | √                         | √                           |
| Affirmative episodic        | */√                       | *                         | *                           |



The main interest of this paper lies in the *-na*-based FCIs: *amwu*-(N)-*na* and *wh*-(N)-*na*. As you see in the first column of each table, they cannot occur in negative or affirmative episodic sentences. But rather, they only appear in DE contexts and FC contexts. The “\*/√” marks in the first and last rows indicate that the *-na* PSIs can be rescued in episodic sentences by the rescuing strategies that we will explore in this paper.

In order to give a unified analysis of the two rescuing strategies, we will first investigate the role of the two indefinite roots *amwu*- and *wh*- in section 4. Following Choi (2005, 2007), we show that Korean *wh*-(N) ranges over a regular domain that is explicitly stated or implicitly understood, whereas Korean *amwu*- induces domain-widening, as Kadmon and Landman (1993) proposed for English *any*. Given that both *amwu*-(N)-*na* and *wh*-(N)-*na* give rise to the same free choice effects, it is concluded that the common source of their free choiceness is not domain-widening. In section 5, we will be concerned with the contribution of the common particle *-na*. By applying and extending von Stechow's (2000) account of English *-ever* Free Relatives, it will be argued that the particle *-na* introduces the presupposition of counterfactual variation. This presupposition is the source of the free choiceness of the *-na*-based FCIs. Only when it is satisfied in the context can the sentence containing the FCIs be judged grammatical. Finally, in section 6, we will explain the two rescuing strategies as devices to make the presupposition of *-na* fulfilled. Section 7 summarizes the conclusions.

## 4 The Two Indefinite Roots: *amwu*- vs. *wh*-

In this section, we will show that *amwu*- is a domain-widening indefinite (Kadmon and Landman 1993). In contrast, the root *wh*- is argued to range over a regular or contextually salient domain. We will briefly summarize Kadmon and Landman's (1993) domain-widening effects of English *any*, and then present four sets of evidence from Choi (2007) which suggest that *amwu*- widens the domain maximally along some contextual dimension while *wh*- ranges over a regular or salient domain.

### 4.1 *Any* as domain-widening indefinite: Kadmon and Landman (1993)

Kadmon and Landman (1993) characterize “*any* CN (common noun)” as the domain-widening indefinite, as opposed to plain indefinites like “a CN”. *Any* widens the interpretation of “a CN” maximally along a contextual dimension, whereas “a CN” ranges over a regular domain. For instance, the generic sentence (15a) that contains a plain indefinite is interpreted as (15b). *An owl* ranges over a regular domain, that is, a set consisting of owls with the regular/normal properties.

- (15) a. An owl hunts mice.  
 b. Every owl, which is normal, hunts mice.

In contrast, sentence (16a) that contains *any owl* instead of *an owl* has a domain-widening effect applied to it. Then the normality is defined in a broader sense, as shown in (16b). As a result, the domain of *any owl* is larger than the domain of *an owl*.

- (16) a. Any owl hunts mice.  
 b. Every owl, which is normal in a widened sense, hunts mice.

To see how to obtain the broader/widened definition of normality with domain-widening, imagine a “HEALTHY-SICK” dimension. Before widening as in (17a), the definition of the normality of an owl includes the property of being healthy, as represented in (17b).

- (17) Before widening  
 a. An owl hunts mice.  
 b.  $\forall \uparrow X_{owl}$  (Healthy owl) (Hunts mice)  
 c. Every owl that is “normal” – in a sense that includes being healthy - hunts mice.

After domain-widening is applied by *any* as in (18a), then the property of being healthy is eliminated from defining the domain, as in (18b). In their terms, *any* induces minimally changing the relevant domain  $X_{owl}$  so as to make both HEALTHY and SICK compatible with “normal”. In the end, *any* ranges over a wider domain than plain indefinites. That is, the set denoted by “a CN” is replaced by a superset when “a CN” is replaced by “any CN”. The choice of the superset is determined by contextual factors.

- (18) After widening  
 a. Any owl hunts mice.  
 b.  $\forall \uparrow X_{owl, healthy or sick}$  (Owl, healthy or sick) (Hunts mice)  
 c. Every owl that is “normal” - in a sense that it is compatible with being healthy or being sick - hunts mice.

## 4.2 *Amwu-* as a domain-widening indefinite

This section displays several pieces of evidence that strongly suggest that Korean *amwu-* is a domain-widening indefinite à la Kadmon and Landman (1993). In contrast to *amwu-*, *wh-* ranges over a normal or salient domain. The evidence to be presented combines the two roots with one of the three particles *-na* ‘or’, *-lato* ‘even’ and *-to* ‘also, even’ from (12), to show that the proposed semantic difference stems from the roots alone and cross-cuts the choice of suffixed particles.

First, the contrast between (19a) and (19b) indicates that the domain of *amwu-(N)-na* is wider than the domain of *wh-(N)-na*. While *wh-(N)-na* only includes normal people, i.e. people who received the appropriate education or have average I.Q., etc., *amwu-(N)-na* ranges over a larger domain that includes contextually marginal people as well, that is, people who have not received any education or are severely handicapped. If the positions for *wh-(N)-na* and *amwu-(N)-na* are switched as in (19b), the sentence does not make sense.

- (19) a. Ku il-un nwukwu-na ha-l.swu.iss-ciman, amwu-na  
 The job-TOP WHO-OR do-can-but AMWU-OR  
 ha-l.swu-iss-ci.ahn-ta.  
 do-can-NEG-DEC  
 ‘(Lit.) As for the job, anyone can do it, but not just ANYone can do it.’

- b. #Ku il-un amwu-na ha-l.swu.iss-ciman, nwukwu-na  
 The job-TOP AMWU-OR do-can-but WHO-OR  
 ha-l.swu-iss-ci.ahn-ta.  
 do-can-NEG-DEC  
 ‘(Lit.) As for the job, just ANYone can do it, but not everyone/anyone can do it.’

Second, *wh*-(N) is usually linked to a contextually salient domain while *amwu*-(N) is not restricted to such a salient domain. Consider the scenario in (20). Under this scenario, suppose the mother thinks being a doctor is better than any other job and says one of the sentences in (21) and (22). Note that in sentences (21), the particle *-na* ‘or’ is kept constant: it combines with *wh*-(N) in (21a), and with *amwu*-(N) in (21b). In sentences (22), the particle *-lato* ‘even’ is constant: it combines with *wh*-(N) in (22a), and with *amwu*-(N) in (22b).

- (20) Mother: You’ve been having a lot of blind dates so far. Now is the time to decide.  
 John: Well, I met Ann and Betty who are doctors, and Cathy who is a nurse and Dianna and Fiona who are professors, but I haven’t made up my mind.
- (21) a. (ne-nun) etten/enu-uysa-hako-na kyelhohay-to.kwaynchanh-e.  
 you-TOP WHAT/WHICH-doctor-with-OR marry-can-DEC  
 ‘You are allowed to marry any doctor (of those you have been dating).’  
 b. (ne-nun) amwu-uysa-hako-na kyelhohay-to.kwaynchanh-e.  
 you-TOP AMWU-doctor-with-OR marry-can-DEC  
 ‘You are allowed to marry any doctor.’
- (22) a. (ne-nun) etten/enu-uysa-hako-lato kyelhohay-to.kwaynchanh-e.  
 you-TOP WHAT/WHICH-doctor-with-EVEN marry-can-DEC  
 ‘You are allowed to marry any doctor (of those you have been dating).’  
 b. (ne-nun) amwu-uysa-hako-lato kyelhohay-to.kwaynchanh-e.  
 you-TOP AMWU-doctor-with-EVEN marry-can-DEC  
 ‘You are allowed to marry any doctor.’

Empirically, regardless of whether *wh*-(N) combines with *-na* ‘or’ (21a) or *-lato* ‘even’ (22a), *wh*-(N) conveys that the mother gives John permission to marry one out of the contextually salient doctors, i.e., out of the doctors that John has had a blind date with, namely, Ann and Betty. In contrast, in the cases where *amwu*-(N) combines with *-na* ‘or’ (21b) or *-lato* ‘even’ (22b), the mother is not committed to the two doctors but gives John the more general permission to marry a doctor and all possible doctors are a marriage option for John.

A third piece of evidence suggesting a difference in domain size between *amwu*-(N) and *wh*-(N) comes from (negative) existential sentences. When combined with the particle *-to* ‘also, even’, both roots are in principle possible in a negative episodic sentence, as illustrated in (23). But, if the negative sentence is existential, as in (24), a contrast between *amwu*-(N)-*to* and *wh*-(N)-*to* arises: *amwu*-(N)-*to* is grammatical in (24a), but *wh*-(N)-*to* is deviant in (24b):

- (23) a. John-un amwu-koki-to mek-ci.anh-ass-ta.  
 J.-TOP AMWU-meat-EVEN eat-NEG-PAST-DEC  
 ‘John didn’t eat any meat.’

- b. John-un etten-koki-to mek-ci.anh-ass-ta.  
 J.-TOP WHAT-meat-EVEN eat-NEG-PAST-DEC  
 ‘John didn’t eat any meat.’
- (24) a. kyosil-ey amwu-to eps-e.  
 classroom-LOC AMWU-EVEN not.exist-DEC  
 ‘There isn’t anyone in the classroom.’
- b. \*kyosil-ey nwukwu-to eps-e.  
 classroom-LOC WHO-EVEN not.exist-DEC

It is well-known that weak quantifiers are ambiguous between a proportional (partitive) reading and a cardinal (non-partitive) reading (Milsark 1974). For instance, the NP *many / some superheroes* in (25) can be given two interpretations, as in (26a) and (26b). On the so-called proportional reading, the NP is equivalent to the partitive *many / some of the superheroes*, as in (26a). On the cardinal reading, the NP means “many / some in number”, as shown in (26b).

- (25) Many / Some superheroes are playing in our neighbor’s garden.
- (26) a. Many / Some of the superheroes are playing in our neighbor’s garden.  
 b. A high / Some number of superheroes are playing in our neighbor’s garden.

Importantly, when an indefinite like *some superheroes* occurs in an existential sentence, it cannot take on the proportional or partitive reading, as shown in (27). It is only interpreted on the cardinal reading.

- (27) There exist some superheroes.  
 ≠ Some of the superheroes exist, as opposed to others.  
 = Some number of superheroes exist.

The fact that the partitive reading of a weak indefinite is blocked in an existential sentence is arguably the reason why *wh-(N)-to* is marginal in (24b). If we assume that *wh-(N)-to* in (24b) takes on the partitive reading while *amwu-(N)-to* in (24a) takes on the cardinal reading, the contrast in (24) can be accounted for on the same grounds as in (27). That is, the two sentences in (24) are paraphrased as in (28a) and (28b) below. Due to the conflict of the partitive reading of *wh-(N)-to* with the existentiality of the sentence, *wh-(N)-to* is judged marginal.

- (28) a. There is not even one person in the classroom.  
 b. \*There is not even one of the people in the classroom.

Assuming that partitivity can be treated as a form of familiarity or specificity, as proposed by Enç (1991), *wh-(N)*’s taking on a partitive reading indicates that *wh-(N)* selects a specific or contextually salient domain of individuals. By contrast, *amwu-(N)* does not pick such a specific domain, and is interpreted on a cardinal reading in an existential sentence.

Lastly, *wh-(N)* and *amwu-(N)* show different scope behavior, arguably due to their difference in the domain sizes. Choi (2005) notes the scope behavior of *wh-(N)-lato* and *amwu-(N)-lato* with respect to modality by presenting example (29) below.

- (29) a. Jane-un nwukwu-hako-lato kyelhonha-yahan-ta.  
 J.-TOP WHO-with-EVEN marry-must-DEC  
 $\sqrt{\square} > \exists$ : ‘Jane has to marry a/any man. The identity does not matter.’  
 $\sqrt{\exists} > \square$ : ‘Some person is such that Jane has to marry, the speaker doesn’t care who it is.’
- b. Jane-un amwu-hako-lato kyelhonha-yahan-ta.  
 J.-TOP AMWU-with-EVEN marry-must-DEC  
 $\sqrt{\square} > \exists$ : ‘Jane has to marry a/any man. The identity does not matter.’  
 $*\exists > \square$

While *wh*-(N)-*lato* can take either narrow scope under the necessity modal or wide scope over the modal as in (29a), *amwu*-(N)-*lato* can only be interpreted inside the scope of the modal, as shown in (29b). On the wide scope, *de re* reading in (29a), *wh*-(N)-*lato* indicates that there is a particular person that Jane has an obligation to marry. *Amwu*-(N)-*lato* lacks such a *de re* reading, and is only interpreted as *de dicto*: “Jane has an obligation to marry a man, any man can be a marriage option for her”. This scope pattern of *wh*-(N) is reminiscent of Musolino and Gualmini’s (2004) observation that NPs with a specific domain (e.g., partitives) can take wide scope more easily than NPs without a specific domain. For instance, the partitive indefinite *two of the birds* in (30a) is easily construed as taking wide scope over negation whereas the non-partitive indefinite *two birds* in (30b) is hard to be interpreted as taking wide scope.

- (30) a. The Smurf didn’t catch two of the birds.  $\sqrt{2} > \neg$   
 b. The Smurf caught all the cats but she didn’t catch two birds.  $*2 > \neg$   
 (Musolino and Gualmini, 2004)

In conclusion, taken together, these four sets of data strongly suggest that the root *amwu*-(N) ranges over an open or widened domain while the root *wh*-(N) ranges over a specific or regular domain. Also, *amwu*-(N) tends to take narrow or in-situ scope whereas *wh*-(N) behaves like a partitive indefinite, i.e., it can or tends to take wide scope over an operator such as a modal.

Since the two roots – regardless of whether they introduce a widened or a regular domain – yield the same free choice effects, Choi (2007) concludes that the source of free choiceness in these items is not Domain Widening, but something else. We turn now to the common source of free choiceness in the *-na*-based FCIs, namely the particle *-na*.

## 5 The contribution of the particle *-na* ‘or’

### 5.1 Essential link

In this section, we examine the contribution of the particle *-na*. Choi (2007) proposes that the nature of the contribution of the particle *-na* ‘or’ is to trigger an essential link or a causal relation between the property expressed by the restrictor of the NP with *-na* and the main predicate of the sentence.

For example, in (31) below, the particle *-na* ‘or’ induces an essential link or a causal relation between “being five years old” and “being allowed/able to solve the problem”.

If the particle *-na* is omitted, (and a case marking is inserted as default according to the Korean morphology system,) then the essential or causal relation is not generated, as in (32).

- (31) a. amwu-tasus-salccali-na ku mwuncey-lul phul-swu.iss-e.  
 AMWU-five.old-OR that problem-ACC solve-can-DEC  
 ‘Just any five-year-old can solve the problem.’
- b. etten-tasus-salccali-na ku mwuncey-lul phul-swu.iss-e.  
 WHAT-five.old-OR that problem-ACC solve-can-DEC  
 ‘Any five-year-old can solve the problem.’
- (32) motun-tasus-salccali-ka ku mwuncey-lul phul-swu.iss-e.  
 ALL-five.year-NOM that problem-ACC solve-can-DEC  
 ‘Every five-year-old can solve the problem.’

As opposed to Kim and Kaufmann (2006), who claim that *amwu*-(N)-*na* conveys a counterfactual implication but *wh*-(N)-*na* doesn’t, we advocate that there is exactly the same counterfactual component with both *amwu*-(N)-*na* and *wh*-(N)-*na*. To see this, let’s consider another example with the scenario in (33).

- (33) Sue’s father and mother want her to get married soon. So they are trying to arrange blind dates for their daughter. From various sources, Sue’s mother was introduced to four doctors, Andrew, Bill, Con, and Dave, and three lawyers, Ethan, Fred, and George, and received a picture of each of them. Now she is asking her husband’s opinion:  
 Mother (showing all the pictures to Father): These are the doctors and lawyers that I was introduced to. Who do you think is the best?  
 Father: Doctors are better than lawyers.  
 Mother (showing the pictures of the doctors): Which one?

- (34) Father:
- a. motun-uysa-ka coh-a  
 ALL-doctor-NOM good-DEC  
 ‘All the doctors are ok.’
- b. Etten/enu-uysa-na coh-a  
 WHAT/WHICH-doctor-OR good-DEC  
 ‘Any of the doctors is ok.’
- c. Amwu-uysa-na coh-a  
 AMWU-doctor-OR good-DEC  
 ‘Just ANY doctor is ok.’

All the three sentences in (34) appear to have the interpretation that each of the four doctors, Andrew, Bill, Con, and Dave is a good candidate from the father’s perspective. However, imagine a situation where Sue’s mother mistakenly showed the father the picture of a non-doctor among the other pictures, say, a picture of the lawyer George? What will happen if the father discovers the mother’s mistake? First of all, (34a) containing the universal quantifier *mot(w)u*- ‘every’ may not hold anymore, because by uttering (34a), the father expresses that each of the four persons in the pictures who

he believes are doctors is ok to him. However, if one of them is actually not a doctor, then the father may want to go on checking the actual doctor, i.e., Dave's picture. If he doesn't like the picture of Dave, then his original opinion will be changed. In contrast to this, the father's opinion in (34b) remains unchanged, because (34b) containing *wh*-(N)-*na* conveys that no matter how the person in each picture looks and who he is, if he is one of the (contextually salient) doctors, then he is a marriage option for Sue. Hence, a counterfactual implication is conveyed by *wh*-(N)-*na* in (34b). In other words, the sentence expresses an essential link or causal relation between "being one of the relevant doctors" (here arguably construed as "being a doctor that has been introduced to the mother and whose picture has been given to her") and "being a marrying option for Sue". *Amwu*-(N)-*na* in (34c) goes one step further. It conveys that a doctor outside of the given domain is also considered as a marriage option for Sue as long as the person is a doctor. That is, the sentence with *amwu*-(N)-*na* expresses an essential or causal link between "being a doctor possibly outside the contextual domain" and "being a marrying option for Sue". This "outside of the domain" reading comes from the domain-widening effects of *amwu*-, which seem to have led Kim and Kaufmann (2006) to claim that only *amwu*-(N)-*na* delivers a counterfactual implication.

## 5.2 Parallelism with *-ever* Free Relatives

Given that the particle *-na* 'or' triggers an essential or a causal relation regardless of the indefinite roots, Choi (2007) suggests that the contribution of *-na* is parallel to the contribution of *-ever* in *-ever* Free Relatives (FRs) in English. von Fintel (2000) adopts Dayal's (1997) insight that *-ever* FRs introduce a layer of quantification over possible worlds, and proposes that *-ever* in *-ever* FRs induces a presupposition of variation on either counterfactual worlds or epistemic worlds. Choi (2007) captures the essential link of *-na* with the same formalism for *-ever* in *-ever* FRs.

Let us first look at the properties of *-ever* FRs, presented in von Fintel (2000). Von Fintel (2000) points out that a subtype of *-ever* FRs expresses "indifference" on somebody's part. Compare (35a) and (35b). Both of them assert the same proposition paraphrasable using a definite description, namely, the proposition that the person who was at the top of the ballot won the election yesterday.

- (35) a. In yesterday's election, who was at the top of the ballot won.  
 b. In yesterday's election, whoever was at the top of the ballot won.

Different from (35a), (35b) conveys an extra meaning triggered by *-ever*, such that the identity of who was at the top of the ballot did not matter to winning yesterday's election. In the sense that the identity of the denotation of *-ever* FRs does not matter for the general nature or outcome of the election, Tredinnick (2005) dubbed this type of essential link "**external indifference**", as in (36). In von Fintel (2000), this essential link follows from the presupposition of variation given in (37), which is identified as the nature of *-ever*'s contribution. The presupposition of variation tells us that if the individual denoted by an *-ever* FR had been different, the truth value of the assertion in the actual world would still be valid in all the counterfactual worlds.

- (36) External indifference essential link: It doesn't matter who was at the top of the ballot in yesterday's election. There was an essential link between "being at the

top of the ballot” and “winning the election”.

- (37) Presupposition of variation: If the person who was at the top of the ballot had been different, the same thing would have happened: that (new) person would have won.

Besides external indifference, there is another type of indifference reading. If you compare (38a) and (38b), both of them assert the following: that Zack voted for the person who was at the top of the ballot. However, while the plain FR in (38a) does not necessarily convey any counterfactual implication, *-ever* in (38b) adds another layer of meaning, that is, the presupposition of variation on the basis of the counterfactual modal, as given in (39).

- (38) a. Zack voted for who was at the top of the ballot.  
 b. Zack voted for whoever was at the top of the ballot.
- (39) Presupposition of variation: If the person who was at the top of the ballot had been different, the same thing would have happened: Zack would have voted for that (new) person.

To satisfy this presupposition, the addressee most plausibly infers that the identity of the person who was at the top of the ballot did not matter to Zack, or in other words, Zack was indifferent about who was at the top of the ballot, as in (40). In this case, since it is the agent Zack who is indifferent about the identity, this type of indifference reading is called “**agent indifference**” (Tredinnick 2005, Choi 2005).

- (40) Agent indifference essential link: Zack was indifferent as to the identity of the person who was at the top of the ballot. There was an essential link between “being at the top of the ballot” and “getting Zack’s vote”.

*-Ever* FRs have another usage, i.e., ignorance (Dayal 1997, von Stechow 2000), where *-ever* FRs express the speakers ignorance about the denotation of the FRs, as in (41). Here again, *-ever* adds a presupposition, but this time the presupposition is based on an epistemic modal base and not a counterfactual modal base. This type of reading, however, will not be dealt with in this paper, because the Korean *-na* FCIs do not induce an ignorance reading and the purpose of this section is to show parallelism between *-ever* FRs and *-na*-FCIs.

- (41) Whatever Arlo is cooking has a lot of garlic in it.

In von Stechow (2000), a sentence containing an *-ever* FR is formalized as in (42). In the formulae, F indicates the modal base for *-ever* FRs, which is a set of worlds on which the presupposition of variation operates. P refers to the denotation of the NP property contained in the *-ever* FR, and Q refers to the property expressed by the rest of the sentence. Sentences containing an *-ever* FR assert that the thing that has P is Q in the actual world, as shown in (42a). The presupposition triggered by *-ever* says that in all worlds (of the corresponding modal base) that are different from the actual world only with respect to the referent of the *-ever* FR, the asserted proposition has in  $w'$  whatever truth value it has in the actual world  $w_0$ .

- (42) Whatever ( $w_0$ ) (F) (P) (Q)



- a. **Asserts:**  $Q(w_0)(\iota x.P(w_0)(x))$   
 b. **Presupposes:**  $\forall w' \in \min_{w_0} [F \cap \lambda w''. \iota x.P(w'')(x) \neq \iota x.P(w_0)(x)]:$   
 $Q(w')(\iota x.P(w')(x)) = Q(w_0)(\iota x.P(w_0)(x))$

By applying this to the example of external indifference, the sentence in (35b), repeated in (43) below, is formally represented as in (44) and paraphrased as in (45). The modal base  $F$  is counterfactual, and thus a presupposition of counterfactual variation is conveyed, as in (45b). That is, the presupposition triggered by *–ever* conveys that if the person at the top of the ballot had been different in all the counterfactual worlds, the truth of the proposition “the person at the top of the ballot won” would also hold in the counterfactual worlds. From this presupposition of variation, it is inferred that regardless of who was at the top of the ballot, “being at the top of the ballot” and “winning yesterday’s election” are in an essential relation.

- (43) In yesterday’s election, whoever was at the top of the ballot won. (=35b)
- (44) a. **Assertion:**  $\lambda w_0. \text{win}(\iota y.\text{top-of-ballot}(y,w_0),w_0)$   
 b. **Presupposition:**  
 $\lambda w_0.\forall w' \in \min_{w_0} [F \cap \lambda w''[\iota y.\text{top-of-ballot}(y,w'') \neq \iota y.\text{top-of-ballot}(y,w_0)]]:$   
 $\text{win}(\iota y.\text{top-of-ballot}(y,w'),w') = \text{win}(\iota y.\text{top-of-ballot}(y,w_0),w_0)$
- (45) a. **Assertion:** In  $w_0$ , the person who was at the top of the ballot in  $w_0$  won.  
 b. **Presupposition:** In each world  $w'$ , a counterfactual world of  $w_0$ , if someone else had been at the top of the ballot in  $w'$ , the person who was at the top of the ballot in  $w'$  won in  $w'$  iff the person who was at the top of the ballot in  $w_0$  won in  $w_0$ .

Likewise, the example of agent indifference repeated in (46) below can be formalized and interpreted as in (47) and (48). The assertion means that Zack voted for the person who was at the top of the ballot in the actual world. The presupposition conveys that if the identity of the person at the top of the ballot had been different, the same thing, i.e., Zack’s voting for the person at the top of the ballot would have happened.

- (46) Zack voted for whoever was at the top of the ballot. (=38b)
- (47) a. **Assertion:**  $\lambda w_0. \text{vote}(z, \iota x.\text{top-of-ballot}(x,w_0),w_0)$   
 b. **Presupposition:**  $\lambda w_0.\forall w' \in \min_{w_0} [F \cap \lambda w''[\iota x.t-o-b(x,w'') \neq \iota x.t-o-b(x,w_0)]]:$   
 $\text{vote}(z, \iota x.\text{top-of-ballot}(x,w'),w') = \text{vote}(z, \iota x.\text{top-of-ballot}(x,w_0),w_0)$
- (48) a. **Assertion:** In  $w_0$ , Zack voted for the person who was at the top of the ballot in  $w_0$ .  
 b. **Presupposition:** In all counterfactual worlds  $w'$  minimally different from  $w_0$  in which someone different is at the top of the ballot, Zack voted in  $w'$  for the person at the top of the ballot in  $w'$  iff he voted in  $w_0$  for the person at the top of the ballot in  $w_0$ .

The formalization in (44) and the one in (47) are exactly parallel. Whether an *–ever* FR has an external indifference or agent indifference interpretation depends on contextual factors, and is only an “epiphenomenal inference” that is drawn from the presupposition of variation (Tredinnick 2005: 108). That is, for the presupposition of variation introduced by *–ever* to be construed most plausibly, in (43), it is inferred that an

essential link was made by some external force on the election, and external indifference obtains. On the other hand, in (46), the easiest way to satisfy the presupposition of variation and capture the essential link between “being at the top” and “receiving Zack’s vote” is to assume Zack’s indifferent attitude. Hence, agent indifference obtains in the case of (46).

### 5.3 Formalization of *-NA* FCIs

Choi (2007) extends the formalization (42) that is proposed for *-ever* FRs to the *-na*-based FCIs, as in (49).

- (49) *wh-/amwu-(N)-na* ( $w_0$ ) (F) (P) (Q)
- a. **Asserts:**  $\exists x [P(w_0)(x) \wedge Q(w_0)(x)]$
  - b. **Presupposes:**  $\forall w' \in \min_{w_0} [F \cap \lambda w''.P(w'')] \neq P(w_0]: \exists x [P(w')(x) \wedge Q(w')(x)]$   
 $\leftrightarrow \exists x [P(w_0)(x) \wedge Q(w_0)(x)]$

The template in (49) for *-na*-FCIs is parallel to the one for *-ever* FRs except for a few details. While the formula for *-ever* FRs contains an iota operator since *-ever* FRs are definite, the iota operator has been replaced by an existential quantifier for *-na*-FCIs because *amwu-(N)-na* and *wh-(N)-na* are indefinites whose basic quantification is existential. In the presupposition in (49b), too, the equation among the iota expressions from *-ever* FRs has been replaced by an equation among the extensions of the NP property P of *amwu-/wh-(N)-na*. Another point that differentiates *-na*-FCIs from *-ever* FRs is that while the presupposition of *-ever* has as its modal base either the counterfactual or epistemic modal, the presupposition of *-na* always takes the counterfactual modal. Now, the computation of the assertion and presupposition in (49) derives the paraphrases in (50).

- (50) a. **Assertion:** Some P is Q in the actual world  $w_0$ .
- b. **Presupposition:** In all the counterfactual worlds  $w'$  that are minimally different from  $w_0$  in the following respect, namely that the set of individuals that have property P in  $w'$  is different from the set of individuals that have property P in  $w_0$ : the asserted proposition  $\lambda w. \exists x [P(w)(x) \wedge Q(w)(x)]$  has in  $w'$  whatever truth value it has in the actual world  $w_0$ .

Now let us apply this to simple sentences like in (51). Similar to *-ever* FRs, *-na*-FCIs can also be interpreted on agent indifference, as paraphrased in (52). Because John did not care about the identity of the book, an essential link holds between “being the set of books” and “having a member picked up by John”. This essential relation is triggered by the presupposition of variation in (53), i.e. if there had been a different set of books, John would have picked one up.

- (51) a. John-un amwu-chayk-ina cip-ese cong-i-uy-ey noh-ass-ta.  
 J.TOP AMWU-book-OR pick-and paper-top-LOC put-PAST-DEC  
 ‘John picked up a random book and put it on the pile of paper.’
- b. ?John-un etten-chayk-ina cip-ese cong-i-uy-ey noh-ass-ta.  
 J.-TOP WHAT-book-OR pick-and paper-top-LOC put-PAST-DEC  
 ‘John picked up (a) random book(s) and put it (/them) on the pile of paper.’

- (52) Agent Indifference essential link: It didn't matter to John what/which (kind of a) book he picks up. There is an essential relation between "being the set of books" and "having one member picked up by John".
- (53) Presupposition of variation: If the set of books had been different, the same thing, i.e., John's picking up a book, would have happened.

If we apply the formalism (49) to *amwu-/wh-(N)-na* in (51), we will get (54), which is read as in (55).

- (54) a. **Assertion:**  $\lambda w_0. \exists x. \text{book}(x, w_0) \ \& \ \text{pick}(j, x, w_0) \ \& \ \text{put-on-pile}(j, x, w_0)$   
 b. **Presupposition:**  
 $\lambda w_0. \forall w' \in \min_{w_0}. [F \cap \lambda w''. \{x: \text{book}(x, w'')\} \neq \{x: \text{book}(x, w_0)\}]:$   
 $\exists x. \text{book}(x, w') \ \& \ \text{pick}(j, x, w') \ \& \ \text{put.on.pile}(j, x, w') \leftrightarrow$   
 $\exists x. \text{book}(x, w_0) \ \& \ \text{pick}(j, x, w_0) \ \& \ \text{put.on.pile}(j, x, w_0)$
- (55) a. **Assertion:** In the actual world  $w_0$ , there is some book in  $w_0$  that John picked up and put on the pile in  $w_0$ .  
 b. **Presupposition:** In all counterfactual worlds  $w'$  minimally different from  $w_0$  with respect to the identity of the set of books, there is some book in  $w'$  that John picked up and put on the pile in  $w'$  iff there is some book in  $w_0$  that John picked up and put on the pile in  $w_0$ .

Now let us consider a more complex case in which some operator  $\Phi$  scopes above the *na*-FCIs. This would be the case, for example, in generic statements like (56a,b), where the generic operator GEN divides the clause's material into a restrictor including the *na*-FCI and a nuclear scope. The particle *na* introduces the presupposition of variation in (57). The resulting essential relation is easily understood as external indifference, as given in (58).

- (56) a. amwu-tasus-salccali-na ku mwuncey-lul phul-swu.iss-e.  
 AMWU-five-year-OR that problem-ACC solve-can-DEC  
 'Just any five-year-old can solve the problem.'  
 b. etten-tasus-salccali-na ku mwuncey-lul phul-swu.iss-e.  
 WHAT-five-year-OR that problem-ACC solve-can-DEC  
 'Any five-year-old can solve the problem.'

- (57) Presupposition of variation: If the set of five-year-old children was different, a five-year-old would in general be allowed/able to solve the problem.
- (58) External indifference essential relation: The identity of five-year-old children doesn't matter. There is an essential relation between "being a five-year-old child" and "being in general allowed/able to solve the problem".

The corresponding formalization and paraphrase are in (59)-(60):<sup>4</sup>

<sup>4</sup>For the sake of simplicity, the formulae involving GEN are somewhat abbreviated throughout the paper. The full version of e.g. (59a) would be (i), following von Stechow (1994:64):

(i)  $\lambda w_0. \text{GENs} \leq w_0 [ s \in \min(\lambda s''. \exists y. 5\text{-yr-old}(y, s'')) ] [ \exists s' \geq s [ s' \in \min(\lambda s''. \exists y. 5\text{-yr-old}(y, s'')) \ \& \ \text{solve}(y, p, s'') ] ]$

- (59) a. **Assertion:**  $\lambda w_0. \text{GENs} \leq w_0 [\exists y.5\text{-yr-old}(y,s)] [\text{solve}(y,p,s)]$   
 b. **Presupposition:**  $\lambda w_0. \forall w' \in \min_{w_0} [F \cap \lambda w'. \{x:5\text{-yr-old}(x,w')\}] \neq \{x:5\text{-yr-old}(x,w_0)\}]$ :  
 $\text{GENs}^+ \leq w' [\exists y.5\text{-yr-old}(y,s^+)] [\text{solve}(y,p,s^+)] \leftrightarrow$   
 $\text{GENs} \leq w_0 [\exists y.5\text{-yr-old}(y,s)] [\text{solve}(y,p,s)]$
- (60) a. **Assertion:** Every  $s$ , a (minimal) subsituation of  $w_0$  containing a five-year-old, is a situation  $s$  in which the five-year-old solves the problem in  $s$ .  
 b. **Presupposition:** For each  $w'$ , a counterfactual world of  $w_0$ , in which the set of five-year olds is different from the set of five-year olds in the actual world: every  $s^+$ , a substitution of  $w'$  where there is a five-year-old, is a situation where the five-year-old solves the problem if and only if every  $s$ , a subsituation of  $w_0$  where there is a five-year-old, is a situation in which the five-year old solves the problem in  $s$ .

## 6 An Account for the Rescuing Strategies

In sections 1 and 2, we saw that subtriggering can rescue universal but not existential FCIs, and that agentivity can rescue existential FCIs.<sup>5</sup> This is so both in Korean and in Romance languages like Spanish. In section 4, we took a closer look at Korean FCIs and saw that the *wh*-root carries a contextual domain while the *amwu*-root induces domain-widening. Since both roots can form FCIs, it was concluded that the source of free choiceness is not Domain Widening. In section 5, we argued that the source of free choiceness is the particle *-na*, which triggers a presupposition of counterfactual variation that must be made felicitous.

Now we attempt to account for the licensing environments of the universal and existential FCIs in Korean. Why are they excluded in an episodic sentence? How can subtriggering and agentivity rescue (one of) the two FCIs? We propose that the presupposition of variation of the particle *-na* is too strong and thus infelicitous in an episodic sentence (cf. Dayal 1998, Chierchia 2005). Subtriggering and agentivity help satisfy this presupposition of variation, making *-na*-FCIs acceptable. Finally, we extend this analysis to the two types of FCIs in Spanish.

### 6.1 Rescuing Korean universal FCIs: Subtriggering

We saw that subtriggering can rescue universal FCIs in episodic sentences, as in (61), but not existential FCIs, as in (62):

- (61) a. \*John-un nwukwu-hako-na macuchi-ess-ta. (Choi, 2007)  
 J.-TOP WHO-with-OR run.into-PAST-DEC  
 '(Lit.) John ran into anyone.'

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"Every  $s$ , a minimal subsituation of  $w_0$  containing a five-year-old, can be extended to a minimal situation  $s'$  in which a five-year-old solves the problem."

<sup>5</sup>We leave the question of whether agentivity rescues universal FCIs for future research.

- b. John-un ke-ipkwu-lo tuleo-nun nwukwu-hako-na  $\forall / * \exists$   
 J.-TOP the-entrance-by enter-REL WHO-with-OR  $\forall / * \exists$   
 macuchi-ess-ta.  
 encountered  
 ‘(Lit.) John ran into anyone who was coming in by the entrance.’
- (62) a. \*John-un amwu-hako-na macuchi-ess-ta. (Choi, 2007)  
 J.-TOP AMWU-with-OR run.into-PAST-DEC  
 ‘(Lit.) John ran into anyone  $\exists$  / a random person.’
- b. \*John-un ke-ipkwu-lo tuleo-nun amwu-hako-na macuchi-ess-ta.  
 J.-TOP the-entrance-by enter-REL AMWU-with-OR encountered  
 ‘(Lit.) John ran into anyone  $\exists$  / a random person who was coming in by the entrance.’

We propose that the crucial role of subtriggering is to help make felicitous the presupposition of variation introduced by *-na*. This is done in the following way. As we have seen, one avenue to satisfy the presupposition of variation is to interpret it as external indifference, that is, to interpret the sentence as making a law-like statement positing an essential relation between the N-property of the FCI and the property expressed by the rest of the clause.

To achieve this goal, we need to turn the episodic sentence into a semi-generic sentence by introducing the GEN operator and placing the FCI-indefinite in the restrictor of GEN. This gives us the LF in (63), that is, an LF where the FCI indirectly receives (quasi) universal quantificational force coming GEN:<sup>6</sup>

- (63) LF: [<sub>IP</sub> GEN [<sub>IP</sub> FCI-indefinite [<sub>IP</sub> John ran into t ]]]

Now, if the FCI is not subtriggered, as in (61a), the assertion and the presupposition of variation would have very implausible truth conditions. As the reader can see in (64), the assertion reads: “Every *s* containing a person is a situation where the person is run into by John”. And the presupposition says that there is an essential relation between “being a person” and “being run into by John”. As Dayal (1998) and Chierchia (2005) note, this interpretation is too strong to ever be true. Thus, the presupposition is infelicitous, and the sentence with the unsubtriggered universal FCI is judged ungrammatical.

- (64) **Assertion:**  $\lambda w_0. \text{GENs} \leq w_0 [\exists x. \text{person}(x,s)] [\text{run.into}(j,x,s)]$   
**Presupposition:**  
 $\lambda w_0. \forall w' \in \min_{w_0} [F \cap \lambda w'. \{x: \text{person}(x,w')\}] \neq \{x: \text{person}(x,w_0)\}]:$   
 $\text{GEN}_{s^+ \leq w'} [\exists x. \text{person}(x,s^+)] [\text{run.into}(j,x,s^+)] \leftrightarrow$   
 $\text{GEN}_{s \leq w_0} [\exists x. \text{person}(x,s)] [\text{run.into}(j,x,s)]$

In contrast, the addition of the relative clause in a semi-generic sentence like (61b) makes (the assertion and) the presupposition of variation weaker and more easily satisfiable. This can be seen in the formalization in (65). The presupposition of variation here says that there is an essential relation between “being someone coming in by the entrance” and “being run into by John”. This essential link can easily be satisfied in a

<sup>6</sup>GEN directly quantifies over situations, as in (59) and in footnote 4.

situation where the entrance was too small and a lot of people were trying to come in and go out by the entrance. Since the presupposition is fulfilled, the subtriggered universal FCI is judged grammatical in this sentence.

- (65) **Assertion:**  $\lambda w_0. \text{GEN}_s \leq w_0 [\exists x. \text{person}(x,s) \ \& \ \text{entering}(x,s)] [\text{run.into}(j,x,s)]$   
**Presupposition:**  
 $\lambda w_0. \forall w' \in \min_{w_0} [F \cap \lambda w''. \{x: \text{person}(x,w'') \ \& \ \text{entering}(x,w'')\} \neq \{x: \text{person}(x,w_0) \ \& \ \text{entering}(x,w_0)\}]:$   
 $\text{GEN}_{s^+ \leq w'} [\exists x. \text{person}(x,s^+) \ \& \ \text{entering}(x,s^+)] [\text{run.into}(j,x,s^+)] \leftrightarrow$   
 $\text{GEN}_{s \leq w_0} [\exists x. \text{person}(x,s) \ \& \ \text{entering}(x,s)] [\text{run.into}(j,x,s)]$

Consider now what happens if, instead of having the FCI in the restrictor of GEN receiving universal quantificational force, the FCI remained in situ with its regular existential force (with or without GEN in the sentence), e.g. as in (66):

- (66) LF: [<sub>IP</sub> John ran into FCI-indefinite ]

It is not entirely clear to us why an unsubtriggered FCI with existential force is unacceptable in this case. The predicted formalization is given in (67). The sentence asserts that the intersection of “people” and “individual run into by John” is non-empty. The presupposition of variation conveys that there is something essential or law-like about this intersection being non-empty, regardless of who the actual set of people are.<sup>7</sup> Be it as it may be, we would like to note that adding a relative clause does NOT make the presupposition weaker and more satisfiable. To the contrary, as can be seen in (68), the subtriggering version makes a stronger assertion –namely, that the intersection of “people coming in by the entrance” and “individual run into by John” is non-empty– and presupposes that there is something essential or law-like about this stronger claim. This is spelled out in (68).

- (67) **Assertion:**  $\lambda w_0. \exists x [\text{person}(x,w_0) \ \& \ \text{run.into}(j,x,w_0)]$   
**Presupposition:**  
 $\lambda w_0. \forall w' \in \min_{w_0} [F \cap \lambda w''. \{x: \text{person}(x,w'')\} \neq \{x: \text{person}(x,w_0)\}]:$   
 $\exists x [\text{person}(x,w') \ \& \ \text{run.into}(j,x,w')] \leftrightarrow$   
 $\exists x [\text{person}(x,w_0) \ \& \ \text{run.into}(j,x,w_0)]$
- (68) **Assertion:**  $\lambda w_0. \exists x [\text{person}(x,w_0) \ \& \ \text{entering}(x,w_0) \ \& \ \text{run.into}(j,x,w_0)]$   
**Presupposition:**  $\lambda w_0. \forall w' \in \min_{w_0} [F \cap \lambda w''. \{x: \text{person}(x,w'') \ \& \ \text{entering}(x,w'')\} \neq \{x: \text{person}(x,w_0) \ \& \ \text{entering}(x,w_0)\} ]:$   
 $\exists x [\text{person}(x,w') \ \& \ \text{entering}(x,w') \ \& \ \text{run.into}(j,x,w')] \leftrightarrow$   
 $\exists x [\text{person}(x,w_0) \ \& \ \text{entering}(x,w_0) \ \& \ \text{run.into}(j,x,w_0)]$

Hence, in the case of existential FCIs, subtriggering does not function as a rescuing strategy. If the original unsubtriggered sentence is deviant, adding a relative clause does not make its felicity conditions easier to satisfy.

<sup>7</sup>Our hunch is that external indifference is not well-suited for capturing the essentiality of a non-empty intersection because external indifference sentences are semi-definitional: they introduce properties that define or characterize the members of a class; they do not “measure” a class against another class by checking their intersection. In section 6.2, we will see that the same essentiality of non-empty intersections is perfectly satisfiable when construed as agent indifference.

## 6.2 Rescuing Korean existential FCIs: Agentivity

We turn now to the second rescuing strategy, agentivity, which rescues existential FCIs in episodic sentences:

- (69) \*John-un amwu-hako-na / nwukwu-hako-na macuchi-ess-ta.  
 J.-TOP AMWU-with-OR / WHO-with-OR run.into-PAST-DEC  
 ‘(Lit.) John ran into anyone.’
- (70) John-un amwu-chaek-ina / ?enu-chaek-ina cip-ese ku-uy-ey  
 J.-TOP AMWU-book-OR / WH-book-OR take-and the-top-LOC  
 olienoh-ass-ta.  
 put-PAST-DEC  
 ‘(Lit.) John took a random book and put it on the top (of the pile).’

In this case, as it corresponds to an episodic sentence, we have the simple LF in (71), with the FCI indefinite interpreted existentially in situ:

- (71) LF: [<sub>IP</sub> John took FCI-indefinite]

Here again, we propose that the crucial role of agentivity is to make plausible the presupposition of variation of *-na*. The formalization is spelled out in (72). Here the essential link is between “being the set of books” and “having one member picked up by John”. In other words, (70) asserts that the intersection of “being a book” and “being picked up by John” is non-empty, and its presupposition of variation conveys that such non-emptiness is not accidental but somehow essential. This presupposition can be easily satisfied if one assumes agent indifference: Because the agent John doesn’t care about the identity of the books, if a different set of books had been available, John would have picked a book too. In this way, agentivity rescues existential FCIs.

- (72) For (70a,b)  
**Assertion:**  $\lambda w_0. \exists x. \text{book}(x, w_0) \ \& \ \text{pick.up}(j, x, w_0)$   
**Presupposition:**  $\lambda w_0. \forall w' \in \min_{w_0} [F \cap \lambda w''. \{x: \text{book}(x, w'')\}] \neq \{x: \text{book}(x, w_0)\}]$ :  
 $\exists x. \text{book}(x, w') \ \& \ \text{pick.up}(j, x, w') \leftrightarrow \exists x. \text{book}(x, w_0) \ \& \ \text{pick.up}(j, x, w_0)$

We have seen how the rescuing strategies align with the quantificational force of Korean FCIs. A remaining question is, why *amwu*-(N)-*na* can only receive an existential reading in these sentences while *wh*-(N)-*na* allows for both quantificational forces. Following Choi (2007), we assume that the difference has to do with scopal properties somehow derived from the nature of the indefinite root. We saw in section 4 that *amwu*- is the widening-domain root and that it imposes in situ scope with respect to a modal, as *amwu*- cannot gain scope over the modal in (29b). In the same way, an *amwu*- indefinite cannot move to the restrictor of a newly introduced GEN to gain universal force in (62). We also saw that *wh*-, the regular-domain root, has more scope freedom, as it can take scope under or over the modal in (29a). In the same fashion, the *wh*-indefinite can stay in situ ( $\exists$  force) in (70) or move to the restrictor of GEN ( $\forall$  force) in (61).

### 6.3 Extension to Spanish

The analysis of rescuing just presented is built on the assumption that free choice effects are due to a presupposition of variation that needs to be satisfied in context, not to Domain Widening. We have seen that there is morphological evidence for this assumption in Korean, as the size of the domain introduced by the roots is orthogonal to the free choice effect (section 4.2).

The morphology of Spanish FCIs brings no evidence in this respect. It is not possible to isolate a morphological component responsible for domain-widening to test whether, with or without it, free choice effects remain or disappear. In the lack of morphological evidence, and since the empirical pattern of rescuing is the same as for Korean, we assume that free choice effects in Spanish are also due to a presupposition of variation. Then, the analysis of rescuing that we have motivated for Korean can be straightforwardly applied to Spanish FCIs as well, as briefly sketched below.

A FCI gives rise to a presupposition of variation. If the FCI is the universal *cualquier* appearing in a (non-agentive) episodic sentence, as in (73a), this presupposition amounts to a law-like statement (“external indifference”) that is too strong for it to ever be satisfied. Subtriggering in (73b) makes the presupposition weaker and, thus, more easily satisfiable. Now the presupposition is that there is an essential link between “being an object that wasn’t in its place” and “being stumbled upon by John”.

- (73) a. \*Ayer Juan tropezó con cualquier objeto.  
 Yesterday Juan stumbled with CUALQUIER object  
 ‘Yesterday Juan stumbled against any object.’
- b. Ayer Juan ??tropezó / tropezaba con cualquier objeto que  
 Yesterday Juan stumbled<sub>PERF</sub> / stumbled<sub>IMPERF</sub> with CUALQUIER object that  
 no estuviese en su sitio.  
 not was<sub>SUBJ</sub> in its place  
 ‘Yesterday Juan stumbled against any object that wasn’t in its place.’

If the FCI is the existential *un N cualquiera* appearing in a (non-agentive) episodic sentence, as in (74a), subtriggering does not make the presupposition any weaker, as seen in (74b). (74a) asserts that the intersection between “being an object” and “being stumbled upon by John” is non-empty, and it presupposes that there is something essential about it being non-empty. (74b) makes the stronger claim that the intersection between “being an object that is not in its place” and “being stumbled upon by John” is non-empty, and it presupposes that there is something essential about this stronger claim. Hence, the presupposition of (74b) is not weaker than the presupposition of (74a). As a result, subtriggering in (74b) does not help as a rescuing strategy.

- (74) a. ???Ayer Juan tropezó con un objeto cualquiera.  
 Yesterday Juan stumbled with AN object CUALQUIERA  
 ‘Yesterday Juan stumbled against any<sub>∃</sub> / a random object.’
- b. ???Ayer Juan tropezó / tropezaba con un objeto cualquier  
 Yesterday Juan stumbled<sub>PERF</sub> / stumbled<sub>IMPERF</sub> with AN object CUALQUIERA  
 que no estuviese (/estaba) en su sitio.  
 that not was<sub>SUBJ</sub> (/was<sub>IND</sub>) in its place



‘Yesterday Juan stumbled against any<sub>∃</sub> / a random object that wasn’t in its place.’

If, instead, we combine the existential *un N cualquiera* with a volitional agent, the FCI is acceptable in an episodic sentence, as in (75). This is because the presupposition of variation –namely, that there is an essential link between "being the set of books" and "having a member picked up by John"– can be easily construed as “agent indifference”.

- (75) Juan necesitaba un pisapapeles, de modo que cogió un libro cualquiera  
 Juan needed a paperweight, of way that he-took A book CUALQUIERA  
 de la estantería y lo puso encima de la pila.  
 from the shelf and it he-put on-top of the pile  
 ‘John needed a paperweight, so he took a random book from the shelf and put  
 it on top of the pile.’

## 7 Summary

We have seen that different sub-types of FCIs respond to different amending strategies. Whereas universal FCIs in Korean and Spanish are rescued by subtriggering in episodic sentences, existential FCIs are not sensitive to this method but are rescued by agentivity instead.

To explain this pattern, we have assumed that the source of free choice effects is a certain presupposition of variation (von Stechow 2000 for *-ever* FRs, Choi 2007 for Korean *-na*-based FCIs) and not Domain Widening (Kadmon and Landman 1993, Chierchia 2005, among many others). The upshot is that, once we have a FCI, we need to make sense of the presupposition of variation. This is easily done in purely generic sentences (e.g. (56)), which present law-like statements where the presupposition of variation is understood as external indifference. But this presupposition is too strong in the case of episodic sentences (cf. Dayal 1998, Chierchia 2005), and it renders both types of FCIs unacceptable in episodic environments. The role of subtriggering and agentivity is to make the presupposition of variation plausible in an episodic context. Subtriggering helps create semi-generic readings where the FCI takes on (quasi) universal force and where the presupposition of counterfactual variation can plausibly be satisfied as external indifference (or law-like statement). Agentivity permits the presupposition of variation of an existential FCI to be cashed out as agent’s indifference.

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# Two types of non-restrictive relatives

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## 1 Introduction

Nonrestrictive relatives are usually conceived of as a unitary type of relative clause (semantically and syntactically opposed to both restrictive and “amount”, or “third type”, relatives). In the literature, they have been analysed either as a sentence grammar phenomenon, specifically as clauses internal to the nominal projection that also contains the Head, like restrictive and “amount” relatives (see, among others, Smith 1964, Jackendoff 1977, chapter 7; Huot 1978; Perzanowski 1980; Cornilescu 1981; Kayne 1994, chapter 8; Bianchi 1999, chapter 5; Kempson 2003; Arnold 2007, Arnold and Borsley 2008), or as a discourse grammar phenomenon, i.e., as sentences generated independently of the sentence containing the Head, whose pronouns relate to the Head much like (E-type) pronouns relate to an antecedent across discourse (see, for instance, Ross 1967, 434ff; Aissen 1972; Emonds 1979; Stuurman 1983; Sells 1985; Haegeman 1988; Fabb 1990; Espinal 1991; Peterson 2004; Grosu 2005).<sup>1</sup>

Here I would like to suggest that the two analyses proposed in the literature should not be seen as competing analyses for a single construction, but as complementary analyses for two distinct nonrestrictive constructions; what I will call the “integrated” and “non-integrated” construction, respectively. Some languages (among which Italian and other Romance languages) display both. Other languages display only one. As suggested in section 6 below, northern Italian dialects (and possibly Chinese and Japanese) have just the sentence grammar, or “integrated”, nonrestrictive; others (English and Romanian) only the discourse grammar, or “non-integrated”, one. Still others lack nonrestrictives entirely.

In what follows, I will first review a number of syntactic properties which differentiate the two types of nonrestrictives in Italian (the ‘integrated’ ones introduced by *che/cui* and the ‘nonintegrated’ ones introduced by *il quale*), adding to those pointed out in Cinque (1978, 1982). I will then consider English, whose nonrestrictives will be seen to systematically pattern with the “nonintegrated” *il quale*-nonrestrictives of Ital-

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<sup>1</sup>This distinction roughly corresponds to what Emonds (1979, 212) calls the Subordinate Clause Hypothesis and the Main Clause Hypothesis, respectively. I abstract away here from the different executions that these two hypotheses have received in the literature, and from those analyses, like Safir’s (1986), Demirdache’s (1991, chapter 3), and Del Gobbo’s (2003, 2006b), which combine the two. For a recent overview, see de Vries (2006).

ian. An (antisymmetric) analysis of the two types of nonrestrictives will then be suggested, followed by some comparative remarks.

One general consequence of the analysis (if correct) is that the properties which are generally attributed to the nonrestrictive construction (because of the earlier focus on English) turn out to be representative only of the “non-integrated” type.

## 2 Some differences between *che/cui*- and *il quale*-nonrestrictives in Italian

In Cinque (1978,1982) some evidence was presented which pointed to the existence of two separate nonrestrictive constructions, one of which virtually identical to the restrictive construction.<sup>2</sup>

For simplicity, I will call the ‘integrated’ one identical to the restrictive construction the *che/cui*-nonrestrictive, and the ‘non-integrated’ one distinct from the restrictive construction the *il quale*-nonrestrictive, from the different relative pronouns that introduce them.

### 2.1 The *che/cui*-nonrestrictive

**a) Subjects and direct objects are represented not by a relative pronoun but by the complementizer *che*:<sup>3</sup>**

- (1) a. Inviterò anche Giorgio, **che/\*cui** abita qui vicino.  
I will invite also G., **that/ who** lives nearby.  
b. Inviterò anche Giorgio, **che/\*cui** voi certamente conoscete.  
I will invite also G., **that/who** you certainly know.

**b) Prepositional objects are represented by the relative pronoun *cui* preceded by a preposition:**

- (2) Inviterò anche Giorgio, [<sub>PP</sub> **di cui**] **/\*che** avete certamente sentito parlare.  
I will invite also G., of whom/that you have certainly heard.

**c) no Pied Piping is possible except for that of a prepositional phrase (compare (2) with (3)):<sup>4</sup>**

<sup>2</sup>This required considering the nonrestrictive construction with *il quale* as conflating two separate paradigms. See Cinque (1978,1982) for detailed discussion. Smits (1989,116) and Bianchi (1999,151f) concede that there is a residue of nonrestrictives that cannot be reduced to an “integrated” (matching or raising) analysis.

<sup>3</sup>For present purposes whether *che* is a complementizer or a weak relative pronoun (with *cui* its non-weak counterpart) is not really crucial. See Kayne (2007) and Sportiche (2008) for recent relevant discussion.

<sup>4</sup>The relative pronoun *cui* is apparently possible even within some complex PPs (*accanto a cui* ‘next to whom/which’, *senza di cui* ‘(lit.) without of whom/which’), but not others (*\*prima di cui* ‘(lit.) before of whom/which’, *\*da dietro a cui* ‘(lit.) from behind to whom/which’). The former, but not the latter, also allow what looks like extraction of the embedded PP (*A chi eri seduto accanto?* ‘(lit.) To whom were you seated next?’, *Di chi potrete fare senza?* ‘(lit.) Of whom will you be able to do without?’ vs. *\*Di chi sei entrato prima?* ‘(lit.) Of whom did you enter before?’ *\*A chi veniva da dietro?* ‘(lit.) To whom was he coming behind?’ - cf. Rizzi 1988,524ff). This may suggest that the two types of complex PPs differ in structure, with the former not being truly complex.

- (3) a. \*Inviterò anche Giorgio, [<sub>DP</sub> **il fratello di cui**] è uno dei nostri più cari amici.  
I will also invite G., the brother of whom is one of our dearest friends.
- b. \*Inviterò anche Giorgio, [<sub>AP</sub> **affezionato a cui**] per altro non sono.  
I will also invite G., fond of whom at any rate I am not.
- c. \*Inviterò anche Giorgio, [<sub>CP</sub> **liberarmi di cui**] non mi è proprio possibile.  
I will also invite G., to get rid of whom is really not possible for me.
- d. \*Inviterò anche Giorgio, [<sub>AdvP</sub> **diversamente da cui**] io non serbo rancore.  
I will invite also G., differently from whom I bear no grudge.

## 2.2 The *il quale*-nonrestrictive

### a) subjects and direct objects are represented by the relative pronoun *il quale*:<sup>5</sup>

- (4) a. Inviterò anche Giorgio, **il quale** abita lì vicino.  
I will invite also G., who lives nearby.
- b. ?Inviterò anche Giorgio, **il quale** voi certamente avrete avuto modo di apprezzare.  
I will invite also G., who you will have had some opportunity to appreciate.

### b) Prepositional objects are represented by the relative pronoun *il quale* preceded by a preposition:

- (5) Inviterò anche Giorgio, [<sub>PP</sub> **del quale**] /\***che** avete certamente sentito parlare.  
I will invite also G., of whom/that you have certainly heard.

### c) Pied Piping of different types of phrases is available:

- (6) a. Inviterò anche Giorgio, [<sub>DP</sub> **il fratello del quale**] è uno dei nostri più cari amici.  
I will invite also G., the brother of whom is one of our dearest friends.
- b. Inviterò anche Giorgio, [<sub>AP</sub> **affezionato al quale**] per altro non sono.  
I will also invite G., fond of whom at any rate I am not.
- c. Inviterò anche Giorgio, [<sub>CP</sub> **liberarmi del quale**] non mi è proprio possibile.  
I will invite also G., to get rid of whom is really not possible for me.
- d. Inviterò anche Giorgio, [<sub>AdvP</sub> **diversamente dal quale**] io non serbo rancore.  
I will invite also G., differently from whom I bear no grudge.

The two constructions also differ with respect to a number of other properties, listed in 2.3.1 to 2.3.10)

<sup>5</sup>Strictly speaking, the obligatoriness of the pronoun and the unavailability of the complementizer *che* in the *il quale*-nonrestrictive construction is not immediately obvious due to the parallel existence of the *che/cui*-nonrestrictive construction, which has *che* for subjects and objects. It is, however, apparent in those contexts, to be presented in section 2.3, where the *che/cui* nonrestrictive is disallowed. Relativization of objects with *il quale* is actually quite marginal, perhaps for the reason discussed in Cinque (1978, section 3.7). Also see section 5.2 below.

## 2.3 Additional differences between *che/cui-* and *il quale-*nonrestrictives<sup>6</sup>

### 2.3.1 Illocutionary independence

Nonrestrictives (just like restrictives) can be declarative even if the matrix is interrogative or imperative:

- (7) a. Is even Clarence, who is wearing mauve socks, a swinger? (Ross 1967,435)  
 b. Get Bill, who is in charge of this operation! (Andrews 1975,28)

This property does not distinguish *che/cui-*nonrestrictives from *il quale-*nonrestrictives. See (8) and (9):

- (8) a. Sarà Gianna, **che** non sopporta tipi del genere, disposta ad aiutarlo?  
 Will G., who cannot stand such kind of people, be willing to help him?  
 b. Sarà Gianna, **la quale** non sopporta tipi del genere, disposta ad aiutarlo?  
 Will G., who cannot stand such kind of people, be willing to help him?
- (9) a. Chiama i Rossi, **che** certamente non ti diranno di no!  
 Call the Rossis, who (lit. that) will certainly not say no!  
 b. Chiama i Rossi, **i quali** certamente non ti diranno di no!  
 Call the Rossis, who will certainly not say no!

More interesting is the converse case, where the matrix is declarative and the non-restrictive interrogative or imperative. Here *che/cui-*nonrestrictives differ from *il quale-*nonrestrictives. The former, like restrictives, can only be declarative (irrespective of the illocutionary force of the matrix clause), while the latter can have their own (non-declarative) illocutionary force (e.g., interrogative or imperative), distinct from the illocutionary force of the matrix clause. See the contrasts in (10) and (11):<sup>7</sup>

- (10) a. L'unico che potrebbe è tuo padre, *il quale* potrà, credi, perdonarci per quello che abbiamo fatto?  
 The only one who could is your father, by whom will we ever be forgiven, you think, for what we have done?  
 b. \*?L'unico che potrebbe è tuo padre, **che** potrà, credi, perdonarci per quello che abbiamo fatto?  
 The only one who could is your father, who (lit.that) will ever forgive us, you think, for what we have done?

<sup>6</sup>In sections 2.3.1 to 2.3.10 the c. examples contain *che/cui-*restrictives, which, as noted, pattern with the *che/cui-*nonrestrictives rather than with the *il quale-*nonrestrictives.

<sup>7</sup>For similar cases in French, see Muller (2006,328f). Note that the matrix need not be declarative when the nonrestrictive is non-declarative. In (i) the matrix and the nonrestrictive are both interrogative:

- (i) (?) Sarebbe stato tuo padre, **al quale** potremo mai rivolgerci ora per aiuto?, ben disposto nei nostri confronti?  
 Would your father, to whom will we ever be able to refer now for help? , have been well disposed toward us?

Also see the English example (37a) below, where the matrix and the nonrestrictive clauses constitute two distinct imperative sentences, even though not all speakers seem to like it.

- c. \*Questa è la sola persona **che** potrà, credi, perdonarci per quello che abbiamo fatto? (restrictive)  
This is the only person that will he ever manage to forgive us, you think, for what we have done?
- (11) a. Ci sono poi i Rossi, **per i quali**, ti prego, cerca di trovare una sistemazione!  
There are then the R.'s, for whom please try to find an accommodation!
- b. \*?Ci sono poi i Rossi, **per cui**, ti prego, cerca di trovare una sistemazione!  
There are then the R.'s, for whom please try to find an accommodation!
- c. \*Sono loro le sole persone *per cui* cerca di trovare una sistemazione! (restrictive)  
It's them the only people for whom please try to find an accommodation!

### 2.3.2 Non adjacency

As opposed to *che/cui*-nonrestrictives (and restrictives), which must be adjacent to the Head<sup>8</sup>, *il quale*-nonrestrictives can be separated from it within the sentence (see (12)) or across discourse (see (13) and (14)):<sup>9</sup>

- (12) a. Da quando i russi se ne sono andati, **i quali** non si erano mai veramente integrati con la popolazione, la pace è finita.  
Since the Russians left, who had never really mixed with the population, there is no more peace.
- b. \*Da quando i russi se ne sono andati, **che** non si erano mai veramente integrati con la popolazione, la pace è finita.  
Since the Russians left, who (lit. that) had never really mixed with the population, there is no more peace.
- c. \*Da quando i russi se ne sono andati **che** non si erano integrati la situazione è migliorata. (restrictive)  
Since the Russians left that had not integrated the situation got better.

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<sup>8</sup>Except for limited cases of extraposition of the type in (i) (nonrestrictives) and (ii) (restrictives):

- (i) a. Se hanno portato Carletto al mare, **che** comunque non c'era mai stato, una ragione c'è.  
If they took C. to the seaside, who in any case had never been there, there is a motive.
- b. Ho incontrato il dott. Setti ieri, **che** mi ha detto che non potrà intervenire.  
I met dr. S. yesterday, who told me that he will not be able to come.
- (ii) a. Ho trovato un uomo ieri alla festa **che** ti assomigliava molto. (cf. Cardinaletti 1987,25)  
I met a man yesterday at the party that looked very much like you.
- b. ...crede di non avere ostacoli davanti a sé **che** non possa abbattere o aggirare. (Cinque 1988,472)  
... (s)he thinks (s)he has no obstacles in front of himself/herself that (s)he cannot pull down or overcome.

On the limited applicability of relative clause extraposition in Italian, see Valesio (1974), Cinque (1978,fn.65; 1988,section 1.1.10), Cardinaletti (1987).

<sup>9</sup>Cf. Cinque (1978,79f). For similar examples of non-adjacency in French with *lequel*, see Gross (1977,136) and Fuchs and Milner (1979, 57), among others. This should not be taken to mean that non adjacency is always possible. In fact, there appear to be severe restrictions, reminiscent of those observed for English by Ziv (1973) and Ziv and Cole (1974), whose nature remains largely to be understood. Also see fn. 17 below.

(Cf. Da quando i russi che non si erano integrati se ne sono andati la situazione è migliorata.

‘Since the Russians that had not integrated left the situation got better’)

- (13) a. Ha difeso la sua tesi quasi contro tutti. **La quale** sosteneva la necessità del non intervento  
He defended his thesis against almost everyone. Which asserted the need of non intervention.
- b. Ha difeso la sua tesi quasi contro tutti. **\*Che** sosteneva la necessità del non intervento.  
He defended his thesis against almost everyone. That asserted the need of non intervention.
- c. \*Ha difeso la sua tesi quasi contro tutti **che** sosteneva la necessità del non intervento. (restrictive)  
He defended his thesis against almost everyone that asserted the need of non intervention.
- (14) a. Non ho mai parlato dei miei parenti<sub>j</sub> a Clara<sub>i</sub>. **Ai quali**<sub>j</sub> d'altronde non serve alcuna presentazione.  
I never talked about my relatives to C. For whom in any event no introduction is necessary.
- b. Non ho mai parlato dei miei parenti<sub>j</sub> a Clara<sub>i</sub>. **\*A cui**<sub>j</sub> d'altronde non serve alcuna presentazione.  
I never talked about my relatives to C. For whom in any event no introduction is necessary.
- c. \*Non ho mai parlato dei miei parenti<sub>j</sub> a Clara<sub>i</sub> **a cui**<sub>j</sub> non serve alcuna presentazione. (restrictive)  
I never talked about my relatives to C. to whom no introduction is necessary.

### 2.3.3 Split antecedents

*Il quale*-nonrestrictives, but not *che/cui*-nonrestrictives (and restrictives), can have split antecedents. See the contrast between (15a/b) (adapted from Cinque 1988,450), and (16a/b):

- (15) a. Se Carlo<sub>i</sub> non amava più Anna<sub>j</sub>, **i quali**<sub>i+j</sub> d'altra parte non si erano mai voluti veramente bene, una ragione c'era.  
If C. was no longer in love with A., who at any rate never really loved each other, there was a motive.
- b. \*Se Carlo<sub>i</sub> non amava più Anna<sub>j</sub>, **che**<sub>i+j</sub> d'altra parte non si erano mai voluti veramente bene, una ragione c'era.  
If C. was no longer in love with A., that at any rate never really loved each other, there was a motive.
- c. \*Se il ragazzo<sub>i</sub> non amava più la ragazza<sub>j</sub> **che**<sub>i+j</sub> si erano voluti bene, una ragione c'era. (restrictive)  
If the boy no longer loved the girl that loved each other, there was a motive.



- (16) a. Se Piero<sub>i</sub> non si trova più tanto bene con Ida<sub>j</sub>, **tra i quali**<sub>i+j</sub> d'altronde non c'è mai stata una vera amicizia,... (Cinque 1981/82,263)  
If P. no longer likes to stay with I., between whom in any event there never was a real friendship,...
- b. \*Se Piero<sub>i</sub> non si trova più tanto bene con Ida<sub>j</sub>, **tra cui**<sub>i+j</sub> d'altronde non c'è mai stata una vera amicizia,...  
If P. no longer likes to stay with I., between whom in any event there never was a real friendship,...
- c. c \*Se il ragazzo non si trova più tanto bene con la ragazza **tra cui** non c'era stata una vera amicizia... (restrictive)  
If the boy no longer likes to stay with the girl between whom in any event there never was a real friendship,...

### 2.3.4 Retention of the 'internal' Head

In more careful styles of Italian the 'internal' Head, despite its non-distinctness from the 'external' one, may be retained in *il quale*-nonrestrictives, but not in *che/cui*-nonrestrictives (nor in *che/cui*-restrictives):<sup>10</sup>

- (17) a. Quel tale farmaco, **col quale farmaco** il Ministero intendeva iniziare la sperimentazione, era il frutto di molti anni di lavoro.  
That medicine, with which medicine the Ministry intended to begin the experiment, was the result of many years' work.
- b. Giorgio riuscì a sposare quella ragazza. **Della quale ragazza**, devo dire, ero invaghito anch'io. (cf. Cinque 1988,449)  
G. managed to marry that girl. Which girl, I must say, I was also in love with.

### 2.3.5 Non identity of the 'external' and 'internal' Heads

*Il quale*-nonrestrictives, as opposed to *che/cui*-nonrestrictives (and restrictives), do not require absolute identity of the 'internal' and 'external' Heads (cf. Cinque 1988, 449; and Sandfeld 1936,179, and Kayne 1975, chapt.1 fn.20, for corresponding facts in French):

- (18) a. Ha raggiunto la fama con *Il giardino dei Finzi-Contini*, **il quale romanzo** ha poi anche avuto una riduzione cinematografica.  
He became famous with *Il giardino dei Finzi-Contini*, which novel was then also made into a film.
- b. All'appuntamento erano venuti quaranta studenti. **Il qual numero** non impressionò nessuno.  
To the rendezvous forty students had come. Which number impressed nobody.

<sup>10</sup>It can, however, be retained in the very formal *il quale*-restrictive discussed in Cinque (1978,84ff; 1982,section 1.5), which has many of the syntactic properties of *il quale*-nonrestrictives, although precisely how many and which ones remains to be investigated more systematically. Here I will not be concerned with the restrictive constructions. French *lequel*-nonrestrictives display the same property. They too can retain the 'internal' Head. See for example Sandfeld (1936,179), Huot (1978,119), Togeby (1982,463), and Muller (2006,325).

The example in (19) represents a different type of non identity (where the ‘external’ and the ‘internal’ Heads differ in number features):<sup>11</sup>

- (19) Giorgio non era certo un romanziere, la prima virtù dei **quali** è quella di catturare l’interesse del lettore.  
G. was no novelist (sing.), the first virtue of whom (pl.) is that of catching the reader’s interest (cf. (49) below)

### 2.3.6 Categorical nature of the Head (DP vs. XP)

*Il quale-* and *che/cui-*nonrestrictives also differ with respect to the categorial nature of the antecedent that they can take. While *che/cui-*nonrestrictives (and restrictives) only take nominal antecedents, *il quale-*nonrestrictives can take a larger class of antecedents, as shown in (20):

- (20) a. Carlo lavora troppo poco. **La qual cosa** verrà certamente notata. (CP)  
(Cinque 1988,467)<sup>12</sup>  
C. works too little. Which thing will certainly be noticed.  
b. Carlo lavora troppo poco. **\*Che** verrà certamente notato.  
C. works too little. That will certainly be observed.  
c. Carlo lavora troppo poco. **\*Di cui** si è reso conto anche il suo principale.<sup>13</sup>  
C. works too little. Which even his boss realized.
- (21) a. Maria è suscettibile. **La qual cosa** sua sorella di certo non è. (AP)  
M. is touchy. Which thing her sister certainly is not.

<sup>11</sup>Cases of gender mismatch like (i) may only be apparent if the relative pronoun actually agrees with a non pronounced *città* ‘city’, feminine; cf. *la città del Cairo* ‘the city of Cairo’ taking *Il Cairo* as its specifier (on non pronunciation see Kayne 2005):

- (i) Il Cairo, la quale/\**il quale* è la capitale dell’Egitto, ...  
(Lit.) the (masc.) Cairo, the which (fem./\*masc.) is the capital of Egypt, ...

<sup>12</sup>In both (20) and (21) one can have, in addition to *la qual cosa* ‘(lit.) the which thing’, *il che* ‘(lit.) the that’, and the pseudo-free relatives *cosa che* ‘thing that’ and *ciò che* ‘that that’. Also see Bianchi (1999,151).

<sup>13</sup>*Cui*, when preceded by *per*, appears to be able to resume a CP (e.g. *Lei si è ammalata, per cui ha dovuto smettere di fumare* ‘She got ill, so that she had to quit smoking’). As this is the only preposition that seems to permit such a usage (see (20c) and the examples in (i)), I tend to interpret it as a fixed expression. This is confirmed by the fact that *per cui* is not exactly synonymous with *per la qual cosa* ‘for which thing’. See (i):

- (i) a. Se il governo vacilla, **alla qual cosa/\*a cui** ho fatto riferimento anch’io, ...  
If the government is shaky, to which I too have referred, ...  
b. Da quando la società è sull’orlo del fallimento, **con la qual cosa/\*con cui** dovremo fare i conti tutti, ...  
Since the company is going bankrupt, with which all of us will have to cope, ...  
c. Il prezzo del petrolio è sceso, **dalla qual cosa/\*da cui** tutti hanno tratto benefici.  
The oil price lowered, from which everybody benefitted.  
d. Gianni un giorno si riprenderà, **nella qual cosa/\*in cui** tutti confidano.  
One day Gianni will recover, on which everyone is relying.  
e. Se Gianni non ha pagato le tasse, **per la qual cosa ≠ per cui** dovrà pagare una multa salata, ...  
If Gianni did not pay his taxes, for which thing/so that he will have to pay an expensive fine, ...

- b. Maria è suscettibile. \***Che** sua sorella di certo non è.  
M. is touchy. That her sister certainly is not.
- c. Maria è suscettibile. \***Di cui** non si era resa conto neanche sua madre.  
M. is touchy. Which not even her mother realized.

### 2.3.7 Preposability (of the sentential relative)

Cinque (1988, 467) notes that one exception to the impossibility of *che* in nonrestrictives with a sentential antecedent like (20b) is given by contexts where *che* is subject of a nominal predicate, as in (22a/b):

- (22) a. Mi sono messo a giocare a carte: **che** è sempre una distrazione. (Cinque 1988, 467)  
I started playing cards: that is always a distracting thing.
- b. Mi sembra di capire che tua madre ora stia bene, **che** è la cosa più importante. (Del Gobbo 2006a, fn.5)  
I understand that your mother is now better, that is the most important thing.

Even this use of *che* differs nonetheless from *la qual cosa* (and *il che, cosa che, ciò che*) in not being preposable to the “antecedent”. See the contrast between (23a/b) (on a requirement such preposing must meet, see Del Gobbo 2006b,fn.2):

- (23) a. \*?Da quando, **che** è sempre una distrazione, mi son messo a giocare a carte, ...  
Since, that is always a distracting thing, I started playing cards, ...
- b. Da quando, **la qual cosa** è sempre una distrazione, mi son messo a giocare a carte, ...  
Since, which is always a distracting thing, I started playing cards, ...

### 2.3.8 Parasitic gaps

Parasitic gaps, which can appear within restrictives (see (24c)), can also marginally appear (for some speakers) within *che/cui*-nonrestrictives, but not within *il quale*-nonrestrictives. See the contrast between (24a/b):

- (24) a. ?La sola persona che i Rossi, **che** conoscono bene, hanno sempre ammirato è Gianni.  
The only person that the Rossis, who (lit. that) know well, have always admired is G.
- b. \*La sola persona che i Rossi, **i quali** conoscono bene, hanno sempre ammirato è Gianni.  
The only person who the Rossis, who know well, have always admired is G.
- c. (?)La sola persona che quelli **che** conoscono bene non possono non ammirare è Gianni. (restrictive)  
The only person that those that know well cannot but admire is G.

### 2.3.9 Temporal DPs as Heads

*Che/cui*-nonrestrictives (25a) (and restrictives - (25c), but not *il quale*-nonrestrictives (25b) can have a temporal adverbial DP as Head (cf. Cinque 1988, 464):

- (25) a. La settimana prossima, **che** sono in ferie, ti vengo a trovare.  
Next week, (lit.) that I am on holidays, I will come and visit you.
- b. \*La settimana prossima, **la quale** sono in ferie, ti vengo a trovare.  
Next week, which I am on holidays, I will come and visit you.  
(ok: La settimana prossima, nella quale sono in ferie, . . .  
'Next week, in which I am on holidays, . . .')
- c. La settimana **che** sono in ferie ti vengo a trovare. (restrictive)  
The week that I am on holidays I will come and visit you.

### 2.3.10 Coordination of the *wh*-pronoun with another DP

*Che/cui*-nonrestrictives (26a-27a) (and restrictive – (26c-27c)) also differ from *il quale*-nonrestrictives (26b-27b) in not allowing coordination with another DP:

- (26) a. \*Gianni e Mario, le rispettive consorti e **che** non si erano mai potuti soffrire, . . .  
G. and M., the respective wives and whom (lit. that) had never been able to stand each other, . . .
- b. ?Gianni e Mario, le rispettive consorti e **i quali** non si erano mai potuti soffrire, . . .  
G. and M., the respective wives and whom had never been able to stand each other, . . .
- c. \*Gli unici le rispettive consorti e **che** non si erano mai potuti soffrire erano loro. (restrictive)  
The only ones the respective wives and whom (lit. that) had never been able to stand each other were them.
- (27) a. \*Gianni e Mario, fra le rispettive consorti e **cui** non c'era mai stato un grande affiatamento, . . .  
G. and M., between their respective wives and whom there never was a real understanding, . . .
- b. Gianni e Mario, fra le rispettive consorti e **i quali** non c'era mai stato un grande affiatamento, . . .  
G. and M., between their respective wives and whom there never was a real understanding, . . .
- c. \*Gli unici fra le rispettive consorti e **cui** non c'era mai stato un grande affiatamento erano loro. (restrictive)  
The only ones between their respective wives and whom there never was a real understanding were them.

### 3 Some properties with respect to which *che/cui-* and *il quale*-nonrestrictives do not differ

#### 3.1 Speech act adverbs and performative verbs

Speech act adverbs like *frankly*, *honestly*, etc., and performative verbs used performatively, have been claimed to occur only in nonrestrictive relatives (Thorne 1972, 552f; Vergnaud 1985, 335; Emonds 1979, 238f; Lehmann 1984, 271; Cornilescu 1996, 215; and references cited there), and thus to be able to discriminate between nonrestrictives and restrictives. One might wonder whether the two types of nonrestrictives differ with respect to this property. They don't. See (28a/b):

- (28) a. Giorgio, **che** francamente non si sarebbe mai dovuto comportare così,...  
G., who (lit. that) frankly should never have behaved like that,...
- a') Giorgio, **che** ti prometto non metterà mai più piede da noi,...  
G, who (lit. that) I promise you will never set foot again in our house,...
- b. Giorgio, **il quale** francamente non si sarebbe mai dovuto comportare così,...  
G., who frankly should never have behaved like that,...
- b') Giorgio, **il quale** ti prometto non metterà mai più piede da noi,...  
G., who I promise you will never set foot again in our house,...

I should point out, though, that in (my) Italian such adverbs and verbs also occur unproblematically in restrictives. See (29):

- (29) a. La sola persona **che** francamente mi sentirei di assumere è Giorgio.  
The only person that frankly I would consider employing is G.
- b. La sola persona **che** ti prometto di non rivedere mai più è Giorgio  
The only person that I promise you not to see any more is G.

#### 3.2 Weak Crossover

While restrictive relatives give rise to Weak Crossover effects (see (30), and Safir 1986, section 2.2), both *che/cui-* and *il quale*-nonrestrictives appear to be immune from it (see 31a/b):

- (30) \*?L'uomo<sub>i</sub> **che** sua<sub>i</sub> moglie pensa sia disonesto si è dimostrato una brava persona.  
The man that his wife thinks is dishonest turned out to be a good guy.  
(cf. L'uomo<sub>i</sub> **che** è amato da sua<sub>i</sub> moglie ha una diversa visione della vita  
The man that is loved by his wife has a different view of life.)
- (31) a. Giorgio<sub>i</sub>, **che** anche sua<sub>i</sub> moglie pensa sia disonesto, si è dimostrato un vero impostore.  
G., who (lit. that) even his wife thinks is dishonest, turned out to be a real impostor.
- b. Giorgio<sub>i</sub>, **il quale** anche sua<sub>i</sub> moglie pensa sia disonesto, si è dimostrato un vero impostore.  
G., who even his wife thinks is dishonest, turned out to be a real impostor.

### 3.3 Pronominalization

As observed in McCawley (1981) a proform can resume a nominal Head plus a restrictive relative (see 32c), but not a Head plus a nonrestrictive relative. Both *che/cui-* and *il quale*-nonrestrictives behave in this respect exactly the same. See (32a/b):

- (32) a. Gianni ha un bellissimo appartamento, **che** da' sul Central Park, e adesso ne vuole un altro. (= bellissimo appartamento; ≠ bellissimo appartamento, che da' sul Central Park)  
G. has a beautiful apartment, which (lit.that) overlooks the Central Park, and now he wants another.
- b. Gianni ha un bellissimo appartamento, **il quale** da' sul Central Park, e adesso ne vuole un altro. (= bellissimo appartamento; ≠ bellissimo appartamento, il quale da' sul Central Park)  
G. has a beautiful apartment, which overlooks the Central Park, and now he wants another.
- c. Gianni ha un bellissimo appartamento **che** da' sul Central Park, e adesso ne vuole un altro. (= bellissimo appartamento; or =bellissimo appartamento che da' sul Central Park) (restrictive)  
G. has a beautiful apartment which overlooks the Central Park, and now he wants another.

## 4 English

As the data in the following sections will show, English appears to lack the equivalent of the Italian *che/cui-*nonrestrictive construction. Its nonrestrictives pattern with Italian *il quale*-nonrestrictives. First, they, like Italian *il quale*-nonrestrictives (see section 2.2) obligatorily retain *wh*-pronouns in subject, object (and, in the presence of preposition stranding, oblique object) positions. See (33).<sup>14</sup> They also retain them with the (more formal) pied piping of a preposition. See (34). In fact, just like *il quale*-nonrestrictives, they display generalized Pied Piping. See (35).<sup>15</sup>

<sup>14</sup>Nonrestrictives introduced by *that* are generally judged impossible in Modern English (Quirk and Greenbaum 1973,383; Quirk, Greenbaum, Leech and Svartvik 1985, §17.22; Rodman (1976,174); Jackendoff 1977,171; Emonds 1979,§2.3; Sag 1997,fn37; De Vries 2002,182; 2006,fn49), although they were possible in Middle English, and literary examples are attested into the nineteenth century (see Maling 1978,723 and references cited there). They are possible in a number of modern British dialects (see, e.g., Beal and Corrigan 2002,128; Peitsara 2002,172; Van den Eynden Morpeth 2002,188, and references cited there), and a few cases (with inanimate antecedents) are even attested in some registers of the modern standard. See, for example, (ia/b), and for further exemplification Jespersen (1949, chapter VIII), Jacobsson (1963,1994), Hudson (1990,396), and Huddleston and Pullum (2002,1052).

- (i) a. She made me swear on the family bible, **that** my aunt's poodle chewed up, that I wouldn't buy French medicines... (Bache and Jakobsen 1980,245)  
b. I hate my untrusting mind, **that** set Parks on the watch. (Cornilescu 1981,43fn.2)

<sup>15</sup>Cinque (1982) suggested that non "deletion" of subject and object *wh*-pronouns and generalized Pied Piping go together. They are shared by Italian *il quale*-nonrestrictives and (formal) *il quale*-restrictives; by French *lequel*-nonrestrictives, and by English nonrestrictives and (formal) restrictives. Conversely, obligatory 'deletion' of subject and object (actually, bare DP) *wh*-pronouns (with the con-

- (33) a. John, who/\*that/\* $\emptyset$  got the offer, will probably refuse.  
 b. John, who/\*that/\* $\emptyset$  we all know, would not have done that.  
 c. John, who/\*that/\* $\emptyset$  we are all proud of, will soon be part of the President's staff.
- (34) John, [<sub>PP</sub> to whom] we talked yesterday, said he strongly opposed the decision.
- (35) a. That woman, [<sub>IP</sub> compared to whom] Attila the Hun was an angel, is unfortunately my husband's favourite aunt. (Nanni and Stillings 1978,311)  
 b. ... delicious entertainments, [<sub>CP</sub> to be admitted to one of which] was a privilege,... (Jespersen 1949,194)  
 c. ... certain steps against his treacherous brother, [<sub>AdvP</sub> as to the precise nature of which] they could not be further enlightened. (Jespersen 1949,194)

In addition to the similarities just reviewed, in all of the contrasts between *che/cui*- and *il quale*-nonrestrictives discussed in section 2.3 above, English nonrestrictives side with Italian *il quale*-nonrestrictives. Compare sections 2.3.1-10 with sections 4.1-10.

#### 4.1 Illocutionary independence

As with *il quale*-nonrestrictives (and differently from *che/cui*-nonrestrictives) in Italian (cf. (10)(11) above), English nonrestrictives can also be non-declarative. See (36), where the nonrestrictives are interrogative, and (37), where they are imperative (37a/b), or optative (37c):<sup>16</sup>

- (36) a. There is then our father, by whom will we ever be forgiven for what we have done?  
 b. It may clear up, in which case would you mind hanging the washing out? (= (10ii) of Huddleston and Pullum 2002,1061)  
 c. She may have her parents with her, in which case where am I going to sleep? (= (10iii) of Huddleston and Pullum 2002,1061)

sequent appearance of a complementizer), and no Pied Piping other than that of a PP also go together. They are displayed by *che/cui*-restrictives and nonrestrictives in Italian, and by English infinitival relatives (modulo the presence of PRO for the subject position and of an infinitival (for or  $\emptyset$ ) complementizer in place of the finite complementizer *that*). See (i), and the discussion in Cinque (1982,280ff), Pesetsky and Torrego (2006), Sportiche (2008, section 3.2.2), and references cited there:

- (i) a. I found someone (\*who(m)) PRO to invite.  
 b. \*I found someone (\*whom) PRO to give the book to.  
 c. I was looking for someone with whom to discuss such matters.  
 d. \*I was looking for someone with whose help to repair my bicycle.

For the marked status of non-bare DPs containing the *wh*-phrase in English, Italian, and French, infinitival relatives, see Green (1973,18), Kayne (1976,fn22), Cinque (1982, end of section 2.2), Pesetsky (1998,352,fn17), Sportiche (2008, section 3.2.2), Koopman and Sportiche (2008).

<sup>16</sup>It thus appears that, differently from Emonds (1979,241), Subject-Auxiliary Inversion can apply in English nonrestrictives. On the related question of why Verb Second is unavailable in Dutch and German nonrestrictives, see Emonds (1979,fn.4). Although certain Verb Second relatives are actually possible in German, they are semantically restrictive only (see Gärtner 2001).

- d. I want to talk to that man, who who the hell is he anyway? (Andrews 1975,28)
- (37) a. Please accept my check for \$3.69, which find enclosed! (Martin 1972,5)  
 b. He said he'd show a few slides towards the end of his talk, at which point please remember to dim the lights!  
 (= (10i) of Huddleston and Pullum 2002,1061)  
 c. My friend, who God forbid you should ever meet,... (John Lyons, reported in Werth 1974,fn.4)

#### 4.2 Non adjacency (cf. (12) to (14) above)

Although non-adjacency to the Head is subject to restrictions, as noted earlier for Italian *il quale*-nonrestrictives (cf. fn.9), various examples of non-adjacency are cited in works on English nonrestrictives.<sup>17</sup> See:

- (38) a. **John** really bothered me at the party last night, **who/\*that**, by the way, I'll never invite to a party again. (cf. Ziv and Cole 1974,777)<sup>18</sup>  
 b. **John** is coming to stay, **who** we haven't seen for ages. (Kempson 2003,302fn4)  
 c. Only **the flower** is used, **which** is not poisonous and is attached to the plant with a very fine stem. (= 23i) of Huddleston and Pullum 2002,1066)  
 d. I was talking to **Howard** the other day, **who/\*that** tells me that you want to resign. (cf. Peterson 2004,396)

As noted above with (formal) *il quale*-nonrestrictives, sentential *which* can also begin a new sentence:

- (39) She borrowed a history book. **Which** suggests that her teacher was having some influence on her. (Quirk, Greenbaum, Leech and Svartvik 1972,702)

#### 4.3 Split antecedents

As was the case with Italian *il quale*- (but not *che/cui*-) nonrestrictives, English nonrestrictives also allow for split antecedents. See (41), from Arnold (2007,274):

- (40) Kim likes muffins<sub>i</sub>, but Sandy prefers scones<sub>j</sub>, **which**<sub>i+j</sub>/**\*that** they eat with jam.

According to Demirdache (1991,118) another such case is Perlmutter and Ross' (1970) celebrated split antecedent relative (41), although a restrictive reading is also possible.<sup>19</sup>

<sup>17</sup>See Jespersen (1949, section 5.3, p.103): "Restrictive clauses are generally placed immediately after the antecedent, while non-restrictive clauses may stand at some distance". An instance of obligatory non-adjacency is represented by (47a) below (from Arnold 2007,289).

<sup>18</sup>Following Jespersen (1949 [1927], 85-115), Ziv and Cole (1974,776) make a distinction between non sentence final nonrestrictives and sentence final "continuative" nonrestrictives (which often bear a causal or temporal relation to the matrix clause, and can be non adjacent to it). Here I take the two types to be two different manifestations of the same "non-integrated" type of nonrestrictive (the non adjacent case being the most restricted).

<sup>19</sup>Also see the examples given in Huddleston and Pullum (2002,1066,fn.13) and De Vries (2006,fn.38). Indeed, according to my informants, replacing *who* with *that* renders such cases much worse.



(41) A man<sub>i</sub> entered the room and a woman<sub>j</sub> went out **who**<sub>i,j</sub> were quite similar.  
which she compares to a case like (42), of anaphora across discourse:

(42) A man<sub>i</sub> entered the room and a woman<sub>j</sub> went out. They<sub>i,j</sub> were quite similar.

#### 4.4 Retention of the ‘internal’ Head

As with (formal) *il quale*- (but not *che/cui*-) nonrestrictives (cf. (17) above), in (formal) English nonrestrictives the ‘internal’ Head can also be retained. See (43).<sup>20</sup>

- (43) a. He rode twenty miles to see her picture in the house of a stranger, **which stranger** politely insisted on his acceptance of it. (Jespersen 1949, section 6.5, p.126)  
b. ... a young woman with a wedding-ring and a baby, **which baby** she carried about with her when serving at the table. (Jespersen 1949, section 6.5, p.126)  
c. The French procured allies, **which allies** proved of the utmost importance. (Poutsma 1916, chapter XXXIX, §4, p.961)

#### 4.5 Non identity of the ‘external’ and ‘internal’ Heads

The ‘internal’ Head which is retained can even be distinct from the ‘external’ one, as we saw above with *il quale*-nonrestrictives in Italian. Various examples are cited in the literature. See, e.g., (44) to (62) (and Jespersen 1949, pp.126-128):

- (44) a. Mark belongs to the Knights of Columbus, **which organization** has been condemned by the Jewish Defense League. (= (33a) of McCawley 1981,118)  
b. \*Mark belongs to a club **which organization** has been condemned by the Jewish Defense League. (restrictive) (= (33a’) of McCawley 1981,118)  
(45) a. An accident on the road, in **which accident** several people were hurt,... (Browne 1986,117)  
b. \*The accident on the road in which accident several people were hurt... (restrictive)  
(46) a. This book, **which masterpiece** I have read twice,... (Kayne 1994,165fn73)  
b. \*The book which masterpiece I have read twice... (restrictive)  
(47) a. There were only thirteen senators present, **which number** was too few for a quorum. (Arnold 2007,289)  
b. \*These are the only thirteen senators present which number we had forgotten. (restrictive)

As with *il quale*-relatives in Italian (see (19)) the ‘internal’ Head of an English nonrestrictive may display non identity in number with the ‘external’ Head, at least for some speakers. See for example (48), from Cantrall (1972,22):

<sup>20</sup>Jespersen (1949, section 6.5, p.126) says that such retention is possible “in a peculiar kind of nonrestrictive clause; very often the clause is at some distance from the antecedent, and some substantive is repeated so as to avoid any doubt as to what word is to be taken as the antecedent”.

- (48) Since John is a lexicalist, **all of whom** are badly confused, I never listen to him.

#### 4.6 Categorical nature of the antecedent (DP vs. XP)

As noted by many authors,<sup>21</sup> nonrestrictives in English differ from restrictives in allowing a wider range of antecedents (as was the case with *il quale*-, but not with *che/cui*-, nonrestrictives in Italian). See (49):

- (49) a. Sheila was beautiful, which was too bad. (Ross 1969,357) (CP)  
 b. She was fond of her boy, which Theobald never was. (Jespersen 1949, section 6.4,p.124) (AP)  
 c. Joe debated in high school, which Chuck did too. (Thompson 1971,84) (VP)  
 d. Peter put it under the table, where I had put it earlier. (Fabb 1990,60) (PP)<sup>22</sup>

#### 4.7 Preposability (of sentential relatives)

With *il quale*-nonrestrictives English nonrestrictives also share the possibility of preposing the relative clause to a sentential “antecedent”. See (50), from Huddleston and Pullum (2002,1066) (also see the examples given in Poutsma 1916,chapter XXXIX, §13, p.972; Jespersen 1949,section 5.7; and Quirk et al. 1985, p.1120):

- (50) The Net will open up opportunities to exploit tax differences and – which makes it even more of an headache than globalisation – it will make it possible to dodge taxes altogether.

#### 4.8 Parasitic Gaps

As noted in Safir (1986), parasitic gaps, which can appear within English restrictives (see (51a)), cannot appear in English nonrestrictives (see (51b)), just as they cannot appear in *il quale*-nonrestrictives in Italian (see (24b) above):

- (51) a. John is a man **who** everyone who knows admires. (Safir 1986,673)  
 b. \*John is a man **who** Bill, who knows, admires. (Safir 1986,673)

#### 4.9 Temporal DPs as Heads

Certain temporal DPs can head a restrictive but not a nonrestrictive in English, just as we saw they cannot head an *il quale*-nonrestrictive in Italian:<sup>23</sup>

- (52) \*That day, **which** Clinton and I were born,... (cf. The day that Clinton and I were born...)

<sup>21</sup>See, for example, Jackendoff (1977,171), Fabb (1990,60), Demirdache (1991,108), Borsley (1997,§5), De Vries (2002,185), Arnold (2007,274).

<sup>22</sup>On the fact that nonrestrictive *where*, but not restrictive *where*, can have the entire PP under the table as an antecedent, see the discussion in Fabb (1990,60).

<sup>23</sup>In English this is true also of the manner DP way.

#### 4.10 Coordination of the *wh*-pronoun with another DP

Once again, as with *il quale*-nonrestrictives (and differently from *che/cui* nonrestrictives) in Italian (see (26b)), *wh*-pronouns in English nonrestrictives can be coordinated with other DPs:

- (53) He recalled the name of the solicitor, between **whom and himself** there had been occasional correspondence. (Jespersen 1949,191)

### 5 An analysis of the two types of nonrestrictives

#### 5.1 The “integrated” nonrestrictive

The analysis of the integrated nonrestrictive that I am going to propose here is a natural extension of the analysis I presented in Cinque (2003) for restrictives (also see Cinque in preparation). There I proposed that restrictive relatives are merged as IPs in the specifier of a prenominal functional projection above the specifiers which host attributive adjectives and numerals and below the projection hosting determiners and demonstratives (i.e., the position in which restrictive relatives overtly appear in many (rigid) OV languages – see Cinque 2003, and in preparation). Following Kayne (1999, 2000, 2002), I also proposed there that their eventual postnominal position in most VO, and non-rigid OV, languages is due to the raising of IP to a higher licensing position, followed by merger of a (finite) complementizer which attracts the internal Head, followed in the “matching” variant by merger of another complementizer which attracts the external Head. In the “raising” variant, the external Head is not raised but “deleted” in situ under identity with the raised internal Head.

The “matching” derivation for a restrictive relative clause like *The two nice books that I read* is given in (54):<sup>24</sup>

- (54) a. [IP<sub>rel</sub> [Num [A NP]]] (merge of C<sub>0</sub> and attraction of IP) →  
 b. IP<sub>rel</sub> C<sub>0</sub> [t<sub>j</sub> [Num [A NP]]]  
 (merge of C<sub>1</sub> (*that*) and attraction of the *wh*-pronoun/ ‘internal Head’)) →  
 c. *wh*<sub>i</sub>- [that [ [IP<sub>rel</sub> ... t<sub>i</sub> ]<sub>j</sub> C<sub>0</sub> [t<sub>j</sub> [Num [A NP]]]]]  
 (merge of C<sub>2</sub> and attraction of the ‘external Head’) →  
 d. [Num [A NP]]<sub>k</sub> C<sub>2</sub> *wh*<sub>i</sub>- [that [ [IP<sub>rel</sub> t<sub>i</sub> ]<sub>j</sub> C<sub>0</sub> [t<sub>j</sub> [t<sub>k</sub>]]]  
 (merge of the determiner) →  
 e. Det [Num [A NP]]<sub>k</sub> C<sub>2</sub> *wh*<sub>i</sub>- [that [ [IP<sub>rel</sub> t<sub>i</sub> ]<sub>j</sub> C<sub>0</sub> [t<sub>j</sub> [t<sub>k</sub>]]]  
 the two nice books that I read

<sup>24</sup>Here I ignore various complexities and alternatives and will not address the question of “raising” vs. “matching”. If relative clauses are merged prenominaly, both derivations are in principle available within Antisymmetry. See Cinque (2003, and in preparation). Different languages provide overt evidence for one or more of the three C heads postulated in (54) in addition to the *wh*-pronoun, with some displaying up to three such elements simultaneously. See, for example, (i), from Buli (Niger-Congo):

- (1) kpàr<sup>w</sup>à-wā:y<sub>i</sub> [ālī e<sub>i</sub> tà nā:b lá] (Hiraiwa 2003,46)  
 farmer-REL C have cow(indef.) Subord.Particle  
 ‘The farmer who has the cow’

“Integrated” nonrestrictives minimally differ in that the IP is merged in the specifier of a nominal projection dominating DP; i.e., outside the scope of the determiner or the demonstrative, as is generally assumed (Lehmann 1984,261f; Kayne 1994,112).<sup>25</sup>

- (55) a. [IP<sub>rel</sub> [DP Dem [ Num [ A NP ]]]] (merge of C<sub>0</sub> and attraction of IP) →  
 b. IP<sub>rel</sub> C<sub>0</sub> [ t<sub>j</sub> [DP Dem [ Num [ A NP ]]]]  
 (merge of C<sub>1</sub> and attraction of the wh-pronoun/ ‘internal Head’) →  
 c. *wh*<sub>i</sub>- [ C<sub>1</sub> [IP<sub>rel</sub> t ] ] C<sub>0</sub> [ t<sub>j</sub> [DP Dem [ Num [ A NP ]]]]  
 (merge of C<sub>2</sub> and attraction of the ‘external Head’) →

<sup>25</sup>So, for example, in languages in which restrictives remain inside the demonstrative, nonrestrictives are found outside. This is the case of Vietnamese (“When the RC precedes the demonstrative, the RC restricts the meaning of the noun; when the RC follows the demonstrative, the phrase has a non-restrictive meaning” Nguyen 2004,61f - see (i)), Indonesian (see (ii) “[ii](a) ist restriktiv, [ii](b) appositiv” Lehmann 1984,282), Javanese (“the *séng* RC preceding a demonstrative are restrictive RC, whereas the *séng* RC following a demonstrative are non-restrictive RC” - Ishizuka 2007, section 2), and Louisiana Creole (see (iii), from Gadelii 1997,128):

- (i) a. Tôi thích cái đầm *RC*[ mà cô ây chọn ] *Dem*[ **này** ] (restrictive)  
 I like CLF dress that aunt that choose this  
 ‘I like this dress that the aunt has chosen’  
 b. Tôi thích cái đầm *Dem*[ **này** ] *RC*[ mà cô ây chọn ] (nonrestrictive)  
 I like CLF dress this that aunt that choose  
 ‘I like this dress, which the aunt has chosen’
- (ii) a. lelaki yang sedang tidur **itu** (restrictive)  
 man Rel Prog sleep that  
 ‘That man that is sleeping...’  
 b. lelaki **itu** yang sedang tidur (nonrestrictive)  
 man that Rel Prog sleep  
 ‘That man, who is sleeping...’
- (iii) a. sa ben zen zom katolik [ki Mari kôtâ] **la** pe vini (restrictive)  
 DEM PL young man catholic that M. loves DET PROG come  
 ‘Those young catholic men that M. loves are coming’  
 b. sa ben zen zom katolik **la** [ki Mari kôtâ] pe vini (nonrestrictive)  
 DEM PL young man catholic DET that M. loves PROG come  
 ‘Those young catholic men, who M. loves, are coming’

According to Kim (1997, section 4.3) Korean relative clauses appearing between the determiner (or demonstrative) and the N also receive a restrictive interpretation, while those appearing outside the determiner (or demonstrative) receive a nonrestrictive interpretation. According to Kameshima (1989, section 4.3.3.1) and Ishizuka (2006,2008), Japanese minimally differs from Korean in that relatives appearing inside a demonstrative have just a restrictive interpretation whereas those appearing outside demonstratives may receive either a restrictive or a nonrestrictive interpretation. All of this suggests that the Merge position of nonrestrictives is outside the demonstrative and that of restrictives inside the demonstrative, even though restrictives, in languages like Japanese, can optionally raise past the demonstrative (cf. Kameshima 1989,215), to a position lower than the Merge position of nonrestrictives (given that the fronted restrictive must follow the nonrestrictive - Kameshima 1989,233ff).

The fact, also noted in Kameshima (1989,210f), that Japanese relatives following the quantifier ‘all’ only receive a restrictive interpretation suggests that nonrestrictives are merged even higher than the position of universal quantifiers (which are themselves merged higher than the position of demonstratives):

- (iv) [IP<sub>nonrestr</sub> [ Q<sub>all</sub> [ Dem [ IP<sub>restr</sub> [ Num [ A NP ]]]]]]

- d. [DP Dem [Num [A NP ]] ]<sub>k</sub> C<sub>2</sub> wh<sub>i</sub>- [C<sub>I</sub> [IP<sub>rel</sub> t<sub>i</sub> ] ]<sub>j</sub> C<sub>0</sub> t<sub>j</sub> [ t<sub>k</sub> ] ]  
 quei dieci bei gattini, che io amo  
 ‘those ten nice kittens, which I love’

## 5.2 The “non-integrated” nonrestrictive

The analysis to be proposed for the “non-integrated” nonrestrictive is more tentative. As mentioned at the outset, the construction appears to belong to what Williams (1977) calls Discourse Grammar, whose basic properties, distinguishing it from Sentence Grammar, are the ability to apply “across utterance boundaries”, and to be immune to island constraints (Williams 1977, 101f). We have already seen that *il quale*-nonrestrictives in Italian and *which/(who)*-nonrestrictives in English can relate to an antecedent across discourse. They also appear to be able to do so across islands. So, for example, in such pied piping cases as (56) and (57) the pronoun can relate to its antecedent (the relation called R-binding in Safir 1986) in spite of the adjunct, sentential subject, or complex NP, island boundary between them:<sup>26</sup>

- (56) a. Questa macchina, [per comprare la quale] Giorgio si è indebitato fino al collo, ...  
 This car, to buy which G. is up to his ears with debts, ...

<sup>26</sup>The more formal cases of “double dependence” in (i) (see Cinque 1988, 473, and references cited there) show the same thing. The *wh*-pronoun is fronted to the left edge of the island (possibly into the Spec of a TopicP above the subordinator, if any).

- (i) a. (?)Una tale ipoteca, *della quale se voi vi liberaste* sareste certamente più felici, non l’ho mai veduta.  
 Such a mortgage, of which if you could get rid you would certainly be happier, I have never seen.  
 b. (?)Un circolo, *al quale essere ammessi a tali condizioni* è senza dubbio un privilegio, ...  
 A club, to which to be admitted under such conditions is certainly a privilege, ...  
 c. (?)Un impegno, *dal quale chi mai riuscirà a liberarsi* si sentirà di sicuro più leggero, ...  
 A commitment, from which whoever will manage to free himself will certainly feel lighter, ...

Also see the quite formal English cases in (ii) from Jespersen (1949, 183f):

- (ii) a. Until the divinity of Jesus became a dogma, *which to dispute* was death, *which to doubt* was infamy... (Jespersen 1949, 183)  
 b. The most piteous tale [...] *which in recounting* this grief grew puissant... (Jespersen 1949, 184)  
 c. ... to understand a little more of the thoughts of others, *which so soon as you try to do honestly*, you will discover... (Jespersen 1949, 202)

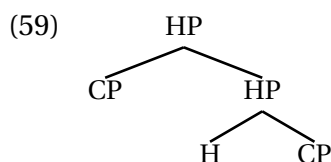
That the *wh*-pronouns are still within the island is indicated by the ungrammaticality of the corresponding cases in which the *wh*-pronoun is extracted (is no longer contiguous to the island). The “double-dependence” construction was apparently quite common in Latin (see Maurel 1989 and references cited there). One example is also given in Ehrenkranz and Hirschland (1972, 26). See (iii), which they take (unnecessarily, if we are right) to violate the Complex NP Constraint:

- (iii) non politus iis artibus quas qui tenent eruditi appellantur (Cic. Fin. 1, 7, 26)  
 not polished in those arts the possessors of which (lit. which those who have) are called erudite.

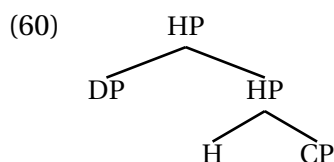
- b. Questa macchina, [comprare la quale] voleva dire per lui rinunciare a tante altre cose,...
- This car, to buy which meant for him to give up many other things,...
- c. Giorgio, [le ragioni per non invitare il quale] erano davvero tante,...
- G., the reasons for not inviting whom were really many,...
- (57) a. The lecture [(in order) to attend which] Sally drove 50 miles,... (Nanni and Stillings 1978,312)
- b. ... delicious entertainments, [to be admitted to one of which] was a privilege,... (Jespersen 1949,194)
- c. John, [the many reasons for not inviting whom] you are old enough to understand... (adapted from Jespersen 1949,194)

If we assume Kayne's (1994) Linear Correspondence Axiom (LCA) to hold of Discourse Grammar as well (the null hypothesis), linear precedence in a discourse must also reflect asymmetric c-command. One way to achieve this is to merge the linearly preceding sentence in the specifier of an (empty) head, which takes the following sentence as a complement. Concretely, the discourse fragment in (58) would have the structural representation in (59):

(58) John is no longer here. He left at noon.



Discourse fragments do not consist of just concatenations of CPs. Other categories can apparently be concatenated; for example, DPs and CPs (*A pink shirt? I will never wear any such thing in my life!*), which would yield the structural representation in (60):<sup>27</sup>



I will take the configurations in (59) and (60) to underlie the “non-integrated” non-restrictive, (59) for the across discourse cases, and (60) for the cases in which the non-restrictive is adjacent to its Head. In both cases, the movement internal to the “non-integrated” nonrestrictive CP is likely to be different in target from that of “integrated”

<sup>27</sup>The configuration in (60) possibly also underlies English-type Left Dislocation, and the Romance Hanging Topic construction, where the relation between the left dislocated phrase and the following CP appears to be one of Discourse Grammar (root character, no island sensitivity, no reconstruction, etc.; see Cinque 1990, chapter 2).

nonrestrictives (and restrictives). If the target were a CP initial TOP position, as occasionally suggested, one could perhaps make sense of certain properties typical of the “non-integrated” construction, namely the fact that objects cannot easily be relativized with *il quale*-pronouns in Italian (cf. Cinque 1978, 3.7), except in those cases where no clitic is required in the corresponding topicalization case (Cinque 1978, fn.71).<sup>28</sup>

Differently from (English-type) Left Dislocation, and the (Romance) Hanging Topic construction, which are only possible at the Root, presumably due to the discourse head which concatenates DP with CP, “non-integrated” nonrestrictives can be subordinate clauses. This can be obtained from the same structure if, in the nonrestrictive case, like in unbalanced coordination (Johannessen 1998), the features of the phrase in specifier position (here the categorial features of DP) are able to percolate up and determine the categorial features of the dominating category (rendering HP non-distinct from DP). Cf. Rebuschi (2005, §3.2).

In the spirit of Williams (1977), we must also assume that the ‘Discourse Grammar’ head H, as is the general rule for sentences in a discourse, blocks every ‘Sentence Grammar’ relation between its specifier and complement (internal Merge, Agree, Binding, etc.), despite the asymmetric c-command relation existing between the two under the extension of the LCA to Discourse Grammar.

### 5.3 Deriving the properties of the two types of nonrestrictives

Let us start from the differences between the two types of constructions noted in 2.3.1 to 2.3.10, beginning with the “non-integrated” type.

The fact that *il quale*- (but not *che/cui*-) nonrestrictives can have illocutionary independence (2.3.1), can be separated from the Head (also across discourse) (2.3.2), can have split antecedents (whereby at least one of the antecedents is not adjacent to the relative clause) (2.3.3), can have non-nominal antecedents (2.3.6), and cannot host a parasitic gap licensed by an operator binding a variable in the matrix (2.3.7), appears to directly depend on the nonrestrictive CP being, in both (59) and (60), an independent sentence at the Discourse level, connected to the antecedent by the same kind of (abstract) heads which concatenate discourse fragments.

The impossibility for *il quale*-nonrestrictives to have as Head a nominal temporal

<sup>28</sup>Given that “non-integrated” nonrestrictives can also be adjacent to a Head internal to an island (*The Ferrari which Pietro, who Sofia adores, bought from me cost him a bundle* - Ross 1967, 174), an analysis in terms of extraction (from the island) followed by remnant movement does not seem a plausible alternative. The present analysis is reminiscent of the “ColonP” analysis advanced in Koster (2000) for both restrictive and nonrestrictive relatives, to the ParatacticP analysis which Gärtner (2001, §2) suggests for V2 relatives in German, and to the analyses proposed in Rebuschi (2005) and Frascarelli and Puglielli (2005) (except that we would limit it here to the “non-integrated” nonrestrictive). De Vries (2002; 2006) proposes modifying Koster’s analysis to one of balanced coordination of the Head with a Headless false (or light) free relative in apposition to the Head ([ $\&P$  Ann<sub>i</sub> [ $\&$  [ $DP$  she<sub>i</sub> [ t<sub>i</sub> who t<sub>i</sub> is our manager]]]] – De Vries 2006, 248), even though he also has to admit the availability of unbalanced coordination for the cases of non-nominal antecedents (De Vries 2006, fn.25 and K of section 5.2). This modification however implies, contrary to fact, that *il quale*-pronouns in Italian should be found in false (or light) free relatives, which are taken to be a necessary component of nonrestrictives. See *\*Quella/una la quale è di là è mia sorella* ‘(Lit.) That/one which is in the other room is my sister’, *\*Cì il quale mi hanno detto è falso* ‘that which they told me is false’ (a comparable problem is raised by French *lequel*). For further critical remarks concerning De Vries’s analysis, see Del Gobbo (2003, §4.4.1) and Citko (2008).

adverbial (2.3.9) may instead be attributed to the particular relation (Safir's R-binding) that is established between the *wh*-pronoun and the Head. In the "non-integrated" nonrestrictive with *il quale* the pronoun is a kind of E-type pronoun requiring coreference with some object(s) (Evans 1980, 340); hence requiring that the antecedent be independently capable of referring (something that nominal temporal adverbials are not).<sup>29</sup>

Properties 2.3.4 (possible retention of the 'internal' Head), 2.3.5 (possible non identity of the 'internal' and 'external' Heads), 2.3.10 (the possibility for *il quale*-pronouns to be coordinated with other DPs), and the property of such pronouns to allow for generalized Pied Piping (2.2), also appear related to the E-type character of *il quale*-pronouns. In that, they behave just like demonstrative pronouns (and adjectives) which can resume an antecedent across discourse, can be followed by an identical or non-identical copy of the antecedent, can be coordinated with other like categories, and can be freely embedded in other phrases:<sup>30</sup>

The non 'deletability' of *il quale* pronouns instead may possibly be related to the fact that their deletion is unrecoverable given that the pronoun cannot enter into any relation (except for the one characteristic of E-type anaphora) with its antecedent (cf. Cinque 1982, 260).<sup>31</sup>

On the other hand, the strictly complementary behavior of the *che/cui*-nonrestrictives appears related to their being an integral part of the DP containing their antecedent. As a consequence of that they lack illocutionary independence (2.3.1), they must be adjacent to the Head (except for the limited cases where extraposition is allowed) and cannot have split antecedents (2.3.2 and 2.3.3). Being merged within the DP that contains their Head (an extended projection of NP), they can take only a nominal antecedent (2.3.6), and are c-commanded by whatever c-commands their Head, thus allowing a parasitic gap to be licensed (for some speakers) by an operator binding another variable in the matrix (2.3.8). Not being E-type pronouns, which require an autonomously referential antecedent (with the provisos of fn.29) they can also relativize nominal temporal adverbials (2.3.9).

The remaining properties (2.3.4, 2.3.5, 2.3.10) may instead be related to whatever properties force the *wh*-pronoun *cui* to 'delete' and be separated from the Head by at most one PP boundary. In Cinque (1978,1982), I took these properties to follow from a principle of obligatory deletion up to recoverability and from the anaphoric status of *cui*, which imposes a strong locality condition on the distance between the Head and the *wh*-pronoun.

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<sup>29</sup>The notion of reference appropriate for E-type pronouns should be somewhat qualified given the possibility for such pronouns to have indefinite antecedents under the scope of a quantifier ((ia), and even a negative quantifier if certain pragmatic conditions hold ((ib) (for discussion see Authier and Reed 2005,641 and references cited there):

- (i) a. Every guest will bring a bottle. It/Which will almost certainly be a bottle of wine.
- b. The professor saw no students in class Thursday. They/ Who had all gone to the beach instead.

<sup>30</sup>Cf. Jackendoff (1977,175): "relative pronouns in nonrestrictives can be anaphoric to the same constituents as ordinary demonstrative pronouns can."

<sup>31</sup>In Cinque (1982, 275 and fn.43) I also conjectured that non-anaphoric *wh*-pronouns must have independent uses in the language (e.g., as interrogative pronouns).



Today, I have nothing more interesting to contribute to this aspect of the syntax of *che/cui-* nonrestrictives (and restrictives), which still awaits to be properly understood.<sup>32</sup>

As to the similarities between the two types of nonrestrictives reviewed in section 3, speech act adverbs and performative verbs, as noted, are possible (at least for me) with *che/cui-*restrictives; hence unsurprisingly also with *che/cui-*nonrestrictives (as well as with *il quale-*nonrestrictives). Concerning Weak Crossover, I noted that both types of nonrestrictives (as opposed to restrictives) are immune to it. This seems to be due to the fact that the Head of *il quale-*nonrestrictives necessarily has, and that of *che/cui-*nonrestrictives can have, independent reference, so that the possessive may directly relate to the Head rather than to the relative clause internal trace. Finally the fact that a pronominal can resume a Head plus a restrictive relative but not the Head plus a non-restrictive relative (whether of the *il quale-* or the *che/cui-*type) may be related to the level of attachment of the nonrestrictive, which is above DP/QP in the “integrated” option, and independent of the DP/QP in the “non-integrated” one (differently in either case from the restrictive, which is below D/Q). If the pronominal is the (possibly elliptical) constituent following D/Q (He wants to buy that one/ another (one)/ two ...), then only a restrictive can be included in that constituent.

## 6 Some comparative remarks

An in-depth typological study of nonrestrictives is not available. The few observations that are found in the literature are sketchy and not even always converging, as the following quotes illustrate:

- (A) “The properties of nonrestrictive RC’s are quite different from those of restrictive RC’s across languages. Some languages apparently have no nonrestrictive RC’s; in others they are syntactically quite distinct; in others restrictive and non-restrictive RC’s are syntactically indistinguishable” (Downing 1978,380)
- (B) “Formal distinction between restrictive and non-restrictive relatives is found sporadically across languages[...].” (Comrie 1981,132).
- (C) “[...] the syntax of non-restrictives in a language will be largely similar to that of restrictives, modulo some small differences, [...]” (Keenan 1985,169).<sup>33</sup>

The remarks that follow thus cannot be but highly selective and tentative. As noted in the quote from Downing (1978), not all languages have nonrestrictives. In fact Jeng (1977,195), Lehmann (1984,268), Berg (1989,231), Carlson (1994,487) and Aboh (2005, fn.2) explicitly claim this to be the case of Bunun, Dagbani, Muna, Supyire and Gungbe, respectively.<sup>34</sup> Andrews (1975,73) and Aygen’s (2003,199) mention Navajo as another

<sup>32</sup>For interesting recent alternatives to the deletion analysis, see Pesetsky and Torrego (2006), Sportiche (2008), and Koopman and Sportiche (2008).

<sup>33</sup>Also see Mallinson and Blake (1981, section 5.5), Andrews (1995,27f, 2007,207), and De Vries (2005,chapter 6).

<sup>34</sup>Aboh (p.c.) points out that Gungbe (perhaps all Gbe) resorts to overt or covert coordination instead, as does Bunun (Jeng 1977,195). Another strategy, utilized in Yoruba (Sadat-Tehrani 2004,\$5), as well as in a number of Mixtecan languages (see Bradley and Hollenbach 1992), consists in inserting a generic noun like ‘person’ in apposition, followed by a restrictive clause (*‘John, a person that no woman would*

language lacking nonrestrictives.<sup>35</sup>

Most languages however do have nonrestrictives, although the question now arises whether they have one, the other, or both, of the two nonrestrictive constructions isolated above. Apparently, it so happens that in addition to languages with both types, there are languages which only have one: either the “integrated” or the “non-integrated” nonrestrictive. The disagreement concerning nonrestrictive relative clauses illustrated in the quotes above is possibly due to the fact that where “restrictive and nonrestrictive RCs are syntactically indistinguishable” only the “integrated” type is present, which we saw is virtually identical to the restrictive construction (in Italian), while in those languages in which restrictive and nonrestrictive relative clauses are syntactically distinct it is tempting to think that just the “non-integrated”, Discourse Grammar, type of nonrestrictives is present, which was seen above to pattern quite differently from restrictives (and “integrated” nonrestrictives).

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*like to marry,...* - possibly a sort of false or light free relative).

<sup>35</sup>Also see De Vries (2005,10f; 2006,266). His, as well as Citko’s (2008), and others’ claim that prenominal and internally headed relatives cannot be nonrestrictive may be correct for the “non-integrated” construction (apparently, languages with exclusively prenominal nonrestrictive relatives cannot relativize a sentence, which is something that only “non-integrated” nonrestrictives can do - see section 6.2 below). It may, however, be wrong for the “integrated” construction. And in fact prenominal and internally headed nonrestrictive relatives are documented in the literature. Setting aside those languages where prenominal nonrestrictives are of the reduced (participial) type, possibly comparable to English *the recently arrived newspapers* (e.g. the Marathi ones according to Pandharipande’s 1977,80f description), some genuine cases of full finite prenominal nonrestrictives seem to exist. This is apparently the case of Basque (De Rijk 1972,134), of Korean and Japanese (Tagashira 1972,217; Kuno 1973,235; Krause 2001a, chapt. IV,§7 and b,§6; Yuasa 2005,§6.3; and references cited there) and of Amharic, Quechua and Turkish (Wu 2008, section 2.2.2.1); this possibility for Turkish, pace Aygen 2003, was confirmed to me by Jaklin Kornfilt). De Vries’s (2006,265) second way to reinterpret “prenominal nonrestrictives”, namely as “(definite) free relatives followed by an apposition” (‘(the one) who I love, Jean, lives in Paris’) also appears dubious if Downing (1978,392) and Keenan (1985,149) are right in claiming that no language with prenominal relative clauses displays genuine (initial) *wh*-pronouns. One of the two classes of internally headed relatives isolated in Basilico (1996) and Grosu and Landman (1998) (those that do not display an indefinite restriction) can also apparently be nonrestrictive. See (i):

- (1) a. Taroo-wa [0 rooka-o isoide aruitekita] Hanako-ni deatta (Japanese - Itô 1986,109)  
T.-Top corridor-Acc hurriedly walked H.-Dat met  
‘Taro happened to meet Hanako, who was hurriedly walking through the corridor’
- b. [Kim-ssi-ka pang-eyse naonun kes]-lul manasse (Korean - Jung 1995,241)  
K.-Mr.-Nom room-from coming.out kes-Acc met  
‘I met Mr.Kim, who was coming out of the room’
- c. (ded) Edwin wayazaka ki he (ded) thi (Dakota - Alboiu 1997,267)  
(here) E. 3sg.sick the that (here) house  
‘Edwin, who is sick, lives here’
- d. [tuut-ee-raa qung-ee 7ij-aa-n]-raaga 'la 7waa-gaa-n (Haida - Enrico 2003,570)  
box-DF-in moon-DF be-EVID-PST-for 3PERS do-EVID-PST  
‘He did it for the moon, which was in the box’

Jung (1995,section3) argues in fact that Korean internally headed relatives can only be nonrestrictive (though see Kim 2004,273f); Prost (1969), cited in Culy (1990,251), claims the same thing for Togo Kã. On nonrestrictive internally headed relatives, see the discussion in Culy (1990,chapter 5,§2.4).

## 6.1 Languages with both integrated and non-integrated nonrestrictives

As seen, Italian possesses both types. And so does French (see the discussion above and Cinque 1982, section 2.1). Spanish, Catalan and (European) Portuguese, which can use either the complementizer or a *wh*-pronoun, plausibly also display both types (see Bruccart 1999, Solà 2002, and Brito 1991, respectively).

Germanic languages, except for Nynorsk and modern spoken Faroese and Icelandic (and certain dialects of Swedish – Karlsson and Sullivan 2002, 103), which only use the relative complementizer *som/sum/sem*, possibly have both types too (Platzack 2002). They employ either *wh*-pronouns, like English, or *d*-pronouns. Since only *d*-pronouns appear compatible with raising of the Head (only *d*-pronouns can relativize amounts and idiom chunks – Prinzhorn and Schmitt 2005, 498fn2; Salzmann 2006, chapter 2), it is plausible that when they appear in the nonrestrictive construction, they instantiate the “integrated” type (while *wh*-pronouns presumably enter the “non-integrated” one).<sup>36</sup> To judge from Sotiri (2006), Albanian (but not Arberesh, the Albanian spoken in Central and Southern Italy), also displays both types of nonrestrictives.<sup>37</sup>

## 6.2 Languages with only “integrated” nonrestrictives

As originally pointed out to me by Paola Benincà, Northern Italian dialects lack *il quale*-nonrestrictives altogether.<sup>38</sup> Hence, they plausibly have just the “integrated” construction.

The same is possibly true of Chinese. As shown in great detail in Del Gobbo (2001, 2003, 2004, 2005, 2006a, 2008), Chinese relatives receiving a “nonrestrictive” interpretation behave with respect to many of the properties reviewed above like English restrictives (and *che/cui*-nonrestrictives in Italian) rather than like English nonrestrictives (and *il quale*-nonrestrictives in Italian). For example, they can only have nominal antecedents, and allow a long-distance anaphor to be bound by an antecedent outside of the nonrestrictive.<sup>39</sup> All of this suggests that (possibly in addition to reduced relatives, which share properties of nonrestrictive adjectives – Del Gobbo 2004, 2005) the only type available in Chinese is the “integrated” nonrestrictive (see, in fact, the conclusion in Del Gobbo 2006c, 2008).

<sup>36</sup>This implies that a restrictive relative like *Ich kenne nicht den Mann der da ist* ‘I do not know the man who is there’ involves some kind of doubling. Both the Head (*den Mann*) and the *d*-pronoun raise to (two adjacent) COMP(s), possibly as in the so-called Contrastive Left Dislocation construction (*Den Mann, den kenne ich nicht* ‘the man, him I do not know’), except that in the former case one has to assume that the Case assigned to the Head within the relative clause is overridden by the Case assigned to the big DP from outside (cf. Kayne 1994, 155, fn.15). Alternatively, the *d*-pronoun is actually an agreeing complementizer, much as Pesetsky and Torrego (2006) argue for for the corresponding *d*-pronouns of Dutch.

<sup>37</sup>Like Italian, Albanian can utilize either the finite complementizer (*që*) or a *wh*-pronoun (*cil-in* ‘which-the’). See Kallulli (2000, 359f) and Sotiri (2006).

<sup>38</sup>In fact, they utilize no *wh*-pronoun (except for *dove* ‘where’), but just the complementizer of finite complement clauses and either a gap or a pronominal (clitic, where possible) within the relative clause, depending on the complement position being relativized.

<sup>39</sup>Tong Wu also tells me that they can only be declarative, cannot have split antecedents, have to be strictly adjacent to the Head, and never show full retention of the internal Head.

To judge from Kuno (1973,235), Andrews (1975,48f), Emonds (1979,fn4), and Kame-shima (1989,4.3.3), Japanese nonrestrictives, which are identical syntactically to restrictives (pace Yuasa 2005), may also just be of the “integrated” type (for example, the language lacks sentential relatives, like Italian *che/cui*-nonrestrictives).<sup>40</sup> Similarly, Basque and Yoruba nonrestrictives (de Rijk 1972,134; and Sadat-Tehrani 2004) cannot have a whole sentence as antecedent, again suggesting that those languages may have only nonrestrictives of the “integrated” type (de Rijk 1972 also notes that “Japanese, Tamil, and Turkish do not allow sentential relatives, either.” (p.135), and connects it to the SOV character of all these languages). Following Kayne (1994, 174,fn71), I will rather take this to be related to the fact that all these languages have prenominal relative clauses, which as noted in fn.35 above lack *wh*-pronouns, which alone can enter the “non-integrated” type of nonrestrictives, given their demonstrative-like character and related use as E-type pronouns.

### 6.3 Languages with only “non-integrated” nonrestrictives

As argued above, English has just the “non-integrated” nonrestrictive construction. Another language that appears to be like English is (modern standard) Romanian, in which nonrestrictives (and restrictives) only employ *wh*-pronouns of the *care* paradigm (also used in interrogatives), and never show the presence of the finite indicative complementizer *că* (Dobrovie Sorin 1994,213; Grosu 1994,212):

- (61) \*Ioana, *că* mi-au prezentat(-o) ieri, nu mi-a plăcut (cf. Grosu 1994,212)  
I., that they introduced (her) to me yesterday, did not appeal to me.

Indeed, Romanian nonrestrictives display the typical properties of English nonrestrictives and of *il quale*-nonrestrictives of Italian. They admit generalized Pied Piping (see (62)), show illocutionary independence (see (63)), possible non adjacency to the Head (see (64)), split antecedents (see (65)), retention of the ‘internal’ Head (see (66)), which may also be non strictly identical to the ‘external’ Head (see (67)); furthermore they may take non-nominal antecedents (see (68)), and may be preposed to a sentential antecedent (see (69)).<sup>41</sup>

#### 6.3.1 Pied Piping of phrases other than PPs

- (62) a. D. maior E.B., **grație amabilității căruia** opera filantropică avusese concursul gratis,... (Caragiale, quoted in Nilsson 1969,19)  
‘D. major E.B., thanks to the amiability of whom the philanthropic deeds had a free competition,...’

<sup>40</sup> Andrews (1975,49 and 62), Emonds (1979,fn.4), and Fukui (1986,235) take the fact that nonrestrictives can stack in Japanese and Korean (while they cannot in English) as further indication that nonrestrictives in these languages are like restrictives. More generally Andrews claims (p.63) that languages with exclusively prenominal relatives do not mark the restrictive/nonrestrictive distinction; i.e. have only “integrated” nonrestrictives, in our terms (also see Kuno 1973,235; Keenan 1985,169; and Kayne 1994,111).

<sup>41</sup>Coordination of the *wh*-pronoun with another DP, however, was not accepted by my informants.

- b. Îi cunosc bine pe frații tăi, **cel mai înalt dintre care** e fără îndoială Ion. (Grosu 2005, §3.3.2.1)  
I am acquainted with your brothers, the tallest of whom is undoubtedly I.
- c. Am făcut de curând cunoștința unui mare savant, **a discuta în mod serios cu care** mi-ar cere cunoștințe pe care nu le am. (Grosu 2005, § 3.3.2.1)  
I have recently made the acquaintance of a great scholar, to carry out serious discussions with whom would require knowledge I do not possess.

### 6.3.2 Illocutionary independence

- (63) a. Ion, **pe care nu uita să-l inviți la nuntă!**, te-a căutat ieri. (Grosu 2005, §2.1)  
I., who do not forget to invite to the wedding!, looked for you yesterday.
- b. Ion, **pe care cine s-ar gândi să-l invite?**,...
- Ion, whom who would think of inviting?,...

### 6.3.3 Non adjacency

- (64) a. Întreba pe cei dimprejur: - Joci? **Care** la rândul lor răspundeau într-un glas: - Se poate. (Nilsson 1969,52)  
(He) was asking those around: - Will you play? Who in turn answered unan-  
imously: - Maybe.
- b. Peste două ore vine trenul de Predeal – **Care** trece pe la Sinaia. (Nilsson 1969,130)  
In two hours the Predeal train arrives – Which passes through Sinaia.
- c. Îmi oferea premii de încurajare pentru răspândirea săpunului în Țara Românească pe cât se poate pentru uzul batistei. **La care** răspundeam. (Nilsson 1969,130)  
(He) was offering me prizes of encouragement for the promotion of soap in Valachia and as far as possible for the use of the handkerchief. To which I replied.

### 6.3.4 Split antecedents

- (65) ?Dacă Ion<sub>i</sub> n-o mai iubește pe Maria<sub>j</sub>, **care copii<sub>i+j</sub>** de altfel nu s-au iubit niciodată cu adevărat,...
- If I. is no longer in love with M., which young people in any event never really loved each other,...

### 6.3.5 Retention of the 'internal' Head

- (66) Guvernul a făcut o propunere cu ramificații multiple și complexe, **care propunere** fusese deja făcută de opoziție cu mulți ani în urmă. (Grosu 2005, §3.3.2.1)  
The government made a proposal with multiple and complex ramifications, which proposal had already been made by the opposition many years ago.

### 6.3.6 Non identity of the ‘external’ and ‘internal’ Heads

- (67) a. Un Micul, **care nume** îi trădează originea vlahă,... (Nilsson 1969,12)  
A guy named M., which name betrays his Valachian origin,...
- b. E posibil ca guvernul să demisioneze în curând, **în care caz** va urma o lungă perioadă de incertitudine politică. (Grosu 2005, §3.3.2.1)  
It is possible for the government to fall soon, in which case a long period of political uncertainty will follow.

### 6.3.7 Categorical nature of the antecedent (CP)

- (68) a. În patruzeci și nouă de lupte crâncene nu-și pierduse niciodată sângele rece, salvase situația de multe ori, **drept care** fusese de atâtea ori lăudat, decorat, îmbrățișat (Nilsson 1969,48) (CP)  
In forty nine cruel fights he never lost his cold blood, he had saved the situation many times, in virtue of which he had been praised, decorated, embraced.
- b. Lelu le-a prezentat-o pe Geta, **după care** au mers în casă (Gheorghe 2004,149) (CP)  
L. introduced G. to her, after which they went into the house.

### 6.3.8 Preposability (of the sentential relative)

- (69) Ne umplu, cu vârf, farfuriile, cu ciorbă, ne așeză frumos șervețelele și – **lucru la care** nu gândeam – ne întinse și câte o ceașcă dolofană cu prăștină (Nilsson 1969,51) (He) filled up the plates with broth, nicely laid the napkins and – something which I had not thought of – (he) also served us a fat cup with prăștină.

Archaic literary Romanian appears to have another relative construction, headed by *ce* (lit. ‘what’), also used in free relatives (*eu spun ce am auzit* ‘I say what I heard’; *fericit de tot ce vedea* ‘pleased of all that I saw’). See Nilsson (1969, chapter 3), Dobrovie-Sorin (1994, §6.1.4.2), Grosu (1994, §8.3). Grosu (1994,212ff) discusses evidence that while the *ce* of free relatives is a wh-pronoun or -adjective, the *ce* which introduces (non neuter) headed relatives is a complementizer. Given the possibility of nonrestrictives like (70a/b) in archaic literary Romanian, one may hypothesize that that language also has the “integrated” construction:

- (70) a. Când trecurăm print-un sat, **ce** Hidveg îi zicea,... (Nilsson 1969,25)  
When we passed through a village, which (lit. what) they call it Hidveg,...
- b. Cuconu Costache Bănescu, **ce** fusese numit șef de poștă aci,... (Nilsson 1969,57)  
Master C.B., who (lit. what) had been appointed head of the post office here,...

Colloquial (substandard) Romanian may have reanalysed *care* as a complementizer (so that one could argue that that variety of Romanian also has both types of nonrestrictive constructions) (cf. Grosu 1994,212):

- (71) a. A venit la noi un elvețian, care proiectul lui l-a interesat pe director. (Gheorghe 2004,279)  
A Swiss came to us, who his project interested the director.
- b. Ion, care l-am văzut pe el ieri,...
- Ion, who I saw him yesterday,...

#### **6.4 Conclusion**

On the basis of some comparative evidence I have argued for the existence of two distinct nonrestrictive relative constructions; one essentially identical to the ordinary restrictive construction (as such part of sentence grammar); the other distinct from the ordinary restrictive construction (with characteristics of the grammar of discourse). Italian and other Romance languages display both constructions; English and Romanian only the discourse grammar construction; Northern Italian dialects only the sentence grammar one; and other languages neither. It thus appears that earlier focus on English, which, as noted, possesses just the discourse grammar construction, has had the effect of biasing the theoretical analyses proposed in the literature for the nonrestrictive construction.

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# Remarks on split intransitivity and fluid intransitivity

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## 1 Introduction

The aim of this paper is to confront the way some types of alignment variations have been dealt with in different frameworks, and to argue that some phenomena extensively discussed in the literature on unaccusativity but largely neglected by typologists (with however the notable exception of Maslova, 2006) are relevant to alignment typology, and necessitate the recognition of a type of fluid intransitivity not identified in classical works on alignment typology.

The paper is organized as follows. In section 2, after recalling the definition of split intransitivity, I review the possible manifestations of split intransitivity, in the coding characteristics of core arguments and in their behavioral properties. In section 3, I briefly discuss several issues in the study of split intransitivity. Section 4 is devoted to a discussion of the relationship between the notions of split intransitivity and unaccusativity. In section 5, devoted to fluid intransitivity, I discuss some illustrations of *pragmatically driven fluid intransitivity*, a particular type of fluid intransitivity accounting in particular for the impersonal construction of French intransitive verbs, and I show that the recognition of this type of alignment variation converges with recent developments in generative studies of unaccusativity.

## 2 Split intransitivity and its manifestations

### 2.1 Alignment, alignment variations, and split intransitivity: definitions

A term  $T$  of a construction  $C$  and a term  $T'$  of a construction  $C'$  are *aligned* for a given property if they show the same characteristics with respect to this property. For example, in the East Caucasian language Akhvakh, in the construction illustrated by ex. (1a-c), the single argument of *bequru*λa ‘come’ is aligned with the patient of *biχoru*λa ‘kill’ with respect to case marking and gender-number agreement, but with the agent of *biχoru*λa ‘kill’ with respect to the variations of the verb in person: the single argument of ‘come’ is in the absolute case, like the patient of ‘kill’ (whereas the agent of ‘kill’ is in the ergative case), it governs variations of the verb in gender and number like

the patient of ‘kill’, and it governs the variations of the verb in person like the agent of ‘kill’.<sup>1</sup>

- (1) *Akhvakh* (author’s field notes)
- a. *čanaqa w-oq-ari*  
hunter.ABS SGM-come-PFV  
‘The hunter came’
  - b. *bača b-eq-ari*  
wolf.ABS SGN-come-PFV
  - c. *de-ne w-oq-ada*  
1SG-ABS SGM-come-PFV.1D/2Q  
‘I came’ (said by a man)
  - d. *čanaqasu-de bača b-iχ-āri*  
hunter-ERG wolf.ABS SGN-kill-PFV  
‘The hunter killed the wolf’
  - e. *bačo-de čanaqa w-uχ-āri*  
wolf-ERG hunter.ABS SGM-kill-PFV  
‘The wolf killed the hunter’
  - f. *de-de bača b-iχ-āda*  
1SG-ERG wolf.ABS SGN-kill-PFV.1D/2Q  
‘I killed the wolf’

In the last decades, the main concern of alignment typology has been the systematic investigation of the alignment of S (single argument of semantically monovalent verbs) with the core terms of the prototypical transitive construction, A(gent) and P(atient).<sup>2</sup> For each property giving rise to a contrast between A and P, S may be aligned with A (*accusative* alignment) or P (*ergative* alignment), or show characteristics different from those of both A and P (*tripartite* alignment).<sup>3</sup>

The intransitive constructions of a given language are not necessarily uniform in their alignment with the prototypical transitive construction, and several types of alignment variations must be distinguished. Alignment variations governed by grammatical characteristics of the verbs or by the nature of the NPs representing their core arguments are commonly termed *split ergativity*. Alignment variations triggered by the

<sup>1</sup>A list of the abbreviations used in the glosses of the examples is given at the end of the paper.

<sup>2</sup>On the basic notions of classic alignment typology, see a.o. (Dixon, 1994; Lazard, 1994). See (Bickel, forthcoming) for an alternative approach aiming at rectifying some shortcomings of traditional alignment typology. On the necessity of a finer-grained approach to the question of lexically driven alignment splits, see (Nichols, 2008). A particularly controversial issue in alignment studies, which however will not be discussed here, is the possibility to accommodate languages whose transitive constructions are characterized by a *relative hierarchical* type of coding within the classic model of alignment—see in particular (Zúñiga, 2006).

<sup>3</sup>As illustrated by the *Akhvakh* example above, S does not necessarily show the same type of alignment for all of its characteristics, but some combinations are more common than others. For example, the combination of ergative alignment in case marking and accusative alignment in indexation is quite common, whereas the combination of accusative alignment in case marking and ergative alignment in indexation does not seem to be attested. Another well-established generalization about alignment mismatches is that ergative alignment is much more widespread in the coding properties of S, A and P than in their behavioral properties.

TAM value of the verb form are particularly common. For example, in the Kurmanji variety of Kurdish, the S argument of intransitive verbs is uniformly in the nominative, and the verb uniformly agrees with it, whereas A and P show variations in case marking and indexation conditioned by the TAM value of the verb: in some tenses, A in the nominative contrasts with P in the oblique case, and verb agreement is governed by A (hence accusative alignment:  $S = A \neq P$ )—ex. (2a-d), whereas in some others, A in the oblique case contrasts with P in the nominative, and verb agreement is governed by P (hence ergative alignment:  $S = P \neq A$ )—ex. (2e-h).

(2) *Kurmanji* (Blau and Barak, 1999)

- a. *Ez dikev-im*  
1SG fall.PRS-1SG  
'I am falling.'
- b. *Mirov dikev-e*  
man fall.PRS-3SG  
'The man is falling.'
- c. *Ez mirov-î dibîn-im*  
1SG man-OBL.SGM see.PRS-1SG  
'I see the man.'
- d. *Mirov min dibîn-e*  
man 1SG.OBL see.PRS-3SG  
'The man sees me.'
- e. *Ez ket-im*  
1SG fall.PFV-1SG  
'I fell.'
- f. *Mirov ket-∅*  
man fall.PFV-3SG  
'The man fell.'
- g. *Min mirov dît-∅*  
1SG.OBL man see.PFV-3SG  
'I saw the man.'
- h. *Mirov-î ez dît-im*  
man-OBL.SGM 1SG see.PFV-1SG  
'The man saw me.'

Two other types of alignment variations, commonly termed *split intransitivity* and *fluid intransitivity*, are recognized in recent literature on alignment typology. They have in common that their conditioning does not involve the inflectional characteristics of verbs or the nature of their arguments. For example, in the Papuan language Galela, transitive verbs have two distinct sets of prefixes cross-referencing A and P respectively—ex. (3a-b), whereas intransitive verbs divide into a subclass whose sole argument  $S_A$  is indexed via the paradigm used to index the A argument of transitive verbs—ex. (3c), and a subclass whose sole argument is indexed via the paradigm used to index the P argument of transitive verbs—ex. (3d).

(3) *Galela* (Holton, 2008)

- a. *No-wi-doto*  
A2SG-P3SGM-teach  
'You teach him.'
- b. *Wo-ni-doto*  
A3SGM-P2SG-teach  
'He teaches you'
- c. *No-tagí*  
A2SG-go  
'You are going'
- d. *Ni-kiolo*  
P2SG-be asleep  
'You are asleep'

A variety of terms have been used with reference to the type of alignment variations designated here as *split intransitivity*: *split S*, *unaccusativity*, *agentive alignment*, *active-stative alignment*, *semantic alignment*. *Split intransitivity* is retained here as the most general, neutral and non-committal term transparently referring to situations in which verbs occurring in intransitive constructions divide into two classes characterized by a contrast in the way their single core argument S is aligned with the two core terms of the transitive construction, A and P.<sup>4</sup> In order to avoid terminological problems with terms variously used in different traditions, intransitive verbs whose S argument is aligned with A and intransitive verbs whose S argument is aligned with P will be designated as S<sub>A</sub> and S<sub>P</sub> verbs respectively.

Any contrasting property of the two core arguments of the prototypical transitive construction may be involved in an intransitivity split. Intransitivity splits may involve the coding characteristics of core arguments (case marking, argument indexation, and/or constituent order—*overt* split intransitivity), or their behavior in various syntactic mechanisms (*covert* split intransitivity).

## 2.2 Overt split intransitivity

### 2.2.1 Split intransitivity in argument indexation

Overt split intransitivity has been reported mainly in predominantly head-marking languages with a split intransitive pattern of argument indexation similar to that of Galela—ex. (3) above. (Boas, 1909) is among the first language descriptions in which an indexation system of this kind is clearly identified. Dakota (Van Valin Jr., 1977) and Guaraní (Gregores and Soares, 1967) are among the best-known examples of split intransitivity manifested in argument indexation.<sup>5</sup>

<sup>4</sup>The inconvenience of terms such as *agentive alignment* or *active-stative alignment* is that they refer to possible semantic correlates of split intransitivity, and therefore imply an a priori decision with respect to what constitutes a controversial question in the study of split intransitivity and related phenomena. Even the term *semantic alignment* recently proposed by S. Wichmann (Donohue and Wichmann, 2008) can be criticized from this point of view, since it excludes the very possibility of purely lexical (i.e., semantically arbitrary) intransitivity splits—see section 3.3.2. The relationship between the notions of *split intransitivity* and *unaccusativity* will be discussed in section 4.

<sup>5</sup>More complex indexation patterns, with three indexation possibilities for S arguments and variations in the indexation of A and O that complicate the identification of alignment patterns, have also

### 2.2.2 Split intransitivity in case marking

Split intransitivity in case marking can be illustrated by Nepali (Li, 2007), Georgian (Van Valin Jr., 1990; Lazard, 1995), or Basque. Most Basque intransitive verbs have their single argument in the same absolute case as the P argument of transitive verbs, but Basque also has a minor class of intransitive verbs that assign ergative case to S—ex. (4).

(4) *Basque*

- a. *Gizon-ak ur-a edan du*  
 man-SG.ERG water-SG.ABS drink.PFV AUX.PRS.P3SG.A3SG  
 ‘The man has drunk the water.’
- b. *Gizon-a etorri da*  
 man-SG.ABS come.PFV AUX.PRS.S3SG  
 ‘The man has come.’
- c. *Ur-ak irakin du*  
 water-SG.ERG boil.PFV AUX.PRS.P3SG.A3SG  
 ‘The water has boiled.’

### 2.2.3 Split intransitivity in constituent order

In languages with a rigid AVP or PVA constituent order in the transitive construction, the choice between SV and VS may constitute a manifestation of split intransitivity, as claimed by Donohue (2008) for Ambonese Malay—ex. (5).

(5) *Ambonese Malay* (Donohue, 2008)

- a. *Dorang cari betang konco*  
 3PL search\_for my friend  
 ‘They are looking for my friend.’
- b. *Betang konco su-bajaang*  
 my friend PFV-walk  
 ‘My friend walked away.’
- c. *Su-jato betang konco*  
 PFV-fall my friend  
 ‘My friend has fallen over.’

Note however that SV~VS alternations are rarely rigidly determined by the choice of individual intransitive verbs, and more commonly involve pragmatically governed *fluid* intransitivity—see section 5.

## 2.3 Covert split intransitivity

In principle, any contrast in the behavior of the two core arguments of transitive verbs can be involved in an intransitivity split. In this section, after illustrating the notion of covert split intransitivity with the example of Nahuatl impersonalization, I enumerate

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been reported. See a.o. (Heath, 1977) on Choctaw, (Donohue, 2001) on Saweru.

the best-known manifestations of covert split-intransitivity (discussed in the generative literature as ‘unaccusativity diagnostics’), and I add two examples of lesser known phenomena that may be involved in intransitivity splits. Several phenomena currently mentioned as possible ‘unaccusativity diagnostics’ are however not mentioned in this section. The reason is that, either they cannot be defined in terms of a contrast between S alignment with A and S alignment with P (see section 4.2), or they involve *fluid* intransitivity rather than *split* intransitivity (see section 5).

### 2.3.1 Nahuatl impersonalization

Nahuatl has no case contrast between A and P, and uniformly uses the same prefixes to index the A argument of transitive verbs and the S argument of intransitive verbs, but shows an intransitivity split in the way to encode unspecific S arguments.

Nahuatl has two distinct morphological devices to encode unspecific agents (passivization by means of the suffix *-lo*) and unspecific patients (the so-called indefinite object prefixes *tla-* and *tē-*), and shows a tripartite split with respect to the morphological operations used to encode unspecific S arguments of intransitives: with some intransitive verbs, unspecific S is encoded via the same passive suffix *-lo* as A—ex. (6a-b), with some others, unspecific S is encoded via the same ‘introversive’ prefix *tla-* as an inanimate P—ex. (6c-d), and a third group of intransitive verbs uses a special impersonal suffix *-hua*—ex. (6e-f) (Launey, 1981, 1994).

(6) *Nahuatl* (Launey, 1981)

- a. *Mayāna in pilli*  
A3SG.be\_hungry.PRS DEF child  
‘The child is hungry.’
- b. *Mayāna-lo*  
A3SG.be\_hungry-PASS.PRS  
‘People are hungry.’
- c. *Popōca in tepetl*  
A3SG.smoke.PRS DEF mountain  
‘The mountain is smoking.’
- d. *Tla-popōca*  
A3SG.INTRV-smoke.PRS  
‘Something is smoking.’
- e. *Tzàtzi in pilli*  
A3SG.scream.PRS DEF child  
‘The child is screaming.’
- f. *Tzàtzī-hua*  
A3SG.scream-IMPERS.PRS  
‘Somebody is screaming’

### 2.3.2 Other possible manifestations of covert split intransitivity

The following manifestations of covert split intransitivity have been widely discussed in the literature:



- Impersonal passives: In languages in which passive morphology can be used to block the expression of the A argument of transitive verbs without affecting the expression of the P argument, the same operation may apply to the S argument of a subclass of intransitive verbs (Perlmutter, 1978). The possibility to passivize ‘unergative’ intransitive verbs but not ‘unaccusative’ ones has been noted by Rice (1991) for the Athapaskan language Slave.
- The syntax of resultatives: In English and some other languages, a resultative phrase can be predicated of the P argument of transitive verbs, or of the S argument of a subclass of intransitive verbs, but cannot be predicated, either of the A argument of transitive verbs, or of the S argument of another subclass of intransitive verbs (Levin and Rappaport Hovav, 1995).
- The attributive use of past participles: In several Germanic and Romance languages, past participles of transitive verbs can modify a head noun semantically identified to the P argument (as in English *uneaten food* vs. *\*uneaten man*). The past participle of a subclass of intransitive verbs can combine in the same way with a head noun identified to the S argument (*unfallen leaves*), whereas with another subclass of intransitive verbs, the attributive use of the past participle is impossible (*\*unrun jogger*)—see (Levin and Rappaport Hovav, 1986). A similar split, involving the attributive use of verb forms including aspectual suffixes, has been described in Japanese—see (Kishimoto, 1996).
- Russian bare po-phrases: In Russian, with transitive verbs, distributive bare po-phrases can occur only in P role, and intransitive verbs divide into a subclass that accepts distributive po-phrases in S role, and a subclass that does not accept them (Pesetsky, 1982; Schoorlemmer, 2004).
- German split phrases: According to (Grewendorf, 1989), in German, NPs where the head and its dependents are separated are allowed in P role, and also in S role with a subclass of intransitive verbs, but not in A role, nor in S role with another subclass of intransitive verbs.<sup>6</sup>
- Germanic ‘what-for’ split: According to (Grewendorf, 1989), the German ‘what-for’ construction is possible with nouns in P role, and also in S role with a subclass of intransitive verbs, but not with nouns in A role, or in S role with another subclass of intransitive verbs. Similar observations have been made on other Germanic languages (Dutch, Swedish).
- Possessor raising: In some languages in which an external possessor can refer to the P argument of a transitive verb, it has been claimed that intransitive verbs divide into two subclasses according to the possibility to be constructed with an external possessor referring to their S argument—see in particular (Borer and Grodzinsky, 1986) on Hebrew.

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<sup>6</sup>Note that Grewendorf’s analysis has been challenged by De Kuthy (2002), who argues that the semantic roles assigned by the verb do not constitute the decisive factor in the conditioning of this phenomenon.

- Noun incorporation: In languages having a productive mechanism of noun incorporation, transitive verbs can incorporate their P argument, but not their A argument, and intransitive verbs may divide into a subclass whose S argument can be incorporated in the same way as P, and another subclass with which S incorporation is impossible— see (Baker, 1988); see also (Rice, 1991) on the Athapaskan language Slave.

Lesser known manifestations of covert split intransitivity include the following two:

- Northern Mande nominalization: Several Northern Mande languages make a distinction between two varieties of genitive construction: inalienable genitive modifiers immediately precede their head, whereas alienable genitive modifiers are marked by a postposition. When transitive verbs are nominalized, A is encoded like an alienable genitive modifier, whereas P is encoded like an inalienable genitive modifier, and in at least some Northern Mande languages, the S argument of some intransitive verbs is treated in nominalization in the same way as A, whereas with other intransitive verbs, the behavior of S in nominalization aligns on that of P—see in particular (Lüpke, 2005, 327–347) on Jalonke.
- Halkomelem Salish desideratives: According to (Gerds, 1991) Halkomelem Salish has a desiderative derivation that modifies the semantic role of the A argument of transitive verbs in the same way as the *want to V* construction of English. The same derivation is possible for a subclass of intransitive verbs but is impossible for others, even in cases in which the *want to V* construction would be fully acceptable in English (for example, Halkomelem Salish uses the desiderative derivation to express ‘I want to go’, but cannot use it to express ‘I don’t want to get lost’—(Gerds, 1991, 236–237)).

### 3 Issues in the study of split intransitivity

#### 3.1 Inconsistencies in the recognition of intransitivity splits

The typological and generative traditions share the same bias in the way they deal with predominantly ergative and predominantly accusative languages. In predominantly ergative languages having a minor class of verbs whose construction involves an argument having the coding characteristics of A but no argument with the coding characteristics of P (which is for example the case of Basque), no typologist hesitates to recognize an intransitivity split with a minor class of intransitive verbs following accusative alignment, and generativists immediately identify a subclass of ‘unergative’ verbs. But when the symmetrical situation is found in predominantly accusative languages (for example, in languages like Latin, German or Russian that have a minor class of ‘impersonal’ constructions involving an accusative NP but no nominative NP), the possibility to analyze it in terms of split intransitivity or unaccusativity is generally neglected. There are however some notable exceptions, in particular (Moravcsik, 1978).<sup>7</sup>

<sup>7</sup>In this article, devoted to manifestations of ergativity in predominantly accusative languages, E. Moravcsik recognizes “accusatively marked intransitive subjects” (and consequently, ergative align-

Ex. (4c), reproduced here as (7), illustrates a monovalent verb of Basque whose sole argument is encoded like the A argument of transitive verbs, contrary to the general rule of ergative alignment. Ex. (8) illustrate the symmetric case of a monovalent verb of Russian whose sole argument, in contradiction with the general rule of accusative alignment, is encoded like the P argument of a transitive verb.

- (7) *Basque*  
*Ur-ak irakin du*  
 water-SG.ERG boil.PFV AUX.PRS.P3SG.A3SG  
 ‘The water has boiled.’
- (8) *Russian*  
*Menja tošnit*  
 1SG.ACC feel\_nauseous.PRS.3SG  
 ‘I feel nauseous.’

Basque verbs like those illustrated by ex. (7) are termed ‘unergatives’ by generativists, which may suggest that they constitute the mirror image of the unaccusative verbs identified in the other European languages. But in fact, they constitute the exact mirror image of the Russian (or Latin, German, etc.) impersonal verbs with a unique argument represented by an accusative NP, like the Russian verb of ex. (8), which are never mentioned in discussions of unaccusativity.

In the typological tradition, it is commonly admitted that the subclass of Basque intransitive verbs with S in the ergative case constitutes an instance of split intransitivity; at the same time, many a typologist would probably disagree with the proposal to analyze in a symmetric way the Russian verb of ex. (8), because this verb shows what could be the trace of 3rd person singular A argument. But accepting this objection implies putting expletive subjects and default agreement marks on a par with NPs or bound pronouns representing arguments in the definition of alignment types, and the same line of argument should be applied to the S<sub>A</sub> verbs of Basque. The construction of these verbs includes the transitive auxiliary in the form that normally implies a 3rd person singular P argument, and therefore can be viewed as an exception to the ergative alignment rule only if expletive subjects and default agreement marks are distinguished from referential NPs and bound pronouns in the identification of alignment patterns. Recognizing *overt* split intransitivity in Basque but not in Russian (or German, or Latin) is therefore totally inconsistent.

Note that even in Romance languages, exceptional valency patterns including an argument fully aligned with P but no argument aligned with A are not totally unknown. In French, *falloir* ‘need’ cannot occur in a canonical construction with a subject NP and does not inflect for person—ex. (9).

- (9) *French*  
 a. *Il me faut ces livres*  
 A3SGM D1SG need.PRS.3SG DEM.PL book.PL  
 ‘I need these books.’

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ment) in constructions including an experiencer in the accusative such as Old English *Mec longade*, ‘I longed’ (lit. ‘Me longed’), Latin *Pudet me* ‘I am ashamed’ (lit. ‘Shames me’), or German *Es friert mich* ‘I am cold’ (lit. ‘It freezes me’).

- b. *Ces livres, il me les faut*  
 DEM.PL book.PL A3SGM D1SG P3PL need.PRS.3SG  
 ‘These books, I need them.’
- c. \* *Ces livres me fallent*  
 DEM.PL book.PL D1SG need.PRS.3PL

Whatever the analysis of expletive subjects, the absence of an argument represented by an NP showing the same properties as A in the prototypical transitive construction, and the presence of an argument fully aligned with P, make this construction comparable to the constructions involving an S argument aligned with P in languages in which overt split intransitivity is traditionally recognized.

### 3.2 Variations in the size and productivity of subclasses of intransitive verbs

As mentioned by (Merlan, 1985), in languages having split intransitive systems, the size of the two subclasses of intransitive verbs varies a good deal. Some languages (for example, Basque) have a small class of S<sub>A</sub> verbs and a large class of S<sub>P</sub> verbs, others (for example, the Saharan language Beria—(Jakobi and Crass, 2004)) have a small class of S<sub>P</sub> verbs and a large class of S<sub>A</sub> verbs, and in other languages, both classes are numerically important. French and Occitan, with just one verb whose construction includes an argument fully aligned with P but cannot include an argument aligned with A (section 3.1), illustrate the borderline case of languages in which a class of verbs characterized by exceptional alignment properties includes just one member.

### 3.3 The semantic correlates of split intransitivity

Leaving apart for the moment the pragmatic conditioning characteristic of situations involving *fluid* intransitivity rather than *split* intransitivity (section 5), two semantic features have been put forward as semantic correlates of split intransitivity: agentivity and verbal lexical aspect (Aktionsart).

#### 3.3.1 Semantically motivated intransitivity splits

Agentivity is a cluster concept, and the distinction between S<sub>A</sub> and S<sub>P</sub> verbs may be sensitive to various aspects thereof. For example, verbs expressing non-volitional bodily processes allowing for some degree of control (such as ‘cry’) belong to the S<sub>A</sub> class in some languages, and to the S<sub>P</sub> class in some others.<sup>8</sup>

Verbal lexical semantics has been reported to condition split intransitivity in three possible ways, which according to the Dowty/Vendler classification of verbs can be defined as follows:

<sup>8</sup>The ambiguous status of such verbs from the point of view of agentivity is apparent in the fact that, out of context, their imperative positive (e.g., *Cry!*) sounds somewhat strange, whereas their imperative negative (e.g., *Don't cry!* or *Stop crying!*) sounds perfectly normal. By contrast, *Sweat!* and *Stop sweating!* are equally anomalous. Another possible criterion is that *feign to be crying* is semantically perfectly normal, whereas for example *feign to be sweating* is semantically problematic.

- (a) states vs. activities ~ achievements ~ accomplishments (or [ $\pm$ stative])
- (b) states ~ activities vs. achievements ~ accomplishments (or [ $\pm$ telic])
- (c) activities vs. states ~ achievements ~ accomplishments

The third possibility has been advocated by Van Valin as an explanation of auxiliary selection in Italian, but also of the intransitivity split of Georgian (Van Valin Jr., 1990), and the second possibility can be illustrated by auxiliary selection in Dutch (see van Hout, 2004, among others). In other words, if one accepts the distinction put forward here between split intransitivity proper and variations in the behavior of intransitive verbs that cannot be straightforwardly formulated in terms of alignment variation, these two possibilities are rather marginal as possible explanations of split intransitivity proper. Uncontroversial cases of semantically motivated split intransitivity are regularly conditioned, either by the [ $\pm$ agentive] distinction in argument structure, or by the [ $\pm$ stative] distinction in lexical aspect.<sup>9</sup>

Mithun (1991) analyzes the semantic basis of split intransitivity in Guaraní, Lakshota (a dialect of Dakota), Central Pomo (from the Pomoan family), Caddo (from the Caddoan family), and Mohawk (from the Iroquoian family), and the wider sample of Northern Amerindian languages she takes into consideration in (Mithun, 2008) confirms the validity of the hypotheses put forward in the former study.<sup>10</sup>

Concerning Guaraní, Mithun concludes that  $S_A$  verbs denote events (activities, accomplishments, and achievements), whereas  $S_P$  verbs denote states, and that consequently this system, “based primarily on a distinction of lexical aspect, could thus be accurately identified as active-stative”.

In the case of Lakshota, Mithun shows that the [ $\pm$ stative] distinction plays no role in the intransitivity split, and that S arguments aligned with A typically perform, effect, instigate and control events, while S arguments aligned with P are typically affected. Central Pomo and Caddo are similar, with however differences in the particular aspects of agentivity (volitionality, control, affectedness, ...) relevant to the classification of intransitive verbs into  $S_A$  verbs and  $S_P$  verbs. Mohawk can also be described as having an intransitivity split whose semantic correlate is agentivity, but in which this original motivation has been somewhat blurred by processes of grammaticalization and lexicalization.

An important aspect of Mithun's study is that she shows how the semantic parameters underlying split intransitivity may evolve, giving rise to apparent exceptions to the predominant regularity.

Recent studies have considerably enlarged the documentation on split intransitivity (in particular among the languages of the Pacific). They have revealed additional cases of split intransitivity conditioned by the [ $\pm$ stative] feature—for example, the Papuan language Galela (Holton, 2008), but on the whole they confirm the preponderance of agentivity in the semantic conditioning of intransitivity splits. For example,

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<sup>9</sup>I am aware of only two cases of overt split intransitivity that have been claimed to be conditioned by telicity: Georgian and Nepali.

<sup>10</sup>On the semantic basis of split intransitivity in Northern Amerindian languages, see also (Hardy and Davis, 1993) on the Muskogean language Alabama.

(Klamer, 2008) provides an overview of split intransitivity in ten languages from Indonesia, from which it follows that semantic features of the arguments are relevant in all languages of the sample, whereas verbal aspect plays a role in two of them only.

More or less complex cases of interaction of agentivity and lexical aspect have been reported too. For example, Li 2007 argues that the intransitivity split of Nepali follows from the interaction of agentivity and telicity.<sup>11</sup>

### 3.3.2 Semantically arbitrary intransitivity splits

The semantic motivation of intransitivity splits may be less transparent than in the cases mentioned in the preceding section. Some languages seem to have a relatively homogeneous small class contrasting with a large class semantically heterogeneous (see for example (Michailovsky, 1997) on Limbu, a Tibeto-Burman language of Nepal).

On the question of the relative size of the subclasses of  $S_A$  and  $S_P$  intransitive verbs, R. Pustet rightly observes that “this aspect of the structure of split-S systems has been widely neglected” (Pustet, 2002, 383), and argues that this parameter is crucial in the semantic analysis of intransitivity splits. She shows that the two related languages Lakota and Osage, in spite of having intransitivity splits based on the same semantic feature of agentivity, greatly differ in the relative size of the two subclasses of intransitive verbs: Osage has much more  $S_A$  verbs and much less  $S_P$  verbs than Lakota, and many cognate verb stems are categorized as  $S_P$  verbs in Lakota, but as  $S_A$  verbs in Osage, for example Lakota  $c\grave{a}c\acute{a}$  vs. Osage  $\zeta\zeta\zeta$  ‘tremble’. The explanation proposed is that “multifactor concepts like agency are per se scalar concepts”, and that consequently, vacillations in the categorization of S arguments of intransitive verbs as [+agentive] are normal. One of the two subclasses of  $S_A$  verbs and  $S_P$  verbs can therefore behave as a default class grouping all intransitive verbs that do not assign prototypical agenthood or prototypical patienthood to their S argument.

The possibility of purely lexical intransitivity splits (i.e., intransitivity splits devoid of any semantic consistency) should be considered at least when the two subsets of intransitive verbs are of a very unequal numerical importance. In particular, Trask explicitly argued that the subclass of Basque  $S_A$  verbs is “semantically arbitrary” (Trask, 1997, 111), and constitutes nothing more than a collection of isolated historical accidents without any connection between themselves. Doubts about the possibility to find a semantic motivation of an intransitivity split have also been expressed for Kali’na, a Cariban language of French Guyana (Renault-Lescure, 2001-2002)

Semantically arbitrary intransitivity splits involving a minor subclass of intransitive verbs with an exceptional alignment pattern may result from the decay of previously semantically motivated intransitivity splits, with a limited subclass of intransitive verbs constituting vestiges of a type of behavior formerly productive, but that the evolution tends to eliminate. An alternative explanation is the emergence of a split alignment pattern due to the accumulation of isolated evolutions affecting individual intransitive verbs but having in common that they create exceptions to the predominant alignment pattern.

<sup>11</sup>Nepali seems to be a particularly complex case: according to (Butt and Poudel, 2007), some aspects of the distribution of the ergative case in Nepali for which no explanation had previously been offered can be explained with reference to the notions of stage-level vs. individual level predication. Note that the variations they analyze constitute an instance of *fluid* intransitivity rather than *split* intransitivity.

### 3.4 The diachrony of split intransitivity

As discussed in Holton, Malchukov and Mithun's papers included in (Donohue and Wichmann, 2008), in predominantly accusative languages, split intransitivity may result from the reanalysis of 'transimpersonal' constructions, i.e., of constructions that have the appearance of transitive constructions, but involve a dummy A pronoun or default A agreement and a unique core argument encoded like the P argument of prototypical action verbs.

In predominantly ergative languages, split intransitivity may develop as the result of the coalescence of light verb compounds, as discussed for Lezgian by (Haspelmath, 1993). The Mayan languages Chol and Chontal are another case in point. As discussed by (Vázquez Álvarez, 2002), (Gutiérrez Sánchez, 2004) and (Gutiérrez Sánchez and Zavala Maldonado, 2005), Chol and Chontal have an intransitivity split in S indexation with a class of  $S_A$  inflected analytically, whereas  $S_P$  verbs are inflected via affixes, and this situation results from the grammaticalization of light verb constructions.

The grammaticalization of aspectual periphrases has also been reported as a possible source of split intransitivity—see (Danziger, 1996) on the Mayan language Mopan.

## 4 Split intransitivity and unaccusativity

### 4.1 Split intransitivity in generative syntax and the Unaccusative Hypothesis

Split intransitivity has attracted the attention of linguists working within very different theoretical frameworks. Sapir (1917) initiated a tradition with a marked typological orientation, which concentrates on cases of *overt* split intransitivity, i.e., split intransitivity apparent in the coding characteristics of S (case marking and/or verb agreement), and tends to neglect *covert* split intransitivity, i.e., split intransitivity manifested in some aspects of the behavior of S in languages in which the coding characteristics of S do not depend on the choice of a particular intransitive verb. The generative tradition was initiated by Perlmutter (1978) within the framework of relational grammar, and by Burzio (1986) within the GB paradigm. At its beginning, it was mainly concerned with the discussion of the *Unaccusative Hypothesis*.

*Unaccusativity* primarily refers to a possible syntactic explanation of split intransitivity within the frame of multistratal theories of syntax, according to which "the single argument of unaccusative verbs is an underlying object, and thus displays many syntactic properties of direct objects of transitive verbs", whereas "the single argument of unergative verbs is a subject at all levels of representation, and thus displays the same syntactic behavior as the subject of transitive verbs" (Sorace, 2004)

### 4.2 'Unaccusativity diagnostics' that are not straightforwardly interpretable in terms of alignment variations

A problem with the notion of unaccusativity is that it is not limited to phenomena straightforwardly definable in terms of alignment variations ( $S = A \neq P$  vs.  $S = P \neq A$ ).

'Unaccusativity diagnostics' also include variable properties of intransitive constructions that cannot be defined in terms of alignment of S with one of the core terms of the transitive construction.

#### 4.2.1 Auxiliary selection

Auxiliary selection in Germanic and Romance languages is one of the most popular unaccusativity diagnostics. However, in spite of several proposals to establish a connection, many authors acknowledge that it remains unclear why auxiliary selection should be sensitive to a distinction between intransitive verbs whose S argument is an underlying A and intransitive verbs whose S argument is an underlying P (see a. o. Levin and Rappaport Hovav, 1995).

In the languages in question, the perfect auxiliary in transitive constructions is invariably *have*, and it would simply be nonsensical to try to describe auxiliary selection as based on a contrast between A triggering the choice of *have* and P triggering the choice of *be*, with extension to S along a split intransitive pattern. Therefore, whatever the possibility to establish a connection between unaccusative syntax and the selection of *be* is, it should be clear that auxiliary selection cannot be described as a contrast between  $S_A$  verbs and  $S_P$  verbs. Consequently, there is no a priori reason to expect that subclasses of intransitive verbs established on the basis of auxiliary selection should coincide with subclasses of intransitive verbs established on the basis of distinctions straightforwardly involving intransitivity splits. For detailed analyses and discussions, see (Legendre and Sorace, 2003; Sorace, 2004; Bentley, 2006; Aranovich, 2007), and references therein.

#### 4.2.2 Inflectional classes of intransitive verbs

Some languages have an inflectional class of stative verbs, and this has sometimes been proposed as an unaccusativity diagnostic (see (Krøger, 1990) on the Philippine-type language Kimarangang Dusun). However, if the inflectional distinction does not correlate with a variation in the way S is aligned with A or P, it cannot be described as a contrast between  $S_A$  verbs and  $S_P$  verbs.

#### 4.2.3 Variations in the transitivization properties of intransitive verbs

In some languages, intransitive verbs divide into two sub-classes with respect to the possibility of being used in a transitive construction. For example, English causative alternation, in which the same verb can be used transitively and intransitively with the meaning equivalence  $V(x, y) = \mathbf{Caus}(x, V(y))$ , has been claimed to be an unaccusativity diagnostic (see a.o. Levin and Rappaport Hovav, 1995, 79–178).

According to (Rice, 1991), Athapaskan languages have a causative derivation that can apply to any intransitive verb in some Athapaskan languages (for example, Navajo), whereas in some others (for example, Slave), its occurrence is limited to a subclass of intransitive verbs.

A variant of this situation is found in languages such as Fijian (Dixon, 1988), in which the general rule is that transitive verbs are overtly derived from intransitive ones by the addition of a transitivizing suffix, and intransitive verbs divide into two classes



with respect to the effect of the morphological operation of transitivization on argument structure: either A bears the same semantic role as S, and an additional P argument is introduced, or P bears the same semantic role as S, and a causer is introduced in A role.

Similar situations are discussed by Austin (1997) for several Australian aboriginal languages, and by Danziger (1996) for three languages of the Yucatecan branch of the Mayan family (Yucatec, Lacandon, and Itzaj). As explicitly stated by E. Danziger for Yucatecan languages, such splits may be motivated by the same distinctions in lexical aspect or argument structure as true intransitivity splits in other languages, and it is reasonable to investigate possible connections. However, the ability of the S argument of an intransitive verb to be converted into the A or P argument of a transitive verb is a derivational property of intransitive verbs, not a characteristic of the intransitive construction, and it cannot be compared with similar derivational properties of the core arguments of the transitive construction, since by definition, transitivization cannot apply to transitive constructions. Therefore, such variations cannot be described in terms of alignment of the intransitive construction with the transitive construction.

### 4.3 Unaccusative verbs, or unaccusative syntax?

An important part of the literature on unaccusativity is devoted to ‘unaccusativity mismatches’. Interestingly, many of them involve phenomena that do not have the same status with respect to split intransitivity in the strict sense of this term. For example, (Gerdts, 1991) describes a mismatch between the classification of the intransitive verbs of Halkomelem Salish according to their behavior in the formation of causatives and desideratives. But, as argued above, the formation of desideratives as described by (Gerdts, 1991) is an uncontroversial case of split intransitivity, whereas the variable behavior of intransitive verbs in causativization cannot be viewed as an alignment split.

A thorough examination of ‘unaccusativity mismatches’ has resulted in that a growing proportion of studies devoted to phenomena considered as possible manifestations of unaccusativity have started expressing doubts about the possibility to explain this rather heterogeneous set of variable properties of intransitive verbs within the frame of the Unaccusative Hypothesis as it was initially formulated. In particular, recent generative studies of unaccusativity tend to focus rather on the representation of *unaccusative syntax* (i.e., on the configurations likely to account for constructions in which the S argument of intransitive verbs shows properties typical of objects), without necessarily postulating that unaccusative syntax should be reserved to a subclass of ‘unaccusative’ intransitive verbs. For example, recent studies of the impersonal construction of French intransitive verbs have concluded that this construction has ‘unaccusative syntax’, but does not involve a division of intransitive verbs into two classes—see in particular (Cummins, 2000). Some aspects of this question will be developed in the following section.

## 5 Fluid intransitivity and presentational focus

### 5.1 *Semantic vs. pragmatic fluid intransitivity*

The difference between fluid-S systems and split-S systems is that, in fluid-S systems, the choice of S alignment cannot be described as involving a division of intransitive verbs into two subclasses. Until recently, the only type of fluid intransitivity discussed in the typological literature was a type in which the choice of S alignment depends on the semantic feature of control (Dixon, 1994, 78–83). What distinguishes such fluid-S systems from the commonest type of split-S systems is that the semantic nature of the verb does not entirely determine the choice of S alignment: in fluid systems, the S argument of the same intransitive verb may align either with A or with P, depending on the degree to which the referent of the S NP controls the activity in the particular event referred to. Acehnese, a western Austronesian language from Sumatra, is one of the best-known and most cited cases of control-driven fluid intransitivity (Durie, 1985).

On the basis of Dogon and Tundra Yukaghir data, Maslova (2006) proposes the recognition of *focus-oriented split intransitivity*. Tundra Yukaghir has a marker *lej* with the following distribution: in transitive predication, regardless of information structure, it attaches to P and is incompatible with A—ex. (10a–b), whereas in intransitive predication, it attaches to S if and only if S is focalized—ex. (10c–d).

(10) *Tundra Yukaghir* (Maslova, 2006)

- a. *met ten'i n'awn'iklie-lej tojore-meŋ*  
1SG here polar\_fox-LEJ chase-PFV.1/2SG  
'I have been chasing A POLAR FOX here.'
- b. *nime-le aq pajp wie-nun*  
dwelling-LEJ only woman.SG make-HAB(AFOC)  
'Only WOMEN install dwellings.'
- c. ... *qahime-lej kelu-l*  
raven-LEJ came-SFOC  
'... A RAVEN came.'
- d. *qad'ir apanala: me-kelu-j*  
DISC old\_woman AFF-come-STOP  
'The old woman CAME.'

The term used by Maslova is somewhat misleading, since the phenomenon in question does not involve a division of intransitive verbs into two subclasses, and therefore constitutes a type of *fluid* intransitivity which differs from the type traditionally recognized in the typological literature by the pragmatic nature of its conditioning.

In the following sections, I show that, in a typological perspective, the notion of pragmatically driven fluid intransitivity also accounts for some phenomena widely discussed in the literature on unaccusativity, but so far neglected by typologists.

### 5.2 French as a 'fluid-S' language

French intransitive verbs have an impersonal construction of a type which is found in Northern Italian dialects (Saccon, 1993), but has no exact equivalent in most other Romance languages. In this construction, illustrated by ex. (11), the S argument appears

in postverbal position (i.e., in the canonical P position), does not govern verb agreement, and more generally shows no evidence of having any of the properties that, in the transitive construction, distinguish A from P.

(11) *French*

- a. *Une femme viendra*  
 INDEF.SGF woman.SG come.FUT.3SG  
 ‘A woman will come.’
- b. *Il viendra une femme*  
 A3SGM come.FUT.3SG INDEF.SGF woman.SG  
 lit. ‘It will come a woman’, same denotative meaning as (a), but with a different perspective (something like ‘There will be a woman coming’).

As illustrated by ex. (12) to (14), in this construction, the postverbal NP representing the subject argument of an intransitive verb patterns with P with respect to a range of properties that are not shared by A: *en*-cliticization—ex. (12), combinability with restrictive *que*—ex. (13), possibility to take the determiner *de* in negative environments—ex. (14), etc.

(12) *French*

- a. *Le garçon a mangé trois pommes*  
 DEF.SGM boy.SG AUX.PRS.3SG eat.PTCP three apple.PL  
 ‘The boy ate three apples.’  
 → *Le garçon en a mangé trois*  
 ‘The boy ate three of them.’
- b. *Trois garçons ont vu ce film*  
 three boy-PL AUX.PRS.3PL see.PTCP DEM.SGM movie.SG  
 ‘Three boys have seen this movie.’  
 → \**Trois en ont vu ce film*  
 intended: ‘Three of them have seen this film’ (OK: *Trois ont vu ce film*, or *Il y en a trois qui ont vu ce film*)
- c. *Trois garçons sont entrés*  
 three boy-PL AUX.PRS.3PL enter.PTCP.PLM  
 ‘Three boys entered.’  
 → \**Trois en sont entrés*  
 intended: ‘Three of them entered’ (OK: *Trois sont entrés*, or *Il y en a trois qui sont entrés*)
- d. *Il est entré trois garçons*  
 A3SGM AUX.PRS.3SG enter.PTCP.SGM three boy.PL  
 ‘Three boys entered.’  
 → *Il en est entré trois*  
 ‘Three of them entered.’

(13) *French*

- a. *Jean n’a invité que Marie*  
 Jean NEG-AUX.PRS.3SG invite.PTCP RESTR Marie  
 ‘Jean invited only Mary.’

- b. \* *Que Jean n'a invité Marie*  
 RESTR Jean NEG-AUX.PRS.3SG invite.PTCP Marie  
 intended: 'Only Jean invited Mary.' (OK: Il n'y a que Jean qui a invité Marie)
- c. \* *Que Jean n'est venu*  
 RESTR Jean NEG-AUX.PRS.3SG come.PTCP.SGM  
 intended: 'Only Jean came.' (OK: Il n'y a que Jean qui est venu)
- d. *Il n'est venu que Jean*  
 A3SGM NEG-AUX.PRS.3SG come.PTCP RESTR Jean  
 'Only Jean came.'
- (14) *French*
- a. *Jean n'a pas mangé de pommes*  
 Jean NEG-AUX.PRS.3SG NEG eat.PTCP DE apple.PL
- b. \* *De garçons n'ont pas vu ce film*  
 DE boy.PL NEG-AUX.PRS.3PL NEG see.PTCP DEM.SGM movie.SG  
 intended: 'No boy saw this movie' (OK: Il n'y a pas de garçon qui ait vu ce film)
- c. \* *De garçons ne sont pas entrés*  
 DE boy.PL NEG AUX.PRS.3PL NEG come\_in.PTCP.PLM  
 intended: 'No boy came in.' (OK: Il n'y a pas de garçon qui soit entré)
- d. *Il n'est pas entré de garçons*  
 A3SGM NEG-AUX.PRS.3SG NEG come\_in.PTCP DE boy.PL  
 'No boy came in.'

The only evidence against identifying the postverbal NP as fulfilling the syntactic role of object is that it cannot be represented by an object clitic pronoun. But this impossibility can be viewed as a mere consequence of the 'thetic' (or 'existential', 'presentational') meaning of the construction. This pragmatic function, repeatedly underscored in the literature (whatever the terms used to characterize it) is sufficient to explain the impossibility to cliticize the postverbal NP, since weak pronouns cannot be used to introduce new referents. There is to my knowledge no convincing evidence against the analysis according to which the postverbal NP fulfills the same *syntactic* role as the postverbal patient NP in the prototypical transitive construction, but the *discourse* value of the construction blocks the manifestation of objectal properties implying a topical status of the object.

The theory according to which the postverbal NP in the French impersonal construction of intransitive verbs fulfills the *syntactic* role of object, in spite of being assigned the same *semantic* role as the subject of the same verb in a canonical predicative construction, is not new in French syntax: it was already advocated by Brunot (1926)<sup>12</sup> and it has been re-discovered recently by formal syntacticians. For example, Cummins

<sup>12</sup>Although he explicitly analyzed the postverbal NP in the impersonal construction of French intransitive verbs as an object, Brunot proposed to designate it by the non-committal term *séquence impersonnelle* ('impersonal sequence'), in order to avoid controversy. This term was subsequently adopted by many French grammarians. Its descriptive adequacy is unquestionable; however, it suggests that the impersonal construction involves a grammatical relation that cannot be assimilated to any of the grammatical relations recognized in other constructions, which is certainly not what Brunot had in mind when he introduced it.

(2000) concludes her analysis of this construction by stating that French has “two basic types of intransitive clauses: subject-verb and verb-object”. Although she does not state it explicitly, this implies recognizing the impersonal construction of French intransitive verbs as an instance of ergative alignment.

In addition to that, contrary to an opinion popularized by early studies within the frame of the Unaccusative Hypothesis, the impersonal construction is not restricted to a limited subset of ‘unaccusative’ intransitive verbs. As shown a.o. by (Cummins, 2000) on the basis of the corpus provided by (Hériaux, 1980), the list of the 50 most frequent verbs in this construction also includes several typically ‘unergative’ verbs, and no semantic subclass of intransitive verbs can be considered as absolutely excluded from this construction. The fact that some intransitive verbs (including ‘unergative’ ones) occur with a particular frequency can be satisfactorily explained by the mere fact that their lexical meaning is “highly compatible with the ‘presentational’ value of the I[mpersonal] C[onstruction], expressing appearance or existence at location” (Cummins, 2000, 239), and with intransitive verbs of other semantic classes, whose compatibility with the impersonal construction may at first sight seem questionable, the presence of a locative complement improves the acceptability of the impersonal construction.

If one accepts this analysis of the impersonal construction of French intransitive verbs with a postverbal NP representing the S argument, from a typological point of view, the only possible conclusion is that French is a *fluid-S* language, but with a pragmatic conditioning of fluid intransitivity similar to that described by Maslova for Tundra Yukaghir. In the French type of fluid intransitivity, ergative alignment is not triggered by the semantic feature [–control], but rather has the pragmatic function of expressing a ‘presentational’ (or ‘thetic’, ‘existential’) organization of predication.

The functional motivation of the French type of fluid intransitivity can be analyzed as follows: in the transitive construction, A is typically more topical than P, and new referents are typically introduced in P position; consequently, in a language in which accusative alignment predominates, it is natural to de-topicalize S by means of a construction in which S is aligned with P. According to Lambrecht,

“S[entence] F[ocus] marking involves cancellation of those prosodic and/or morphosyntactic subject properties which are associated with the role of subjects as topic expressions in P[redicate] F[ocus] sentences ... One natural way of achieving non-topic construal (though not the only logically possible one) is to endow the subject constituent with grammatical properties which are conventionally associated with FOCUS arguments. Since in a P[redicate] F[ocus] construction the unmarked focus argument is the OBJECT, topic construal can be cancelled by coding the subject with grammatical features normally found on the object of a P[redicate] F[ocus] sentence.”

(Lambrecht, 2000, 624–625)

### 5.3 The impersonal construction of Tswana intransitive verbs

The transitive construction of Tswana has a rigid AVPX constituent order. A and P are equally unmarked, but transitive verbs obligatorily agree with A, whereas the use of

pronominal affixes representing P is conditioned by topicality. Tswana intransitive verbs have an accusatively aligned construction in which S precedes the verb and governs verb agreement in the same way as A. In this construction, S is obligatorily interpreted as topical, but intransitive verbs also have an impersonal construction very similar to that of French, whose function is to de-topicalize S. In the impersonal construction, the intransitive verb does not show any overt mark of a valency change, the NP representing the S argument occurs immediately after the verb, i.e. in the canonical position of objects, and is not cross-referenced on the verb, which invariably shows a dummy subject marker of class 15/17 —ex. (15).

(15) *Tswana* (author's field notes)

- a. *Ba-simane ba-tlaa-bin-a*  
 2-boy A3:2-FUT-dance-FIN  
 'The boys will dance.'
- b. *Go-tlaa-bin-a ba-simane*  
 A3:15/17-FUT-dance-FIN 2-boy  
 'There will be a dance performed by (the) boys.' (lit. 'There will dance boys')

This construction is much more frequent in Tswana than in French, due to constraints on the topicality of NPs in subject role particularly strict in Tswana. For example, in Tswana, negative or interrogative pronouns cannot occur in A/S<sub>A</sub> role. With transitive verbs, passivization is the strategy commonly used to avoid A NPs that would not meet the topicality requirements imposed by the system of Tswana, and with intransitive verbs, the impersonal construction provides a possible strategy to encode S arguments that do not meet the conditions to occur in a construction in which S is aligned with A.

(16) *Tswana* (author's field notes)

- a. *Go-tlaa-bin-a bo-mang?*  
 A3:15/17-FUT-dance-FIN 2-who  
 'Which persons will dance?' (lit. 'There will dance which persons?')
- b. \* *Bo-mang ba-tlaa-bin-a?*

It is interesting to note in this connection that in Tswana, 'Thank you' is usually expressed as *Ke-a-lebog-a*, lit. 'I am THANKING', a polite reply being *Go-lebog-a nna* (lit. 'There thanks ME'), with the same verb in the impersonal construction, and the first person singular pronoun *нна* in postverbal position. Similarly, Tswana speakers use the impersonal construction to identify themselves at the beginning of a phone call. For example, a man named Kitso usually begins a phone call by the sentence *Go-bu-a Kitso*, lit. 'There speaks KITSO'. In this context, the accusatively aligned construction *Kitso o-a-bu-a* 'Kitso is SPEAKING' would be inappropriate.<sup>13</sup>

<sup>13</sup>For a similar analysis of an analogous construction in another Southern Bantu language, see (Du Plessis and Visser, 1992, 130-133). On the basis of misinterpreted second-hand data, (Van Valin Jr., 1999, 516) analyzes the same construction in Southern Sotho as a construction similar to those found in Spanish and Italian, where focalized S NPs occur in postverbal position without losing all of their A-like properties (see section 5.4). In fact, the impersonal construction of Sotho intransitive verbs has exactly the same characteristics as those of French or Tswana.

## 5.4 Russian genitive of negation

According to Pesetsky (1982), in Russian, as illustrated by ex. (17), objects of transitive verbs, but not subjects, can appear in the genitive case when the clause contains negation, and this property is shared by the subjects of a subclass of intransitive verbs.

(17) *Russian* (Pesetsky, 1982)

- a. *Mal'čiki ne polučili nikakix pisem*  
 boy.PL NEG receive.PST.PL any.PL.GEN letter.PL.GEN  
 'The boys didn't receive any letters.'
- b. \**Nikakix mal'čikov ne polučilo pis'ma*  
 any.PL.GEN boy.PL.GEN NEG receive.PST.SGN letter.PL  
 intended: 'No boys received letters.'
- c. *Ne prišlo ni odnogo mal'čika*  
 NEG come.PST.SGN not\_even one.SG.GEN boy.SG.GEN  
 'Not a single boy came.'
- d. \**Ne tancevalo ni odnogo mal'čika*  
 NEG dance.PST.SGN not\_even one.SG.GEN boy.SG.GEN  
 intended: 'Not a single boy danced.'

However, Babby 2001 observes that 'unergative' intransitives are not disallowed from occurring in this construction, provided a locative preposition phrase precedes the verb, as in ex. (18).

(18) *Russian* (Babby, 2001)

- a. *Meždu brevnami ne skryvalos' tarakanov*  
 between beam.PL.INSTR NEG hide.PST.SGN cockroach.PL.GEN  
 'There were no cockroaches hiding among the beams.'
- b. *Tam bol'se ne igraet nikakix detej*  
 there more NEG play.PRS.A3SG any.PL.GEN child.PL.GEN  
 'There are no longer any children playing there.'

Therefore, the genitive of negation of Russian does not involve split intransitivity, and must be viewed as another case of pragmatically driven fluid intransitivity.

## 6 Partial fluid intransitivity

### 6.1 Subject inversion and 'unaccusative inversion' in French

In addition to the impersonal construction analyzed above, French has several constructions in which an NP representing the S argument of an intransitive verb occurs in postverbal position. These constructions are not clearly distinguished by traditional grammar, but have been analyzed in detail by Bonami, Godard and Marandin (see Marandin, 2001; Bonami et al., 1999; Bonami and Marandin, 2001). In two of them (inversion in extraction contexts and heavy subject NP inversion), A arguments of transitive verbs may occur in postverbal position too, and are equally concerned by the loss

of some properties typical for canonical S/A NPs. The constructions in question cannot be analyzed in terms of alignment variation, and do not necessitate a revision of the characterization of inverted NPs as subjects. But in the construction termed ‘unaccusative inversion’ in Marandin’s terminology, illustrated by ex. (19), the possibility to occur in postverbal construction is limited to the S argument of intransitive verbs.

(19) *French* (Marandin, 2001)

- a. *Je voudrais que vienne Marie*  
 A1SG want.COND.1SG that come.SBJV.3SG Marie  
 ‘I would like for Marie to come.’
- b. [Le silence se fit.]  
*Alors sont entrés deux hommes*  
 then AUX.PRS.3SG enter.PTCP.PLM two man.PL  
 ‘[Silence fell.] Then entered two men.’
- c. *Pierre ne savait pas que suivaient d’autres personnes*  
 Pierre NEG know.IMPF.3SG NEG that follow.IMPF.3PL INDEF-other.PL  
 person.PL  
 ‘Pierre did not know that other persons were following.’

In this construction, unlike inverted subjects in extraction contexts, indefinite postverbal S NPs trigger *en*-pronominalization in the same way as P NPs in the transitive construction. But in other respects they are aligned with A: as shown in detail by (Marandin, 2001), unlike postverbal S NPs in the impersonal construction, S NPs in the ‘unaccusative inversion’ can control adjuncts like canonical S/A NPs, and agree with the verb in number. Therefore, they do not lend themselves to a straightforward characterization as syntactic subjects (as in inversion in extraction contexts) or objects (as in the impersonal construction), and are best analyzed as a special type of complement (Bonami and Marandin, 2001, 123). In other words, this construction is an instance of *partial* fluid intransitivity.

## 6.2 Partial fluid intransitivity in other languages

Presentational constructions of intransitive verbs functionally similar to the impersonal construction of French intransitive verbs have been described in many other European languages, but formally, these constructions are rather comparable to French ‘unaccusative inversion’, in the sense that the S argument occurring in postverbal position is aligned with P with respect to some other properties, but remains aligned with A as regards the control of verb agreement. Languages in which such constructions are found can still be characterized as having pragmatically driven fluid-S systems, but their fluidity involves an alternation between accusative and *mixed* alignment (and not between accusative and *ergative* alignment, as in the case of the impersonal construction of French intransitive verbs).

In languages in which the basic constituent order of the transitive construction is AVP, it has often been observed that intransitive S NPs in postverbal position may show alignment with P with respect to some other properties, without however losing the



control of verb agreement. A crucial characteristic of the constructions in question is that the possibility to show ergative alignment in some behavioral properties is limited to postverbal S arguments, i.e. to S arguments overtly aligned with P with respect to constituent order, and disappears when the S argument of the same intransitive verbs occupies the canonical A/S position to the left of the verb.

In the literature on unaccusativity, partial alignment with P limited to postverbal S NPs in languages having SV~VS alternations has been characterized as *surface unaccusativity*, in order to distinguish it from *deep unaccusativity* manifested irrespective of the position of the argument (Levin and Rappaport Hovav, 1995, 17–21). The tendency in recent works is clearly to question the status of such alignment variations as unaccusativity diagnostics, and to emphasize the relation with presentational focus (see a.o. Lambrecht, 2000; Alexiadou, 2007).

Here again, using the notions of alignment typology, the crucial point is that ‘surface unaccusativity’ is an instance of *fluid* intransitivity rather than *split* intransitivity, since it involves the possibility for (at least a subclass of) intransitive verbs to have two constructions differing in the alignment properties of S. The difference with the constructions of French or Tswana examined in section 5 is that, in the cases considered in this section, the alignment variation affects some characteristics of S only, and in particular does not affect its status as the controller of verb agreement.

This applies in particular to Italian *ne*-cliticization. According to (Burzio, 1986), in Italian, *ne* can represent the head of an NP in P role, or of an NP encoding the S argument of a subclass of intransitive verbs, but cannot represent, either the head of an NP in A role, or of an NP encoding the S argument of another subclass of intransitive verbs. Crucially, *ne* can represent the head of postverbal S NPs only—ex. (20).

(20) *Italian* (Burzio, 1986)

- a. *Molti esperti arriveranno*  
many.PLM expert.PL arrive.FUT.3PL  
‘Many experts will arrive.’
- b. *Arriveranno molti esperti*  
arrive.FUT.3PL many.PLM expert.PL  
‘Many experts will arrive.’
- c. *Ne arriveranno molti*  
of\_them arrive.FUT.3PL many.PLM  
‘Many of them will arrive.’
- d. \* *Molti ne arriveranno*  
many.PLM of\_them arrive.FUT.3PL

Several studies have shown that the division of Italian intransitive verbs into two classes according to this criterion is questionable (Lonzi, 1986), and have pointed to a relation with sentence focus (Bentley, 2004).

Another unaccusativity diagnostic proposed for a number of languages (see a.o. (Torrego, 1989) for Spanish, (Alexiadou, 1996) for Greek) is that, in languages in which bare nouns can occur in P role but not in A role, bare nouns in S role are possible with a subclass of intransitive verbs only—ex. (21). But here again, this possibility is limited to postverbal S NPs, and the division of intransitive verbs into two classes according to this criterion is not so clear-cut as it may seem at first sight. ‘Unergative’ predicates

may become acceptable when a locative adverbial phrase is added, which suggests a parallel with locative inversion and points to a pragmatic conditioning in terms of presentational focus (Ortega-Santos, 2005; Alexiadou, 2007).

(21) *Spanish* (Ortega-Santos, 2005)

- a. *Llegaron libros*  
arrive.PFV.3PL book.PL  
'Some books arrived.'
- b. ?? *Corren chicos*  
run.PRS.3PL boy.PL  
'Boys run.'
- c. *Aquí corren chicos*  
here run.PRS.3PL boy.PL  
'Boys run here.'

English Locative Inversion and there-insertion are other cases in point—see a.o. (Levin and Rappaport Hovav, 1995, 215–277). The same analysis also applies to the contrast found in the Mayan language Ch'orti' between fixed alignment with respect to indexation and fluid alignment in constituent order (Quizar, 1994).

The SV~VS alternation of Mandarin Chinese (Li and Thompson, 1981, 501–519) basically illustrates the same phenomenon, with however the particularity that Chinese simply cannot have mismatches between constituent order and other coding characteristics of core syntactic terms, due to the total absence of case marking and argument indexation.

## 7 Conclusion

In this paper, I have tried to show that,

- (a) not all variable properties of intransitive constructions can be described in terms of alignment variations, and in particular, several phenomena currently mentioned as 'unaccusativity diagnostics' are not so straightforwardly related to split intransitivity as could be expected from the definition of unaccusativity as it is currently formulated;
- (b) overt split intransitivity is a more widespread phenomenon than assumed by most typologists, and should in particular be recognized in a number of predominantly accusative languages in which current practice tends to occult the existence of a minor class of intransitive verbs whose coding properties show ergative alignment;
- (c) although current hypotheses about the semantic correlates of split intransitivity seem to be basically correct, the possibility of semantically arbitrary intransitivity splits should not be totally discarded;
- (d) the distinction between split intransitivity proper and fluid intransitivity is crucial in the evaluation of the precise status of variations in the alignment properties of intransitive verbs;

- (e) a thorough analysis of the impersonal constructions of French and Tswana intransitive verbs confirms the existence of a type of alignment variation not recognized in classical works on alignment typology, namely pragmatically driven fluid intransitivity;
- (f) as illustrated by French, several constructions involving pragmatically driven fluid intransitivity but differing in the extent to which S shows A-like vs. P-like properties may coexist in the same language.

## Abbreviations

|                                                                                                                                                                                |                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| In the Tswana examples, numbers at the beginning of nominal forms, or after '3:', indicate noun classes (3:1 = 3rd person class 1, etc.). Otherwise, numbers indicate persons. | HAB: habitual                                                                       |
| 1D/2Q: (Akhvakh) 1st person in declarative clauses, 2nd person in questions                                                                                                    | IMPERS: impersonal                                                                  |
| A: pronominal clitic or affix referring to the agent of prototypical action verbs                                                                                              | IMPF: imperfective                                                                  |
| ABS: absolutive                                                                                                                                                                | INDEF: indefinite                                                                   |
| ACC: accusative                                                                                                                                                                | INF: infinitive                                                                     |
| AFF: affirmative                                                                                                                                                               | INSTR: instrumental                                                                 |
| AFOC: A-focus                                                                                                                                                                  | INTROV: introversive                                                                |
| AUX: auxiliary                                                                                                                                                                 | M: masculine                                                                        |
| COND: conditional                                                                                                                                                              | N: neuter                                                                           |
| D: pronominal clitic or affix referring to a participant represented by a dative NP                                                                                            | NEG: negation                                                                       |
| DEF: definite                                                                                                                                                                  | OBL: (Kurmanji) oblique case                                                        |
| DEM: demonstrative                                                                                                                                                             | P: pronominal clitic or affix referring to the patient of prototypical action verbs |
| DISC: discourse particle                                                                                                                                                       | PASS: passive                                                                       |
| ERG: ergative                                                                                                                                                                  | PFV: perfective                                                                     |
| F: feminine                                                                                                                                                                    | PL: plural                                                                          |
| FIN: (Tswana) inflectional ending of verbs that does not carry a meaning by itself, but contributes to the identification of tense                                             | PRS: present                                                                        |
| FUT: future                                                                                                                                                                    | PST: past                                                                           |
| GEN: genitive                                                                                                                                                                  | PTCP: participle                                                                    |
|                                                                                                                                                                                | RESTR: restrictive                                                                  |
|                                                                                                                                                                                | S : pronominal clitic or affix referring to the single argument of monovalent verbs |
|                                                                                                                                                                                | SBJV: subjunctive                                                                   |
|                                                                                                                                                                                | SG: singular                                                                        |
|                                                                                                                                                                                | SFOC: S-focus                                                                       |
|                                                                                                                                                                                | STOP: S-topic                                                                       |

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# “I love me some him”: The landscape of non-argument datives

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## 1 The quarry

A familiar syntactic feature of dialectal (Southern and Appalachian) U.S. English is the optional occurrence of a nonsubcategorized “personal dative” pronominal in transitive clauses which obligatorily coindexes the subject but whose semantic contribution is ill-understood. As we shall see, this personal dative (PD) bears suggestive if not always straightforward relations to constructions in such languages as French, German, Walbiri, Hebrew, and Old English involving what have been variously termed “ethical”, “free”, “non-lexical”, or “affected” datives. Some of these datives are coreferential with the subject (e.g. *Je me prends un petit café*, lit. “I take me a little coffee”) while others are non-coreferential (e.g. *Ils lui ont tué son oiseau*, lit. “They killed him his bird”); they typically invite benefactive and malefactive (adversative) understandings respectively.

We begin, however, with the English personal dative, as described in the literature (cf. e.g. Green 1974: 190ff., Christian 1991, Sroda & Mishoe 1995, Webelhuth & Dannenberg 2006) and displayed in a range of traditional country and mountain ballads and their modern descendants [**boldface** used here to indicate coreference, not contrast/focus]:

- (1) Well, I’m a rake and a ramblin’ boy  
There’s many a city I did enjoy;  
And now I’ve married **me** a pretty little wife  
And I love her dearer than I love my life.

(“Rake and Rambling Boy”, trad.)

- (2) a. I’m gonna buy **me** a shotgun, just as long as I am tall

(Jimmie Rodgers, “T for Texas”)

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\*Parts of this paper, in particular relating to the discussion in §2, were presented on earlier occasions (see e.g. Horn 2002). I am grateful to participants in the American Dialect Society list, including Ellen Johnson, Donald Lance, Dennis Preston, and especially Michael Montgomery, for getting me started on personal datives back in the previous century, to audiences in New Haven, Urbana, Reading, San Francisco, Evanston, Rutgers, Leysin, and Oslo for helpful suggestions, and especially to commentators at the CSSP presentation for useful pointers and caveats. Thanks are specifically due to Barbara Abbott, Kent Bach, Elitzur Bar-Asher, John Beavers, Olivier Bonami, Patricia Cabredo Hofherr, Stacey Conroy, Bridget Copley, Clare Dannenberg, Bart Geurts, Owen Greenhall, Daniel Gutzmann, Polly Jacobson, Julie Legate, Chao Li, Didier Maillat, Haben Michael, Jean-Daniel Mohier, Kelly Nedwick, Ken Safir, William Salmon, Gregory Ward, Gert Webelhuth, and Jenny Yang. The usual disclaimers apply.

- b. I'm gonna grab/catch **me** a freight train. (various songs)
- c. When I was a young girl, I had **me** a cowboy  
(John Prine, "Angel From Montgomery")
- d. I had **me** a man in summertime/He had summer-colored skin  
(Joni Mitchell, "Urge for Going")
- e. Now the Union Central's pulling out and the orchids are in bloom,  
I've only got **me** one shirt left and it smells of stale perfume.  
(Bob Dylan, "Up to Me")

The ordinary pronominals here contrast minimally with the expected reflexive in e.g. *"I'm gonna sit right down and write myself a letter."* (The PD counterpart *I'm gonna write me a letter* would also be possible in the relevant dialect, provided that *me* is not a Goal argument.) While first person singular "bound" pronominals predominate, second and third person cases are also possible in the backwoods:

- (3)  $\emptyset_i$  Get **you**<sub>i</sub> a copper kettle,  $\emptyset_i$  get **you**<sub>i</sub> a copper coil,  
Cover with new-made corn mash and never more you'll toil.  
You just lay there by the junipers, when the moon is bright,  
Watch them jugs a-fillin' in the pale moonlight.  
(*"Copper Kettle"*, traditional ballad)
- (4) Born on a mountain top in Tennessee  
The greenest state in the land of the free  
Raised in the woods so's he knew every tree  
[ **pro**<sub>i</sub> ] Kilt **him**<sub>i</sub> a b'ar when he was only three.  
(*"Ballad of Davy Crockett"*; cf. M. Lewis 2002)

Note the co-occurrence of the PDs in (3) and (4) with other well-known instances of Appalachian English features (cf. Wolfram & Schilling-Estes 1998)— the determiner in *them jugs*, the verb forms *lay* and *kilt*, the noun *b'ar* [= *bear*], contracted *so-[a]s*, *a*-prefixation and "g-dropping" in *a-fillin'*.

Moving from song lyrics to prose, we see that PD cites, while still restricted to (informal) register, range freely over person, number, and geography:

- (5) a. "I'm going to have to hire **me** a detective just to follow you around." (1988 Sara Paretsky novel, *Blood Shot*, p. 191, set in Chicago)
- b. "I wish I could afford **me** a swimming pool and a Buick and all. I was at Diamond Head thirty-eight years, no counting the war, but I sure never got **me** a retirement deal like that." (1992 Sara Paretsky novel, *Guardian Angel*, p. 312, set in Chicago)
- c. "It's too bad we don't have any of those hellebores", I say. "**We** could drop them in the Meer and poison **us** some fish." (Ayelet Waldman (2006), *Love and Other Impossible Pursuits*, p. 224, set in New York)
- d. "If you attend church just to go through the motions, God'd rather **you** get **you** a bottle of bourbon and a whore and go to a hotel and have **you** a good time." (Uncle Al in Garrison Keillor's *Lake Wobegon Summer 1956* (2001), p. 274, set in Minnesota)

- e. I keep logs of illegal huntin' here on the wildlife preserve. Poachers, hunters – **they** come by at night, tryin' to pinch '**em** some deer meat. (Ranger to detectives on "Cold Case", CBS, 28/11/04, set in Philadelphia)

The literature on PDs provides a somewhat sketchy picture of the construction and its motivations. Here is an early passage from Green (1974: 190-91):

[T]he for-dative verbs...may occur with non-reflexive, co-referential indirect object pronouns, but only in certain colloquial, rural, or substandard [!] types of speech, and for no apparent reason, only if the indirect object is internal.

Green's examples include *I baked **me** a cake*, *Bill earned **him** \$1000*, *We ought to kill **us** a male chauvinist*. She opines that "for some reason, second-person pronouns sound very strange in this construction". (But cf. the evidence in Christian (1991) and data collected by Michael Montgomery that second-person PDs are more frequent than third-person occurrences, although first-person cases are strongly favored.)

Thirty years later, in their magisterial *CGEL*, Huddleston & Pullum (2004: 1488) provide an equally incomplete account. Describing local binding domains, they note:

In some dialects, mainly US, an accusative is found in informal style as a variant of the reflexive. This usage occurs predominantly with a 1<sup>st</sup> person pronoun: %*I bought me a new car*, %*Let's get us a hamburger* ...The meaning, however, is not always quite the same. While *I caught myself some fish* implies that the fish were specifically for me, %*I caught me some fish* does not. There is also a non-standard use of *me* where the standard dialect would not have an indirect object at all: <sup>!</sup>*I seen me a mermaid once*; <sup>!</sup>*I want me a house by the beach*.

Note that both Green and the *CGEL* take it for granted that PDs are in fact indirect objects; we shall claim that they are not arguments at all, but non-subcategorized pronouns, whence the co-occurrence with verbs like *need* and *see*, as well as the meaning difference signaled above, or for that matter the possible co-occurrence of a PD with a true indirect object benefactive: *I caught me some fish for my kids*, along the lines of Christian's *He was looking to buy him a house for his family*.

More recently, Webelhuth & Dannenberg (2006) [=W&D] offer a Construction Grammar-based account of the "Southern Double Object construction" (a misleading label if the second "object" is not an object). Their crucial tenet is that the PD "is idiomatically constrained to being a subject-bound personal pronoun and hence exempt from Principle B of the binding theory". But while this "exemption" is indeed at the heart of the issue, it's not clear how invoking idiomacity per se really helps. After all, inherent reflexives and resultative fake reflexives may be described as lexical or constructional idioms and yet observe standard binding theory restrictions on locality:

- (6) a. **She** behaved **herself**/\***her**.  
b. **I** drank **myself**/\***me** into a stupor.  
c. **The dog** barked **itself**/\***it** awake.

Other restrictions cited by W&D as evidence of the idiosyncratic nature of PDs—their failure to topicalize, passivize, or alternate with a full lexical NP—carry over to nonargument datives (of both coreferential and “ethical” varieties) in Romance, German, and other languages, which makes a *sui generis* Constructional account less appealing.

As for the exemption from Principle B, we need to distinguish the behavior of the personal dative from that of a construction bearing some superficial resemblances to it, the Contrastive Focus Pronominal; as we shall see below, the latter are more plausible candidates for true exceptional status.

Additional relevant data for any treatment of PDs is provided below:

- (7) a. **He** bought **him/himself** a new pick-up.  
 b. **He** needs **him** /\***himself** just a little more sense.  
 c. What I like is goats. **I** jus’ like to look at **me** some goats.  
 [in title of Sroda & Mishoe 1995; but perhaps *look-at* reanalyzed as simple verb?]  
 d. **We** want **us** a black German police dog cause I had one once.
- (8) a. **She** fed **\*her/herself** some chitlins.  
 b. **She** gave **\*her/herself** a big raise. (vs. **She** got **her** a big raise.)
- (9) a. **He’s** gonna buy **him/\*himself** a pick-up for his son.  
 b. **He’s** gonna buy (**\*him**) his son a pick-up.  
 c. **I** need **me** a little more time for myself.
- (10) a. **She** bought **herself/?her** and Kim some ice cream.  
 b. **Kim** would love **her/him/\*Kim** some flowers.  
 c. **I** want **me/\*yours truly** some grits.

The behavioral characteristics of PDs are summarized in (11):

- (11) A catalogue of PD properties
- a. PD constructions always co-occur with a quantified (patient/theme) direct object.<sup>1</sup>
  - b. PDs can’t be separated from the verb that precedes and case-marks them.
  - c. PDs are most frequent/natural with monosyllabic “down-home” type verbs (e.g. *buy, get, build, shoot, get, catch, write, hire, cook*).
  - d. Lack any external (PP) pronominal counterpart (cf. Green 1974: 191 on **Bill** played **him** a lullaby vs. **\*Bill** played a lullaby for **him**).
  - e. PDs can occur in positions where a true indirect object is ruled out (10a) and can co-occur with (rather than substituting for) overt dative/indirect object (10a,c).
  - f. PDs are WEAK PRONOUNS (Cardinaletti & Starke 1996, 1999; Bresnan 2001); they can’t be stressed or conjoined (but for many speakers (10a) isn’t that bad).

<sup>1</sup>I ignore here the related intransitive construction illustrated in *I lay me down to sleep, Ø Sit you down, or Ø Hie thee hence*; cf. Fodor (1992; 1994: 435-36) for some discussion.

- g. PDs have no full NP counterpart (10b,c). [But see below for a pseudo-candidate]
- h. There's no consistent thematic role for PD nominals, although they sometimes resemble non-subcategorized benefactives; they can be suppressed *salva veritate*. They get Case but no  $\theta$ -role and do not represent true datives/ recipients/ goals.
- i. Most PD speakers have no absolute restriction against 3<sup>rd</sup> person pronominals but some exhibit a residual person-based asymmetry: 1<sup>st</sup> > 2<sup>nd</sup> > 3<sup>rd</sup>
- j. PD pronominals are not objects of their verbs; they are **non-arguments** coreferring with the subject.

## 2 The PD vs. the CFP: non-arguments, misbehaving arguments, and binding

Given their status as non-arguments, PDs will not be subject to the co-argument version of Condition B (Pollard & Sag 1992, Reinhart & Reuland 1993). The presence of pronominals rather than anaphors in the PD construction stems from the non-argument (and hence non-**co**-argument) status of the "object" pronoun, which motivates the availability of third person pronominals. This yields a theoretically significant distributional distinction (unmentioned in W&D and other work) between PDs and the less dialectally restricted "bound pronouns" – and bound R-expressions – that appear in contrastive focus contexts and present a well-known challenge to Principles B and C of the binding theory. Whereas PDs range over all object pronominals, regardless of person, contrastive focus cases involve true arguments that, while locally bound, must be referentially independent (Evans 1980) and are hence restricted to 1<sup>st</sup> and 2<sup>nd</sup> person pronominals and proper names. The contrast can be realized as a subject (antecedent) focus, as in the cases of (12); **boldface** again marks coreference and *italics* mark focus.

- (12)
- a. He nods but I'm not sure he believes me. I'm not sure **I** believe **me**.  
(Sandra Scoppetone mystery novel *I'll Be Leaving You Always*, 1993, p. 82)
  - b. It was like an out-of-body experience. Nobody wanted to look at me. Hell, **I** wouldn't look at **me** either.  
(ex-Oakland A's pitcher Dennis Eckersley, on aftermath of giving up celebrated game-winning World Series home run to the gimpy Kirk Gibson, 15 Oct. 1988)
  - c. "New York didn't destroy me. **I** destroyed **me**. I take full responsibility."  
(Darryl Strawberry, quoted in *NYT Magazine* p. 58, 15 Apr. 2001)
  - d. "Let me toast you." She toasted me. You'll notice she didn't offer me a drink so that **I** could toast **me**. (Ed Gorman (2001), *Save the Last Dance for Me*, p. 135)
  - e. "Teams are going to be waiting. People expect us to win; **we** expect **us** to win." (Jason Sehorn of the division-winning Giants, quoted in *NYT* 10 Sep. 1998, C7)
  - f. "You told me, that's the important thing. Besides, **you** don't fancy **you** like I do." (from *Neurotica*, Sue Margolis novel, 1999, p. 272)

In the cases in (13), the object (target) is the site of contrastive focus and is stressed. Again, 1<sup>st</sup> and 2<sup>nd</sup> (but not 3<sup>rd</sup>) person pronouns are possible, as are names.

- (13) a. I believed in you. I always believed in you. **I** just didn't believe in **me**. (Blane to Andie, last line of *Pretty in Pink*, 1986 movie)
- b. "You're looking at me like I'm some kind of monster." I shook my head. "I'm not looking at you. **I'm** looking at **me**." (from 1994 Stephen Greenleaf mystery novel, *False Conception*, p. 268)
- c. **You** can't afford to pay **you**. How are you gonna pay me? (from *The Practice*, ABC television drama)
- d. TAKE GOOD CARE OF YOURSELF. **YOU** BELONG TO **YOU**. (ad for Philadelphia Blue Cross, cited in Ward 1983)

The last of the 2<sup>nd</sup> person object focus cases above involves covert focus; the advertisement works only if the intended audience is familiar with the 1929 verse:

Button up your overcoat,  
When the wind is free,  
Take good care of yourself,  
You belong to me.

Similarly, the narrator Dan Roman ( $\delta$ ) in his reassurance in (14) plays off an implicitly evoked open sentence of the form [x will/should worry about  $\delta$ ]

- (14) "Just go on home. **I'll** worry about **me**." (from 1989 Edward Mathis mystery novel, *The Burned Woman*)

As noted, the phenomenon of contrastive focus bound pronominals extends to contrastive focus bound names, in which case it's Principle C rather than Principle B that is under attack. The first three of the examples in (15) are from Ward (1983).

- (15) a. JR: Cliff is in the hospital because of you.  
Sue Ellen: No, **Cliff** is in the hospital because of **Cliff**. (from *Dallas* episode)
- b. "Maybe she [= Amanda] loves the boy too much."  
"**Amanda** loves **Amanda**." (from 1985 Martha Grimes novel, *The Deer Leap*)
- c. "**Baxter** looks out for **Baxter**" [referring to a local politician]  
(*Philadelphia Inquirer* editorial headline, 30 Oct. 1982)
- d. Jeff doesn't run for glory. **He** runs for **Jeff**. (Advil commercial)

The properties of the two constructions can be distinguished in a tabular fashion:

| Personal datives                                                                   | Contrastive focus pronominals                                                              |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <i>I want me an iPod.</i><br><i>He<sub>i</sub> bought him<sub>i</sub> an iPod.</i> | <i>I'm not buying YOU an iPod—</i><br><i>I'm buying ME an iPod.</i>                        |
| dative non-arguments following verb immediately following verb                     | may be direct/ indirect objects or objects of prepositions                                 |
| no person restriction but must be pronominal (except as noted below)               | must be referentially independent<br>1st or 2nd person or proper name<br>no 3rd p. pronoun |
| weak pronouns or clitics;<br>can't be stressed or [?] conjoined                    | strong pronouns;<br>may be stressed or conjoined                                           |
| exclude contrast                                                                   | require contrast (subject or object)                                                       |
| not subcategorized for; don't satisfy arg. structure requirements of verb          | subcategorized for (optionally or obligatorily) by the verb                                |
| must be followed by overt theme /DO that requires [or prefers?] a determiner       | can occur in simple transitive or ditransitive frames, no determiner restriction           |
| do not affect truth-conditional content but are semantically relevant              | contributes to truth-conditional content equivalently to corresponding anaphor             |

In (12)-(15), Principles B and C are apparently overridden, allowing the local pronominal when, as Ward (1983) formulates the condition, the normal-stressed of the two coreferential NPs is in the "given" part of a discourse-salient open proposition while the other, stressed NP is the new (focal) value for the variable in that open proposition. Elsewhere, a similar informational contrast obtains between participant and observer readings of the two nominals, as in (16a) (Lakoff 1972: 639) and (17):

- (16) a. I dreamed I was Brigitte Bardot and **I** kissed **me**.  
 b. ≠ I dreamed I was Brigitte Bardot and **I** kissed **myself**.
- (17) If I Were a Man, I'd Marry **Me**. (title of 1999 novel by P. S. Wall)

The two pronominals in such cases have been described as representing different guises of the referent; cf. Castañeda (1966), Heim (1998), Safir (2001). Crucially, however, this possibility is precluded for third person cases. Someone reporting Lakoff's dream or Wall's book title is forced to switch to an anaphor, lest non-coreference result:

- (16') So Lakoff tells me he had this dream where he was Brigitte Bardot and **he** kissed **#him/#her/?himself**.
- (17') P. S. Wall vows that if she were a man, she'd marry **#her/#him/?herself**.

What we have in the 3rd person cases is not just different guises but different guys. One final example is provided by the politician's and athlete's dissociative 3rd person (Horn 2002):<sup>2</sup>

- (18) a. [Bob Dole, responding to Ted Koppel's query about whether he intended to stress the character issue against Bill Clinton in the upcoming campaign]  
 "I don't think so," Dole said. "My view is that **I**'m going to talk about **Bob Dole**, and I've been doing a little of that." (ABC *Nightline* show, March 1996)

<sup>2</sup>This is an instance of the practice of ILLEISM; see Zwicky (2007) for extensive discussion.

- b. “I’m just going to do the things **Derek Harper** has done for 10 years, and hopefully that will be enough.” (*N. Y. Times* interview, 8 Jan. 1994, p. 32)
- c. “I just want to go to a place where **Howard Johnson** is going to put up some big numbers.” (Nov. 1993 radio interview after Johnson signed with a new team)

An athlete or politician may establish distance between himself (virtually never herself) and his public persona, but only by the use of his name, never a 3<sup>rd</sup> person pronoun. When asked to diagnose his poor play, basketball star Larry Johnson insisted, “People know what L.J. can do. **I** know what **L.J.** can do” (*N. Y. Times*, 22 Nov. 1996). What L.J. could not have replied—barring amnesia or multiple personality disorder—was “I know what he can do.”

### 3 I love me some snowclones: the Braxton effect

Returning to our original quarry, the personal dative, we will seek to determine the nature of the semantic contribution of the non-argument pronominal to the clause in which it occurs, given that it does not alter truth conditions. We will approach this question after re-examining the characteristics of predicates that license PDs, looking at the sociolinguistic correlates of the construction, and briefly surveying a range of correlated constructions in other languages. First, it is worth noting a relatively recent addition to the set of licensors. In the decade since Toni Braxton’s pop song “*I Love Me Some Him*” (lyrics by SoulShock & Karlin, Andrea Martin, and Gloria Stewart) with the chorus

I love **me** some him  
I’ll never love this way again  
I love **me** some you  
Another man will never do

reached the top of the charts in 1997, the title has generated a snowclone<sup>3</sup> of the form *I (Just) Love Me Some X*. Note that X here is not semantically quantified (the singer does not adore just an unspecified subpart of her beloved) but is a name, pronoun, generic, etc. that must occur with an indefinite to satisfy the constraints on the PD. Thus T.O.’s T-shirt declaration below essentially reduces to the observation “I love myself”.

- (19) The “*I love me some*” snowclone
- a. **I LOVE ME SOME ME** — slogan popularized by American football player Terrell Owens (“T.O.”)
  - b. **I just love me** some Jude Law. — posting on salon.com
  - c. **My husband** used to **love him** some Jack Daniels. — Halle Berry’s character to Billy Bob Thornton’s, in the movie *Monster’s Ball*
  - d. **I just love me** some cats! Don’t you just LOVE cats?! ...Grace keeps to herself these days. And her crime of the month is to pee in my big house plant.

<sup>3</sup>See the wiki-entry at <http://en.wikipedia.org/wiki/Snowclone> for much more on snowclones.



"**I love me** some plants. The green sets off my beauty. And the soil is just right for a little wee."

<http://www.hayllar.com/dec00/51200.html>

- e. **I love me** a big man, I purely do. (from an on-line story; note generic indefinite)
- f. **I love me** some fat bitches! More cushion for the pushin'. (The rapper Redman, in 2001 movie *How High*, gratia Kelly Nedwick)
- g. Let's make sure we've got this clear, right from the start: **I love me** some Crocodile Hunter. (Referring to the TV show and now the movie.) (Opener of story in e-column, 7/22/02, reported by Mark Mandel on ads-l)

## 4 PD as sociolinguistic shibboleth: pronouns and politics

A key turning point in the run-up to the 2004 U.S. presidential election was a campaign stop John Kerry made in Ohio in which— as the Washington Times would put it in their editorial on 23 October 2004, "When Johnny went a-huntin'" — he staged an ill-fated event to demonstrate his empathy with rural gun owners:

Mr. Kerry's Ohio hunting adventure started last Saturday, when the senator, campaign entourage in tow, went into a grocery store and asked the owner: "Can I get me a hunting license here?" Even the phraseology sounded staged. Mr. Kerry ordinarily doesn't talk this way, and his language sounded fake and patronizing— as if he was pretending to talk like someone from rural Ohio.

Kerry was then savaged in numerous gleeful right-wing blogs and columns for his inauthentic modeling of "uneducated redneckese", "hick" or "ignorant" speech, or even "dumbed-down grammar". Commentators wondered rhetorically, "Is poor grammar something that amounts to reaching out to them-there dumb, gun-loving right-wing rednecks?" While he was widely portrayed as having asked "Can I get me a huntin' license here?", the actual recording of Kerry's query (although web-filed as "Can I Get Me A Huntin License Here.mp3") clearly confirms that he used the velar nasal<sup>4</sup>. Whatever the facts of the matter, two weeks later Kerry barely lost Ohio to George W. Bush.

How can we reconcile the vitriolic reaction to Kerry's personal dative with the claim (Christian 1991: 14; W&D: 31, 34) that the use of PDs is "not stigmatized" among Southern vernacular speakers? It appears that the PD is indeed accepted non-judgmentally within the in-group of users while serving as shibboleth to impugn outsiders who employ it as prejudiced and/or lame. In this respect it parallels the evaluation of reclaimed slurs like *nigger*, *hebe*, *queer*, *fag*, *dyke*, or *bitch*.

As a parallel instance of negative evaluation of outsiders for venturing a personal dative, consider the case of the Midwestern singer-songwriter Dan Fogelberg (1951-2007), who was especially celebrated for his 1980 classic narrative "Same Old Lang Syne", a song that 25 years later prompted this screed from blogger Kate Marie at <http://whatstherumpus.blogspot.com/2005/12/more-stupid-holiday-songs.html>:

<sup>4</sup>C.f. <http://liveshot.cc/Audio/Can%20I%20Get%20Me%20A%20Huntin%20License%20Here.mp3>

Here are the lines that always bothered me:

*She said she'd married her an architect,  
Who kept her warm and safe and dry,  
She would have liked to say she loved the man,  
But she didn't like to lie.*

First of all, I understand why Fogelberg wants to throw in that extra syllable in the first line, but couldn't he have found a more elegant way of doing it? Did she really say "*I married me an architect?*" Or is Fogelberg, who seems capable of standard usage, the kind of guy who would say, "*Dag nabbit, she up 'n' married her an architect.*"

Presumably it was this very "dagnabbit" effect that helped John Kerry up 'n' lose the Ohio vote, and with it the 2004 election.

## 5 Constraints on PD, revisited

Standard accounts of personal datives claim that they must co-occur with quantified indefinite themes or direct objects (cf. e.g. W&D, fn. 7). But there is some evidence that definite objects are not always excluded, as various google hits attest:

- (20)
- a. I want me the cash.
  - b. I want me the notional MacBook nano
  - c. I want me the biggest, gaudiest, most heinously pink mostrosity of a cake there is
  - d. I want me the Blythe Black BOOTS!!! and the red ones too
  - e. i want me the 6 with tha trix and a TV in the roof [from a Lil' Bow Wow song "You Know Me"]
  - f. I want me the new CrackBerry and those super comfy looking Nike shoes.
  - g. I want's me the Transformerss Battlin Robots set
  - h. I want me that job/baby/album/giant easter basket filled with toys/Bulls hat/ gravity chair/purty cowboy over there/lovely white coat she wore in that scene [in "The Devil Wears Prada"]
  - i. I need me this coffee mug/keyboard/book/sign/here album

Some of these examples involve type definites, where *that X = an X of that type*, but many do not. Even more strikingly, PDs may be followed by bare NP objects (contra W&D and earlier accounts), as when chocoholic speakers confess their addiction:

- (21)
- a. Yar, I love me chocolate syrup!
  - b. I Love's me chocolate, I Loves it!
  - c. Mmmm, I love me chocolate cake.
  - d. I love me chocolate and I love me milk.

Arguably, however, such extensions of the basic construction involve dialect mixing, as in the tendency for *y'all* to be used as a true singular when it spreads into non-Southern U.S. dialect areas.

The exclusion of non-pronominal PDs (see (10b/c) above) faces a challenge of its own in the form of metonymic *X's ass*. But as Beavers & Koontz-Garboden (2006) point out, this expression, whether or not coindexed with the subject, exhibits the distribution of pronouns (anaphors or pronominals, as the case may be), rather than that of R-expressions. Thus the occurrence of attested PDs with personal *ass*-based datives should come as no shock:

- (22) a. **GOD LOVES HIS ASS SOME KIDNEYS.** (= 'God loves kidneys')  
 b. I have a 152 tested IQ and **I love my ass** some red meat.  
 c. Movies, **i love my ass** some funny movies.  
 d. I should take this time to state how much **I LOVE my ass** some Magma!

In fact, though, the real puzzle is why are there so few examples of this kind? In fact, there are well over 1.5 million google hits for *I love my ass* (...), but virtually all with literal rather than metonymic reference. Along the same lines, we find exactly one hit each for *I need/want my ass*...—

- (23) a. **i need my ass** some ginkgo biloba  
 b. **I want my ass** some quesadillas

— and none at all for 3rd person examples of the form *S/he loves, wants, needs, got her/his ass some X*.

This (near) gap can be attributed to the evaluative tension between the PD, which (as we shall see in more detail below) implies a benefit to the subject, and the typically adversative or pejorative nature of *X's ass*. This may be too gross a characterization of *one's ass*, however. Consider, for example, the ambiguity of the amply attested phrase *get one's ass some help*. On its literal, referential reading (= 'consult a proctologist') *X's ass* retains its ordinary final major constituent stress. On its metonymic reading (= 'consult a therapist'), *X's ass* is an anaphor and consequently destressed. Examples from the internet:

- (24) a. Stop reading and get your ass some help. See a podiatrist if you have to.  
 b. Not a man alive (or dead, for that matter) would put up with your whiney ass. Hmm, that explains a lot. Maybe you should get your ass some help instead?  
 c. Get your ass some therapy or meds or both. What is wrong with your ass?

*Your ass* here marks not simply a pejorative attitude, but rather the speaker's impatience toward the addressee/subject. But if the addressee gets the help the speaker recommends, a positive affect is achieved, whence the appropriateness of the PD.

As further support for the role played by positive affect, compare the minimal pairs in (25) and (26), in which the personal dative is awkward or unacceptable for most speakers in the absence of intention.

- (25) a. **He** shot **him** two squirrels.  
 b. **#He** (got drunk and) shot **him** two coonhounds (by mistake).

- (26) a. **She** caught **her** a catfish.  
 b. **#She** caught **her** a cold/case of the clap.

Predictably, the versions in (26b) are fine in the unlikely event that the cold or case of the clap was contracted intentionally. Affect-linked asymmetries in the licensing of PDs are reflected in the data in (27), collecting entries googled on 1 April 2007.

- (27) a. **I love me some X**: 636,000 vs. **I hate me some X**: 516 (*Dr. Phil, Yankees, exams, emo*)  
 [**I just love me some X** (see §3 above) : 867 vs. **I just hate me some X**: 0]  
 b. **She loves her some X**: 630 (*grapefruit, sparkly dance boys, Ozzy, chocolate, jesus, Halloween*) vs. **She hates her some**: 5 (*J. Lo, Mao, Patriots*)  
 c. **I want me some X**: 34,900 (*fonts, Krispy Kremes, candy, monitors,...*)  
 d. **I saw me some X**: 488,000 (relating to entertainment, fun, goal attained, etc.)  
 e. **I found me some X**: 346,000 (*inspiration, happiness, friends*) vs. **I lost me some**: 8370 (many of the form **I lost me some weight**)

The examples with apparent negative affect are often more positive than it may initially appear; many of the *I lost me some X* examples occur in the frame *I lost me some weight*, where the loss the result of intentional action. When *see* licenses PDs, it typically alludes to the result of a conscious effort of looking; along the same lines, consider the 2007 Toby Keith song lyric “*I’m gonna get my drink on/I’m gonna hear me a sad song*” (gratia Will Salmon), in which the sad song is not encountered accidentally but deliberately sought out. In other cases, a PD with negative affect is facilitated by local syntagmatic priming, often in a contrastive context. Thus a blog evaluating the movie *Serendipity*, which featured John Cusack as protagonist and fate and destiny as plot elements, includes the verdict in (28):

- (28) **I love me** some John Cusack. **I hate me** some Fate and Destiny.

Another factor favoring the appearance of PDs is the spontaneous, occasion-specific nature of the utterance, typically signifying the satisfaction of a current intention, need, or desire. In (29)—the response of Miss South Carolina (the geographically challenged contestant in the 2007 Miss Universe pageant) to the query “What’s the first thing you’ll do when you get home?”—the PD expressing the speaker’s current dining plans disappears in the reportive follow-up.

- (29) [I’m gonna] eat **me** some hamburgers. I haven’t eaten hamburgers in three years.

While many PDs (with *get*, *buy*, etc.) directly involve possession, others—in particular with *need* or *want*—look forward to a future possession marking the completion or satisfaction of a current modal or propositional attitude, as in (30), from Michael Montgomery’s extensive database.

- (30) **He** needs **him** just a little more sense.

Both *need* and *want* are typically analyzed as embedding possession—to need/want is to need/want to have<sup>5</sup>—and *have* is a canonical PD predicate.

<sup>5</sup>Evidence for this analysis includes the distribution of time adverbials modifying the interval of possession: *I need/want your printer until tomorrow afternoon (for a week,...)*.

Other attested examples are more recalcitrant, extending the construction to contexts in which the "personal" dative is impersonal (although still benefactive in a sense) or affective but not obviously benefactive, even in an extended sense:

- (31) a. **That house** needs **it** a new roof. (Sroda & Mishoe 1995)  
 b. **He** rode **him** around with a head in his trunk for a week. (Montgomery)

## 6 PDs and conventional implicature

Narrowing down the contexts in which PDs appear (or appear naturally; it's hard to determine any absolute exclusions, especially as the construction spreads beyond its original home turf) helps determine the meaning they contribute. But what is the status of that meaning? If PDs are not subcategorized by the verb, and *a fortiori* not (indirect) objects (the "Southern Double Object" label of W&D notwithstanding), what are they? If personal datives do not constitute arguments of the predicate, what is their semantic contribution, if any, to the sentences in which they appear?

The view I shall defend here is that PDs contribute a CONVENTIONAL IMPLICATURE (Grice [1967] 1989), or more strictly a neo-Fregean implicature as described in Horn (2007), of subject affect. By definition, such an implicature does not alter the truth conditions of the relevant sentence but does impose an appropriateness constraint on its felicitous assertion, in this case that the speaker assumes that the action expressed has or would have a positive effect on the subject, typically satisfying the subject's perceived intention or goals.

With Barker (2003) and Williamson (2003, to appear)— and contra Bach (1999) and Potts (2005)— I take the standard Frege-Gricean treatment of conventional implicature, as exemplified by *but*, *even*, honorifics, pejoratives, and a range of other phenomena, to be eminently sustainable. Strictly speaking, we are dealing here with a semantic, not pragmatic, phenomenon:

The conventional implicature possessed by a sentence S is not part of its force, but is a part of S's semantic content— rule-based content capable of falling within the scope of logical operators. Nevertheless, S's implicature makes no contribution to S's truth-conditions. (Barker 2003: 3)

As opposed to non-restrictive relatives and related constructions that constitute secondary assertions (Horn 2007: 51-52), conventional implicatures are thus part of encoded but not truth-conditional content. They can be embedded (as implicatures, not as "said" content) and can affect judgments of assertability and validity. (Cf. Kaplan 2004 for an independent elaboration of the notion of "validity-plus.")

One property that PDs share with (other) conventional implicatures is what Potts (2007) calls INEFFABILITY: the content of conventional implicatures is notoriously elusive, *insaisissable*. Consider inter alia:

- (32) a. the implicature of effort or difficulty associated with *manage*  
 b. the source of the positive or negative assessment in the implicatures associated respectively with *deprive* and *spare* (Wilson 1975)  
 c. the nature of the contrast implicated by *but* (Bach 1999, Vallée 2008)

- d. the characterization of the scalar conventional implicature associated with *even* (relative or absolute? unlikelihood or noteworthiness?)
- e. the nature of the expressive attitude embodied in racial and ethnic slurs and other epithets (Williamson 2003, to appear; Potts 2007)
- f. the precise notion of uniqueness or individuability constituting (according to Horn 2007) the conventional implicature of definite descriptions
- g. the appropriateness implicatures for *tu* vs. *vous* or other **T** vs. **V** 2<sup>nd</sup> person sg. pronouns within a given context in a particular sociolinguistic community of practice (**T** can be affectionate, presumptuous, comradely, or condescending; **V** can be polite, aloof, diplomatic, or hostile; cf. Brown & Gilman 1960, Mühlhäusler & Harré 1990, Greenhall 2007)

Thus the fact that it is difficult to pin down precisely what it is that PDs contribute to the semantics of the sentences in which they occur, as eloquently demonstrated by the literature on the construction, is an indirect argument for situating that meaning—however it is to be represented— as a conventional implicature. It is plausible that the edges of truth-conditional meaning should be discrete, while inconsistency in the mental representation of non-truth-conditionally relevant content is less pernicious. If you know generally that my use of *vous* rather than *tu* signals something in the range of formal respect, distancing, and/or lack of intimacy, my precise motives can be left underdetermined, but if you don't know whether I'm using a 2<sup>nd</sup> person or 3<sup>rd</sup> person pronoun, the indeterminacy would be more serious. Similarly, you will want to know whether I bought the car for myself or for my son, and hence to whom an indirect object pronoun refers, but whether or not you can figure out precisely why "*I bought me a car for my son*" rather than simply buying it for my son, no difference in argument structure or truth conditions will emerge.

Another feature of the PD that speaks to its conventional implicature status is its resistance to negation. We saw in (27) above that PDs generally prefer emotively positive contexts that reflect the fulfillment of the subject's intentions or goals. More generally, we noted the contrast between *love* (whether or not resulting from the snowclone) and *hate*. Now, as it happens, there are over 23,000 raw google hits for "*I don't love me some X*", but these tend overwhelmingly to involve either syntagmatic priming (recall (28)) or the canceling effect of double negation:

- (33)
- a. Okay, I don't love me some Adam Sandler, the way I love me some Cadbury Eggs and the way I love me some latex kitchen gloves. But his new movie, Punch-Drunk Love...
  - b. I love me some M. Night, but I don't love me some Village. This is a huge misstep for the once burgeoning director. The Village is a lame ass duck. ...
  - c. Which is not to say I don't love me some Wham!
  - d. I don't presume to be Chris Sims, but damned if I don't love me some Christmas - the trees, the presents, the music, and the tv specials. ...
  - e. At what point do fanatics say to themselves, 'Okay, I know killing is supposed to be all wrong and shit, but dammit if I don't love me some God!?' ...
  - f. Run DMC or something (not that I don't love me some Run DMC, cuz I do

- g. But that doesn't mean I don't love me some cinnamon twists to dip into my non-organic coffee, or to eat in bed, or the car, or, you know, wherever. ...
- h. Just because I'm not watching Elf repeatedly does not mean I don't love me some Christmas.

Indeed, the vast majority of negated *love me some* cites are of the form "(It's) *not/It isn't that I don't love me some X*", or "*Don't think that I don't love me some Y*", or "*I can't say I don't love me some Z*".

When we move to other PD predicates, the results are similar. Some empirical contrasts, courtesy once again of Google, with samples of the outliers:

|      |                            |                |
|------|----------------------------|----------------|
| (34) | "I have me some":          | 1,460,000      |
|      | "I have me a":             | 782            |
|      | "I don't have me a":       | 14             |
|      | "I don't have me any":     | 1 <sup>a</sup> |
|      | "I lack me a/any":         | 0              |
|      | "I want me some (X)":      | 27,300         |
|      | "I don't want me any (X)": | 1 <sup>b</sup> |
|      | "I like me some":          | 28,900         |
|      | "I like me a":             | 924            |
|      | "I don't like me a":       | 5 <sup>c</sup> |
|      | "I don't like me any":     | 1 <sup>d</sup> |
|      | "I dislike me some/any/a": | 3 <sup>e</sup> |

<sup>a</sup>*I wants me some medicine but I don't have me any cash.*

<sup>b</sup>*I don't want me any of those sissy pants girly men that believe you can get good, or better, information out of people with tactics other than threats*

<sup>c</sup>3 in scope of double negation, e.g. *I'm not going to lie and tell you that I don't like me a slice of cake once in a while*

<sup>d</sup>*I don't like me any wasps*

<sup>e</sup>*I dislike me some FGM as well as the next gal. I must be honest, as much as I dislike me some Parasite Hilton, Wow, I dislike me some Nascar, but it actually sounds fun to watch in Japaneese!*

As is well known, some standard examples of conventional implicature are largely impermeable to negation, and cancelability is one of Grice's earmarks of the relation. If you tell me *She's poor but happy* and I am willing to agree that she possesses both properties but reject your conveyed expectation that poverty and honest generally contrast, it's not clear how I can convey this, especially with a simple negative (*#She's not poor but happy*). Classic examples of conventional implicature cancellation involve more arcane devices:

- (35) a. Whaddaya mean EVEN George can do it? (D. Lewis 1979: 339)
- b. "Her name is Caroline. She's an Italian girl but she's pretty."  
          "What do you mean, *but* she's pretty, Ma?...Why not '*and* she's pretty?'"  
          (Stephen McCauley (1987), *The Object of My Affection*, p. 209)

Some conventional implicata can be attacked with metalinguistic or echoic negation, while others (e.g. the assumptions conveyed by the use of epithets or T/V pronouns) consistently scope out of negation. Once again, the behavior of the PD con-

struction as effectively positive polarity items resisting the scope of negation is consistent with their treatment in terms of Fregean/Gricean conventional implicature, a non-truth-conditional contribution to content.

## 7 Around the world with non-argument datives

One problem with the Construction Grammar perspective on PDs advocated in W&D is that this rules out drawing any systematic relationship between the non-standard English construction and analogous (if distinct) non-subcategorized datives in other languages. This landscape includes specimens that have been variously termed the ethic(al) dative, the free (or nonvalence) dative, the nonlexical dative, the dative of interest, and the *dativus (in)commodi*; the languages concerned include French and its Romance cousins (Leclère 1975, Barnes 1980, 1985, Authier & Reed 1992, Herschensohn 1992), German (Abraham 1973, Wegener 1989, Maling 2001, Cook 2006, Hole 2006, Gutzmann 2007), Old and Middle English (Sweet 1900, Keenan 2003), Hebrew—both Ancient (Gesenius 1910, Muraoka 1978) and Modern (Berman 1982, Borer & Grodzinsky 1986), and Walpiri (Simpson 1991, Legate 2001). Overviews ranging across many languages and language families are offered by Lamiroy & Delbecque (1998) and Hole (2006). While space prevents a full travelogue, some relevant high points of the journey will be touched on briefly here.

We begin with French, in which a coreferential construction bearing apparent connections with the PD occurs in informal or colloquial usage, typically (but not exclusively) with 1<sup>st</sup> person subjects and common monosyllabic verb forms:

- (36) a. Je me bois un bon café chaud.  
'I drink (me) a good hot coffee.'
- b. J'ouvre le frigo, je me bois un verre de vin rouge, je me détend dans mon canapé...  
'I open the fridge, I drink (me) a glass of red wine, I relax on my couch...'
- c. Je me lis tantôt la Bible et le Coran, du Porno et du mystère.  
'I read (me) sometimes the Bible and the Koran, porno and mysteries.'
- d. Je me fais un voyage. [6210 hits; virtually none for non-1<sup>st</sup> person voyagers]  
'I make (me) a trip.'
- e. Manger pour elle devient secondaire ou alors elle se prend un repas devant le pc  
'Eating becomes secondary to her or else she has (her) a meal in front of her p.c.'

Note that when a 3<sup>rd</sup> person example is attested, as in (36e), the reflexive clitic is mandatory; \**Elle<sub>i</sub> lui<sub>i</sub> prend un repas...* is impossible.<sup>6</sup>

<sup>6</sup>The appearance of non-argument reflexive clitics in such cases can be taken as evidence for different OT-style rankings of the relevant soft constraints, where the preference for reflexive marking of locally coreferential nominals clashes with the preference for restricting non-logophoric reflexives to coarguments. (See Burzio 1991 and Levinson 1991 for two very different treatments of anaphora in terms of soft constraints.) We cannot pursue this issue here, but it is worth noting that English PDs may themselves exceptionally take the form of reflexives rather than pronominals, as in the 2008 Mariah Carey song lyric "The whole entire world can tell/That you love yourself some me" [gratia Ben Zimmer].



In Ancient Hebrew, the "Lamedh" *le*-marked dative in Biblical Hebrew occurs in collocations glossed as 'Get thee away', 'Turn thee aside', or 'Our bones are dried up, our hope is lost, we are cut off' (Ez. 37:11, lit. 'we are cut us off the parts'): Gesenius 1910: §119, Muraoka 1978. In fact, as Elitzur Bar-Asher informs me (p.c.), translators are typically advised to leave the Lamedh dative untranslated, but Gesenius (1910: 381) describes it as a *dativus commodi* or *incommodi*, i.e. dative of benefit/harm,

used— especially in the colloquial language and in later style— in the form of a pronoun with [*le*-] as an apparently pleonastic *dativus ethicus*, with many verbs, in order to give emphasis to the significance of the occurrence in question for a particular subject. In this construction the person of the pronoun must always agree with that of the verbal form.

The construction described by Gesenius is an intransitive cousin of the PD; note the reference to its "apparently pleonastic" character. We find something similar closer to home. Sweet (1900: §1106) describes the "pleonastic dative" of Old English in analogous terms (**boldface** added again here and below for coreference and underlining to highlight passages of particular relevance):

In OE a personal pronoun in the dative is often added reflexively to a pronoun in the nominative but without materially affecting the meaning, as in *hē ondrēd **him** þone mann* 'he was afraid of the man', literally 'feared for himself', *hīe gewiton **him*** 'they departed'.

Over a century later, Keenan (2003: §1.2) updates the terminology but independently provides a similar, if more detailed, account of the same range of data:

[F]rom Late OE through ME we also find many non-theta (pleonastic) occurrences of pronouns. They do not satisfy either a semantic role requirement or a syntactic requirement of the verb. In OE they are usually dative, sometimes accusative, never genitive or nominative. They are always bound to the local subject, agreeing with it in person, number and gender and serve semantically to heighten the involvement of its referent: e.g. the subject acted intentionally or was involved in the action in some way other than the role it has in virtue of being the subject argument. At times they suggest a telic interpretation.

Keenan's examples include the sentences in (37), from sources written in c. 880 and 1052 respectively.

- (37) a. forðæm **hi** **him** ondrædað ða frecenese ðe hi ne gesioð  
 because they them fear the danger that they not see
- b. ac **he** ne wandode na **him** metes to tylienne... & nam **him** on  
 but he not hesitated at all him provisions to provide... and took him in  
 orfe & on mannum & .... gewende **him** þa east werd to his feder  
 cattle and in men and ... went him then eastward to his father  
 & gewendon heom þa begen east weard ...  
 and went them then both eastward ...

Like those in ancient Hebrew, the Old/Middle English “pleonastic” datives indexed a heightened subject-involvement but occurred in transitive as well as intransitive clauses. Intransitives allowed a similar extended use of the reflexive, notes Bourciez (1930: §118c), in late Latin “*dans l’usage populaire, pour indiquer d’une façon plus intensive la part que le sujet prend à l’action; beaucoup de verbes se sont ainsi construits, notamment des verbes de mouvement.*”

Traveling to yet another continent, we find pronominal non-argument datives in Warlpiri as described by Simpson (1991: 382):

- (38) a. ka-**nyanu** kuyu **nyanungu-ku** pi-nyi. Liwirringki-rli-ji.  
 PRES-REFL meat it-DAT hit-NONPAST Lizard sp.-ERG-EUPH  
 ‘...it kills itself animals, that Lizard.’
- b. Palkarni-**rlipa-nyanu** yalumpuju **ngalipa-ku**-jala  
 scarce-1PL.SUBJ-REFL that.near we.PL.INCL.-DAT-CLEAR  
 marda-rni.  
 hold-NONPAST  
 ‘We’ll keep these scarce things just for ourselves.’

Commenting on the same construction, Legate (2001) notes its similarity to English *I’m gonna bake me a cake*, i.e. the PD.

In addition to the non-argument dative pronominals (and reflexives) surveyed above, we might also touch on the range of “ethical” datives. These too index the involvement of a participant (albeit a non-subject participant) not subcategorized by the predicate. Typically (although not always), these datives serve to mark adversative or maleficiary rather than beneficiary affect, as in *Foutez-moi le camp*, “go away”. One language with a robust “free dative” or “ethic(al) dative” is German. Discussing the examples in (39),

- (39) a. Helf **mir** mal deinem Vater in der Küche.  
 help me-DAT a-minute your-SG father in the kitchen  
 ‘Go help your father in the kitchen for a minute for me.’
- b. Der David hat **mir** der Claudia schon zuviel Geschenke  
 the David has me-DAT the Claudia-DAT already too-many gifts-ACC  
 gegeben.  
 given  
 ‘I think [lit., ‘To me’] David has already given Claudia too many presents.’

Maling (2001: 432) comments:

This extra dative...is interpreted as a beneficiary or person adversely affected by the event...I assume that this dative is not subcategorized for by the verb. As an adjunct rather than an argument, it is not a grammatical object, and thence not a counterexample to the descriptive generalization that German allows at most one dative object per clause.

Although not co-indexing the subject in the manner of PDs, these datives on Maling’s account (1986, 2001) are non-subcategorized, adjuncts rather than arguments, and non-objects, and her invocation of adverse affect is the negative counterpart of

our characterization of the semantic contribution of PDs. Indeed, Gutzmann (2007) has recently analyzed the *dativus ethicus* in (39a) or "*Schreib mir schön deine Hausarbeit!*" (lit. 'Write me nicely your homework') as a conventional implicature expressing "that the speaker has some personal interest in the hearer's execution of the action requested".

Similar "affected dative" constructions are found in Hebrew and Romance (including French and Spanish), with either non-coreference or coreference, but in the latter case generally requiring a reflexive pronoun (in the third person, where the distinction is marked) as we saw in (36e); in particular, Leclère (1976), Barnes (1980, 1992), and Herschensohn (1992) offer useful studies on a range of phenomena involving non-lexical, non-subcategorized datives in French. In French, German, Serbian/Croatian, Modern Hebrew, and other languages, the non-coreferential cases are often taken to extend to possessive datives. Thus we obtain paradigms of cases like (40) (culled from above sources; glosses mine); note that lexical dative NPs are ruled out in these environments, as seen in (40d).

- (40) a. Paul **se** tape un pastis.  
'Paul knocks (him) down an anisette.' ["Reflexive dative", marking the subject's interest in the process]
- b. Au mont St. Michel, la mer te monte à une de ces vitesses!  
'At Mont St. Michel, the sea rises (on you) at an incredible speed.' ["Ethical dative", marking affected non-core participant]
- c. Il **te** lui a donné une de ces gifles.  
He gives her a slap (on you).'
- d. Jean **lui** a attrapé deux rhumes. (\*Jean a attrapé deux rhumes à sa mère.)  
'Jean caught her/\*his mother two colds.'
- e. Les mains **lui** tremblent.  
'His hands are shaking.' ["Possessive dative"]

Lamiroy & Delbecque (1998: 63) gather this family of constructions together under the same umbrella:

[T]he possessive and the ethical dative are different manifestations of one and the same basic phenomenon, viz. that of introducing entities into the sentence structure which, from a syntactic point of view, are not lexically predicted by the verb and which semantically correspond to entities that are not actively involved in the process but nonetheless affected by it, in one way or another.

All of the datives in the structures of (40) are animate and "affected" by the action of the clause without being related to the valency of verb. But (following Barker & Dowty 1992), possessives are arguments— viz., nominal arguments of the possessee— while ethical datives are full non-arguments, whence some of the differences cited in the literature, e.g. the fact that passives are fine with lexical datives in French, somewhat unnatural with possessive datives, and totally out with "ethical" datives (Lamiroy & Delbecque 1998: 64 [100a-c]; glosses theirs):

- (41) a. Ce livre lui a été donné par son grand-père.  
 ‘This book was given to him by his grandfather.’
- b. ??La figure lui a été cassée par la police.  
 ‘His face was broken [i.e. he was stabbed] by the police.’
- c. \*Une de ces gifles te lui a été donnée.  
 ‘He got one of those smacks (to your detriment).’

## 8 Concluding remarks

Our whirlwind tour of some of the world’s memorable non-argument dative cites has barely scratched the surface of the complex range of phenomena involved, but they do indicate that the personal dative of non-standard varieties of American English is not an isolated “idiom” but is in fact one representative of a widely class of non-argument affectees.<sup>7</sup> Such affectees are typically marked as datives in languages with a more sophisticated panoply of case options than modern English retains, whence the partial misnomer of “personal dative” for what is not formally a dative at all. In English, which lacks a weak clitic reflexive like Dutch *zich* or French *se* (cf. Reuland 2001), the non-argument status of the locally co-indexed element suffices to allow, or for most speakers in the relevant dialect require, its representation as an ordinary pronominal, in apparent (but, I argue, not real) violation of Principle B.<sup>8</sup> Semantically, the PD contributes a conventional implicature of typically benefactive subject affect, relating to the satisfaction of the actual or perceived intention, goal, or preference of the subject. As noted, the appearance of pronominals rather than anaphors to mark this relation reflects the non-argument and hence non-co-argument status of the so-called object pronoun. Unlike the contrastive focus pronominals (§2 above) which are co-arguments and thus constitute true motivated exceptions to (or overrides of) Principles B and C, no binding effects or strong person asymmetry obtains with PDs because there’s no argument to be bound.

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<sup>7</sup>Mention should be made of related constructions in which non-subject affectees appear as obliques (as in the English adversative *My dog died on me*) or as subjects (as in the adversative passives found in many languages); cf. Hole (2006) for a comprehensive study of “extra arguments”.

<sup>8</sup>Conroy (2007) offers an alternative analysis on which PDs despite their pronominal form, are indeed anaphors, bound variables assigned case but no theta role, akin to SE anaphors on the theory of Reuland (2001).

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# Two Kinds of Event Plurals: Evidence from Romanian Nominalizations

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## 1 Introduction

Beginning with the generalization in Grimshaw (1990), it has been known that Complex Event Nominals (CENs) disallow plural marking, a property which Grimshaw relates to the presence of the argument structure inherited from the verb. Thus, in (1) below Grimshaw opposes the CEN preserving the theme argument *of the problems* to the Result Nominal (RN) which has no arguments and can be pluralized:

- (1) a. The assignments were long. (RN)  
 b. The assignment(\*s) **of the problems** took a long time. (CEN)

More recently, this generalization has been challenged by Roodenburg (2006) who provides empirical evidence from French and Italian where plural CENs are not excluded. His claim is that the possibility to pluralize has to do with language-specific properties concerning the syntax-semantics of Number which predict Romance CENs to allow plural and Germanic CENs to disallow it, as illustrated by the contrast between the French and English data in (2).<sup>1</sup> Grimshaw's generalization would thus be restricted to Germanic languages:

- (2) a. les désamorçages **de bombes lourdes** par les recrues  
 'the dismantlements of heavy bombs by the young soldiers'  
 b. \* the destructions **of the city** by the soldiers

While we do not deny the importance of language-specific properties, we would like to draw attention to the fact that this cannot be the only explanation for the contrast in (2), since both the Romance (2a) and the Germanic pattern (2b) can be instantiated within one and the same language, in our case, Romanian, a Romance language.

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<sup>1</sup>The data in (2) are taken from Roodenburg (2006). Note that the two examples do not form a minimal pair, since the theme is a bare plural in (2a) and a singular definite in (2b). Although this may have implications for the grammaticality contrast, we do not attempt to address this matter here.

As indicated by the data in (3) where the genitive phrase *ale cartierelor vechi* ‘of the old quarters’ qualifies as a theme, infinitive CENs in Romanian easily accept plural marking, while supine CENs totally exclude it:

- (3) demolările / \*demolaturile frecvente **ale cartierelor vechi**  
 demolish-Inf-Pl / demolish-Sup-Pl frequent-Pl of quarters-Gen old  
 de către comuniști  
 by communists  
 ‘the frequent demolitions of the old quarters by the communists’

On the basis of the aspectual differences between the two CEN patterns in Romanian, in part already observed by Cornilescu (2001), we reach the conclusion that they each realize one of two plurality patterns directly related to two patterns of internal functional structure available for CENs: nominal or verbal. The nominal pattern in a CEN indicates that the syntactic structure includes a Number projection which explains the availability of plural morphology. The verbal pattern corresponds to the projection of imperfective/unbounded Asp(ect) which blocks Num(ber) and thus plural morphology. In Romanian, infinitive CENs instantiate the nominal pattern and supine CENs, the verbal one.

In support of our generalization, we bring further evidence for the nominal properties of the infinitive and the verbal characteristics of the supine. We will show that unlike supine CENs, infinitive CENs display morphologically marked gender features and non-defective case declension, they develop RN readings, and are incompatible with aspectual adverbs. Besides the fact that it lacks these nominal properties, the supine will be argued to introduce aspect shift by turning bounded/perfective events into unbounded/imperfective ones. Thus, AspP hosts a [-bounded] feature which expresses (verbal) semantic plurality.

In Section 2, we present the morphological properties of infinitive and supine nominalizations in Romanian: derivational procedures, plural marking, determiner selection, gender marking, and case inflection. In Section 3, we discuss the aspectual differences between infinitive and supine CENs and we establish some correlations with the morphological differences from Section 2. In Section 4, we describe the special aspectual contribution of the supine, that of triggering aspect shift. On the basis of our empirical generalizations, we describe the functional structure of the nominal and the verbal CEN patterns in Section 5. In Section 6, we formulate our conclusion and consider a few cross-linguistic predictions that our analysis makes with respect to pluralization in CENs and Grimshaw’s generalization.

## 2 Morphological properties: infinitive vs. supine

In this section, we concentrate on the morphological properties of infinitive and supine nominalizations, with particular focus on the differences between the two.

### 2.1 Two nominalization patterns

Infinitive and supine nominals are the most productive deverbal nominalizations in Romanian and they derive from the stem of the long infinitive and that of the past

participle, respectively:

- (4) a. Infinitive:
- i. a cînta - cînta -**r** -**e** / cîntă -**r** -**i**  
to sing - sing -Inf -FSg / sing -Inf -Pl
  - ii. a reproduce - reproduce -**r** -**e** / reproduce -**r** -**i**  
to reproduce - reproduce -Inf -FSg / reproduce -Inf -Pl
- b. Supine:
- i. a cînta - cînta -**t** / # cînta -**t** -**uri**  
to sing - sing -Sup / sing -Sup -Pl
  - ii. a reproduce - reprodu -**s** / # reprodu -**s** -**uri**  
to reproduce - reproduce -Sup / reproduce -Sup -Pl

The infinitive suffix *-re* is an unambiguous derivative affix, since it exclusively appears within (infinitival) nominalizations. The restricted use of the verbal infinitive employs a short infinitive (5a) or a prepositional infinitive (5b):

- (5) a. Ion nu poate **citi** fără ochelari.  
John not can read without glasses  
'John cannot read without glasses.'
- b. Pentru **a citi**, Ion are nevoie de ochelari.  
for to read, John has need of glasses  
'In order to (be able to) read, John needs glasses.'

The suffix *-t/s* that appears in the supine nominal is two-way ambiguous: it generally participates in the formation of the Romanian past participle (6a), and it also appears in the traditionally called 'verbal' uses of the supine (6b,6c):

- (6) a. **Am citit** deja cartea.  
have read-Part already book-the  
'I have already read the book.'
- b. S-a apucat **de citit** o carte.  
Cl-has started of read-Sup a book  
'He started reading a book.'
- c. A plecat **la pescuit**.  
has left at fish-Sup  
'He went fishing.'

In view of the differences between the two suffixes, Soare (2007) argues that *-re* is a nominalizing affix, while *-t/s* is only the marking of a verbal stem and carries no particular nominalizing features. Thus, while the infinitival noun is a derivational nominalization marked for gender (see (4a) and Section 2.3 below), the supine nominal is mainly distinguished on the basis of its distributional properties. The distinction between the two corresponds to the classical differentiation between 'lexical' and 'syntactic' nominalizations originating in Chomsky (1970) and taken over in Picallo (1991).

## 2.2 Plural marking and determiner selection

A first parameter that differentiates between the two nominalizations is the countable/uncountable distinction, manifested in the possibility/impossibility to realize morphological number marking. As already indicated in (4), only the infinitive nominals display morphologically marked plural (4a), as opposed to the supine nominals (4b) which get the ending *-uri* by default. This latter point will be addressed in Section 2.3.

Importantly, the plural form is available for the infinitive not only in its RN reading (7a), but also in its CEN reading (7b), thus contradicting Grimshaw's generalization. In turn, the supine is always plural-defective and also unambiguously a CEN, obeying Grimshaw's generalization. We will return to the tests identifying the CEN vs. RN readings of the infinitive in Section 3.1, in connection with its aspectual properties.

- (7) a. **Interpretările** acestui actor sînt memorabile.  
interpret-Inf-Pl this-Gen actor are memorable  
'The performances of this actor are memorable.'
- b. **Interpretările acestui rol** de către diverși actori i-au  
interpret-Inf-Pl this role-Gen by various actors Cl-have  
schimbat stilul.  
changed style-the  
'The performance of this role by various actors has changed its style.'

The contrasting behavior of the two CENs with respect to the countable/un-countable property is further confirmed by the selection of determiners. Thus, discrete quantifiers are compatible with the infinitive (8a), but not with the supine which accepts only mass quantifiers (8b):

- (8) a. **Prea multe** spălări / **o** spălare a(le) rufelor distrug(e)  
too many wash-Inf-Pl / one wash-Inf of laundry-Gen destroy(e)  
țesătura.  
fabric-the
- b. **Prea mult** / \***un** spălat al rufelor distruge țesătura.  
too much / one wash-Sup of laundry-Gen destroys fabric-the  
'Too much washing of the laundry destroys the fabric.'

Note that the contrast clearly relies on the discrete vs. mass type of the determiner and not on number, since the quantifier *one* is out with the supine and grammatical with the infinitive.

Selection of discrete determiners is thus another property that infinitive CENs share with count nouns. Mass quantifiers are selected by both supine CENs and mass nouns. The count noun *pată* 'stain' accepts the discrete quantifier *multe* 'many' and rejects the mass quantifier *mult* 'much' (9a). The mass noun *vin* 'wine' is compatible with the mass *mult*, but incompatible - in its mass interpretation - with the discrete *multe* (9b):

- (9) a. **Prea multe** pete / \***prea multă** pată a(u) distrus rochia.  
too many stains / too much stain have/has destroyed dress-the  
'Too many stains/\*too much stain destroyed the dress.'

- b. **Prea mult** vin / # **prea multe** vinuri dăunează sănătății.  
 too much wine / too many wines endangers health  
 ‘Too much wine/#too many wines endangers one’s health.’

However, there are differences between Romanian mass nouns and supine CENs. For instance, the ‘vague’ quantifier *niște* ‘some’ is allowed with concrete mass nouns and rejected by the supine. Most likely this is due to a lexical restriction holding for abstract mass nouns in general, since *frumusețe* ‘beauty’, an abstract mass noun, is incompatible with *niște*, too:

- (10) a. Caut **niște sare**.  
 search some salt  
 ‘I am looking for some salt.’
- b. \***Niște** cântat n-o să-ți faci niciun rău.  
 some sing-Sup not-will Subj-Cl do no harm  
 ‘A bit of singing will not do you any harm.’
- c. \***Niște** frumusețe nu strică nimănui.  
 some beauty not harm nobody  
 ‘A bit of beauty will not do any harm to anybody.’

Just like *some* in English, *niște* combines with singular mass nouns but also with plural count nouns and it denotes a vague quantity. As expected, the infinitive CEN admits *niște* only in the plural form:

- (11) a. Am **niște mere**.  
 have some apples  
 ‘I have some apples.’
- b. Au avut loc **niște premieri** ale participanților.  
 have taken place some prize-award-Inf-Pl of participants-Gen  
 ‘There have been some prize-awardings to the participants.’

In conclusion, infinitive CENs pattern with count nouns and supine CENs with mass nouns. The possibility of a noun to be counted has been related in the literature to the presence of a NumP projection in its internal structure (see for instance Borer 2005 for a recent approach). NumP appears in the syntax of count nouns, but not in that of mass nouns. Plural marking and the selection of determiners obviously point towards the generalization that number features are present in the infinitive CEN and that they are absent in the supine CEN. We will make this precise in our proposal in Section 5.

### 2.3 Gender and case

A further distinction that can be established between the infinitive and the supine CEN concerns the nominal declension, more precisely gender features and the case inflection. As we will show below, the infinitive CEN behaves like a typical noun with a complete nominal paradigm, while the supine CEN has a defective nature.

The infinitive nominalizer *-re* has gender features, being marked as [+fem](inine). Compare the infinitive form in (4a), repeated below as (12a) with the one of a prototypical feminine noun in Romanian (12b):

- (12) a. cîntar **-e** / cîntăr **-i**  
sing-Inf -FSg / sing-Inf -Pl
- b. floar **-e** / flor **-i**  
flower -FSg / flower -Pl

The supine is traditionally considered to have neuter gender (see Graur et al. 1966) with an unmarked ending in the singular and *-uri* in the plural. The supine itself is not used in the plural form as a CEN, the plural ending *-uri* is constructed by analogy with other nouns which are derived from the supine/past participle stem. For example, the nouns *venit* and *mers* in (13b) and (13c) originate from the past participle and the supine forms, respectively, but they are perceived as lexicalized items, since these derivations are not productive. Similar nouns like the ones in (14a) and (14b) are unattested or have a very restricted use:

- (13) a. cîntat  $-\emptyset$  / # cîntat **-uri**  
sing-Sup -N.Sg / sing-Sup -Pl  
'singing(#s)'
- b. venit  $-\emptyset$  / venit **-uri**  
come-Past.Part -N.Sg / come-Past.Part -Pl  
'income(s)'
- c. mers  $-\emptyset$  / mers **-uri**  
walk-Sup -N.Sg / walk-Sup -Pl  
'way(s) of walking'
- (14) a. sosit  $-\emptyset$  / \* sosit **-uri**  
arrive-Past.Part -N.Sg / arrive-Past.Part -Pl  
'thing(s) that arrived'
- b. citit  $-\emptyset$  / ?? citit **-uri**  
read-Sup -N.Sg / read-Sup -Pl  
'way(s) of reading'

Some supine forms can also be used as simple event nominals and thus have a plural realization. This is the case with the example in (15). However, note that the corresponding CEN cannot pluralize, as shown in (15b):

- (15) a. tuns  $-\emptyset$  / tuns **-uri**  
cut-Sup -N.Sg / cut-Sup -Pl  
'(hair) cutting(s)'
- b. **tunsul** părului / \* **tunsurile** părului  
cut-Sup-the hair-Gen / cut-Sup-Pl hair-Gen  
'the cutting(\*s) of the hair'

Given the fact that Romance languages in general have only two gender classes (masculine and feminine), it has been argued that Romanian neuter is not a proper

gender class either. Two arguments have been brought in support of this idea: the lack of semantic identity and the lack of a specific ending. With respect to the former issue, although one would expect neuter to be the gender for inanimate nouns, it does not completely cover this semantic area (see for instance the feminine inanimate *carte - cărți* ‘book - books’ and the masculine inanimate *trandafir - trandafiri* ‘rose - roses’). As for the latter argument, the neuter has no formal identity since it exhibits syncretism with the masculine singular and the feminine plural form. In (16) below, we exemplify the gender paradigm of three nouns in Romanian. The null ending in the singular characterizes both neuter and masculine nouns, while the plural endings *-e* and *-uri* appears both with neuter and feminine nouns:

|      | GENDER    | SINGULAR              | PLURAL                  |
|------|-----------|-----------------------|-------------------------|
| (16) | MASCULINE | băiat -∅ ‘boy’        | băieți - <b>i</b>       |
|      | FEMININE  | fat - <b>ă</b> ‘girl’ | fete - <b>e</b>         |
|      |           | blan - <b>ă</b> ‘fur’ | blăni - <b>uri</b>      |
|      | NEUTER    | măr -∅ ‘apple’        | mere - <b>e</b>         |
|      |           | chibrit -∅ ‘match’    | chibrituri - <b>uri</b> |

### 2.3.1 Gender marking in the supine?

While we do not attempt to address the issue of whether there is a neuter gender in Romanian or not,<sup>2</sup> we would like to argue that the so-called ‘neuter gender’ of the supine is merely a default specification. In order to do that, we will show that the only indicator of gender in the supine form – i.e. the plural ending *-uri* – does not always carry gender features.

We follow Picallo (2006) in regarding gender features as indicators of the class/declension to which a noun belongs. Under this view, gender features are hosted by a Class(ifier) projection to which the noun moves in order to check its class information. Moreover, Picallo argues that gender features and ClassP are obligatory for the projection of Number. Thus, the lack of gender triggers the lack of a NumP and implicitly the unavailability of the plural marking. Within this theory, saying that neuter does not exist as a gender class in Romanian would have the consequence that neuter nouns should not be able to form plural.<sup>3</sup> This is too strong a generalization, since neuter count nouns like *scaun - scaune* ‘chair(s)’, *stilou - stilouri* ‘pen(s)’ clearly do pluralize.

Leaving aside the fact that the plural form does not show up with the supine CEN but only with the simple event supine (see (15)), the only ending that the supine takes is the plural *-uri*. Besides functioning as a plural ending for feminine and neuter nouns (see also (16) above), we assume that it can also be used as a default ending for words which behave like nouns, although they have not been integrated into a nominal class. This would be the case of the supine.

In support of our hypothesis, it should be observed that *-uri* is the default plural ending for newly formed nouns and for the most recent borrowings:

- (17) un **X** - două **X-uri**; un **8** - două **8-uri**  
 one X - two X’s; one 8 - two 8’s

<sup>2</sup>But see Bateman and Polinsky (2006) for a recent approach against the existence of an individual gender class ‘neuter’ in Romanian.

<sup>3</sup>We would like to thank a CSSP anonymous reviewer for drawing our attention on this issue.

With respect to borrowings, Brâncuș (1978) argues that the plural *-uri* is a sign that the noun has not been completely adapted to the language. Once they are fully integrated, foreign nouns get the plural marking *-e*. See for instance the recent borrowing *weekend* as opposed to the older *verb* in (18):

- (18) a. un **weekend** - două **weekend-uri** / \***-e**  
 one weekend - two weekends
- b. un **verb** - două **verburi** / \* **verbe** (19th century)  
 one verb - two verbs
- c. un **verb** - două **verbe** / \* **verburi** (present-day)

We conclude from this discussion that *-uri* is associated with supine CENs as a default ending like in the case of ‘unestablished’ nouns. Since the singular form of the supine has no morphological indicator of gender, we may conclude that the supine CEN does not carry gender features. In Picallo’s theory, the lack of gender correlates with the lack of a ClassP and implicitly, with the absence of a NumP. This explains the unavailability of plural marking in supine CENs. If NumP is not projected, there is no way to accommodate the plural ending in the supine CEN.

### 2.3.2 Gender marking: infinitive vs. supine

In Section 2.2, we showed that the infinitive CEN behaves like a count noun and we suggested that it projects a NumP in the syntax. If we compare the supine with the infinitive CEN with respect to gender and Picallo’s claim that gender features ‘feed’ Number, we find a further confirmation for our initial hypothesis. In particular, the infinitive CEN has both a singular (*-e*) and a plural ending (*-i*) clearly indicating feminine gender, as shown in (12). In Picallo’s terms, this means that the infinitive projects a ClassP specified with feminine gender and a NumP can also be projected.<sup>4</sup>

The gender specification in the two Romanian CENs can thus be correlated with the availability of plural marking: the infinitive carries feminine gender, while supine carries a default ‘neuter’; the former accepts plural, the latter does not. To confirm our generalization with respect to gender, it should be noted that the infinitive successfully establishes anaphoric relations with the feminine demonstrative *aceasta*,<sup>5</sup> while the supine rejects the masculine/neuter syncretic form *acesta* and can only be referred to by the genderless form *asta*, the common anaphor for CPs in Romanian:

- (19) a. **Că Ion a venit, asta/ \*aceasta/\*acesta știu.**  
 ‘That John came, I know it/this-F/this-M.’
- b. Am vorbit despre **interpretarea rolului Hamlet** în general. Se pare ca **aceasta** / ??**asta** îi consacră indubitabil pe actorii tineri.  
 ‘We spoke about the interpretation-Inf of Hamlet in general. It seems that this-F / ??it undoubtedly validates the young actors.’

<sup>4</sup>Note that both mass and count nouns carry gender features, but only the latter exhibit plural marking. In Picallo (2006), we also need a feature [ $\pm$ count] under ClassP to distinguish between the two noun classes, such that only count nouns are specified as [+count] and project NumP (see also Alexiadou et al. (to appear), Iordăchioaia and Soare (2007)).

<sup>5</sup>Note that the anaphor *asta* is not excluded in (19b). But in this case we are dealing with coercion since the noun *interpretarea* is understood as a fact.



- c. Am vorbit despre **interpretatul rolului Hamlet** în general. Se pare că **\*acesta / asta** îi atrage pe toți actorii tineri.  
 ‘We spoke about the interpretation-Sup of Hamlet in general. It seems that \*this-M.N / it attracts all the young actors.’

In conclusion, the neuter form of the supine is not the effect of neuter gender features. Typical neuter nouns like *stilou* ‘pen’ are referred to by the anaphor *acesta* and not *asta*:

- (20) Ieri, Ion își pierduse **stiloul**. Se pare că **acesta / \*asta** rămăsese pe masă în sala unde predase.  
 ‘Yesterday, John lost his pen. Apparently, this-M.N / \*it had remained on the desk in the room where he had taught.’

### 2.3.3 Nominal features and the Classifier projection

Following Picallo (2006), the presence of gender in infinitive CENs and the lack of it in supine CENs is expressed in the syntax by the presence/absence of a ClassP. The Classifier - as previously noted - hosts the nominal features of a noun, its class information. The projection of a NumP that hosts the plural marker is also a nominal property. The default gender in the supine suggests that this CEN lacks the ClassP in the syntax, so it carries no noun class information.

Besides gender, case is also an indicator of the noun declension. Romanian common nouns display two case paradigms with nominative-accusative and genitive-dative syncretism. The nominative-accusative form is the most unmarked one. Interestingly, the infinitive CEN exhibits both case inflections, while the supine cannot appear in the genitive-dative form (21):

- (21) a. **Tăierea** / **tăiatul** pădurilor a provocat  
 cut-Inf-Nom / cut-Sup-Nom woods-Gen has brought about  
 alunecări de teren.  
 earth-flows  
 ‘Cutting down the woods brings about earth flows.’
- b. Alunecările de teren au loc din cauza **tăierii** / \* **tăiatului**  
 earth flows-the occur because of cut-Inf-Gen / cut-Sup-Gen  
 pădurilor.  
 woods-Gen

## 2.4 Interim conclusion

To summarize our observations with respect to the morphological properties of the two CEN patterns in Romanian, we have shown that the infinitive CEN behaves like a typical count noun: it accepts plural marking and can combine with discrete determiners, it carries well-determined gender features, and it has a full case paradigm. The supine CEN exhibits a clear contrast with the infinitive in nominal properties: it does not accept plural marking or discrete determiners, it carries default gender, and it is

case-defective. By taking up Picallo's analysis of nominal features in relation with syntactic projections, the infinitive projects [+fem] ClassP and NumP. For the supine, there is no evidence for either of the two projections.

In what follows, we would like to suggest that the infinitive is a full nominal, while the supine exhibits a more verbal nature which blocks nominal properties. For this, we will investigate the aspectual properties of the two CENs.

### 3 Aspectual properties

The contrast between infinitive and supine CENs in Romanian is further confirmed by their aspectual properties, which correlate with the plural marking contrasts. In this section, we will show that infinitive CENs express telic/bounded events, unlike supine CENs which are atelic/unbounded.

#### 3.1 Telicity

Cornilescu (2001) offers a detailed investigation of the aspectual properties of the two CENs and concludes that the infinitive is telic, while the supine is atelic. Cornilescu's argumentation is based on three issues: the projection of the theme argument, the possibility to develop R-readings, and the selection of the verbal bases.

First of all, Cornilescu follows Borer (1994) in assuming that if a transitive CEN obligatorily projects its theme argument, then it is telic, while a CEN which can project its external argument without having projected its theme is atelic. This generalization is based on the intuition that the theme identifies the culmination of an event. If the theme is obligatory, it means that the event must culminate so the CEN is telic; if the theme is not projected, the event does not need to culminate, so the CEN is atelic. In this respect, Cornilescu shows that the infinitive CEN qualifies as telic and the supine, as atelic. As the data in (22) indicate, the infinitive CEN cannot project the agent without having projected the theme, but the supine can:

- (22) a. \* **citirea**        lui Ion  
           read-Inf-the John-Gen  
           'John's reading'
- b. **cititul**        lui Ion  
           read-Sup-the John-Gen  
           'John's reading'

The infinitive in (22a) can only be understood as a RN. This brings us to the second aspectual difference between infinitive and supine, the possibility to develop R-readings. Only telic events have a resulting state, and thus should be able to derive result readings. The infinitive and the supine CEN comply with this prediction: the former gives rise to RNs, the latter does not. In Romanian, R-readings are indicated by the presence of the preposition *de* 'of' which appears with locative modifiers. In (23), it can be noticed that the infinitive is compatible with *de*, while the supine is not:

- (23) a. \* **cîntatul**        lui Ion    **de** la baie  
           sing-Sup-the John-Gen of in bathroom

- b. interpretarea **de** la Paris (a operei Oedip)  
 perform-Inf-the of in Paris (of opera-Gen Oedipus)  
 ‘The Paris performance of the opera Oedipus’

A final piece of evidence that Cornilescu makes use of in order to indicate the telicity of the infinitive and the atelicity of the supine involves the selectional restrictions of the two CENs with respect to the verbal base. While they are both compatible with transitive verbs (see the discussion above), only the supine can be formed from unergative verbs, known to always express activities. The infinitive rejects them on the basis of their atelicity:<sup>6</sup>

|      | UNERGATIVE VERB |             | INFINITIVE  | SUPINE    |
|------|-----------------|-------------|-------------|-----------|
|      | a călători      | ‘to travel’ | *călătorire | călătorit |
| (24) | a locui         | ‘to live’   | *locuire    | locuit    |
|      | a munci         | ‘to work’   | *muncire    | muncit    |
|      | a râde          | ‘to laugh’  | *rîdere     | rîs       |

The generalization in Cornilescu (2001) that the infinitive CEN is telic and the supine CEN is atelic correlates with the plural marking facts in Section 2. This confirms previous observations in the literature, according to which telic CENs do pluralize and only atelic ones do not, so only the former obey Grimshaw’s generalization (see for instance Mourelatos 1978, Borer 2005). As a telic CEN, the infinitive is expected to exhibit plural marking.

### 3.2 Boundedness

In order to facilitate a thorough investigation of the aspectual differences between infinitive and supine CENs, we propose to reformulate the telicity contrast above in terms of *boundedness*, a term borrowed from Jackendoff (1991). According to Jackendoff, the expression of plurality is ‘a feature of conceptualization that is orthogonal to the distinction between objects and events’. Thus, in his terms, nominal plural, mass nouns, atelic and imperfective aspect count as [-b](ounded), while nominal singular, count nouns, telic and perfective aspect are [+b].

As expected, given Cornilescu’s observations, the supine CEN cannot express a single (bounded) event located in space or/and time. This is however possible with the infinitive:

- (25) **Citirea** / # **cititul** cărții a avut loc **ieri** /  
 read-Inf-the / read-Sup-the book-Gen has taken place yesterday /  
**în sala de lectură.**  
 in reading room-the  
 ‘The reading of the book took place yesterday/in the reading room.’

According to Jackendoff, plural is a function that maps a [+b] entity into a [-b] multiplicity of entities of the same type. The infinitive CEN is thus expected to undergo

<sup>6</sup>It seems that nominalizations of unergative verbs exclude plural also in other languages with rich morphology, like Georgian (Léa Nash, p.c).

pluralization, since it is [+b]. The [-b] supine is incompatible with the plural function. A further test is provided by the (in)compatibility with the function ‘until’ which is assumed to bind an unbounded event with a time producing a bounded event. As expected, ‘until’ can combine only with the plural of the infinitive CEN and not with the [+b] singular form (26a).<sup>7</sup> But it felicitously modifies the supine CEN:

- (26) a. **arestările** / # **arestarea** lui Miron Cozma **pînă** la schimbarea  
 arrest-Inf-Pl / arrest-Inf-the Miron Cozma-Gen until at changing  
 guvernării  
 government-Gen  
 ‘Miron Comza’s arrestings until the government changes’
- b. **cititul** benzilor desenate **pînă** la vîrsta de 16 ani  
 read-Sup-the comics-Gen until at age of 16 years  
 ‘reading comics until the age of 16’

So far we can conclude that the infinitive CEN as a [+b] event is expected to pluralize, while the supine CEN as a [-b] event naturally rejects the plural marking since it already involves a form of plural. In what follows, we will show that the unbounded character of the supine best matches a verbal syntactic structure with an Aspect projection. In view of our conclusions in Section 2, the bounded character of the infinitive is compatible with its nominal syntax with Classifier and Number projections.

## 4 Aspect shift

In this section, we address another level of aspectuality as instantiated by the two Romanian CENs, that of aspect shift. The possibility to trigger aspect shift will be taken as evidence for the presence of an Asp(ect)P in the syntax. With ‘aspect shift’ we refer to the possibility of the nominalization to change the aspectual value that comes with the base verb. This means that the nominalization itself contributes an aspectual operator,<sup>8</sup> independently of the lexical aspect of the root. In Verkuyl (1993)’s terms, who distinguishes between ‘inner’ and ‘outer’ aspect, aspect shift takes place at the level of the outer aspect. So it is the outer aspect information that we will correlate with a syntactic projection AspP.<sup>9</sup> As we will see, only the supine CEN introduces aspect shift, so it has aspectual contribution, a fact which indicates its verbal nature and thus, explains its defective nominal properties. We first consider infinitive CENs and then, for comparison, supine CENs.

### 4.1 The infinitive

As already indicated in Section 3.1, the infinitival form in general is incompatible with unergative roots (24) known to express unbounded events. At the same time, the infini-

<sup>7</sup>The only reading available for (26a) with the singular *arestarea* is ‘the arresting of Miron Cozma **before** the government changes’, so *pînă* is interpreted as ‘before’ and not as ‘until’.

<sup>8</sup>See de Swart (1998), van Geenhoven (2004), Laca (2006) for various examples of such aspectual operators acting as ‘eventuality modifiers’.

<sup>9</sup>See also Alexiadou et al. (to appear) for more details on the distinction between inner and outer aspect and its relevance for nominalizations.

tival CEN obligatorily requires the projection of the theme which qualifies it as carrying telicity (Cornilescu 2001).

In order to understand if it is the lack of a theme that makes the infinitive CEN incompatible with unergatives or the unbounded character of the latter, we should test transitive verbs with a bare plural theme which are atelic/unbounded (Dowty 1979). However, this test cannot be applied to infinitive CENs, since their theme is realized in the genitive case which always involves a definite determiner and thus the construction becomes again telic/bounded. In (27) below, *pînă* can only be interpreted as ‘before’ and not as an endpoint bounding an unbounded event, and the CEN in (27c) is related only to (27b):

- (27) a. A citit **cărți pînă** la miezul nopții.  
has read books until at midnight  
‘He read books until midnight.’
- b. A citit **cărțile pînă** la miezul nopții.  
has read books-the until at midnight  
‘He had read the books by midnight.’
- c. **citirea cărților pînă** la miezul nopții  
read-Inf-the books-Gen until at midnight  
i. # = 27a: ‘the reading of books until midnight’  
ii. = 27b: ‘the reading of the books by midnight’

In conclusion, infinitive CENs with the theme in genitive case always derive from bounded constructions. Considering this in relation with the conclusion in Section 3.1 according to which infinitive CENs express bounded events, it means that the infinitival CEN does not change the boundedness specification of the base verb. That is, it cannot trigger aspect shift,<sup>10</sup> it merely inherits the aspectual specification of the verb.

## 4.2 Verb semantic classes and the supine

The situation is different with the supine. As noted in Section 3.1, supine CENs are unbounded. But this does not preclude them from applying to bounded roots like achievements (28):

- (28) a. **Sositul lui Ion** cu întârziere la toate întâlnirile importante  
arrive-Inf-the John-Gen with delay at all meetings important  
nu e un secret.  
not is a secret  
‘John’s arriving late at all important meetings is not a secret.’
- b. **Sositul lui Ion** cu întârziere la toate întâlnirile importante  
arrive-Inf-the John-Gen with delay at all meetings important  
**pînă** când a fost amenințat cu concedierea nu e un secret.  
until when has been threatened with firing not is a secret

<sup>10</sup>Note that this conclusion holds of infinitival constructions in general, since even in unbounded constructions with a “*de* ‘of’ + bare plural” theme they maintain the unbounded character of the original construction: *citirea de cărți pînă miezul nopții* corresponds to (27a) above.

'John's (continuously) arriving late at all important meetings until he was threatened with getting fired is not a secret.'

Since the supine CEN in (28) is still unbounded (according to the possibility to combine with *pînă*: (28b)) despite the bounded character of the achievement root *a sosi* 'to arrive', it means that the supine actually introduces aspect shift on the root: it turns [+b] events into [-b] events. This is confirmed by the interaction between the supine and various semantic verb classes.

States and activities are known as classes of atelic verbs, so they express unbounded events. The supine nominals derived from these verbs do not simply inherit the original unboundedness, but they seem to be possible only if the original event is bounded. Thus, supine CENs derived from states and activities are very questionable if not completely excluded, unless we can understand them as pluralities of bounded events:

- (29) a. \* **statul** lui Ion / \* **dormitul** lui Ion  
 stay-Sup-the John-Gen / sleep-Sup-the John-Gen
- b. **statul** lui Ion la Maria / **dormitul** lui Ion **pînă**  
 stay-Sup-the John-Gen at Mary / sleep-Sup-the John-Gen until  
 după-amiaza târziu  
 afternoon late  
 'John's habit of staying at Mary's/sleeping until late in the afternoon'
- (30) a. \* **muncitul** lui Ion / \* **învățatul** lui Ion  
 work-Sup-the John-Gen / learn-Sup-the John-Gen
- b. **muncitul** lui Ion / **învățatul** lui Ion **pînă** la  
 work-Sup-the John-Gen / learn-Sup-the John-Gen until at  
 miezul nopții  
 midnight  
 'John's (habit of) working/studying until midnight'

Once they are circumscribed in space and/or time, the atelic events can be understood as bounded and thus the supine form becomes available. Both the states in (29b) and the activities in (30b) become bounded due to *pînă* 'until'. But note that *pînă* does not bound the unbounded event expressed by the supine, since the overall interpretation of the two constructions is habitual and thus still unbounded. In order to test this, we can see that another 'until'-phrase semantically compatible with the unbounded event expressed by the supine is easily available:

- (31) a. **dormitul** lui Ion **pînă** după-amiaza târziu **pînă** la vârsta  
 sleep-Sup-the John-Gen until afternoon late until at age-the  
 adolescenței  
 teen  
 'John's (habit of) sleeping until late afternoon (which lasted) until he was a teenager'
- b. **învățatul** lui Ion **pînă** la miezul nopții **pînă** la absolvirea  
 learn-Sup-the John-Gen until at midnight until at graduating  
 facultății  
 university

'John's (habit of) studying until midnight (which lasted) until he graduated university'

In conclusion, the supine introduces unboundedness as a form of pluralization over individual/bounded events. It cannot combine with unbounded events (in (29a) and (30a)) for the same reason for which plural is not available for mass nouns. If this happens, then the unbounded event has to be interpreted as bounded (in (29b) and (30b)), just like mass nouns have to be interpreted as countable. In (32b), the plural makes *water* be understood as 'river' or 'kind of water' (e.g. sweet and salty; clean and dirty):

- (32) a. I saw **water**(#s) on the floor.  
b. There are two **waters** flowing into the Danube.

As a further confirmation of this generalization, the supine is grammatical with accomplishments (33a) and punctual events (33b) which are bounded, but ungrammatical with i-level predicates (33c) which cannot be located in space and time (Kratzer 1995), so they cannot become bounded and then multiplied:

- (33) a. **Mîncatul** micului dejun pe terasă este obiceiul lui de o viață.  
eat-Sup-the breakfast-Gen on terrace is habit his of a life  
'Having breakfast on the terrace has been his lifetime habit.'
- b. **Clipitul** Mariei în acest moment important este enervant.  
blink-Sup Mary-Gen in this moment important is annoying  
'Mary's blinking at this important moment is annoying.'
- c. \* **cunoscutul** limbilor străine / \* **descinsul** omului  
know-Sup-the languages-Gen foreign / descend-Sup-the man-Gen  
din maimuță  
from monkey  
'knowledge of foreign languages/the man's descent from the monkey'

As shown by (33b), the unboundedness of a punctual event in the supine form correlates with iterativity at a given moment. In all the other examples, we noticed that unboundedness usually correlated with habituality. These two patterns can also be identified in the two interpretations possible with semelfactive verbs. A semelfactive verb has both a punctual event (34a) and an accomplishment reading (34b). The supine CEN corresponding to the former has an interative reading, while the one corresponding to the latter receives a habitual reading. Compare the interpretation of (35a) with (34a) and that of (35b) with (34b):

- (34) a. În acest moment important, Ion sare într-un picior.  
in this moment important John jumps on one foot  
'At this important moment, John is jumping on one foot.'
- b. Ion a sărit peste gard.  
John has jumped over fence  
'John jumped over the fence.'

- (35) a. **Săritul** lui Ion într-un picior în acest moment important  
 jump-Sup-the John-Gen on one foot in this moment important  
 este enervant.  
 is annoying  
 'John's jumping on one foot at this important moment is annoying.'
- b. **Săritul** lui Ion peste garduri nu este tocmai o calitate.  
 jump-Sup-the John-Gen over fences not is exactly a quality  
 'John's (habit of) jumping over fences is not really a quality.'

### 4.3 The pluractional operator in the supine

The behavior described above indicates that the supine contains an operator that triggers aspect shift, so it turns bounded events into unbounded. We support the idea that this is a pluractional operator in the sense of Lasersohn (1995), van Geenhoven (2004) and Laca (2006), and as argued in Iordăchioaia and Soare (2007).

Pluractional operators (POs) are known from Cusic (1981) and Lasersohn (1995) to introduce verbal plurality/atelicity. POs with a morphological character have often been identified in polysynthetic languages, as for instance the PO *qattaar* in West Greenlandic (van Geenhoven 2004, p. 147) which expresses verbal plurality in general:

- (36) a. ?? Qaartartoq sivisuumik qaarpoq.  
 'A/the bomb exploded for a long time.'
- b. ? Qaartartoq sivisuumik qaa**qattaar**poq. (a magic bomb)  
 'A/The bomb exploded again and again for a long time.'
- c. Qaartartut sivisuumik qaa**qattaar**put.  
 'Bombs exploded again and again for a long time.'

Given that a 'for'-PP requires an atelic event, and *explode* is a punctual telic event, the incompatibility in (36a) is expected. The combination improves once the PO *qattaar* is introduced, since it turns the telic event into an atelic one (36b). The oddity of the sentence is due to the fact that the same bomb cannot explode again and again, unless it is a magic bomb. The oddity disappears if the theme of *explode* is plural, which allows the interpretation that different bombs were involved in the multiple explosion events that spread over a long time.

Among the usual semantic effects associated with POs we can enumerate distributivity (reduplicative POs in Klamath), frequentativity/iterativity (*tar* in West Greenlandic, *andar* in Spanish), repetition (West Greenlandic *urar*), and habituality (*tar* in West Greenlandic). In the literature (see Lasersohn (1995), van Geenhoven (2004), Laca (2006)), these terms often overlap, but this is also due to the ambiguity of POs which usually carry several of these semantic properties at the same time. As pointed out especially in Section 4, iterativity and habituality are often associated with supine CENs in Romanian,<sup>11</sup> which is already an indicator that they carry pluractionality.

Several other characteristics associated with POs in general (see Laca (2006) for an overview) were discussed in Iordăchioaia and Soare (2007) with respect to the Romanian supine. Here, we address two main properties that give POs unquestionable the-

<sup>11</sup>The habitual interpretation of the supine is discussed in details in Soare (2006).



oretical status: 1) *the lack of multiplicity effects with indefinites* and 2) *the distribution effects with plurals*. The first property refers to the fact that unlike a frequency adverb like *occasionally* in (37), a PO like *qattaar* in (36) does not provide an interpretation in which the indefinite *a bomb* would refer to several different bombs. If this were possible, the sentence in (36b) would not sound odd:

- (37) A bomb **occasionally** exploded.  
 a. The same bomb exploded. (magic bomb)  
 b. A different bomb exploded every time.

With respect to the second property, by comparing the West Greenlandic (36c) to (36b), it is obvious that the grammaticality of the former is directly connected to the fact that different bombs explode.

The two properties are accounted for by van Geenhoven (2004) and Laca (2006). The analysis relies on the idea that unlike a frequency adverb a PO can only take scope at the V level and not over the whole VP, so this is why it cannot multiply the indefinite within the VP: it does not have scope over it. The distribution effects with plurals are accounted for on the basis of the assumption that a PO can only combine with a VP whose object has ‘cumulative reference’ (see van Geenhoven 2004, p. 154), a property which characterizes plurals in general.<sup>12</sup>

Coming back to the Romanian supine CEN, we can see that it clearly displays the two properties described above. Thus, (38a) is ungrammatical because a journalist cannot be killed several times. This means that the PO in the supine cannot multiply the singular indefinite theme *un jurnalist*, so it takes narrow scope with respect to it. The construction becomes grammatical once the theme is a plural (38b). That is, similarly to *qattaar*, the PO in the Romanian supine CEN creates distribution effects with a plural argument:

- (38) a. \* **Ucisu** **unui jurnalist** de către mafia politică este un subiect  
 kill-Sup-the a journalist-Gen by mafia political is a topic  
 foarte actual în presă.  
 very actual in media
- b. **Ucisu** **jurnaliștilor** de către mafia politică este un subiect  
 kill-Sup-the journalists-Gen by mafia political is a topic  
 foarte comun.  
 very common  
 ‘Th killing of journalists by the political mafia is a very common topic.’

The same properties have been identified by Laca with respect to the PO “*andar + gerund*” in Spanish. Compare (39a) below with the West Greenlandic (36b) and the Romanian (38a) above, and (39b) with (36c) and (38b):

- (39) a. ?? El zorro **anduvo matando una gallina**.  
 the fox walk-Pres.Pf killing a hen  
 ‘The fox has been killing a hen.’

<sup>12</sup>While it is not within the aim of our paper to give a semantic account of POs, we refer the reader to van Geenhoven (2004), and Laca (2006), pp. 198-201, for one which we consider to apply for the Romanian supine CEN, too.

- b. El zorro **anduvo matando gallinas.**  
 the fox walk-Pres.Pf killing hens  
 ‘The fox has been killing hens.’

In order to keep an eye on the comparison between infinitive and supine CENs, note that the infinitive structure corresponding to (39a) above is grammatical:

- (40) **Uciderea unui jurnalist** de către mafia politică este un subiect foarte  
 kill-Inf-the a journalist-Gen by mafia political is a topic very  
 actual în presă.  
 actual in media  
 ‘The killing of a journalist by the political mafia is a very up to date topic in the media.’

This contrast is due to the difference between the two CENs with respect to boundedness and pluractionality. Since unlike supine, infinitive does not involve pluractionality, the interpretation of (40) is that of a singular bounded event. Thus, the singular indefinite theme of the infinitive does not raise the problem that is raised by the conflict between the pluralized killing event expressed by the supine and the singular theme which cannot undergo the same event more than once. As a consequence, the structure with the infinitive is fine.

As a further piece of evidence for the presence of the PO, we observe that it exhibits scope interaction with aspectual modifiers. In (41) below a ‘for’-adverbial can either specify the time interval for the single event and thus get narrow scope with respect to the PO (41a), or modify the plurality of events and thus outscope the PO (41b):

- (41) plantatul de copaci **timp de 3 ore / timp de 3 ani**  
 plant-Sup-the of trees for 3 hours / for 3 years  
 a. PO - *plant* > 3 hours: ‘a plurality of tree-planting events, each of them taking 3 hours’  
 b. 3 years > PO - *plant*: ‘3 years covered with (a plurality of) tree-planting events’

This kind of scope interaction does not occur with the infinitive, where only a ‘for’-adverbial that specifies the time interval for the basic event is plausible (42). This is expected, if we consider our observation in Section 4.1, according to which the infinitive simply inherits the lexical aspectual<sup>13</sup> properties of the root. No further aspectual information above this is available that would give rise to scope interaction with aspectual modifiers specifying different time intervals:

- (42) plantarea de copaci **timp de 3 ore / # timp de 3 ani**  
 plant-Inf-the of trees for 3 hours / for 3 years  
 a. *plant* > 3 hours: ‘the event of planting trees which took 3 hours’  
 b. # *plant* > 3 years: ‘the event of planting trees which took 3 years’  
 c. \* 3 years > *plant*

<sup>13</sup>Lexical aspect is understood here as corresponding to the notion of Aktionsart, or ‘inner’ aspect of Verkuyl (1993). See also Iordăchioaia and Soare (2007) for a comparison between the Romanian infinitive and the Spanish infinitive as both inheriting the lexical aspect of the root.

We conclude from this section that the infinitive CEN selects bounded eventualities as verbal bases and since it eventually still expresses bounded events, it does not introduce any aspectual information of its own. On the contrary, we have observed that the supine CEN expresses unbounded events, but that this does not correspond to a selection of correspondingly unbounded roots. The supine takes a bounded root, it multiplies it and thus turns it into an unbounded plurality. It carries a pluractional operator which introduces aspect shift by mapping bounded events into unbounded ones. We take this information to be hosted by an Aspect projection in the syntax of the supine. This projection - we will show below - is independently motivated by the presence of Aspect modifiers

## 5 The functional structure of Romanian CENs

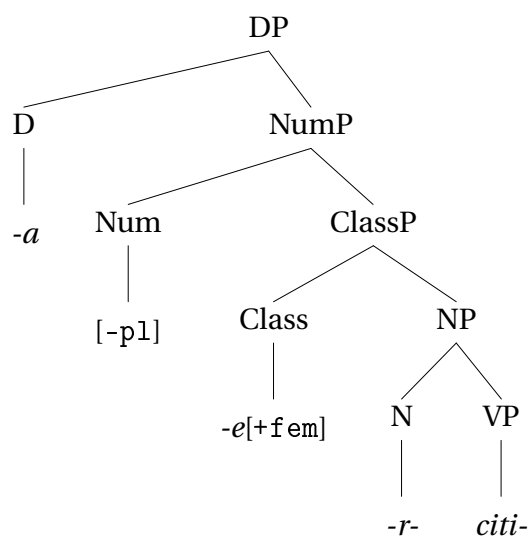
The contrasting properties of the two CEN patterns in Romanian lead to the generalization that we are dealing with two types of event plurality: one by means of (nominal) Number – in the infinitive CEN and the other by means of Aspect (triggered by the PO) – in the supine CEN. We showed that these properties can be accounted for by corresponding functional projections in the syntax, in agreement with general principles assumed in the linguistic literature.

We thus propose that infinitive CENs project a mainly nominal structure with NumP, whereas supine ASNs project a mainly verbal structure with AspP. This corresponds to two patterns of nominalization, both of them starting from a VP and taking the overall shape of a DP: the functional projections in between account for the differences.

### 5.1 The nominal pattern

The nominal pattern for the realization of plural, instantiated by the infinitive CEN receives the functional structure in (43):

(43)

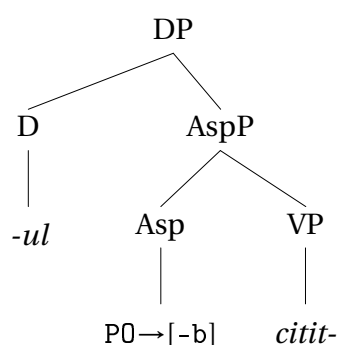


The nominalizer *-r-* selects the VP *citi*, turning it into a noun. Following Picallo's proposal, we argue that the N head moves to Class in order to check its class features gender and case carried by the ending *-e*. Under the Number projection on top of ClassP, plural can be realized, as we argued before. The whole structure is a DP.

## 5.2 The verbal pattern

The verbal pattern expressing plurality is given in (44) and characterizes the Romanian supine CEN:

(44)



Since the suffix *-t/s* is not morphologically specific to the supine (see the discussion in Section 2.1), we assume that it comes together with the VP in the structure. Alternatively, one could argue that it appears under AspP, so it carries the PO and contributes the [-b] feature, in a similar fashion to the claim that is made of the verbal gerund suffix *-ing* as contributing imperfective aspect (see Alexiadou 2001, 2005). Note however that in English the suffix *-ing* in the verbal gerund contributes the same imperfective value that it contributes when it plays the role of the present participle. In contrast to this, if we assumed the same kind of analysis for the Romanian suffix *-t/s*, we would make the prediction that it contributes perfective/bounded aspect in the past perfect form, and imperfective/unbounded aspect in the supine CEN. Since so far we have no evidence that this should be the case, we assume that the aspectual value of unboundedness in the supine CEN is contributed by the PO which appears in the course of the nominalization process.<sup>14</sup>

As argued in Section 2, the supine CEN does not display evidence for the nominal projections ClassP and NumP, so the next projection above the VP is AspP, hosting the PO which triggers unboundedness. The nominal behavior of the supine CEN – mainly relying on its distributional properties – is accounted for via the DP projection which embeds the rest of the structure (see also Soare 2007).

A final confirmation for the presence of an AspP in the functional structure of the supine is provided by the test of aspectual adverbs like *constantly*, which are argued by Cinque (1999) to modify an Asp head:

- (45)    *cititul*            (**constant**) *al ziarelor*            (**constant**)  
           *read-Sup-the constantly newspapers-Gen constantly*

<sup>14</sup>We are not sure for now if the PO can be posited of the supine form in general. In order to establish this, further investigation is needed on the behavior of the so-called 'verbal supine'. For the moment, we keep our generalization with respect to the CEN.

‘constantly reading newspapers’

As correctly predicted by our analysis, the infinitive CEN cannot be modified by such adverbs, it only accepts the corresponding adjective *constant*:

- (46) a. omiterea (\***constant**) a unor informații (??**constant**)  
omit-Inf-the constantly some information-Gen constantly
- b. omiterea **constantă** a unor informații  
omit-Inf-the constant-F.Sg some information-Gen  
‘the constant omission of information’

It should also be pointed out that although the adverb *constant* is homonymous with the masculine-neuter adjective *constant*, in (45) we are dealing with the adverb, and not with the adjective. As a test, adjectives in Romanian can appear prenominally. Notice the contrast between the supine and the infinitive CENs modified by the adjective *constant* in (47). It clearly shows that in (45) it cannot be the adjective modifying the supine.

- (47) a. \***constantul** **citit** al ziarelor  
constant-M.N.the read-Sup newspapers-Gen
- b. **constanta** **omitere** a unor informații  
constant-F.the omit-Inf some information-Gen

As a further confirmation, note also that in the case of suppletive adverb-adjective pairs,<sup>15</sup> the supine only accepts the adverb, so the supine in general is incompatible with adjectives:

- (48) Învățatul **bine** / \***bun** nu îl caracterizează.  
learn-Sup-the well / good not him characterizes  
‘Learning well is not really like him.’

## 6 Conclusions and cross-linguistic implications

Throughout this paper, we have focused on the morphological and aspectual differences between the infinitive and the supine CENs in Romanian which have led us to an explanation of their contrasting behavior with respect to plural marking.

We have shown in the spirit of the observation in Roodenburg (2006) that Grimshaw’s generalization does not hold entirely, since the infinitive CEN in Romanian does accept plural, contrary to predictions. However, we argued that this deviation is not directly related to a language parameter Romance vs. Germanic as Roodenburg claimed, since Romanian instantiates both varieties of CENs: with and without plural. The Romanian supine conforms to Grimshaw’s generalization, while the infinitive does not.

The sharp differences between the two Romanian CENs allowed us to explain the (un)availability of plural marking via the structural architecture of the CEN. We related

<sup>15</sup>We thank Patricia Cabredo Hofherr for suggesting this test to us.

the possibility to realize morphological number to the presence of a Number projection in the functional structure and we explained the unavailability of plural as a blocking effect of a semantic plural encoded in aspectual features as unboundedness. At the syntactic level, the unbounded feature is hosted by an Aspect projection which as a verbal projection blocks the realization of NumP, a nominal projection. We eventually reduced the contrast to an opposition between a nominal and a verbal pattern of realizing plural as Number and Aspect, respectively.

The generalizations we presented for Romanian seem to be also confirmed in other languages, as already predicted by Mourelatos (1978) and Borer (2005) who observe that telic/bounded CENs can pluralize, and only the atelic/unbounded ones cannot. The contrast is supported in English by the distinction between the nominal and the verbal gerund (see Alexiadou (2005) and Alexiadou et al. (to appear)). At the same time, the atelic/unbounded aspect of the base verb blocks plural also in Spanish infinitival nominals (Iordăchioaia and Soare 2007). The study of the Romanian CENs is particularly enlightening since the differences between the two plural patterns are very systematic and thus provide a reliable background to test further cross-linguistic generalizations with respect to the functional structure and the behavior of deverbal nominalizations.

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# *Presque* and *almost* : how argumentation derives from comparative meaning

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## 1 Introduction

In this text, we focus primarily on the semantic properties of the French adverb *presque*. Although we consider only French for the syntax-semantics interface, there is no essential difference between *presque* and *almost*, as witnessed by the English transliterations of the French examples. Like *almost*, *presque* is two-sided. It expresses an approximation and, in this respect, is quite similar to other adverbs like *environ* ('about') or *à peu près* ('nearly'). Moreover, as observed by Ducrot (1972) and Anscombe and Ducrot (1976), it has *argumentative* properties. Superficially, this means that the occurrence of *presque* in a discourse segment A may constrain the other segments related to A. Parallel observations exist for *almost*, see Sadock (1982); Penka (2006); Nouwen (2006); Jayez and Tovena (2007); van Gerrevink and de Hoop (2007) and others.

The paper is organised as follows. In section 2, we present the main syntactic and semantic properties of *presque*. In particular, we draw attention to its double set of approximation and argumentation properties, and look at the issue of approximating values that are too vague, through a discussion of the context dependence of *beaucoup* ('many'). In section 3, we tackle the approximation side of *presque* and *almost*. The intuition behind our proposal is that the expression *almost P*, where *P* is a property, points to properties that must count as the same as *P* for some purposes, i.e. be indiscernible, but at the same time be ordered among themselves. We argue that indiscernibility may characterise approximators at large, but *presque* and *almost* share argumentative properties that do not follow from it. In section 4, we look into these properties and show that the  $\neg P$  component of meaning is a conventional implicature, and that a comparative facet of meaning influences the argumentative behaviour of the two items. The syntax-semantics interface is presented in section 5. Extensions to other items and considerations on previous work are provided in section 6, rounding up the approach. Section 7 concludes the paper.

## 2 Characterisation

### 2.1 Main distributional properties

Categorially, *presque* can combine with gradable<sup>1</sup> and nongradable AdjPs (1) and with AdvPs (2).

- (1) Paul était presque blond / idiot / mort  
Paul was almost blond / stupid / dead
- (2) Paul a répondu presque (très) méchamment  
Paul answered almost (very) harshly

It can also combine with NPs (3a), verbs (3b), VPs (3c) or PPs (3d).

- (3) a. Presque tous les étudiants ont résolu le problème  
Almost all the students have solved the problem
- b. Paul a presque disséqué chaque article  
Paul has almost dissected each paper  
'For each paper, Paul almost dissected it'
- c. Paul a presque renoncé à son projet  
Paul has almost given up his project
- d. Paul a agi presque comme son père  
Paul has behaved almost like his father

*Presque* cannot be considered a sentential adverb, as shown by the unacceptable sentence initial positioning in (4a) and pre-verb positioning in (4b), nor a manner adverb, cf. the unacceptable post-verb positioning in (4c), see Molinier and Lévrier (2000); Bonami et al. (2004).

- (4) a. \*Presque Paul a renoncé à son projet  
Almost Paul has given up his plan
- b. \*Paul presque a renoncé à son projet  
Paul almost has given up his plan
- c. \*Paul a renoncé presque à son projet  
Paul has given up almost PREP his plan

*Presque* cannot occur after a non-finite verb (5). In all other cases, *presque* occurs just before the phrase it adjoins to.

- (5) \*Paul a été accusé de renoncer presque à son projet  
Paul has been accused to give up almost PREP his plan

<sup>1</sup>There are variations with gradable adjectives and adverbs. For instance, sentence (i) may be difficult to use, due to its requiring a previously identified shared standard for being 'big'. However, it remains acceptable. See Hitzeman (1992) and Morzycki (2001) for parallel observations on *almost*. On the contrary, sentence (ii) is perfect, a difference to which we return at the end of section 2.

(i) #Cette boîte est presque grande ('This box is almost big')

(ii) Cette boîte est presque trop grande ('This box is almost too big')

When it adjoins to quantified nominals, *presque* is subject to subtle differences. It is not always compatible with *la plupart* ('most'), *la majorité* ('the majority'), *la totalité* ('the totality'), *les deux tiers* ('the two thirds'), etc. However, an anonymous reviewer claims that, although *presque* is not compatible with *la plupart*, it is perfectly compatible with the others.<sup>2</sup> It turns out that the situation is more complex. In fact, all these nominals resist a combination with *presque* in subject position.

- (6) a. ??Presque la plupart des étudiants ont accepté la proposition du  
 Almost most students have accepted the proposal of the  
 doyen  
 dean
- b. ??Presque la totalité des étudiants ont/a accepté la proposition  
 Almost the totality of the students have/has accepted the proposal  
 du doyen  
 of the dean

In object position or within PPs, there is more variation, as shown by (7).

- (7) a. (?) Le doyen a contacté presque la plupart des étudiants  
 The dean has contacted almost most students
- b. (?) Le doyen a contacté presque la totalité des étudiants  
 The dean has contacted almost the totality of the students
- c. Comme presque la plupart des chats, mon minou à moi est ce qu'  
 Like almost most cats, my own kitty is what  
 on appelle un minou difficile<sup>3</sup>  
 you may call a fastidious kitty

These data are not isolated. Analogous examples exist for *pratiquement* and *quasiment* ('practically'). Moreover, expressions like *le/la N entier/entière* ('the whole' N) behave similarly.

- (8) a. ??Presque la planète entière est concernée par ce problème  
 Almost the whole planet is concerned by this problem
- b. Ce problème concerne presque la planète entière  
 This problem concerns almost the whole planet

We conjecture that *la plupart des N* and similar expressions denote complex individuals or *groups*, rather than generalized quantifiers.<sup>4</sup> This accounts for the fact that they

<sup>2</sup>This reviewer bases his/her claim on Google figures. This is not a reliable estimator since Google (i) does not 'see' obvious differences between, for instance, *presque la plupart* and *presque, la plupart* and (ii) does not filter out pages written by non-native speakers. We have performed a parallel investigation on a corpus of eleven years (1987-1998) of newspaper articles drawn from the French journal *Le Monde*. The results do not confirm those of Google, since, for instance, there is no occurrence of *presque la totalité* or *presque la majorité*. This leads us to think that it is very difficult to take the different figures at face value and that a preliminary classification of environments is needed to make sense of the results.

<sup>3</sup>From: [http://www.ciao.fr/Carrefour\\_Eminces\\_en\\_sauce\\_sachets\\_\\_Avis\\_1061286](http://www.ciao.fr/Carrefour_Eminces_en_sauce_sachets__Avis_1061286)

<sup>4</sup>However, they select properties that are only true of subsets of N that satisfy the relative size constraint conveyed by the expression, e.g. that a subset must be the totality of N with *la totalité*, bigger than half the size of N for *la majorité*, etc.

are not modified by *presque*, which does not modify individuals. When the quantified nominal is in object position, *presque* can be analysed as a VP modifier. For instance, (7a) might mean something like ‘The dean almost contacted the greatest part of students’. As for PPs, the improvement is due to the possible equivalence between *presque* Prep NP and Prep *presque* NP when the NP complement of the PP is associated with some quantity. For instance, *presque comme tout le monde* (‘almost like everybody’) and *comme presque tout le monde* (‘like almost everybody’) are both acceptable and hardly different.

The marked NPs are acceptable in elliptic answers (9) and can be the targets of elliptic *ou* (‘or’) corrections (10). We have no explanation for this difference, but we conjecture that it is related to the general fact that elliptic constructs do not require recovering the exact morpho-syntactic environment of the target sentences.

- (9) A – Combien d’étudiants ont réussi?  
How many students have succeeded?  
B – Presque la totalité  
Almost the totality
- (10) La totalité des étudiants, ou presque, ont réussi  
The totality of the students, or almost, have succeeded

Unlike *tous les*, *chaque* is not always compatible with *presque* (11a), except in correction phrases (11b) and temporal expressions (11c). This is due to the fact that *chaque* NPs do not measure quantities. In particular, they cannot be used to answer a question about number or proportion (12). In contrast, temporal expressions with *chaque* do have a measure interpretation (13).

- (11) a. ??Presque chaque étudiant a compris  
Almost each student has understood  
b. Chaque étudiant (, ou presque,) a compris (, ou presque)  
‘Each student got it, or nearly so’  
c. Presque chaque jour il y a un problème  
Almost each day there is a problem
- (12) A – Combien ont été convoqués?  
‘How many did they summon?’  
B – ??Chaque étudiant  
‘Each student’
- (13) A – Combien de fois Paul a-t-il été convoqué?  
‘How often did they summon Paul?’  
B – Chaque jour  
‘Each day’

However, certain examples show that the incompatibility with *chaque* NPs is not absolute, see (14a) that is a slightly modified version of an example suggested by a reviewer. In this sort of cases, the preferred reading is generic, habitual or dispositional, but not episodic, as evidenced by the contrast between (14a) and (14b). *Chaque* resembles *each* in that it demands distributive predicates. It seems that the crucial factor is the possibility for the predicate to characterise nonetheless the whole set of individuals.

This is the case whenever the set of eventualities referred to results from a 'global' situation, which affects each member of the set. For example, (14) conveys the idea that the topic in question is of special interest for the inhabitants as a whole. Further work is needed to offer a more precise account.

- (14) a. Presque chaque habitant du village a une histoire à raconter à ce sujet  
'Almost each inhabitant from the village has some story to tell on this topic'  
b. ??Presque chaque habitant du village a raconté une histoire  
'Almost each inhabitant from the village told some story'

Finally, when *presque* combines with an adjective, the adjective cannot occur in prenominal position (15a,b), in contrast with some French degree modifiers (15c).

- (15) a. Un chat presque gentil  
a cat almost kind  
'An almost kind cat'  
b. \*Un presque gentil chat  
An almost kind cat  
c. Un très / assez / bien / trop gentil chat  
a very / fairly / (quite/rather) / too kind cat

After this short review of syntactic properties of *presque*, we turn to semantics. Two distinct sets of properties must be taken into consideration, namely the properties that come from its being an approximator, and its specific argumentative properties, first noted by Anscombe and Ducrot (1976). In both respects, *presque* parallels fairly closely *almost*. Table 1 shows that approximators are incompatible with existential determiners and compatible with numerals and universal determiners.

|                    | <i>presque</i> | <i>à peu près</i> | <i>pratiquement</i> | <i>quasiment</i> | <i>en gros</i> |
|--------------------|----------------|-------------------|---------------------|------------------|----------------|
| <i>quelques</i>    | ??             | ??                | ??                  | ??               | ??             |
| <i>plusieurs</i>   | ??             | ??                | ??                  | ??               | ??             |
| <i>beaucoup</i>    | ??             | ??                | ??                  | ??               | ??             |
| <i>la plupart</i>  | ??             | ??                | ??                  | ??               | ??             |
| <i>la majorité</i> | ??             | ??                | ??                  | ??               | ??             |
| <i>tous les</i>    | OK             | OK                | OK                  | OK               | OK             |
| num. NPs           | OK             | OK                | OK                  | OK               | OK             |

Table 1 : Approximators

In short, as for the approximation side, *presque* behaves like its fellow items. *Mutatis mutandis*, table 1 describes also the behaviour of *almost*. Notice that *presque* + *beaucoup* on the third row and its corresponding *almost* + *many* may not be rejected by all speakers, but whatever degree of acceptability is assigned to them, it is inferior to that of e.g. *almost every*. We come back to it in section 2.2. On the other hand, *presque* is unexpectedly different from other approximators in its argumentative properties, see the contrast between (16) and (17) from (Anscombe and Ducrot, 1976).

- (16) #Peu d'automobilistes dépassent le 120 km/h, presque 20%  
#'Few car drivers go faster than 120 km/h, almost 20%'

[intended: it is correct to say that few car drivers go faster than 120 km/h since they are (only) 20%]

- (17) Peu d'automobilistes dépassent le 120 km/h, à peu près 20%  
'Few car drivers go faster than 120 km/h, about 20%'

## 2.2 Approximation and the context dependence of *beaucoup*

Generally speaking, approximations are defined on ordered sets with a more or less rich structure, e.g. partially ordered sets, linear orders (scales) or lattices. Approximators can apply to exact measures, degrees and sets of properties, see (18).

- (18) a. A peu près      chaud  
Approximately hot    [degree]  
b. A peu près      pendant deux heures  
Approximately for    two hours [measure]  
c. Paul a    presque réussi  
Paul has almost succeeded  
[properties: Paul almost satisfied the set of properties that count as succeeding]

Approximation is open to pragmatic constraints and the felicity of approximation depends on different independent factors. For instance, approximation hardly makes sense on too precise quantities (Krifka, 2007). Symmetric problems arise with too vague quantities (see below). Next, existentials and small numbers may be problematic with approximators, as it seems important to make room for approximation. Thus, an expression like ??*A peu près deux étudiants* ('about two students'), generally sounds odd and, at best, a sort of substitute for 'one' or 'three'. Finally, there are intervention effects with NPIs, as discussed by Penka (2006).

As we saw in table 1, *beaucoup* does not easily accept to be approximated. The question is how to account for the contrast in (19).

- (19) a. Cet exercice est trop difficile pour à peu près / presque 80% des  
This exercise is too difficult for about / almost 80% of the  
étudiants  
students  
b. ??Cet exercice est trop difficile pour à peu près / presque beaucoup  
??This exercise is too difficult for about / almost many  
d'étudiants  
students

The answer builds on the fact that approximators are defined over operators that return values (degrees or results of measures) and are not 'too vague'. An operator is too vague when it is not (even) a function but is totally contextual, this is the case of *un grand/petit nombre* exemplified in (20). The number referred to cannot be approximated through the linguistic expression itself. A given number can be viewed as small or large depending on the context and this not just with respect to the cardinality of the set under consideration. For instance, 'a small number of students' can stand for

any proportion of the set of students, including 100% if the total set of students corresponds to a ‘small’ number in the context. The same observation applies to (19). Proportional quantifiers like *la plupart* (‘most’) are partly different, as shown by (21). The vagueness of ‘most students’ is real but limited. 40% or 50% would not be good proportions whereas they would be possible candidates for ‘many students’.

- (20) ??A peu près un grand/petit nombre  
 ??Approximately a large/small number
- (21) a. La plupart des étudiants, ou presque ...  
 Most students, or almost ...  
 b. ??Beaucoup d’étudiants, ou presque ...  
 ??Many students, or almost ...

The fact that approximators do not occur naturally with expressions that are heavily context-dependent accounts directly for their incompatibility with certain determiners like *quelques*, which are neither exact nor proportional but refer to ‘moderate’ quantities, where ‘moderate’ is context-dependent. This extends to gradable adjectives (see note 1). Following Cresswell (1976) and Kennedy (1997), we take adjectives like *grand* (‘big’) to signal that the possible degrees are beyond some threshold of bigness. In general, the determination of this threshold is largely left to context, hence the possibly problematic combination with *presque*. However, accommodating the existence of a fixed threshold improves the examples. The role of *trop*, mentioned in note 1, is to point to this fixed threshold (Jayez, 1985).

### 3 *Presque and approximation*

#### 3.1 Indiscernibility

In this section, we start describing the meaning of *presque* as an approximator. The intuition we pursue is the following. *Presque P*, where *P* is a property, points to any *P'* such that *P* and *P'* are ‘indiscernible’. ‘Indiscernibility’ cannot be simply understood with respect to particular consequences, since two incomparable propositions may have the same consequences in a given context. Rather, we must say that *presque* + property *P* refers to a property that has the same particular consequences as *P* in contexts where having strictly *P* is not crucial for those consequences to obtain. For instance, *presque rouge* (‘almost red’) refers to a property that involves some degree of redness and is equivalent to ‘red’ in contexts where having strictly ‘red’ is not crucial.

This kind of reasoning applies also to properties of events. Sentence (22) is ambiguous, see the discussion in Martin (2005) among others. It has a first reading according to which Paul did not make any noise but was on the verge of screaming. In any context where screaming and being in an emotional state conducive to screaming have the same consequences, ‘almost screaming’ has those consequences.

- (22) Paul a presque crié  
 Paul has almost screamed

Sentence (22) also has a second reading according to which Paul shouted almost to

the point of screaming. In any context where screaming and shouting loudly have the same consequences, ‘almost screaming’ has those consequences.

In order to capture the meaning of *presque*, we must be able to establish a comparison among properties when a range of values must ‘count as the same’, i.e. be indiscernible, but at the same time be ordered among themselves. We proceed in steps. We first identify what logical expressions we must order (descriptions, that is, roughly speaking, the body of  $\lambda$ -terms). Next, we define the two ordering relations we use (degree or model-based), subsuming them under a common notation,  $<$ , in definition (25). Finally, we come to indiscernibility itself: two descriptions are indiscernible when they share their non-logical consequences in a given context (definition 28). A threshold for a description is a description ‘from which indiscernibility starts’, that is, a description above or below which non-logical consequences do not vary.

In order to express identity of consequences in a simple way, we use the model-theoretic notion of satisfaction. Assuming some typed  $\lambda$ -calculus, for each  $\lambda$ -term, its body is an expression in higher-order logics, where the  $\lambda$ -bound variables are free variables.<sup>5</sup> For instance, a property  $\lambda x.P(x)$  is paired with  $P(x)$ . Quite generally, a  $\lambda$ -term  $\lambda \vec{x}.\Delta(\vec{x})$  is paired with a *description*  $\Delta(\vec{x})$ , or simply  $\Delta$ . For instance, the  $\lambda$ -term corresponding to a verb *verb* in traditional Montague semantics has the form:  $\lambda Q\lambda \vec{y}.Q(\lambda x.verb'(x, \vec{y}))$ , where  $Q$  is a variable for generalized quantifiers. It is represented as  $Q(verb'(x, \vec{y}))$ . The usual restrictions on renaming apply. We will not insist on making the correspondence explicit every time, but the general rule of thumb is that we have in mind the  $\lambda$ -term when we need to combine things, and the description when we consider model-theoretic satisfaction.

As an example for degrees, consider the property of being red. An entity is ‘red’ if it exhibits a degree of redness equal or superior to a minimal degree required for qualifying as red. This can be represented as in (23).

$$(23) \quad \lambda x.red(x) = \lambda x.\forall y(redness-threshold(y) \Rightarrow \exists z(redness-degree(x, z) \& z \geq y))$$

If a description  $\Delta(x)$  involves degrees of a certain property  $P$  through a formula of the form  $P-degree(x, t)$ , we note  $deg_{\mathcal{M}}(\Delta, P)$  the union of the sets of degrees that satisfy  $P-degree(x, y)$  when  $x$  runs through all the values such that the model satisfies  $\Delta(x)$ .

$$(24) \quad \text{Let } \Delta(x) \text{ be a description where } P-degree(x, t) \text{ occurs for some term } t, \mathcal{M} \text{ a model and } g \text{ an assignment function. } deg_{\mathcal{M}}(\Delta, P) \text{ is defined as the following set of degrees:}$$

$$\cup\{Y : \exists g(\mathcal{M}, g \models \Delta(x) \& (y \in Y \Leftrightarrow \mathcal{M}, g \models P-degree(x, y)))\}$$

In order to rank  $\Delta$ ’s, we use a meta-relation  $<$  which covers the two cases of model-entailment and degree ordering.

$$(25) \quad \Delta_1(x) < \Delta_2(x) \text{ whenever:}$$

- a. for every model-assignment pair  $(\mathcal{M}, g)$ , if  $\mathcal{M}, g \models \Delta_2$  then  $\mathcal{M}, g \models \Delta_1$  and, for at least one model-assignment pair  $(\mathcal{M}, g)$ ,  $\mathcal{M}, g \models \Delta_1$  and  $\mathcal{M}, g \not\models \Delta_2$ ,

or

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<sup>5</sup>See Aczel and Lunnon (1991) for a discussion of the ‘parallel’ versions of  $\lambda$ -calculus, where variable substitution is done in one pass.



- b. for every  $\mathcal{M}$ ,  $deg_{\mathcal{M}}(\Delta_1, P) \subset deg_{\mathcal{M}}(\Delta_2, P)$  or each member of  $deg_{\mathcal{M}}(\Delta_1, P)$  is strictly inferior to each member of  $deg_{\mathcal{M}}(\Delta_2, P)$ .

(25) allows for the ‘at least’ and ‘exactly’ readings of degree expressions. For instance, if  $x$  is red, one can consider that it exhibits every degree of redness between its maximal degree and zero (the ‘at least’ reading) or that it exhibits only one degree (the ‘exactly’ reading).<sup>6</sup> In the former case,  $\Delta_1 < \Delta_2$  means that the set of redness degrees associated with  $\Delta_1$  is a strict subset of that associated with  $\Delta_2$ . For instance, if we have several red and pink objects and assume that every red object is redder than every pink object, we get (26), where  $\Delta_1(x)$  is *pink*( $x$ ) and  $\Delta_2(x)$  is *red*( $x$ ).

$$(26) \quad \begin{aligned} & \cup\{Y : \exists g(\mathcal{M}, g \models pink(x) \ \& \ (y \in Y \Leftrightarrow \mathcal{M}, g \models pinkness-degree(x, y)))\} \subset \\ & \cup\{Y : \exists g(\mathcal{M}, g \models red(x) \ \& \ (y \in Y \Leftrightarrow \mathcal{M}, g \models redness-degree(x, y)))\} \end{aligned}$$

In the latter case, the degrees for pink objects are strictly inferior to the degrees for red objects and we have (27).

$$(27) \quad \begin{aligned} & \forall d_1, d_2 \\ & ((d_1 \in \cup\{Y : \exists g(\mathcal{M}, g \models pink(x) \ \& \ (y \in Y \Leftrightarrow \mathcal{M}, g \models pinkness-degree(x, y)))\}) \ \& \\ & d_2 \in \cup\{Y : \exists g(\mathcal{M}, g \models red(x) \ \& \ (y \in Y \Leftrightarrow \mathcal{M}, g \models redness-degree(x, y)))\}) \\ & \Rightarrow d_1 < d_2) \end{aligned}$$

We are now ready to define indiscernibility for *presque*. In the definitions to come, it is understood that the interpretation of  $<$  (model entailment or degree) is kept constant in the different clauses.  $C$  stands for any set of formulas.  $C, g \models \Delta$  means that for any model  $\mathcal{M}$ , if  $\mathcal{M}, g \models C$ , then  $\mathcal{M}, g \models \Delta$ . We note  $\Delta \models_C \Delta'$  the fact that, for every  $g$ , if  $C, g \models \Delta$  then  $C, g \models \Delta'$ . In (28),  $C$  corresponds to a context of interpretation (not necessarily the actual context) and  $T$  to the set of consequences with respect to which two or more descriptions are indiscernible.

- (28)  $\Delta_1$  is *left*-indiscernible from  $\Delta_2$  w.r.t.  $T$  and  $C$  whenever
- $\Delta_1 < \Delta_2$ ,
  - $\Delta_2 \not\models T$ ,
  - $\Delta_2 \models_C T$  and,
  - if for every  $\Delta_3$  such that  $\Delta_1 < \Delta_3 < \Delta_2$  it is the case that  $\Delta_3 \models_C T$ , then  $\Delta_1 \models_C T$ .

In words,  $\Delta_1 (< \Delta_2)$  is *left*-indiscernible from  $\Delta_2$  whenever it has the same set of consequences as all other descriptions closer to  $\Delta_2$ . This is dependent on the context ( $C$  and  $T$ ) and does not necessarily hold for true logical consequences of  $\Delta_2$ , hence the  $\Delta_2 \not\models T$  condition. There is a very natural counterfactual reading of indiscernibility.<sup>7</sup> Using *presque*  $\Delta_2[a]$  for some entity  $a$  implies that, in the actual situation, say  $\mathcal{M}_0$ ,  $\Delta_2[a]$  is false. The situations  $C$  one could consider, for example, are all those situations that differ from  $\mathcal{M}_0$  in that (i) they are compatible with or satisfy  $\Delta_2[a]$  and (ii)  $\Delta_1[a]$  and its  $T$ -indiscernible variants satisfy  $T$ . At this point, we must eliminate two possible sources of confusion. First, a counterfactual situation  $C$  of that type can be

<sup>6</sup>For an analysis of scales and their entailment properties, see Horn (1972, 1989, sec. 4.4).

<sup>7</sup>See Ziegeler (2000) for the relation between *almost* and counterfactual interpretations.

markedly different from the actual situation. It is judged similar with respect to  $T$  only, not in general. For instance, a situation where Paul forgot his passport could be very different from a situation in which he almost forgot it, a situation where a bomb killed the president could be very different from a situation where he was only almost killed, etc. Second, indiscernibility concerns only those consequences of the  $T$ -indiscernible  $<$ -weaker variants of  $\Delta_2$  that are considered at some point in discourse, not each and every consequence. For instance, in the bomb example, there is nothing in definition (28) which requires that the long-term consequences of the explosion or the physical damage done to the president be included in  $T$ . In general, the interpretation is not constrained beyond general considerations of contextual appropriateness and communicative relevance. This distinguishes the very general notion of indiscernibility presented here from more demanding conditions on the similarity of worlds.

One can devise a symmetric definition for indiscernibility on the ‘right’, i.e. when  $\Delta_1 > \Delta_2$ .

- (29)  $\Delta_1$  is *left*-indiscernible from  $\Delta_2$  w.r.t.  $T$  and  $C$  whenever
- a.  $\Delta_2 < \Delta_1$ ,
  - b.  $\Delta_2 \not\models T$ ,
  - c.  $\Delta_2 \models_C T$  and,
  - d. if for every  $\Delta_3$  such that  $\Delta_2 < \Delta_3 < \Delta_1$  it is the case that  $\Delta_3 \models_C T$ , then  $\Delta_1 \models_C T$ .

Given some description  $\Delta_2$ , many descriptions can be *left*-indiscernible or *right*-indiscernible from  $\Delta_2$ . We introduce *thresholds*, that is, descriptions beyond or below which we have *left* or *right*-indiscernible descriptions with respect to  $\Delta_2$ .

- (30)  $\Delta$  is a *left*-threshold of  $\Delta_2$  w.r.t.  $C$  and  $T$ ,  $left.thr_{C,T}(\Delta, \Delta_2)$ , whenever (i)  $\Delta$  is not *left*-indiscernible from  $\Delta_2$  and (ii) every  $\Delta_1$  such that  $\Delta < \Delta_1 < \Delta_2$  is *left*-indiscernible from  $\Delta_2$  w.r.t.  $C$  and  $T$ . Similarly,  $\Delta$  is a *right*-threshold of  $\Delta_2$ ,  $right.thr_{C,T}(\Delta, \Delta_2)$ , whenever  $\Delta$  is not *right*-indiscernible from  $\Delta_2$  and every  $\Delta_1$  such that  $\Delta_2 < \Delta_1 < \Delta$  is *right*-indiscernible from  $\Delta_2$  w.r.t.  $C$  and  $T$ .

In the following, we omit  $C$  and  $T$  in order to simplify notation. For instance, we use  $left.thr(\Delta, \Delta_2)$  instead of  $left.thr_{C,T}(\Delta, \Delta_2)$ . Indiscernibility might be defined with  $\leq$  instead of  $<$ . This is largely a matter of convenience or convention. For instance, nothing in section 4.3 would be essentially different if we used  $\leq$ .

### 3.2 Two problems with indiscernibility

In view of the previous section, one would be tempted to think that the argumentative properties of *presque* are a consequence of indiscernibility. For a property  $P$ , *presque P* would be equivalent to  $P$  in the context. So, the non-logical conclusions one can draw from  $P$  could also be drawn from *presque P*. This view raises two difficulties.

First, there is a strong intuition that *presque P* points to an indiscernible value *but* implies  $\neg P$ . For instance *presque rouge* ‘almost red’ implies ‘not quite red’, *presque 18* implies ‘slightly less than 18’. If we substitute this implied value for *presque P* in (16), the oddness disappears (31). It is then unclear why this piece of information is not readily available to argumentation.

- (31) Peu d'automobilistes dépassent le 120 km/h, (légèrement) moins de 20%  
 'Few car drivers go faster than 120 km/h, (slightly) less than 20%'  
 [intended: it is correct to say that few car drivers go faster than 120 km/h since they are (only) (slightly) less than 20%]

Moreover, the very idea that *presque P* is argumentatively aligned with *P* is misleading. If things were so simple, the oddness would persist when we replace *presque P* by *P*. But this is not the case (32).

- (32) Peu d'automobilistes dépassent le 120 km/h, 20%  
 'Few car drivers go faster than 120 km/h, 20%'  
 [intended: it is correct to say that few car drivers go faster than 120 km/h since they are 20%]

It turns out that *presque P* is somewhat stronger than *P* in some cases. This is an unexpected observation, that the next section will contribute to make sense of.

## 4 *Presque* as a two-layered element

### 4.1 Two solutions and their problems

Ducrot (1972, 262-266) proposes that *presque* has two meaning components. *Presque P* presupposes  $\neg P$  and entails that the denoted property is close to *P*. According to him, discourse attachments tend to bypass presupposed propositions. This is what he calls *loi d'enchaînement* (1972, 81) ('linking law'). Given the linking law, the fact that the  $\neg P$  part is ignored in examples like (16) is no longer mysterious.

Ducrot is well aware that *presque P* may be argumentatively stronger than *P* in some sense. He accounts for the difference by a Grice-style reasoning. Being presupposed,  $\neg P$  is taken for granted.  $\neg P$  is all the more likely to be part of the common ground as *P* is high on some scale. For instance, it is *a priori* more plausible that somebody is not 7 feet tall than the contrary. In addition, according to him, by indicating that 'almost *P*', the speaker is all the more informative as she considers high values for *P*. So, the status of presupposition and informativity conspire to favour interpretations in which *P* is an upper element on some scale(s).

Each of these claims is problematic. If *presque* presupposed  $\neg P$ , this would be reflected in the standard tests for presupposition. However (33a) does not presuppose that Mary did not succeed, in contrast with (33b), which presupposes that Mary has been smoking, and (34a) is rather unintelligible, in contrast to (34b).

- (33) a. Paul pense que Marie a presque réussi  
 'Paul thinks that Mary almost succeeded'  
 b. Paul pense que Marie a cessé de fumer  
 'Paul thinks that Mary has stopped smoking'
- (34) a. #Si Marie a échoué, je suis content qu'elle ait presque réussi  
 #'If Mary failed, I am glad that she almost succeeded'  
 b. Si Marie a fumé, je suis content qu'elle ait cessé  
 'If Mary has been smoking, I am glad she stopped'

The Gricean reasoning proposed by Ducrot is open to objections. First, if  $\neg P$  is not a presupposition, one reason for preferring high values evaporates. Let us assume for the sake of argument that Ducrot is right in assuming that  $\neg P$  is presupposed. If  $P$  were a small value,  $\neg P$  would be *a priori* implausible but could be forced into the common ground by a preliminary assertion. In that case, *presque P* entails that the denoted value is close to  $P$ . There is no longer any reason for  $P$  to be high on a scale since  $P$  has been explicitly presented as low. Yet, *presque* is not totally appropriate under interpretations where ‘almost  $P$ ’ is a justification for a judgement that positions an entity in the lower part of a scale. In (35), the first assertion (‘Paul is very light’) makes it plausible that  $P$  (the property of weighing 52 kg) is low on the weight scale. In this perspective, ‘almost 52 kg’ should not be more problematic than a standard approximation like ‘about 52kg’, but it is.

- (35) a. #Paul est très léger puisqu’il pèse presque 52 kg  
 #‘Paul is very light since he weighs almost 52kg’  
 b. Paul est très léger puisqu’il pèse environ 52 kg  
 ‘Paul is very light since he weighs about 52 kg’

In subsequent work, Ducrot abandoned the Gricean view (Ducrot, 1980, 1983) for the notion of *argumentative scale*. Arguments in favour of a proposition can be ordered along scales:  $x >_A y$  if and only if  $x$  is a better argument than  $y$  with respect to the conclusion  $A$ . *Presque* selects argumentative scales that are homomorphic to degree scales. Specifically, *presque d* (where  $d$  is a degree) is appropriate for any property  $P$  and proposition  $A$  such that having  $P$  to  $d$  is a better argument for  $A$  than having  $P$  to  $d'$  for  $d' < d$ . This new approach accounts for contrasts like the one in (35). Since ‘Paul weighs almost 52 kg’ is an argument in favour of ‘Paul is very light’, and the weight scale is non-homomorphic to the argumentative scale (the lesser the weight of  $x$  the more likely the conclusion ‘ $x$  is light’), the argumentative link is predicted to be deviant.

However, as shown in Jayez (1987), this revised theory is not entirely satisfactory. First, the idea of argumentative strength is unclear. There is no self-evident explicit definition of ‘being a better argument than’. Second, it seems that assigning to *presque* a particular argumentative profile misses possible generalisations. For instance, the behaviour of *presque* is parallel to that of *plus de* (‘more than’)—compare (16,17) with (36)—although nothing in the theory leads one to expect this analogy.

- (36) a. #Peu d’automobilistes dépassent le 120 km/h, plus de 20%  
 #‘Few car drivers go faster than 120 km/h, more than 20 %’  
 b. Peu d’automobilistes dépassent le 120 km/h, moins de 20%  
 ‘Few car drivers go faster than 120 km/h, less than 20 %’

Jayez (1987) keeps the idea that *presque P* presupposes  $\neg P$  but adds a new element. He claims that (i) *presque P* entails that the actual value for  $P$  is *superior* to a proximity threshold and (ii) that the argumentative properties are not intrinsic semantic aspects but are derived from this comparative facet. We think that his comparative analysis is on the right track, and we adopt it, but Jayez’s (1987) proposal as such inherits the presupposition problem of Ducrot’s. It also suffers from some technical uncertainty about the proper way of calibrating the derivation mechanism. However, if such a mechanism was available, it would serve as the basis for explaining the similarity between

*presque* and *plus de*. We contribute precisely on this point.

## 4.2 A new approach

The proposal we develop in this section comes in two parts.

- We reanalyse the  $\neg P$  part as a *conventional implicature*, instead of a presupposition.
- We derive the argumentative properties of *presque* from a comparative facet of meaning, following Jayez (1987), but using Merin's (1999) decision-theoretic approach for calibrating the derivation mechanism.

### 4.2.1 The implicature of *presque*

In Jayez (2005), it is proposed that certain determiners like *plusieurs* 'several' convey simultaneously a conventional implicature and an entailment, and that this two-layered nature explains the apparent divorce between their referential and argumentative properties. We apply the same analysis to *presque*. As we saw in section 4.1, the  $\neg P$  part of *presque* cannot be a presupposition. It cannot be a conversational implicature either, since it is not cancellable, as evidenced by (37).

- (37) ??*Paul a presque été élu président, mais il a été élu président*  
 ??'Paul was almost elected president, but he was elected president'

$\neg P$  could be a conventional implicature. It has been noted (Jayez, 2005) that conventional implicatures, as characterised by Potts (2005) for instance, behave like presuppositions with respect to Ducrot's 1972 linking law, that is, they resist discourse connection in monologues.<sup>8</sup> For instance, in (38), the preferred interpretation is that the reason for smashing the hedge was that it is a beautiful array of flowers. In contrast, the interpretation using the conventional implicature, that is 'It is unfortunate that my neighbour smashed the hedge because it was a beautiful array of flowers', is not available.

- (38) #Unfortunatly, my neighbour smashed the hedge, because it was a gorgeous array of flowers

The advantage of classifying  $\neg P$  as a conventional implicature is that (i) this is compatible with the basic observations (non-cancellability, insensitivity to presupposition tests) and (ii) the absence of effect of the negative value of *presque* on discourse directly follows, see the second paragraph of section 3.2. More precisely, we claim that *presque*

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<sup>8</sup>The arguments offered in Nouwen (2006) are in favour of the conventional implicature option that we defend here. However, Nouwen seems to refrain from drawing the conclusion that *almost* conveys a conventional implicature, because he seems to assume that, in that case, the negative part of *almost* should be involved in normal discourse attachments. The interest of Ducrot's linking law is precisely that it can be extended to conventional implicatures, thus sparing us the trouble of explaining how part of meaning—the negative part of *presque* and *almost*—can be conventional (i.e. non-cancellable) and non-conventional (i.e. escape discourse attachments) at the same time. In fact, it is characteristic of non-central information (presuppositions and conventional implicatures) that it is invisible or poorly visible in discourse.



For the other cases, there are three vs. one and one, and five vs. one and one possibilities. On the whole, eleven possibilities satisfy  $v > z$ , whereas five satisfy  $v < z$  and three satisfy  $v = z$ . In the initial belief state, all possibilities are equally distributed, in the resulting state the proportion is in favour of  $v > z$ .

It has been independently proposed by Merin (1999) that the argumentation relation of Anscombe and Ducrot reflects *relevance* in the following sense.

- (40) In an epistemic state  $S \not\models \neg A$ ,  $A$  is positively (negatively) relevant to  $B$  whenever the probability of  $B$  in  $S \oplus A$  is higher (lower) than the probability of  $B$  in  $S$ .

More precisely, if we adopt the framework of Kripke models and assume probability distributions  $\text{Prob}_W$  on sets  $W$  of information points ('worlds'), we need the following minimal assumptions to make sense of (40).  $p_W$  denotes the set of points in  $W$  where  $p$  is true.

1.  $W' \subset W'' \subseteq W$  entails  $\text{Prob}_W(W') < \text{Prob}_W(W'')$  (probability ordering  $<$  is homomorphic to  $\subset$ ).
2. if  $W' \subset W$ ,  $\neg p_{W'} \subset \neg p_W$ , and  $p_{W'} = p_W$ , then  $\text{Prob}_{W'}(p) > \text{Prob}_W(p)$ .

The definition of relevance then comes out as (41).

- (41) Let  $W$  denote any set of propositional information points and  $\text{Prob}_W$  any probability distribution on  $W$ .  $p$  is positively (resp. negatively) relevant to  $p'$  whenever for every  $W$  such that  $W \not\models p$ ,  $W \not\models \neg p$ ,  $W \not\models p'$  and  $W \not\models \neg p'$ ,  $\text{Prob}_{W \oplus p}(p') > \text{Prob}_W(p')$  (resp.  $\text{Prob}_{W \oplus p}(p') < \text{Prob}_W(p')$ ).

In this perspective, the argumentative properties of *presque* emerge when the entailed content has positive or negative relevance with respect to some proposition. There is no need to postulate a special argumentative value. What we *do* need in our approach is the comparative value ( $v > \text{left.thr.}(y)$  above), which is independently found to play a role for other items (*plusieurs* 'several', *plus de* 'more than', *moins de* 'less than', *à peine* 'hardly').

The linking law of Ducrot (1972) can be extended to conventional implicatures to account for the fact that the 'negative' part of *presque* is less easily exploited than the 'positive' one. However, the linking law is best conceived as a preference that can occasionally be defeated, as evidenced by examples (42) that most speakers deem natural.

- (42) a. Paul n'a que presque dix-huit ans  
'Paul is only almost eighteen'
- b. Le livre n'est pas cher, seulement presque 20 euros  
'The book is cheap, only almost 20 euros'

We conjecture that the orientation imposed by *ne que* and *seulement* ('only') is responsible for this reversal of preference.<sup>10</sup>

<sup>10</sup>Interestingly, this observation is not replicated with *plusieurs* ('several'), as noted in Jayez (2005). More work is needed to determine what factors could account for the difference. We conjecture that the indiscernibility facet of *presque* is crucial here.

## 5 The syntax-semantics interface

For compactness, we use a categorial grammar presentation, see Steedman (2000). As usual, we use / and \ for left-associative and right-associative connectives. Capital roman characters refer to syntactic categories (N,V, etc.), variables  $X$ ,  $Y$ , etc. refer to strings. Semantic denotations are assigned to strings:  $\llbracket X \rrbracket$ ,  $\llbracket Y \rrbracket$ , etc.. Features of the general form attribute = value or attribute  $\neq$  value can be assigned to strings as needed. In section (2.1), we saw that *presque* can adjoin to AdjPs, AdvPs, NPs, PPs, Vs, and VPs. Accordingly, we have the possibilities in (43).

- (43) **Adjectives**  
 Syntax:  $Y:\text{AdjP}/X:\text{AdjP}$       Semantics:  $\llbracket Y \rrbracket = \llbracket \textit{presque} \rrbracket(\llbracket X \rrbracket)$
- Adverbs**  
 Syntax:  $Y:\text{AdvP}/X:\text{AdvP}$       Semantics:  $\llbracket Y \rrbracket = \llbracket \textit{presque} \rrbracket(\llbracket X \rrbracket)$
- NPs**  
 Syntax:  $Y:\text{NP}/X:\text{NP}$       Semantics:  $\llbracket Y \rrbracket = \llbracket \textit{presque} \rrbracket(\llbracket X \rrbracket)$
- PPs**  
 Syntax:  $Y:\text{PP}/X:\text{PP}$       Semantics:  $\llbracket Y \rrbracket = \llbracket \textit{presque} \rrbracket(\llbracket X \rrbracket)$
- VPs (with an auxiliary)**  
 Syntax:  $Z:(Y[\text{aux}=\text{true}] \setminus (\text{NP} \setminus \text{S})) / X:(Y[\text{aux}=\text{true}] \setminus (\text{NP} \setminus \text{S}))$   
 Semantics:  $\llbracket Z \rrbracket = \llbracket \textit{presque} \rrbracket(\llbracket X \rrbracket)$
- VPs (without auxiliary)**  
 Syntax:  $X:(\text{NP} \setminus \text{S})[\text{tense}=\text{finite}] \setminus Y:(\text{NP} \setminus \text{S})[\text{tense}=\text{finite}]$   
 Semantics:  $\llbracket Y \rrbracket = \llbracket \textit{presque} \rrbracket(\llbracket X \rrbracket)$
- Vs (with an auxiliary)**  
 Syntax:  $Z:\text{V}/X:(Y[\text{aux}=\text{true}] \setminus \text{V})$   
 Semantics:  $\llbracket Z \rrbracket = \llbracket \textit{presque} \rrbracket(\llbracket X \rrbracket)$
- Vs (without auxiliary)**  
 Syntax:  $Y:\text{V}/X:\text{V}[\text{tense} = \text{finite}]$   
 Semantics:  $\llbracket Y \rrbracket = \llbracket \textit{presque} \rrbracket(\llbracket X \rrbracket)$

When *presque* adjoins to an AdjP, an AdvP, a PP or a VP, it semantically modifies a property. When it adjoins to an NP, it modifies a generalized quantifier. When it adjoins to a verb, it modifies an object of type  $((ett)et)$ . In each case, the contribution of *presque* is similar. It entails that the actual degree or set of properties is above ( $>$ ) some indiscernibility threshold and implicates that it is below ( $<$ ) the degree or set of properties denoted by the expression modified by *presque*. The degree or property interpretation depends on the modified expression. In the spirit of Potts (2005), we represent the semantic contribution of the modifier as a two dimensional object, specifically a pair  $\langle E, CI \rangle$ , where  $E$  is the entailed content and  $CI$  the implicated content. The parallel descriptions corresponding to the three cases have the following form, where  $X$  is the string to which *presque* adjoins.

- (44) AdjPs, AdvPs, PPs and Vps  
 $\llbracket X \rrbracket = \Phi(x)$ ,  $x$  being of type  $e$ .
- NPs  
 $\llbracket X \rrbracket = \Phi(P)$ ,  $P$  being of type  $(et)$ .



Vs with complements

$\llbracket X \rrbracket = \Phi(Q, \vec{x})$ ,  $Q$  being of type  $(\vec{e} \ t) \ t$  and  $\vec{x}$  being a vector of individual variables.

- (45) Given contextual parameters  $C$  and  $T$ ,  
 $\llbracket presque \rrbracket_{C,T} = \lambda \Delta(\vec{v}). \langle \exists \Delta'(\vec{v}), \Delta''(\vec{v}) (\text{left.thr}_{C,T}(\Delta', \Delta) \ \& \ C \models \Delta'' \ \& \ \Delta'' \succ_{C,T} \Delta'), \neg \exists \Delta'(\vec{v}) (C \models \Delta' \ \& \ \Delta' \geq \Delta) \rangle$

We provide a set of examples illustrating definition (45).

- (46) *Presque rouge* ‘almost red’  
 $\langle \exists \Delta'(x), \Delta''(x) (\text{left.thr}_{C,T}(\Delta', \llbracket red \rrbracket_C(x)) \ \& \ C \models \Delta'' \ \& \ \Delta'' \succ_{C,T} \Delta'), \neg \exists \Delta'(x) (C \models \Delta' \ \& \ \Delta' \geq \llbracket red \rrbracket_C(x)) \rangle$   
*Presque tous les étudiants* ‘almost every student’  
 $\langle \exists \Delta'(P), \Delta''(P) (\text{left.thr}_{C,T}(\Delta', \llbracket every \ student \rrbracket_C(P)) \ \& \ C \models \Delta'' \ \& \ \Delta'' \succ_{C,T} \Delta'), \neg \exists \Delta'(P) (C \models \Delta' \ \& \ \Delta' \geq \llbracket every \ student \rrbracket_C(P)) \rangle$   
*détester presque* ‘to almost hate’  
 $\langle \exists \Delta'(Q, x), \Delta''(Q, x) (\text{left.thr}_{C,T}(\Delta', \llbracket hate \rrbracket_C(Q, x)) \ \& \ C \models \Delta'' \ \& \ \Delta'' \succ_{C,T} \Delta'), \neg \exists \Delta'(Q, x) (C \models \Delta' \ \& \ \Delta' \geq \llbracket hate \rrbracket_C(Q, x)) \rangle$

Let us now analyse Anscombe and Ducrot’s example (16). We assume the following correspondences ( $C$  and  $T$  are left implicit).

1.  $\llbracket peu \ de \rrbracket = \lambda P, P'. \llbracket P \ \& \ P' \rrbracket < \text{few.thr.}(P)$ ,  
 where  $\text{few.thr.}(P)$  is a ‘fewness’ threshold for  $P$ .
2.  $\llbracket peu \ d'automobilistes \rrbracket = \lambda P. \llbracket \llbracket drivers \rrbracket \ \& \ P \rrbracket < \text{few.thr.}(\llbracket drivers \rrbracket)$ ,
3.  $\llbracket peu \ d'automobilistes \ dépassent \ le \ 120 \ km/h \rrbracket =$   
 $\llbracket \llbracket drivers \rrbracket \ \& \ \llbracket fast \rrbracket \rrbracket < \text{few.thr.}(\llbracket drivers \rrbracket)$ .
4.  $\llbracket 20\% \ des \ automobilistes \rrbracket = \lambda P. \llbracket \llbracket drivers \rrbracket \ \& \ P \rrbracket = 0.2 \llbracket \llbracket drivers \rrbracket \rrbracket$
5.  $\llbracket presque \ 20\% \ des \ automobilistes \rrbracket =$   
 $\lambda P. \langle \exists \Delta'(P), \Delta''(P) (\text{left.thr.}(\Delta', \llbracket \llbracket drivers \rrbracket \ \& \ P \rrbracket = 0.2 \llbracket \llbracket drivers \rrbracket \rrbracket)) \ \& \ \Delta'' \ \& \ \Delta'' \succ \Delta'),$   
 $\neg \exists \Delta'(P) (\Delta' \ \& \ \Delta' \geq \llbracket \llbracket drivers \rrbracket \ \& \ P \rrbracket = 0.2 \llbracket \llbracket drivers \rrbracket \rrbracket) \rangle$
6.  $\llbracket presque \ 20\% \ des \ automobilistes \ dépassent \ le \ 120 \ km/h \rrbracket =$   
 $\langle \exists \Delta'(\llbracket fast \rrbracket), \Delta''(\llbracket fast \rrbracket) (\text{left.thr.}(\Delta', \llbracket \llbracket drivers \rrbracket \ \& \ \llbracket fast \rrbracket \rrbracket = 0.2 \llbracket \llbracket drivers \rrbracket \rrbracket)) \ \& \ \Delta'' \ \& \ \Delta'' \succ \Delta'),$   
 $\neg \exists \Delta'(\llbracket fast \rrbracket) (\Delta' \ \& \ \Delta' \geq \llbracket \llbracket drivers \rrbracket \ \& \ \llbracket fast \rrbracket \rrbracket = 0.2 \llbracket \llbracket drivers \rrbracket \rrbracket) \rangle$

Under this form, we see that the intended discourse relation of justification connects  $(\alpha)$  and  $(\beta)$ .  $(\gamma)$  is kept apart since it stands for the implicated content.  $(\beta)$  says that the actual proportion of ‘fast’ drivers (those who pass 120 km/h) is superior to an indiscernibility threshold. As explained for (39), such a connection would violate positive relevance.

$(\alpha) \llbracket \llbracket drivers \ \& \ fast \rrbracket \rrbracket < \text{few.thr.}(\llbracket drivers \rrbracket)$

$(\beta) \Delta'(\llbracket drivers \rrbracket, \llbracket fast \rrbracket) < \Delta''(\llbracket drivers \rrbracket, \llbracket fast \rrbracket)$

$(\gamma) \Delta''(\llbracket drivers \rrbracket, \llbracket fast \rrbracket) < \llbracket \llbracket drivers \rrbracket \ \& \ \llbracket fast \rrbracket \rrbracket = 0.2 \llbracket \llbracket drivers \rrbracket \rrbracket$

It is possible to extend (45) to cases where the indiscernibility-threshold is on the right, which seems necessary to interpret examples like (47). In such cases, the speaker presumably intends to signal that, for Paul, the property of being eighteen and three months is not, with respect to the targeted conclusions, significantly different from the property of being eighteen. While nothing crucial hinges on the admission of two

symmetric thresholds instead of one, it seems that the default option for *presque* is left-indiscernibility.

- (47) Paul est encore très jeune: après tout, dix-huit ans et trois mois c'est presque dix-huit ans  
 'Paul is still very young: after all, eighteen and three months, it's almost eighteen'

## 6 Extensions and discussion

As noted above, the kind of approach we defend can be extended to other items. Since *plus de* ('more than') and *moins de* ('less than') have a comparative instruction directly built into their semantics, they exhibit similar or symmetric behaviours to that of *presque*. This is true also of *au moins* ('at least') and *au plus* ('at most'), although their detailed semantics is complex. As noted already in Ducrot (1972), *à peine* ('hardly') can be described as symmetric to *presque*, as illustrated in (48).

- (48) a. ??Beaucoup d'automobilistes dépassent le 120 km/h, à peine 20%  
 ??'Many drivers drive faster than 120 km/h, hardly 20%'  
 b. Peu d'automobilistes dépassent le 120 km/h, à peine 20%  
 'Few drivers drive faster than 120 km/h, hardly 20%'

A major difference with *presque* is that *à peine P* implicates *P*, hence the oddness of (49b).

- (49) a. Paul a presque dix-huit ans, mais il n'a pas dix-huit ans  
 'Paul is almost eighteen, but he is not eighteen'  
 b. ??Paul a à peine dix-huit ans, mais il n'a pas dix-huit ans  
 ??'Paul is barely eighteen, but he is not eighteen'

Another difference is that *à peine* seems to be even less natural than *presque* in contexts that violate relevance. It is possible that *à peine* is preferably associated with low values. This would account for contrasts like those in (50), noted in Jayez (1987).

- (50) a. ??Le thé est à peine brûlant  
 ??'The tea is hardly very hot'  
 b. Le thé est à peine chaud  
 'The tea is hardly warm'

The semantics of *à peine* is given in (45).<sup>11</sup>

- (51) Given contextual parameters *C* and *T*,  

$$\llbracket \text{à peine} \rrbracket_{C,T} = \lambda \Delta(\vec{v}). \langle \exists \Delta'(\vec{v}), \Delta''(\vec{v}) (\text{right.thr}_{C,T}(\Delta', \Delta) \& C \models \Delta'' \& \Delta'' <_{C,T} \Delta'), \neg \exists \Delta'(\vec{v}) (C \models \Delta' \& \Delta' < \Delta) \rangle$$

<sup>11</sup>We disregard the temporal uses of *à peine* in this paper. They seem to be amenable to a variant of (51), though.

As explained in Jayez (1987), (51) predicts that *à peine* will not be felicitous with *maximum standard* gradable adjectives like *brûlant*, that is, adjectives which require that their argument possess a maximal degree of the denoted property (Kennedy and McNally, 2005; Kennedy, 2007). It is difficult to imagine degrees above a maximal degree, which explains the relative infelicity of (50) and similar examples.<sup>12</sup> However, other examples cannot be disposed of in the same way (Jayez, 1987). We won't go into them here and will consider (51) as a first try, probably in need of correction and precision.

Unexpectedly, expressions like *autant de ... que (de) ...* ('as many as') also have argumentative properties. Again, this was noted by Anscombe and Ducrot, see the contrast in (52) and Anscombe (1975, 1976) for a detailed analysis.

- (52) a. #Paul n'est pas très prolifique puisqu'il a écrit autant d'articles que Marie  
#Paul is not highly productive since he has written as many papers as Mary'  
b. Paul est très prolifique puisqu'il a écrit autant d'articles que Marie  
'Paul is highly productive since he has written as many papers as Mary'

It is certainly difficult to see how equality can convey argumentative preferences. This difficulty has sometimes led to a rejection of the very idea of ascribing argumentative force to these items (de Cornulier, 1984). Granted that the notion of equality and the contrast in (52) support conflicting intuitions in this case, we submit that the solution lies in a division of labour between implicature and entailment. Specifically, *autant* implicates  $\leq$  and entails  $\geq$ . In this way, equality is preserved but kept unbalanced.

$$(53) \quad \llbracket \textit{autant} \rrbracket = \lambda P, \lambda P'. \langle \llbracket P \rrbracket \geq \llbracket P' \rrbracket, \llbracket P \rrbracket \leq \llbracket P' \rrbracket \rangle$$

Returning to *presque*, two further points are worth mentioning. First, it has been observed by Martin (2005) that *faillir de* 'to be on the verge of' et *presque* are significantly different in certain cases, illustrated in (54).

- (54) a. ??Paul a failli réussir, en fait il a réussi  
'Paul has been on the verge of success, in fact he succeeded'  
b. Paul a presque réussi, en fait il a réussi  
'Paul almost succeeded, in fact he succeeded'

This suggests that *faillir*, in contrast to *presque*, is not sensitive to *perspectives* in the sense of Jayez and Beaulieu-Masson (2006). The intensional entities that *presque* qualifies can be 'objective' or open to evaluation. In the former case, there is no difference between *faillir* and *presque*, as shown by (55).

- (55) a. ??Paul a failli gagner la course, en fait il a gagné  
??'Paul has been on the verge of winning the race, in fact he won'  
b. ??Paul a presque gagné la course, en fait il a gagné  
??'Paul almost won the race, in fact he won'

When an entity is open to evaluation, we observe that it can be nested in the characteristic constructions for viewpoints, in French *je trouve que* ( $\approx$  'I deem that') and *de ce*

<sup>12</sup>Jayez (1987) shows that combining *à peine* with such adjectives is possible in particular contexts.

*point de vue* ‘in this respect’, see (56).

- (56) a. De ce point de vue / Je trouve que Paul a réussi  
           ‘In this respect / I deem that Paul succeeded’  
       b. #De ce point de vue / Je trouve que Paul a dix-huit ans  
           #‘In this respect / I deem that Paul is eighteen’

*Faillir* simply implicates that the actual value is below the target value, but *presque* implicates that this is the case either objectively or under a given perspective. When the perspective-based reading is possible, a correction by *en fait* ‘in fact’, or equivalent expressions, is also possible and signals a perspective change. The integration of this sensitivity in the semantics of *presque* is left for future work.

Finally, we comment briefly on recent analyses of *almost* in terms of possible worlds (Morzycki, 2001; Nouwen, 2006). Nouwen, for instance, characterises what he calls *intensional* approaches as saying that *almost*  $\phi$  is true whenever  $w \models \phi$  for some  $w$  close to the actual world. He argues that, in order to account for an example like (57), a scalar approach has to postulate a scale based on the VP denotation and is likely to run into problems at this stage, because *qualify* does not give access to what is relevant, i.e. Travis’ efforts, in the interpretation of the sentence.

- (57) Travis almost qualified for the long-jump final

We agree with Nouwen that, in itself, the VP does not provide sufficient cues for interpretation. Still, this does not condemn a scale-based theory, at least if we take ‘scale’ in the very general sense of ‘ordering’.

First, if we assume—as we did in this paper—that the indiscernibility scales are contextual, the difference between our ‘scalar’ theory and an intensional one seems to be rather thin. In fact, we need a minimum of scalar structure to inform a *counterfactual* reasoning (Ziegeler, 2000). According to (57), Travis did not qualify. Either he did not achieve the degree of performance needed for qualifying or he had not all the necessary properties. However, there is a set of conclusions that are left untouched by the difference between a genuine qualification and Travis’ unsuccessful attempt. For instance, Travis was, anyway, a valiant competitor, proved that he was able to qualify, to beat the long-jump record, etc. It seems that we have two options. We can order these indiscernible degrees or set of properties on a scale, in the very general sense of a ranking, *or* decide for an intensional analysis. In the latter case, we would say that, in some world minimally different from the actual one, Travis qualified. This world corresponds to a counterfactual paraphrase: ‘If Travis had qualified, things would not have been very different from what they are’. Such a world would be described with the help of the untouched set of conclusions that we mentioned. That is, ‘a minimally different’ world means a world in which, except for the fact that Travis qualified, the ‘rest’ is as in the actual world. But, as we explained just after definition (28), the ‘rest’ must only include what we have described as the propositions that do not crucially depend on Travis’ success. It is not required, in addition, that the worlds where Travis succeeds be extremely close to the actual world, because the consequences of Travis’ success or failure could be remarkably different. So, it seems that resorting to an intensional approach is perfectly legitimate but cannot use a general mechanism of modal similarity between worlds.

Second, we have made clear that it will be very difficult to account for the argumentative properties of *presque*, *almost* and other items without some notion of comparison ( $<$  or  $\leq$ ) between a 'limit' (threshold) and a value. An intensional analysis has, in any case, to make room for the notion.

## 7 Concluding remarks

In this paper, we have provided an integrated description of the main properties of *presque* and its English counterpart *almost*. On the one hand, we have characterised their behaviour as approximators via the notion of indiscernibility of descriptions, defined as contextual equivalence with respect to a variable set of conclusions. On the other hand, we have provided an account of their argumentative properties in connection with the approximation value. *Presque P* (and *almost P*) conventionally implicates  $\neg P$  and entails that the actual value is superior to the left threshold of *P*, but indiscernible from *P* for the purposes at issue. The usefulness of the notion of threshold goes beyond this specific case, on to items such as *à peine* ('hardly') and *au moins* ('at least'). Furthermore, the two-layered approach defended in this paper extends to other classes of elements that exhibit argumentative properties, including expressions of equality like *autant de ... que (de) ...* ('as many as'). We have thereby offered reasons to reduce the argumentative properties of these items to the type of comparative semantics which has been independently advocated for adjectives.

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# Scalarity and state-changes in Mandarin (and other languages)

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One of the goals of lexical semantics is to delineate the space of possible meanings, how it varies across language, and to compare that space with what we know of conceptual space. Vendler (1967), Dowty (1979), Carter (1976), Bach (1986), Talmy (2000), among others, have argued that the space of verb meanings can be divided into four quadrants. Verbs can describe states, processes, changes of state, or causal events. Individual verb meanings, then, differ in the constraints they impose on the base predicates (states and processes) and their arguments. Individual verbs can, of course, be quite idiosyncratic in the constraints they impose on (induced) states and participants. Thus, the French verb *limoger* is defined in the *Trésor de la langue française* as in (1a). Its idiosyncrasy, though, does not prevent its meaning from being analyzed as composed of the same building blocks as other verb meanings, as shown, very informally, in (1b). (We use, for mere expository purposes, some standard lexical decomposition representational scheme. “*Military*” is a stand-in for another conjunct (or possibly, a presupposition) constraining the argument of *relieved-of-command*. Nothing substantial hinges on these expository conveniences.)

- (1) a. *limoger* ‘to relieve a high-ranking military officer of his/her command’  
 b. CAUSE(x, BECOME(*relieved-of-command* (“*military*”)))

Similarly, the French verb *chambrier*, whose definition in (2a) seems equally idiosyncratic, can be equally aptly (and equally informally) schematized along the lines of (2b).

- (2) a. *chambrier* ‘to keep a bottle of wine in a warm room so that it can slowly be brought to room temperature’  
 b. CAUSE(x, BECOME(*at-room-temperature* (“*wine*”)))

Such idiosyncratic variation in verb meaning does little to further elucidate the space of possible verb meanings, aside, possibly, from shedding light on its informational boundaries. This paper investigates more systematic differences within and across languages between verb meanings. In particular, we discuss differences in the kinds of induced changes of states languages may have verbs for. What varies across verb meanings within and across languages in our study are the kinds of caused or induced changes of state, not the end states or processes by themselves. Verb meanings

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can vary in the kinds of states, processes, and the arguments they lexicalize; but they can also vary in the properties of induced changes of state they lexicalize, even though they may not vary in the meaning of the stems denoting base states or processes.

## 1 The incompleteness effect

Sentences like (3)-(10) are semantically felicitous in a variety of South- and East-Asian languages, among which, at least, Hindi (see (3)-(5) and Singh (1998)), Tamil (Paramasivam (1977)), Thai (see (6) and Koenig and Muansuwan (2000)), and Mandarin (see (7)-(10) and Smith (1997)).

- (3) *chaar auraton=ko mAAraa gayaa par keval do mArii*  
 4 women=DAT kill go-PERFV but only 2 died  
 ‘Four women were killed but only two of them died./He wanted to kill four people but only two died.’
- (4) *us=ne ek cup chai pii par purii nahii pii*  
 Pron.3.Sg=ERG one cup tea drink but all NEG drink  
 ‘He drank a cup of tea, but he did not drink all of it.’
- (5) *us=ne do murgiyaa pakaayii par vo taiiyaar nahii hai*  
 Pron.3.Sg=ERG two chicken cook but Pron.3.Pl ready NEG be  
 ‘He cooked two chickens but they are not ready yet.’
- (6) *Surii t`εεŋ klɔn bɔt nii k<sup>h</sup>ũn tɛɛjaŋ māj sɛd*  
 Surii compose poem CL this SEMI-PERFV but still not finish  
 ‘Surii composed this poem, but has not finished it yet.’
- (7) *Xu Mei he Sun Mazi ba Lao Luo sha le mei sha-si*<sup>Google</sup>  
 Xu Mei and Sun Mazi BA Lao Luo kill PERF not kill-die  
 ‘Xu Mei and Sun Mazi killed Lao Luo but didn’t make him die. (lit.)’
- (8) *PinWei qingji zhixia jiu ba JiaHui gei sha le, mei xiangdao Jiahui mei*  
 PinWei nervous under then BA JiaHui give kill LE, not think Jiahui not  
*si, buguo que hunmibuxing lo*<sup>Google</sup>  
 die, but coma Sent.Ptr.  
 Pinwei killed Jiahui under stress; he didn’t expect that Jiahui didn’t die, but she was in a coma ...’ (Intended Reading)
- (9) *wo (...) gai le xin fangzi, fangzi hai mei gai-wan*<sup>Google</sup>  
 I (...) build PERF new house, house still not build-finish  
 ‘I build a new house, but it is not finished.’
- (10) *Tuoersitai-de Zhanzheng yu Heping wo bu xihuan, du le ji ci*  
 Tolstoy’s War and Peace I not like, read PERF several time  
*dou mei du-wan*<sup>Google</sup>  
 all not read.finish  
 ‘I don’t like Tolstoy’s War and Peace, I read it several times, but never finished reading it.’

The phenomenon sentences (4)-(10) illustrate can be described as follows. Sentences whose English translations typically denote induced changes of state can felicitously apply to situations where the change of state seems to not have occurred. In other words, it is as if, in those languages, there are described killings in which no death occurred, repairs in which nothing gets fixed, persuasions in which nobody was persuaded ... We call this phenomenon the *Incompleteness Effect* (in short, the IE), meaning that the described killings, repairs, or persuasions need not be completed. For reasons of space, we concentrate mostly on Mandarin in this paper and only provide suggestive data from Hindi and Thai.

Although a killing may not strictly have occurred for sentences such as (7) to felicitously apply,<sup>1</sup> the patient must have been affected in some way, as the following examples from Mandarin illustrate. The change also typically needs to be significant enough. A scratch would not satisfy the semantic requirement that Lisi be affected in (12). In fact, *shā* can only be used when the agent used a weapon of some sort (hands included) to attempt to kill the patient and manages to at least significantly injure him/her. (Since the need for a significant change to have occurred might be a Gricean effect and what constitutes a significant change varies with individual verbs, we do not discuss it further in this paper.)

- (11) #Jintian zaoshang chi le yi ge hanbao, buguo wo liean yi kou ye  
 Today morning eat PERF one CL hamburger, but I even one bit also  
 mei chi  
 not eat  
 'I ate a hamburger this morning, but I didn't even have one bite.'
- (12) #Ta sha le Lisi, danshi Lisi mei shou bandian shang  
 He kill PERF Lisi, but Lisi not receive little.bit injury  
 'He killed Lisi, but Lisi was not even hurt a little bit.'

The fact that many induced state change stems in several languages display the IE effect suggests that it is unlikely to be due to just a stem or two being wrongly glossed. (13) lists some Mandarin verb stems which display the IE when inserted in a syntactic frame of the kind illustrated in sentences (7)-(10). (Note that the English translations of some verbs in (13) may also lead to the IE, a point we return to briefly at the end of the paper.)

- (13) *jiǎn* 'to cut with scissors', *xiū* 'to repair', *quàn* 'to persuade', *shā* 'to kill', *guān* 'to close', *niàn* 'to read', *chī* 'to eat', *hōng* 'to dry (clothes)', *xǐ* 'to wash', *zhǔ* 'to cook', *dú* 'read', *xiě* 'write', *bèi* 'to recite (memorize)', *chàng* 'to sing', *xiàzài* 'to download', *jiāo* 'to teach', *gài* 'to build', *zhì* 'to cure', *guān* 'to close', *zhuā* 'to catch', *diǎn* 'to light up', ...

The IE and the existence of incomplete languages raises two questions. (i) What is the source of the Incompleteness Effect? (ii) Is there a way of capturing what is com-

<sup>1</sup>Examples such as (7) and (8) are felicitous for this paper's second author and we found dozens of attested sentences on Google in which the patient's death is explicitly denied in a subsequent clause. But, some native speakers reject our attested examples (7) and (8). We do not know at present if dialectal differences or other factors are the source of this apparent discrepancy.

mon to the meaning of corresponding stems that differ in “completeness” in two languages (e.g., Mandarin and English)? The first question is an exercise in (Fregean) sentential semantics and is the topic of section 2. The second question is an exercise in comparative semantics and is the topic of section 3.

## 2 The source of the incompleteness effect

Frege (1884) wrote the following dictum:

‘Only in the context of sentences do words have meaning.’ (Frege, 1884)  
 (‘nach der Bedeutung der Wörter muß im Satzzusammenhange, nicht in ihrer Vereinzelnung gefragt werden’)

Pelletier (2001) names this principle the *Context Principle* and discusses its various interpretations. For our purposes, the relevant interpretation is methodological. If the Context Principle is correct, what we observe, as semanticists, once pragmatic enrichments are removed from an utterance’s interpretation, are the semantic values of sentences or propositions. The meaning of words and morphemes are the result of theorizing (we have only indirect access to them). We can see the effect of Frege’s Context Principle in Zucchi’s (1999) indirect access problem, i.e. that we only have indirect access to the meaning of bare sentences that serve as input to tense and aspect markers. More generally, we only have indirect access to the meaning of *all* sub-sentential natural language expressions.

The methodological consequences of the Context Principle are particularly stark when trying to explain the IE. To see why, consider the schematic representation of the meaning of the relevant sentences in (14), where *Operator’* stands in for the relevant aspect (or tense) operators. The semantic expression in (14) contains expressions that belong to three semantic types: entities, relations, and, property/relation modifiers (assuming with de Swart (1998) that aspect operators are event description modifiers). If we make the assumption that the semantic content of sentences such as (7) can be schematized, informally as in (15), there can be three sources of the IE: the meaning of the aspect (or tense) operators, the meaning of NPs that denote arguments, and the meaning of the verbal stems. Much work in the last thirty years has demonstrated that all these components of a sentence’s meaning can affect its Aktionsarten and telicity. In other words, Mandarin (and Hindi, Tamil, and Thai) can differ from English and English-like languages in the kinds of meaning that are associated with a subset of their verbal stems that describe induced changes of state; they can differ in the kinds of meaning their perfective-like aspect operators encode; or they can differ in the meaning of some of their NPs. It is a testimony to the methodological correctness of Frege’s Context Principle that all three hypotheses have been proposed.

(14) Operator’ (Verb’(e, argument’<sub>1</sub>, ... argument’<sub>n</sub>))

(15) -le’(sha’(e, Xu Mei, Lao Luo))

## 2.1 Three possible sources of the IE

Soh and Kuo (2005) proposes the following hypothesis to account for the IE in Mandarin.

**Hypothesis 1** (The Quinian hypothesis, Soh and Kuo, 2001). *The source of the IE is the denotation of one or more of the stems' arguments.*

Simply put, their hypothesis is that the denotation of (some) theme/patient NPs in Mandarin differs from the denotation of corresponding theme/patient NPs in English; their denotation is paraphraseable as *a non-necessarily proper part of NP* where *NP* is the denotation of the corresponding NP in English. Thus, sentence (16) from Tai (1984) would be better translated as (17), according to this hypothesis. Soh and Kuo's hypothesis is reminiscent of Quine's (1960, 1969) argument to the effect that the reference of terms is not determined by the truth or falsity of sentences they appear in. Hence, the mnemonic name for this hypothesis. Note that English sentences whose patient NPs' denotation is similar to the purported denotation of *yi-feng xin* 'a letter' in sentence (16) display the same entailment failure, as (18) demonstrates. The difference in entailments between Mandarin and English is thus ascribed, according to the Quinian hypothesis, to differences in the denotation of some NPs.

- (16) Wo zuotian xie-le yi-feng xin, keshi mei xie-wan.  
I yesterday write.PERF one.CL letter, but not write.finish  
'I wrote a letter yesterday, but I didn't finish it.'
- (17) 'I wrote (a non-necessarily proper) part of a letter yesterday, but I didn't finish it.'
- (18) Schubert composed *part of* the Unfinished Symphony ≠ The Unfinished Symphony has been (completely) composed.

Smith (1997) proposes that the meaning of Mandarin *-le* is not that of ordinary perfect(ive) markers. Its denotation is paraphraseable as *stopping* (in contrast to *finishing*). Thus, sentence (16), according to this hypothesis, would be more appropriately translated in English as (19) (*modulo* the conversational implicature that the main clause of the English translation conveys (that the letter was not finished), which Mandarin *-le* does not convey).

- (19) 'I stopped writing a letter yesterday and didn't finish it.'

If generalized, Smith's proposal amounts to the following hypothesis.

**Hypothesis 2** (Aspectual Hypothesis, Smith, 1997). *The source of the IE lies in the meaning of aspect operators.*

English sentences that use aspectual verbs (in the sense of ter Meulen (1995)) that are close paraphrases of the putative meaning of Mandarin perfective operators display the same entailment failure characteristic of Mandarin, as (20) shows. This suggests that Smith's Aspectual Hypothesis, which adjusts the meaning of aspect operators across these two languages *can*, in principle, correctly model the difference between English and Mandarin.

- (20) Schubert *stopped* composing the Unfinished Symphony ≠ The Unfinished Symphony has been (completely) composed.

Finally, a number of researchers have assumed that the source of the IE lies in the meaning of verb stems (see Singh (1998) for Hindi, Koenig and Muansuwan (2000) for Thai, Talmy (2000) and Lin (2004) for Mandarin, and Zucchi (1999) for Russian, assuming that the Russian data are comparable to the data we discuss in this paper). In other words, rather than hypothesizing that it is the reference of terms or meaning of NPs, or the meaning of aspect operators that varies between these languages, these researchers hypothesize that it is the denotation of verbal stems that need adjustments. Because this last hypothesis claims that it is the denotation of members of major lexical categories that can vary between languages, we mnemonically label it *ps(eudo)-Quinian*, despite the fact that Quine himself, in contrast to Davidson (1967), would not have assumed that verbs denote. English paraphrases of the meaning of induced change of state stems in incomplete languages will vary somewhat with individual proposals, but for many of them, the relevant stems in Mandarin (or Hindi, Tamil, and Thai) mean something like *performed part of an activity (e.g., reading) that would induce a state-change*. According to Talmy (2000), the verb *wash* in English is an incomplete stem and does not license an entailment that the patient is clean, as indicated in (21) (Talmy's judgments). It means something like *act on the dishes with the intent of making them clean*. Talmy's analysis of *wash* is similar to the analysis of incomplete stems in Koenig and Muansuwan or Zucchi.

**Hypothesis 3** (ps-Quinian Hypothesis, Talmy 2000, Koenig and Muansuwan, 2000, Lin 2004). *The source of the IE is the meaning of the verb stems themselves.*

- (21) I *washed* the dishes ≠ The dishes are clean.

## 2.2 Which hypothesis is correct?

**The IE is not restricted to non-bounded complements:** As alluded to above, a methodological consequence of Frege's principle is that all three hypotheses are *a priori* possible. How are we, then, to decide between these hypotheses? The short answer is that the Quinian Hypothesis under-estimates and the Aspectual hypothesis over-estimates the set of sentence types that lead to the IE. One predicts that some sentences that lead to the IE should not and the other that some sentences that do not lead to the IE should. We address both kinds of problems in turn.

Soh and Kuo (2005) is an often-cited example of the Quinian hypothesis. Soh and Kuo make two claims. First, they suggest that the IE in Mandarin only applies to sentences whose main verbs are a subset of verbs of creation and destruction and does not apply to sentences whose verbs are not verbs of creation or destruction. Second, they suggest that the IE only arises when the proto-patient NP (to use Dowty's (1991) phrase) does not include a numeral (what they call a *demonstrative object*). We address their second claim first. The intuition behind Soh and Kuo's proposal is that Determiner Phrases (DPs) that include numerals are bounded ([+bounded] in their analysis) whereas DPs that include demonstratives or indefinites are not necessarily bounded ([±bounded] in their analysis). Thus, they contrast the unacceptability of sentence (22a) and the felicity of sentence (22b). Soh and Kuo's argument is thus that finishing,

in contrast to stopping, requires an event description to be telic and that the boundedness of its direct object is a necessary condition for sentences including verbs of creation/destruction to be telic. Since only DPs containing demonstratives are not necessarily bounded, the event description that is the argument of *wan* in sentence (22a) (i.e., the event description expressed by the sentence minus *wan*) is telic, thus explaining the infelicity of the overall sentence.

- (22) a. #Ta chi-le liang-ge dangao, keshi mei chi-wan  
 he eat-LE two-CL cake, but not eat-finish  
 'He ate two cakes, but he did not finish them.'
- b. Ta chi-le na-ge dangao, keshi mei chi-wan  
 he eat-LE that-CL cake, but not eat-finish  
 'He ate that cake, but he did not finish it.'

The attested sentence (23) contradicts Soh and Kuo's judgment on sentence (22a) and shows that the presence of numerals in object NPs does not necessarily block the IE. In fact, other DP complements that are traditionally assumed to be bounded do not block the IE, in particular proper names, as the attested sentence (7) shows.

- (23) wo (...) chi le liang chuan dakao, dan mei chi-wan<sup>Google</sup>  
 I (...) eat PERF two CL kabob, but not eat-finish  
 'I ate two kabobs, but didn't finish eating them. (lit.)'

The IE in other languages is similarly not restricted to sentences that include a subset of non-numeral direct objects, as sentences (24)-(25) from Thai and Hindi, respectively, show. Sentence (26) additionally shows that the IE can arise in Hindi, even when the direct object is a proper name (similar facts hold in Thai).

- (24) Piti kin súp sǎŋ chaam  
 Piti eat soup two bowl  
 'Piti ate two bowls of soup.'
- (25) us=ne do kitaab-ēē padii par puur-ii nahii padii  
 pron.3.Sg=Erg 2 book-FPl read but completely-F neg read  
 He read two book but did not read it completely (read parts of both).
- (26) us=ne Ramayan padh-ii par puur-ii nahii padh-ii  
 pron.3.Sg=Erg Ramayan.F read-F.Sg but completely-F neg read-F.Sg  
 He read the Ramayan but did not read it completely.

In summary, attested examples from Mandarin (and similar, constructed examples from Hindi and Thai) show that that the IE does not seem to be due to properties of Mandarin (or Hindi or Thai) DPs. To be sure, for event completeness to arise and the use of *wan* 'finish' to be felicitous, the DPs filling the verb's proto-patient argument position must be bounded (quantized) and the sentence must be in the perfective aspect, as expected and known since at least Verkuyl (1993). But, the IE effect is not due to the fact more DPs are not bounded (quantized) in Mandarin, Hindi, or Thai than in English.

**The IE is restricted to a subset of verbal stems:** We saw that Soh and Kuo's first constraint on the IE pertains to the boundedness of the proto-patient DP. Soh and Kuo's second constraint pertains to the event type denoted by the main verb. They claim that only certain verbs of creation and destruction lead to the IE, for example *hua* 'draw', *xie* 'write', *kan* 'read', or *chi* 'eat', but not others, for example *zuo* 'bake' or *zao* 'build', as sentence (27) exemplifies (their judgement).

- (27) #Ta zao-le yi-jian fangzi, keshi mei zao-hao  
 he build-PERF one-CL house but not build-finish  
 'He built a house, but did not finish it.'

The following attested example suggests that Soh and Kuo's claim is incorrect. Sentences whose main verb is *gai* 'build' (a more natural verb when the patient is a building) can display the IE.

- (28) yushi you gai le yi tao xin fang, keshi fangzi mei gai-wan, tian  
 so again build PERF one CL new house, but house not build-finish, sky  
 jiu leng le, wufa shigong<sup>Baidu attested</sup>  
 jiu cold le, unable construct  
 'So they built a new house, but the house was not finished, the weather became cold, and it could not be under construction.'

Sentence (28) shows that Soh and Kuo's claim is too restrictive. But, there *are* constraints on the verbal stems that can appear in sentences that license the IE, although not the ones Soh and Kuo propose. A critical observation on which this paper focuses is that only a subset of verbal stems license the IE. This observation invalidates both the strictly Quinian hypothesis and Smith's Aspectual Hypothesis. Smith (1991) proposes that Mandarin *-le* indicates that an event was stopped, not necessarily finished. Leaving aside the issue of verbs of creation and destruction, both Soh and Kuo's Quinian and Smith's Aspectual hypotheses predict that the IE will arise no matter which (dyadic) state-change stem is used as a main verb, since they locate the source of the IE in either differences in the boundedness of DPs or the meaning of the aspect marker *-le*. This prediction is incorrect. Sentence (29) shows that not all non-creation verbs can license the IE. Table 1 lists some Mandarin verbal stems that license the IE (those in column *I*) and some that do not (those in column *C*). Table 2 does the same for Thai.<sup>2</sup>

- (29) #ta tou le yi zhang piao, keshi mei tou-wan  
 he cast PERF one CL ballot, but not cast-finish  
 'He cast a ballot, but didn't finish voting. (lit.)'

In summary, the IE does not depend on the proto-patient DP being non-bounded (non-quantized) (*contra* Soh and Kuo). But the IE depends on the main verb stem. That is, not all induced changes of state stems lead to the IE in Mandarin, Thai, or Hindi. This state-of-affairs is exactly what the ps-Quinian hypothesis predicts, as it assumes the meaning of state-change stems is the source of the IE. We conclude that the ps-Quinian hypothesis is correct: *Some* state-change stems do not mean in languages like Mandarin what their English glosses suggest they mean.

<sup>2</sup>We leave a fuller discussion of Hindi to another venue, as the facts seem more complex in Hindi than in Mandarin or Thai.



| Group I                                                                                                                                                                                                                                     | Group C                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>jiǎn</i> ‘to cut’, <i>xiū</i> ‘to repair’, <i>quàn</i> ‘to persuade’, <i>shā</i> ‘to kill’, <i>guān</i> ‘to close’, <i>niàn</i> ‘to read’, <i>chī</i> ‘to eat’ <i>hōng</i> ‘to dry (clothes)’, <i>xǐ</i> ‘to wash’, <i>zhǔ</i> ‘to cook’ | <i>zhuǎn</i> ‘to turn’, <i>zhà</i> ‘to deep fry’, <i>yān</i> ‘to pickle’, <i>kǎo</i> ‘to bake’, <i>fù</i> ‘to pay’, <i>jìn</i> ‘to soak/immerse in liquid’ |

Table 1: Some incomplete and complete stems in Mandarin

| Group I                                                                                                                                                     | Group C                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <i>ʔàan</i> ‘read’,<br><i>khâa</i> ‘kill’,<br><i>kin</i> ‘eat’,<br><i>khïan</i> ‘write’,<br><i>tàd</i> ‘cut’,<br><i>pəəd</i> ‘open’,<br><i>sôm</i> ‘repair’ | <i>càaj</i> ‘pay’,<br><i>câaŋ</i> ‘hire’,<br><i>cèεk</i> ‘distribute’,<br><i>lûaktâŋ</i> ‘vote’ |

Table 2: Some incomplete and complete stems in Thai

### 3 Defining the class of incomplete stems

In the previous section, we showed that the ps-Quinian hypothesis is correct. The source of the IE lies in the meaning of induced change-of-state stems in languages like Mandarin. A crucial piece of evidence in favor of this hypothesis is that only a subset of induced changes of state stems leads to the IE. This raises two sets of questions. First, which state-change stems lead to the IE and does the class of stems that lead to the IE form a natural semantic class? Second, what do these stems mean, if not a “true” induced state-change and what is the relation between the meaning of corresponding stems in pairs of languages like English and Mandarin? We answer these questions in turn.

#### 3.1 Previous proposals

In this section, we review previous proposals regarding the meaning of incomplete stems in Mandarin or other languages displaying the IE. As we will see, none of them are entirely satisfactory. Talmy (2000) proposes that some verbs are *implied-fulfillment verbs* and that, for those, the occurrence of a result state is only implicated, not entailed. Talmy cites, for example the English verb *wash* as such a verb.<sup>3</sup> The meaning of *wash* for Talmy can be paraphrased as in (30).

<sup>3</sup>Native speakers we polled seem to vary on the correctness of Talmy’s claim. This issue is irrelevant to our point.

- (30) *wash (the shirt)*: an activity whose intent is to get the shirt cleaned, but whether the shirt ends up clean or not is only implied.

Mandarin, then, for Talmy, is a language that includes many more implied fulfillment stems than English. In particular, many of the standard English induced changes of state stems are implied fulfillment stems in Mandarin (and, similarly, for incomplete stems in Hindi or Thai). Talmy's analysis must be improved upon, as it seems to mostly describe the issue, namely that some induced change of state stems which one would expect to entail the occurrence of a particular result state (given the correct arguments and aspect marking) merely implicate it. It does not say much about what incomplete stems actually mean.<sup>4</sup> Nor does it characterize the set of stems that are incomplete.

Lin (2004) suggests that Mandarin has only states and activity stems. Lin's proposal ignores the set of induced change of state stems that do not license the IE (Lin calls accomplishments what we call, to avoid confusion, induced change of state stems). Furthermore, his proposal does not recognize that Mandarin incomplete stems describe induced changes of state and that, crucially, a minimal change of state has to have occurred, as sentences (11) and (12) show (again, similar facts hold of Hindi, see Singh (1998), or Thai). Finally, Lin does not propose an analysis of what incomplete stems mean in Mandarin or whether there is a common semantic core to incomplete stems.

Zucchi (1999) proposes that Russian stems denote predicates that are true of both complete and incomplete events. Because of the complexity of Slavic lexical aspect, we do not commit ourselves to whether or not Russian (or other Slavic languages) is on a par with Mandarin (and other languages we cited). But, Zucchi's characterization of Russian stems can be applied to incomplete stems in incomplete languages. According to Zucchi's proposal, the meaning of the VP *read Moby Dick* in Russian should be glossed as in (31). As previous proposals, Zucchi does not recognize that the IE only arises with some induced changes of state stems, let alone characterize semantically the set of induced changes of state stems that are incomplete stems. Furthermore, since stem meanings in Zucchi's analysis do not include information as to what would constitute completion of the event, Zucchi is forced to have event-type specific principles (a writing principle; a building principle, ...) that ensures that when the described event *is* complete, there is an object that is completely affected in the right way (see the *The Building Principle*, p.189).

- (31) *read (Moby Dick)*: applies to all events where part or whole of *Moby Dick* is read.

Finally, Koenig and Muansuwan (2000) propose that state-change stems in Thai include an operator that says that a (non-necessarily proper) part of the relevant event-type occurred. Informally, the stem  $\text{t}^{\text{e}}\text{e}\text{n}$  in Thai is analyzed as meaning something like the progressive form of the word *composed* in English, as indicated informally in (32).

- (32) *write (Surii, "a poem")*  $\simeq$  *be writing (Surii, "a poem")*

<sup>4</sup>Entailments or implicatures of change of state are, of course, a property of sentences which depends on several factors, including, as mentioned in the text, the boundedness of the arguments or the verb or the sentence's aspect markers, see Verkuyl (1993) and others. For ease of exposition, we talk of stems entailing or implicating, when we mean to refer to stems in sentences with the appropriate arguments and aspect markers.

In contrast to Zucchi's analysis of Russian incomplete stems, Koenig and Muansuwan have a *single* operator rather than a list of event-type specific rules. Their analysis, like Zucchi, also makes a specific proposal as to the meaning of incomplete stems. But, Koenig and Muansuwan's proposal makes monomorphemic incomplete stems semantically more complex than complete stems and includes an imperfective marker, something theoretically unusual. Moreover, like all previous proposals, their proposal does not recognize that only a subset of induced change of state stems license the IE nor, of course, do they characterize the set of stems that do so.

In brief, all extant proposals are unsatisfactory. They either do not say much about the meaning of incomplete stems, in particular how their meaning differs from that of their corresponding complete counterparts in English or other languages (Lin and Talmy) or the meaning they assign to these stems is unsatisfactory (Zucchi and Koenig and Muansuwan). More importantly, in the context of this section, they do not answer two critical questions: (1) How can the class of incomplete stems be defined in Mandarin (or Hindi or Thai)? (2) Do incomplete stems belong to a natural semantic class?

### 3.2 The Scalar Hypothesis

The basic insight underlying our hypothesis is that only stems that denote event-types that include a change of property that is a matter of degree can be incomplete stems. To illustrate with some of the incomplete stems we have mentioned, killing involves seriously lowering the degree of somebody's health. Similarly, reading involves going through more or less of some printed material and cooking involves changing more or less the chemical structure of vegetables or meat so that it conforms to some cultural norm. We state our hypothesis, which we dub the *Scalar Hypothesis* as follows.

**Hypothesis 4** (Scalar Hypothesis). *Incomplete stems denote induced changes of state whose result state is a property that can be a matter of degree.*

To make precise the Scalar Hypothesis, we need to first provide a few definitions, which borrow much, sometimes liberally, from Cresswell (1976), Hay et al. (1999), Kennedy and McNally 2005, and others.

**Definition 1.** *A gradable property is a relation between an entity and a degree  $d$  that obeys the following entailment pattern: For all eventualities  $e$ , entities  $o$ , and degrees  $d$ , if  $e$  is such that the property holds of  $o$  to degree  $d$ , it also holds of  $o$  to non-zero degrees  $d'$  inferior to  $d$ .*

Thus, if your health is extremely bad (as it has to be when you are dead), it is very bad. If you have read the entire *Moby Dick*, you have read the first chapter. If you have baked a cake, you have half-baked it (modulo Gricean implicatures). A more formal definition is provided below.

**Definition 1.** *A gradable property is a relation between an entity and a degree on a scale (defined, for now, simply as a pair of a dimension and an ordered set of degrees) that obeys the following entailment pattern  $\forall e, o, 0 < d' < d, (C(e, o, d) \models C(e, o, d'))$*

**Definition 2.** *A normative gradable property is a pair consisting of a gradable property and a designated degree.*

The difference between non-normative gradable properties and normative gradable properties corresponds to the difference between open and closed scales in Kennedy and McNally (2005) and is easily illustrated by comparing the English verbs *learn* and *damage*. In its use illustrated in sentence (33), *learn* implies the existence of a boundary that counts as enough learning: When Joe knows the entire alphabet to a satisfactory degree, he can be said to have learnt it. In contrast, there is no clear boundary for *damage*, as used in sentence (34). More precisely, once a little damage has been done, one can go on and damage ever more to an indeterminate degree.

(33) Joe learnt the alphabet.

(34) Joe damaged the car.

Two kinds of designated degrees or thresholds must be distinguished (*contra* Caudal and Nicolas (2005)). In most cases, the designated degree is the maximum degree on the scale. For example, for *kill*, the threshold is the minimum of health or maximum of injury, for *read* or *eat*, the threshold is the destruction or otherwise affectedness of the *whole* patient (to the extent that the intellectual content of the book changes state by being known). In these cases, one cannot conceive of a higher degree on the relevant scale. But, in some cases, the designated degree is a cultural/individual norm and it is not hard to think of higher degrees on the relevant scale. Consider for example the verb *cook*. What counts as cooked varies with foods, cultures, and individuals and one can, unfortunately, think of many degrees of overcookedness!

Equipped with these definitions, we can now more precisely semantically characterize, informally for now, incomplete stems and the difference between English and Mandarin near translation equivalents.

**Hypothesis 4 (Revised).** *Only those stems that denote induced normative gradable changes can lead to the IE.*

**Definition 3 (Informally).** *Induced normative gradable changes are those changes that (i) are the result of an activity and (ii) whose resulting state is equivalent to a gradable normative property such that (iii) the proto-patient argument's degree on the relevant scale at the event's final time interval is greater than at the event's initial time interval.*

This last definition is fairly similar to ideas developed in previous work, in particular that of Kennedy and McNally (2005) or Beavers (2008). The only part where it differs is in the qualification *equivalent to a gradable normative property*. We will return to this qualification in the next section after we discuss in detail different kinds of induced normative gradable changes. We restate Definition 4 as follow to introduce terminology that will ease our exposition of the various kinds of gradable changes. Henceforth, whenever we use *A* and *C*, we will mean the activity and gradable change entailed to occur, respectively, by an induced normative gradable change.

**Definition 3 (More formally).** *A predicate  $P$  describes an induced normative gradable change if and only if whenever it holds of an event  $e$ , (i) an activity  $A$  holds during an initial subinterval of the temporal trace of  $e$  ( $\tau(e)$ ) and a normative gradable property*

*C* holds during a final subinterval of  $\tau(e)$ , (ii) the occurrence of *A* causes *C* to hold, and (iii)  $d > d'$  ( $d'$  is the degree at the initial subinterval of  $\tau(e)$  and  $d$  the degree at the final subinterval of  $\tau(e)$ ).

### 3.3 Different kinds of scalarity

A lot of recent work in lexical semantics has stressed the relevance of scalar semantics to the event structure encoded in verbs (see Beavers (2008), Filip and Rothstein (2006), Hay et al. (1999), and Wechsler (2005), among others). Most of this research has stressed the relevance of the nature of the change (binary or gradable) to the temporal contour of the events (durativity or punctuality of the change of state; the underpinnings of the notion of incremental theme; constraints on resultatives). In all of this work, a crucial distinction is made between binary changes (a change in non-gradable properties) and multi-valued or gradable change (a change in gradable properties), between *dead* and *clean*. But, to account for incomplete stems, we must define a more general notion of induced gradable changes that includes *shā* ‘kill’ in Mandarin or *khâa* ‘kill’ in Thai, but not words like *tou* ‘cast (a vote)’ in Mandarin or *càaj* ‘pay’ in Thai. Including words such as *shā* in the set of induced gradable changes of state requires a distinct definition of multi-valued changes than assumed in previous work. Our definitions must therefore generalize somewhat the notion of gradable change so as to capture the common semantic core of incomplete stems. The overall classification of changes we assume is represented in Figure 1.

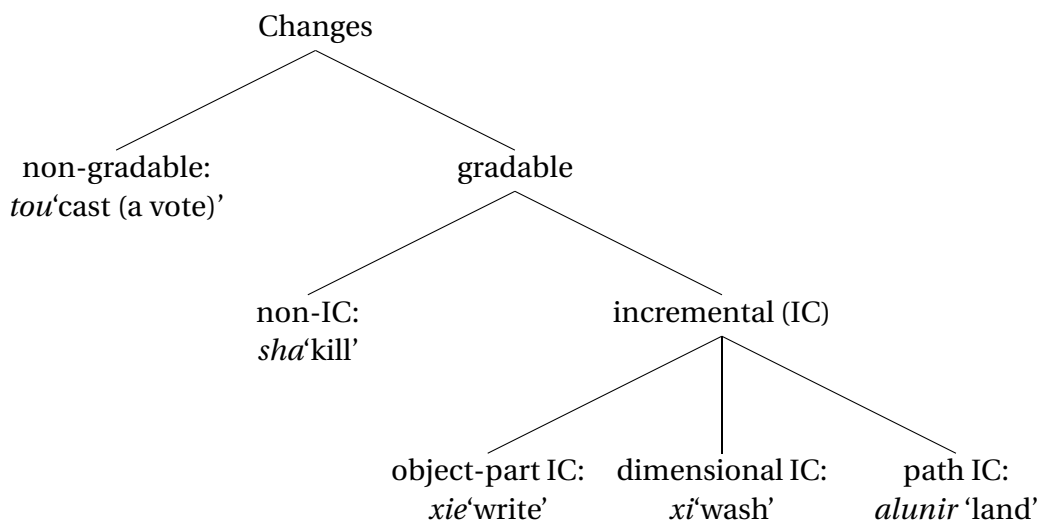


Figure 1: A classification of (dyadic) state-change stems

The basic insight underlying our analysis of the distinction between stems such as Mandarin *shā* ‘kill’ and stems such as Mandarin *xie* ‘write’ is that normative gradable changes can differ in their temporal contour. As Krifka (1989) has argued, for some changes, there is a correspondence between the change in degree on the scale and the event’s progress: The more you read, the larger the portion of the manuscript that is read; the more you cook the food, the less raw/more cooked it is. For others, there is no such correspondence, although the change can be still be analyzed as a non-binary change in the degree to which an entity bears a certain property. It is not the case that

the more preparations one makes for killing a turkey, the worse the health of the bird is. Similarly, it is not the case that the more time you spend repairing your computer, the better it works. We call such changes *non-incremental* (non-IC) as the degree of change does not incrementally follow the temporal progression of the event. In other words, we distinguish between induced changes whose resulting property is (or is equivalent to) a gradable property that changes over the course of the event and induced changes for which, additionally, one can define a correspondence (a homomorphism) between the degrees on the scale underlying the gradable property and the event parts. We provide a definition of incremental changes of state below. Non-incremental changes of state are simply those normative gradable changes that are non incremental.

**Definition 4.** *An induced gradable normative change is incremental if and only if for any two of its subparts  $e$  and  $e'$  of that event such that  $e \sqsubseteq e'$ ,  $d \leq d'$  where  $d$  and  $d'$  are the degrees to which the gradable property  $C$  holds at the final subinterval of the temporal traces of  $e$  and  $e'$ , respectively.*

Finally, we need to make some distinctions between incremental themes on the basis of the nature of the scale involved. In the case of *read*, the relevant scale involves parts of the object (one can paraphrase the scale as *portion  $x$  of manuscript  $y$  is read*). In the case of *cook*, the relevant scale is a more traditional kind of scale, the kind which underlies the meaning of gradable adjectives in those languages which have gradable adjectives (e.g., *raw*). In the case of French *alunir* 'land on the moon', the scale is the path of motion. We define these distinct incremental changes below. (There is no need to provide a definition of dimensional gradable changes, as in this case, the degrees involved are part of the definition of the property. That is, being tall, sharp, and so forth requires reference to degrees, see Cresswell (1976), among others.) These three kinds of incremental change involve three distinct homomorphisms between the event part-whole structure and the degree of change, depending on whether degrees of change involve the affected object's part-whole structure, the distance traversed by the theme since the event's inception, or the degree to which the affected object bears a dimensional property (such as being tall, long, or hot).

**Definition 5.** *An induced incremental gradable change of state is object-oriented if and only if the degrees of the property  $C$  whose change is induced by the activity  $A$  are parts of the patient (in other words, the degrees on the scale are the parts of the patient).*

**Definition 6.** *An induced incremental gradable change of state is path-oriented if and only if the degrees of the property  $C$  whose change is induced by the activity  $A$  are distances from the location of the theme at the initial subinterval of the activity included in  $A$ .*

Having distinguished among various kinds of induced normative gradable changes, let us return to our qualification in Definition 3 that the resulting state need not be a normative gradable property, but merely *be equivalent to one* (where equivalence may be defined as truth of the two alternative descriptions of the event in the same set of possible worlds or a suitably restricted subset of possible worlds). In the case of changes in induced dimensional gradable properties (e.g., for verbs such as *sharpen* or *lengthen*), there is no doubt that the resulting state is a gradable property, i.e. a relation between an entity and a degree. But, the issue is more difficult in other cases.

Consider, for example, object-oriented gradable changes and verbs such as *eat*. Analyzing the change as an incremental object-oriented change, as we did, amounts to saying that the change involved is paraphraseable as *the patient is consumed to degree  $d$*  where the degrees involved are the portion of the patient consumed. While any event of eating can be so analyzed, we do not wish to commit ourselves that this is *the* proper semantic analysis of events of eating. That is, speakers may not always analyze events of eating in this manner. For our purposes, it is sufficient that they can do so.

The issue is even more difficult with non-incremental induced gradable changes. Consider our parade *shā* 'kill' Mandarin example. Our analysis amounts to saying that this stem describes events in which a patient is caused to be hurt or otherwise injured to a degree that is not null, but may be less than death. Two questions arise. First, are all events we would characterize as true killings categorizable as events of induced injury that have reached the normative degree (death)? And if yes, is that the way English *kill* should be characterized? To answer *No* to the first question means we believe there are possible worlds in which an animate entity is killed, but is not caused to be injured to the normative degree. We must confess that we have a hard time having firm judgments on the matter or even being sure that there is a fact of the matter about this kind of issue. We find answering the second issue also hard. It is well-known since at least McCawley (1973) that English *kill* allows a so-called internal reading of degree modifiers such as *almost* in a way that *buy* does not (see the contrast between (35) and (36)).

(35) That almost killed Bill.

(36) #I almost bought the car.

The availability of an internal reading (i.e., an interpretation in which what is almost the case is that Bill has reached the maximum on the injury scale), suggests that induced changes of state, even in English, *may* be gradable, and contrast with non-gradable change of state verbs such as *buy*.

Additionally, *kill* can be modified by scalar modifiers like *half* in a way *buy* cannot. For example, a Google search of the string *he half killed* returned 1,100 examples, including (37) and (38). A similar search for the string *he half bought* returned 4 examples. In three of them, *buy* is used metaphorically to mean 'be convinced', which is a gradable property; in the fourth, it is used non-literally and ironically. The behavior of scalar modifiers provides some additional evidence that induced death can be categorized as a degree on a scale in a way that purchases cannot. But, the fact that it can be so categorized does not mean it needs to be so categorized and sentences such as (35) or (37)-(38) can only be considered suggestive evidence at best.<sup>5</sup>

<sup>5</sup>J. Bonhemeyer (p.c.) suggested to us an alternative analysis according to which *shā* in Mandarin is incremental, in contradistinction to its English counterpart. In other words, the difference between English and Mandarin (or other IE) languages, at least for this class of verbs, is that the change is conceived as incremental in Mandarin, whereas it is not so conceived in English (as Bonhemeyer (2005) claims). The difference between this view and the analysis we propose is partly terminological. We mean by *incremental* that the meaning of the sentence entails a non-trivial homomorphism between degrees of change and the denoted events parts (what Krifka (1998) calls strict incrementality). Bonhemeyer's view relies on the seemingly weaker notion of incrementality expressed in Dowty (1991) (although, Dowty's text may be interpreted differently), namely that such an homomorphism is *possible* (i.e., is true in at least some possible worlds). And, it is clear that our non-strictly incremental analysis of *shā* often means

- (37) ‘Then he half killed me,— kicked and trampled on me, as he’s done many a time’ *Nevermore*, Rolf Boldrewood, 1892.
- (38) ‘One punch and he half killed the guy with it. Broken nose, 2 teeth broken, and he was out cold for a good half minute.’  
<http://forum.canucks.com/lofiversion/index.php/t174493.html>

### 3.4 Comparing languages

We have now answered the question of *which stems* in Mandarin (and Hindi or Thai) lead to the IE: Only stems that denote induced normative induced gradable changes, including, maybe somewhat surprisingly, induced normative induced non-incremental gradable changes. We have also defined normative gradable changes as well as distinguished various kinds of induced normative gradable changes. We must now answer the question of *why* those stems lead to the IE or why those stems lead to the IE in these languages, but not other languages like English. Otherwise put, what is it about the meaning of stems that denote induced normative gradable changes in these languages that explains the IE? The following is our answer.

**Hypothesis 5.** *In languages like Mandarin, sentences with main verbs that describe induced normative gradable changes entail that a normative gradable change occurred with degree  $d_0 < d \leq d_N$ . In languages like English, telic sentences with corresponding main verbs entail that a normative gradable change occurred with degree  $d = d_N$*

that it is also weakly incremental, at least in possible worlds that obey our physiological laws. Remember that for all sentences that denote induced gradable changes of state (including sentences containing non-strictly incremental verbs such as *shā*), a change  $d$  such that  $d_0 < d \leq d_N$  must have occurred. Now, consider the minimal non-null degree of change sufficient to warrant the utterance of a sentence with a verb like *shā* and let’s call this degree  $d_m$ . For any event  $e$  that involves a degree of injury  $d_N$ , a sentence with *shā* can truthfully apply to any subpart of  $e$  that entails a degree of change at least equal to  $d_m$ . Assuming that killings at least take time, there will be subparts of  $e$  where the degree of change is between  $d_m$  and  $d_N$ . So, in most circumstances our analysis will entail weak incrementality. But not as a matter of necessity. One can imagine a word *ps-shā* that means just what Mandarin *shā* means, but additionally requires the change to be non-weakly incremental, i.e. there can be preparations to the “killing”, but once a change occurs, it is instantaneous so there is no proper subpart of  $e$  where a degree of change between  $d_m$  and  $d_N$  has occurred. Of course, the way the world works means it is quite unlikely gradable changes *must* be instantaneous (the only case where non-strictly incremental gradable change categories do not coincide with weakly incremental gradable change categories). One possible case is the use of the expression *Beam me up, Scottie!* in Star Trek where one can define degrees of change (an order of locations), but where the change, once the “magical” button is pressed, is instantaneous (so that there cannot be a possible world where there is a homomorphism between proper parts of the events and degree changes). Our intuitions are shaky on the true meaning of that expression (after all, it is a Star Trek world we are talking about), but it is interesting to note that such non-weakly incremental gradable change categories seem restricted to sci-fi worlds. Aside from our desire not to build in the definition of gradable change a constraint that seems to us to be a matter of physics and physiology, our analysis was motivated by our desire to explain the differences between Mandarin (or Hindi and Thai) and languages like English. Sentences such as (35) or (37) suggest that English may conceptualize killings as gradable. If this is the case, the only way to distinguish between *shā* and *kill* would then be to say that *shā* denotes a weakly incremental gradable change, and *kill* simply a gradable, but not weakly incremental change. We are not sure what that would mean. Clearly, to the extent *kill* denotes a gradable induced change of state, it will be weakly incremental for the reason *shā* is: Among worlds we can conceive of, the induced gradable change *kill*’s denotation is equivalent to can occur in time-steps and a homomorphism can then be defined in these worlds between subevents and degrees of change.



We illustrate this difference in meaning between corresponding stems in Mandarin and English by discussing entailment patterns in incomplete languages. We use English as a metalanguage to state the entailment pattern for ease of understanding. The basic entailment patterns for incomplete stems is exemplified in (39).

- (39) a. Pat has killed Dodo  $\models$  Dodo's health has been affected by Pat's activity.  
 b. Pat has read *Moby Dick*  $\models$  *Moby Dick* has been partially read.  
 c. Pat has cooked a roast  $\models$  The roast is not entirely raw.

As the entailment patterns in (39) indicate, incomplete stems *do* entail that a change occurred. The proto-patient must have been affected in some way, i.e. it must have undergone some change of state, as the unfelicity of (40) (repeated from (12)) demonstrates. But, it is only *implicated* that Dodo is dead, *Moby Dick* is finished, or the roast is ready to serve.

- (40) #Ta sha le Lisi, danshi Lisi mei shou bandian shang  
 he kill PERF Lisi, but Lisi not receive little.bit injury  
 'He killed Lisi, but Lisi was not even hurt a little bit.'

The fact that incomplete stems entail the proto-patient *did* undergo some change of state means that these stems do not simply denote actions performed on an entity. In other words, *shā* 'kill' or *khâa* 'kill' do not simply mean 'be engaged in the activity that would result in a killing', as there must be some negative effect on the proto-patient's health for these words to be used. The fact that sentences including these words (with bounded arguments and non-imperfective aspect) implicates (sometimes strongly) that the proto-patient died suggests that they do not denote mere activities, as Lin (2004) suggests. Nor are they equivalent to verbs such as English *hurt*, as *shā* or *khâa* evoke in some manner the maximal degree of injury, as we mentioned in section 1. Our analysis of the meaning of incomplete stems models both of these observations by saying that there must be a non-null degree *d* of injury/health that has changed, but that that degree may but need not be equal to the norm (the maximal degree of injury in the case of events of killing).

In other words, the difference between Mandarin and English does not reduce to the fact that some predicates that describe quantized changes in English (in Hay et al. (1999) or Beavers' (2007) sense) have translations that describe non-quantized changes in Mandarin. A verbs such as *shā* 'kill' can only describe events in which an agent (significantly) affects the patient (in the sense that the patient undergoes that some change of state) and intends that change of state to be death, even though the injury might actually not be that severe for the event to be felicitously described by *shā*. Translating *shā* as either *hit* or *injure*, as it has sometimes been suggested to us, would, therefore, be inadequate. The degree of affectedness entailed by *hit* is less than the one entailed by *shā*. The verb *injure* does not describe a quantized change or even the intention of carrying out a quantized change (any injury level is large enough for an event to be described by the verb *injure*), whereas the meaning of Mandarin *shā* makes reference to the norm on the relevant scale (death, here). Our use of the notion of a normative degree in Definition 3 and Hypothesis 5 allows us to distinguish between true degree achievements in Mandarin and the kind of induced non-incremental, gradable

changes that *shā* describes, i.e. the kind of induced changes that make reference to a normative or maximal value on the relevant scale.

Our claim is that membership in the class of normative gradable changes is a necessary condition for the IE in languages like Mandarin. Is it a sufficient condition? If yes, we can redefine non-gradable changes as *binary* scalar changes (à la Beavers (2008) or Caudal and Nicolas (2005)). That non-gradable/binary scalar stems do not lead to the IE, reanalyzed as binary scalar stems then, would be an immediate consequence of Hypothesis 5, revised as in the following.

**Hypothesis 5 (Alternative).** *In languages like Mandarin, sentences with main verbs that describe induced changes of state entail that a scalar change occurred with degree  $d_0 < d \leq d_N$ . In languages like English, corresponding sentences entail that a scalar change occurred with degree  $d = d_N$*

A binary scalar change analysis of *buy* amounts to saying that events of buying involve an induced change of ownership of an object that goes from 0 to 1. According to our alternative formulation of Hypothesis 5, all induced changes of state stems in incomplete languages entail that the proto-patient state changed to degree  $0 < d \leq d_N$ . If there are only two degrees (0 and 1), as in the case of verbs such as Mandarin *fū* 'to pay', then  $d = d_N$ .

Until now, we have tacitly assumed that most, if not all, stems describing induced gradable changes in languages like Mandarin were incomplete stems. It is certainly true that the overwhelming majority of stems that describe induced gradable changes we tested (over a hundred), are indeed incomplete stems and lead to the IE. Whether all of them are is not easy to determine. Consider the following Mandarin and Thai stems, which are not incomplete, although they seem to be describing induced gradable changes of state.

- (41) *zhuǎn* 'turn (a knob)'
- (42) *zhà* 'deep fry', *yān* 'pickle': both mean 'immersing into a particular kind of liquid'
- (43) *jiā yóu* 'pump gas': completion entailed when the amount is a direct object
- (44) *won* 'circle' in Thai is not an incomplete stem

Explaining why *zhuǎn* 'turn (a knob)' is not an incomplete stem is relatively easy: Any amount of turning counts as turning a knob, and therefore, Hypothesis 5 *does* predict that sentences that include this stem do not lead to the IE. In other words, *zhuǎn* is a weak induced change of state stem. Stems in (42) are also weak induced change of state stems, we believe, despite what their translation would suggest. Both *zhà* 'deep fry', *yān* 'pickle' mean to immerse in a liquid (boiling oil and some kind of brine, respectively). The fact that the proto-patient was affected and that the action's goal is to cook or otherwise prepare the food is an implicature that is not part of the stems' meanings. Whether all potential counterexamples can be so easily disposed of is unclear.<sup>6</sup>

<sup>6</sup>There might also be differences between Hindi and Mandarin and Thai. Despite the attested example in (3), Hindi speakers we asked find sentences such as i. *unfelicitous*. This suggests that only stems denoting induced incremental gradable changes of state might be in the set of incomplete stems in Hindi, or at least that stems denoting induced non-incremental gradable changes might only lead to

Reciprocally, languages like English may include incomplete stems. They may have a few words that leave unspecified whether the result state's property is maximal or not. Such is the case for *wash*, according to Talmy (2000) or French *chambrier*. Leaving aside the case of English *wash*, on which our consultants disagreed, the felicity of sentence (45), for example, suggests that even in languages like French, some normative induced gradable change of state stems are incomplete.

- (45) Marc a               chambré le vin, mais le vin n' est       pas encore  
 Marc have.PRES warm'.PPT the wine, but the wine NEG be.PRES NEG yet  
 Chambré.  
 warm.PPT  
 '%Marc has brought the wine to room temperature, but the wine is not yet at  
 room temperature.'

In fact, Kratzer (2004) has claimed that many more verbs in English are what we would call incomplete stems (although her analysis of the phenomenon differs from ours). It includes, for example, verbs such as *cook*, *read*, *clean*, *wash*, and many others. Whether all of these stems or others Kratzer cites are indeed incomplete is not clear to us, because of the difficulty of factoring out the possible confounding effect of coercion. If Kratzer is correct, the difference between languages like English and Mandarin with respect to incomplete stems might not be as significant as it might seem. The main difference would be that in Mandarin, but not English, induced non-incremental gradable change of state stems (e.g., *shā* 'kill') are incomplete.

## 4 Conclusion

What we have called the Incompleteness Effect has been noted for a long time. In this paper, we argued that the source of the effect is in the meaning of stems that denote induced changes of state. We call such stems *incomplete stems*. Taking stock of recent work on the relationship between scalarity and change, we then suggested that incomplete stems denote induced gradable changes and provided a semantic characterization of these stems. We showed that the difference between incomplete and complete stems is whether the stem requires the degree of induced change to have reached the norm on the relevant scale or merely be non-null (or "significant") and be semantically vague whether or not the degree of change reached the norm.

There is a wider moral in our analysis of incomplete stems, if it is correct. We mentioned at the beginning of our paper how it is common practice to divide the space of verbal meaning into four quadrants (states, processes, changes, and induced changes). It is tempting to think that the more complex meanings can be derived from base categories, state and activities, through the application of two or three operator constants,

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the IE in very restricted contexts. We leave further discussion of this issue to another venue.

- i. #Rama=ne Sarah=ko maaraa par vo nahii marii  
 Rama=ERG Sarah=DAT kill.MASC but pron NEG die.FEM  
 #Rama killed Sarah but she didn't die.

following the lead of Dowty (1979). The contrast between incomplete and complete stems within a language and between near translation equivalents across languages suggests there can be semantic differences not reducible to differences in base categories. There can be differences in *how much* of a change toward a normative end-state (death, health, or persuasion) is entailed to have occurred, without a difference in the end-state themselves. In other words, there can be “molecular” differences in word meaning that are not reducible to differences in “atomic” meanings.

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# Comparison in Chinese

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## 1 Introduction

In the recent literature on comparatives, evidence from different languages has been used to argue for the nontrivial semantic variation in the expression of comparison, see Beck et al. (2004); Bhatt and Takahashi (2007); Kennedy (to appear). Beck et al. (2004) initiated the discussion by bringing to light some data from Japanese that present a challenge to the standard degree semantics of comparatives developed for English, cf. von Stechow (1984), Heim (2001). According to Beck et al. (2004), Japanese lacks comparative clauses interpreted as properties of degrees due to the absence of degree abstraction at the LF. This leads them to the hypothesis that the possibility to bind degree variables in the syntax is subject to parametric variation. To generate an LF without degree abstracts Beck et al. (2004) assume that the item of comparison is not compositionally integrated into the structure of a Japanese comparative sentence, but determines the value of the contextual variable on the comparative operator.

A more recent paper by Bhatt and Takahashi (2007) underlines another potential source of cross-linguistic variation in the semantics of gradation, namely the logical type of the item of comparison. Bhatt and Takahashi argue that some languages, like Hindi, employ individual type standards and adopt Heim's 1985 phrasal analysis of comparatives for Hindi. Kennedy (to appear) reconsiders the facts reported in Beck et al. (2004) and suggests that the individual/degree distinction in the type of the standard is sufficient to account for the semantic differences without imposing a ban on degree abstraction at the logical form.

The aim of this study is to support the conclusions reached in Beck et al. (2004) by presenting evidence from Chinese. Focussing on the cluster of properties discussed in Beck et al. (2004), we will demonstrate that Chinese, similar to Japanese, lacks structures whose semantics depends on the mechanism of degree abstraction and propose a semantic analysis of degree constructions in Chinese. We will develop the idea already discussed in Beck et al. (2004) that the lexical entries of gradable adjectives encode the comparative relation per se. Assuming the comparative meaning of gradable predicates implies that their degree argument is not bound by an external comparative operator but lexically and allows to generate an LF without degree abstraction. Thus, the main claim of the paper is that the lexical semantics of degree predicates is responsible for the differences in the expression of comparison and, particularly, it results in the contextual type of comparison advocated in Beck et al. (2004).

The paper is structured in the following way: Section 2 sets the background by introducing the Japanese data that motivated the analysis of Beck et al. (2004). In Sec-

tion 3 we first introduce the basic types of Chinese sentences with degree predicates and then show that the Japanese data pattern discussed in Section 2 is present in Chinese as well. The main conclusion of this section is that Chinese comparatives are not amenable to the standard degree operator analysis developed for English. In Section 4 we propose an analysis based on a new semantics of degree predicates that overcomes the difficulties we came across. Section 5 evaluates the present proposal in light of the discussion about the variation in the semantics of degree constructions and summarises the results.

## 2 Degree Abstraction Parameter

Beck et al. (2004) discuss three properties of Japanese comparatives that are not predicted by the standard English-based analysis of degree constructions and driven by the observed phenomena they argue that the degree semantics is subject to cross-linguistic variation. First, they observe that Japanese differs from English in that it does not display negative island effects under the comparative, see (1) vs. (2). In (2) the comparative *yor*i-clause hosts a negation but this does not result in unacceptability as in the English example in (1). von Stechow (1984) and later Rullmann (1995) argued that (1) cannot receive any interpretation because the coercion operator that mediates between the comparative operator and the embedded clause fails to pick the maximum degree from the denotation of the latter, i.e. the set of degrees  $d$  s.t. nobody bought a  $d$ -expensive book does not have a maximum. If we adopt this account, the contrast between (1) and (2) suggests that Japanese *yor*i-clauses are not interpreted as sets of degrees like their English counterparts, even though they look similar on the surface.

- (1) \*John bought a more expensive book than nobody did.  
 (2) John-wa [dare-mo kawa-naka-tta no yori] takai hon-o taka.  
 John-TOP anyone buy-NEG-PAST NO YORI expensive book-ACC bought  
 'John bought a book that is more expensive than the book that nobody bought.'

The second phenomenon that Beck et al. (2004) consider to be related to the lack of negative island effects is the absence of subcomparatives of degree in Japanese, cf. (3)-(4) below. Under the standard analysis of comparatives, the interpretation of (3) crucially depends on abstracting over the degree argument of the embedded adjective and thus constructing a predicate of degrees out of the comparative clause. The fact that this option is not available in Japanese, cf. (4), calls into question the applicability of the standard analysis to this language.

- (3) This shelf is taller than that door is wide.  
 (4) \*Kono tana-wa [ano doa-ga hiroi yori (mo)] (motto) takai.  
 this shelf-TOP [that door-NOM wide YORI MO] more tall

Another datum that points to the special status of the Japanese comparative clause concerns variation in acceptability of comparative sentences depending on the involved degree predicates, see (5) vs. (6). Beck et al. (2004) argue that if we assume that the *yor*i-clauses in (5) and (6) are relative clauses denoting the maximal plurality



of objects bought by Hanako, we can derive the observed contrast. The cardinality of the set of umbrellas bought by Hanako can be easily calculated and can serve as the appropriate item of comparison in (5b), whereas this set does not lend itself to the kind of comparison made in (6b), i.e. it is not naturally associated with a degree of length.

- (5) a. Taroo bought more umbrellas than Hanako did.  
 b. Taroo-wa [Hanako-ga katta yori (mo)] takusan(-no) kasa-o  
 Taroo-TOP [Hanako-NOM bought YORI MO] many(-GEN) umbrella-ACC  
 katta.  
 bought
- (6) a. Taroo bought a longer umbrella than Hanako did.  
 b. ?\*Taroo-wa [Hanako-ga katta yori (mo)] nagai kasa-o katta.  
 Taroo-TOP [Hanako-NOM bought YORI MO] long umbrella-ACC bought

Finally, shifting the focus to the matrix clause, Beck et al. (2004) point out that Japanese comparatives with modals in the main clause never display ambiguities attested in English that are argued to be the result of scope interactions between the comparative and the corresponding modal operator, see Heim (2001). The Japanese sentence in (7) can only mean that Laura has an obligation to buy a smaller number of candles than Pete. In contrast, (8) has an additional natural reading conveying that the minimal amount of candles satisfying Laura's obligation falls below the minimal amount satisfying Pete's, i.e. the comparison is between the sets of degrees corresponding to Laura's and Pete's requirements. The availability of the latter reading suggests that in English the comparative can scope over the modal and bind the degree variable left behind. Beck et al. (2004) conclude that Japanese lacks such an option.

- (7) Laura-wa Pete yori (mo) sukunai kazu-no roosoku-o  
 Laura-TOP Pete YORI MO small number-GEN candle-ACC  
 kawa-nakerebanaranai.  
 buy-required
- (8) Laura needs to buy a smaller number of candles than Pete.

Two proposals have been recently made to account for the differences between English and Japanese. Beck et al. (2004) assume that Japanese disallows binding of degree variables at the logical form and thus cannot build prototypical degree abstraction structures like subcomparatives, absolute measure phrase constructions or degree questions. This empirical pattern leads the authors to the formulation of the Degree Abstraction Parameter that should affect the semantics of degree operators and regulate the availability of certain types of degree constructions cross-linguistically.

- (9) Degree Abstraction Parameter (DAP):  
 A language {does, does not} have binding of degree variables in the syntax.

Beck et al. (2004) propose that as a result of the negative setting of the DAP Japanese relies on a pragmatic inference strategy in establishing the item of comparison. This means that Japanese only employs context setters akin to the English 'compared to' phrases instead of proper comparative clauses. Thus, the *yori*-constituent denotes an

individual that determines the value of the contextual variable on the comparative operator. The latter combines with a gradable predicate and the subject in the usual way, see (10).

$$(10) \quad \llbracket \text{ER}_C \rrbracket^g = \lambda A_{d(et)}. \lambda x_e. \max(\lambda d. A(d)(x)) > g(C)$$

Kennedy (to appear) follows up on the idea that Japanese *yor*i-clauses express predicates of individuals and argues that the comparative selects individual-denoting standards in this language. He proposes an analysis in the spirit of Heim's 1985 analysis of phrasal comparatives in English. It should be noted that, although this strategy is successful in explaining the properties of embedded clauses, it is not DAP-driven and fails to predict the absence of scope interactions with modals in the main clauses of comparative sentences.

### 3 Comparative Constructions in Chinese

In this section we will first describe the properties of the main types of degree constructions in Chinese—the positive and the comparative sentences. Then we will apply the tests identified in Beck et al. (2004) to check for the availability of degree abstraction in this language. We will show that Chinese patterns with Japanese and thus presents additional evidence in favour of the DAP.

#### 3.1 Basic Data

Due to the lack of comparative morphology, degree constructions in Chinese always feature the unmarked positive form of the gradable predicate. (10) is an example of a simple comparative sentence, where the standard of comparison is introduced by *bi*. There is no agreement in the literature about the syntactic status of *bi* in the comparative. For an overview and analysis of *bi* as a verb see Erlewine (2007). We will not commit ourselves to any of the existing proposals and will remain neutral as to the exact syntactic structure of (11).

- (11) Lisi bi Zhangsan gao.  
 Lisi BI Zhangsan tall  
 'Lisi is taller than Zhangsan.'

The comparative *bi* sentence can involve an explicit differential measure phrase or an intensifier adverb *geng*/'even/still', see (12) and (13). The latter is very common if the standard of comparison is not explicit, which lead to the claims that *geng* is the comparative marker. However, the fact that *geng* is incompatible with a measure phrase differential like 5 li mi/'by 5 cm', cf (13), suggests that it is rather some sort of intensifier. See Beck et al. (2004) for a similar conclusion concerning the Japanese particle *motto*.

- (12) Lisi bi Zhangsan gao 5 li mi.  
 Lisi BI Zhangsan tall 5 cm  
 'Lisi is 5 cm taller than Zhangsan.'

- (13) Lisi *bi* Zhangsan *geng* gao (\* 5 li mi).  
 Lisi BI Zhangsan GENG tall 5 cm  
 ‘Lisi is (even) taller than Zhangsan.’

Turning to the positive construction, it is a well-known (see e.g. Liu (2005); Kennedy (2007) and references therein) that it requires the presence of the degree adverb *hen*/‘very’, see (14). *Hen* cannot co-occur with an explicit standard of comparison. In other words, *hen* is compatible with *bi*-standards or any other expression that refers to the comparison class, cf. (15) and (16) (= Kennedy’s 2007 example (8b)), it can tolerate the presence of *geng* or overt differentials.

- (14) Lisi \*(*hen*) gao.  
 Lisi very tall  
 ‘Lisi is (very) tall.’<sup>1</sup>
- (15) Lisi \*(*hen*) *bi* Zhangsan \*(*hen*) gao.  
 Lisi very BI Zhangsan very tall
- (16) Lisi \*(*hen*) gao *de* neg *mozhao* tianpeng.  
 Lisi very tall DE can touch ceiling  
 ‘Lisi is tall enough to touch the ceiling.’

If *hen* is omitted and no *bi*-phrase is introduced the sentence can still be interpreted as a comparative construction if the context supplies some standard of comparison. For example, in (17)—the so called conjoined comparative—the context is restricted to two people and a comparative interpretation obtains.

- (17) Lisi gao, Zhangsan ai.  
 Lisi tall Zhangsan short  
 ‘Lisi is taller than Zhangsan.’

It has been tentatively suggested in Kennedy (2007) that Chinese *hen* is the positive morpheme responsible for the expression of implicit comparison, i.e. *hen* introduces comparison to the contextually set standard. In von Stechow (2006) English *very* has also been treated as the overt realisation of the POS operator, though within a different approach to the semantics of positive constructions, the idea being that *very* is a universal degree operator restricted by a relatively large neutral region, i.e. the span that forms what is called the ‘extension gap of the predicate’ in the non-degree theories of gradable adjectives. However, if *hen* were the positive marker or POS itself, we would expect it to be an indispensable component of any degree construction lacking an explicit standard. This prediction does not seem to be borne out. In negative contexts *hen* appears to be optional. If present under negation, it corresponds to *very*, cf. (18). Negated *hen*-less sentences are unambiguously interpreted as positive constructions, no matter if the context provides a potential standard of comparison or not. The comparative interpretation is only possible in the presence of *bi*.

- (18) Lisi bu (*hen*) gao.  
 Lisi neg very tall  
 ‘Lisi is not (very) tall.’

<sup>1</sup> When focused, *hen* is interpreted as ‘very’.

Besides the constructions introduced above, Chinese makes wide use of context-setters to express both the positive and the comparative, see (19)-(20).

- (19) Bi qi            Zhangsan, Lisi *hen* gao.  
 Compared to Zhangsan Lisi very tall  
 ‘Compared to Zhangsan, Lisi is tall.’
- (20) Bi qi            Zhangsan, Lisi gao 5 li mi.  
 Compared to Zhangsan Lisi tall 5 cm  
 ‘Lisi is taller than Zhangsan by 5 cm.’

In (19) *hen* indicates that we deal with the positive construction. This sentence passes the usual tests for implicit positive-like comparison. For instance, Lisi’s height should exceed Zhangsan’s height by an amount that counts as considerable in the context. See Kennedy (to appear) for the so-called crisp judgement test. Example (20), on the other hand, features a gap measure phrase that is a hallmark of the comparative construction. Thus, we may draw a descriptive conclusion that the item of comparison can always be provided contextually, irrespective of whether it is a vague interval on the relevant scale, as in the positive case, or a precise degree that can serve as a reference point for a measurement operation, as in the comparative case.

To conclude, despite the absence of comparative morphology, Chinese has tools to distinguish between the positive and the comparative. In non-negated sentences the degree adverb *hen*/‘very’ precludes the comparative interpretation, whereas in negated sentences, where *hen* is optional, it is the presence of the overt item of comparison that determines whether we deal with the comparative or the positive. Like in English, the standard of comparison can be introduced by so-called context-setters and then used as an object of the comparative relation or to specify an implicit standard in positive constructions.

### 3.2 DAP Tests

As discussed in Section 2, Beck et al. (2004) provide empirical evidence that the semantics of comparison is subject to parametric variation. In particular, they point to a number of features of the Japanese *yori*-clauses suggesting that Japanese does not have English-like comparative clauses with the semantics of degree predicates. The crucial facts they discuss are the absence of negative island effect under the comparative and the impossibility to form a subcomparative of degree. This empirical pattern leads Beck et al. (2004) to the conclusion that Japanese bans degree abstraction, which they spell out as the negative setting of the DAP, see (9). Matrix clauses seem to support the generalisation that Japanese cannot build degree predicates in the syntax. Japanese comparatives with modals in the matrix never display scope ambiguities, unlike their English counterparts. Modals never seem to split the scope of the comparative. It takes the most local scope and so does not provide us with evidence that it can bind the degree variable.

In the following, we shall apply the DAP criteria identified by Beck et al. (2004) to Chinese.

It has already been discussed in the literature (Fu (1978); Xiang (2006)) that Chinese disallows subcomparatives of degree, see (21). The Chinese paraphrase of the

English subcomparative in (21) is an ‘exceed’-type comparative employing the nouns *gao-du* ‘height’ and *kuan-du* ‘width’ as can be seen in (22).

- (21) \*Zhe ge zhuozi bi nage men kuan gao.  
 this CL table BI this door wide tall  
 Intended: ‘The table is taller than the door is wide.’
- (22) Zhe ge zhuozi de gaodu chaoguo le na ge men de kuandu.  
 this CL table DE height exceed ASP this CL shelf DE width  
 ‘The height of this table exceeds the width of this shelf.’

The impossibility to build subcomparatives has been related to the absence of clausal comparatives in Chinese, see Xiang (2006). *Bi* is always followed by a nominal expression and the prototypical cases of clausal comparative in English involve free relative clauses in Chinese, compare (23) and (24).

- (23) Lisi is richer than I thought.
- (24) Lisi bi [ wo xiangxiang de] fu.  
 Lisi BI I imagine REL rich  
 Lit: ‘Lisi is richer than what I thought.’

However, (21) cannot be rescued by inserting the relative pronoun *de* as in (24) and constructing the maximum from the set of degrees to which the door is wide, as one would immediately expect. This suggests that Chinese comparative sentences, like the Japanese ones, do not involve predicates of degrees in the object position of the comparative relation.

The latter conclusion is confirmed by the absence of negative island effects in Chinese. Consider the contrast between (25) and (26):

- (25) \*Peter bought a more expensive book than Mary didn’t.
- (26) Lisi mai de shu bi [ Zhangsan mei mai de] gui.  
 Lisi buy DE book BI Zhangsan NEG buy DE] expensive  
 ‘Lisi bought a book that is more expensive than the book that Zhangsan didn’t buy.’

The acceptability of (26) and its interpretation given by the English paraphrase indicate that *bi* is followed by a relative clause denoting a set of individuals and not a set of degrees as in (25).

Finally, modalised main clauses of Chinese comparative sentences are not ambiguous in the way predicted by the standard degree-operator analysis of the comparative. The Chinese sentence in (27) cannot be truthfully uttered in the context (28a), unlike its English counterpart. It therefore cannot have the reading paraphrased in (28b) and represented in (29) that corresponds to the wide scope of the comparative with respect to the universal modal. The sentence can only be true in the scenario, in which Lisi buys less candles than Zhangsan in all worlds complying with the rules. This corresponds to the structure with the modal scoping over the comparison.

- (27) Lisi xuyao bi Zhangsan shao mai yixie lazhu.  
 Lisi must BI Zhangsan little buy some candles  
 ‘Lisi had to buy less candles than Zhangsan.’

- (28) a. To fulfil the requirement Lisi had to buy from 5 to 10 candles. Zhangsan had to buy from 8 to 10.  
 b. The minimal amount of candles that Lisi had to buy is surpassed by the minimal amount of candles that Zhangsan had to buy.
- (29)  $\max(d : \text{Lisi was required to buy } d\text{-many candles}) <$   
 $\max(d : \text{Zhangsan was required to buy } d\text{-many candles})$

According to Heim (2001), the ambiguity of English modalised comparatives is an important argument for the analysis of the comparative morpheme as a degree operator that can take scope at LF. Since we do not find this kind of evidence in Chinese, we have to conclude that the main clause of Chinese comparatives does not provide any support for the degree abstraction analysis.

To sum up, the lack of subcomparatives of degree and the absence of a negative island effect speak against the analysis of Chinese comparative clauses as degree predicates and the absence of scope interactions between the comparative and modal operators in the main clause deprive us of crucial evidence for the same kind of treatment of main clauses. These facts suggest that Chinese, similarly to Japanese, cannot build degree abstracts at the LF.

## 4 Contextual Comparison: Lexical Approach

A possible explanation of the Japanese and Chinese facts that we will explore in this section is that degree predicates in these languages have semantics different from that standardly assumed for English. The absence of degree abstraction could be due to the fact that the degree argument is bound inside the gradable predicate. This would account for the absence of structures involving degree abstraction and thus would conform with the negative setting of the DAP. The goal of this section is to elaborate such a solution, drawing on the insights of the contextual comparison approach by Beck et al. (2004). The core ideas of the analysis of Chinese degree constructions that we shall present below are the following:

- Comparison in Chinese is expressed by gradable adjectives.
- The standard of comparison is a contextually provided interval in both comparative and positive sentences.
- Chinese degree constructions feature a family of degree modifiers, like *hen*, operating on the standard interval.

### 4.1 Comparative Degree Adjectives

We assume that Chinese, which does not have any degree morphology, does not employ any abstract degree operators either. Instead, the comparative relation is an inherent part of the lexical meaning of degree predicates. In other words, the Chinese *gao* 'tall' compares the height of an individual to another point or interval on the tallness scale. More concretely, *gao* measures the distance between the height of the subject and the standard of comparison. This is expressed by the following lexical entry of *gao*:

$$(30) \quad \llbracket gao_{S_{\text{tall}}} \rrbracket^g = \lambda D_{(dt)t} . \lambda I_{dt} \in S_{\text{tall}} . \lambda x_e . D(\text{Height}(x) -_{S_{\text{tall}}} \max(I)),$$

where  $\forall d, d' (d -_{S_{\text{tall}}} d') = \{d'' \mid d >_{S_{\text{tall}}} d'' >_{S_{\text{tall}}} d'\}$ .

According to (30), *gao*, associated with the tallness scale *S*, expresses a relation between the differential, the standard-of-comparison interval and the individual corresponding to the subject of comparison that holds if the gap between the height of the subject and the maximum of the standard has the length corresponding to the differential.

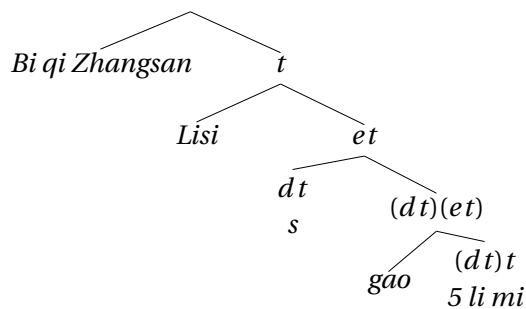
Following Schwarzschild (2005), we analyse differential measure phrases as predicates of intervals, i.e. differentials measure the length of the gap interval. For example, the expression *by 5 cm* denotes a set of intervals on the centimetre scale whose length is 5, see (31). In (30), the differential is true of the set of degrees that corresponds to the region on the scale between the height of the subject and the maximum of the standard.

$$(31) \quad \llbracket 5 \text{ cm} \rrbracket^g = \lambda I_{dt} . \text{Length}(I) = 5 \wedge I \in S_{\text{cm}}$$

The crucial part of the analysis is the contribution of the constituent that introduces the object of comparison. We follow Beck et al. (2004) who argue for a pragmatic strategy in providing the degree argument for the Japanese comparative and assume that the standard of comparison is fixed by a contextual variable that restricts the covert comparative morpheme. Under this assumption, the semantics of the context-setter comparative, repeated in (32), is the basis for the analysis of other degree constructions. The LF we propose is given in (33) and its interpretation in (34).

- (32) *Bi qi Zhangsan, Lisi gao 5 li mi.*  
 Compared to Zhangsan Lisi tall 5 cm  
 ‘Lisi is taller than Zhangsan by 5 cm.’

- (33) *Lisi is taller than Zhangsan by 5 cm.*



$$(34) \quad \llbracket [gao \ 5 \ li \ mi] \rrbracket^g (\llbracket s \rrbracket^g) (\llbracket Lisi \rrbracket^g) = \text{Length}(\text{Height}(\text{Lisi}) -_{S_{\text{tall}}} \max(g(s))) = 5,$$

where  $g(s) = \{\text{Height}(\text{Zhangsan})\}$   
 = the interval between Lisi’s height and Zhangsan’s height is 5 cm long.

*Bi qi Zhangsan* / ‘compared to Zhangsan’ does not contribute to the meaning of the comparative sentence (32) compositionally, but makes the height of Zhangsan salient in the context. The free variable *s* that ranges over intervals and provides the standard of comparison is correspondingly assigned the height of Zhangsan as its value.

The context-setter positive construction exemplified in (35) is analysed similarly.

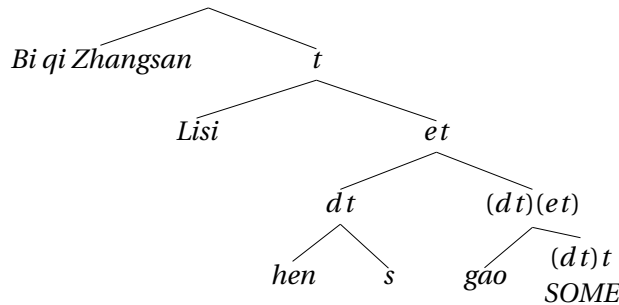
- (35) Bi qi                    Zhangsan, Lisi hen gao.  
 Compared to Zhangsan Lisi very tall  
 ‘Compared to Zhangsan, Lisi is tall.’

We need to take into account the vagueness of the standard in (35), i.e. the difference between the object and the subject cannot be measured, but is rather a vague contextually significant amount, see Kennedy (2007) for the notion of “stand out”. We believe that it is the role of the degree modifier *hen* to extend the standard interval in a context-dependent way. Put differently, *hen* turns the original point-like standard that is fixed by the context-setter into a larger interval. This is reflected in the following lexical entry of *hen*:

$$(36) \llbracket hen_{C,S} \rrbracket^g = \lambda I. \lambda d \in g(C). \forall d' \in I : d \leq_{g(S)} d'$$

*Hen* depends on the scale and a set of degree variables that are determined by the context. It takes an interval corresponding to the standard of comparison and extends its higher bound by a contextually restricted amount w.r.t. the relevant ordering. To see this at work, let us consider the analysis of (35) sketched in (37) and (38). To saturate the first argument of the adjective, we assume a default abstract differential SOME that denotes a set of intervals of indefinite length.

- (37) *Compared to Zhangsan, Lisi is tall.*



- (38)  $\llbracket gao \text{ SOME} \rrbracket^g (\llbracket hen_{C,S} \rrbracket^g) (\llbracket Lisi \rrbracket^g =$   
 $\exists n : \text{Length}(\text{Height}(\text{Lisi}) - s_{\text{tall}} \max(\lambda d \in g(C). \forall d' \in g(s) : d \leq_{s_{\text{tall}}} d')) = n,$   
 where  $g(s) = \{\text{Height}(\text{Zhangsan})\}$   
 = there is some difference between Lisi’s height and the maximum of the interval that extends Zhangsan’s height by a contextually given degree.

Under this analysis, the sentence (35) is predicted true iff Lisi’s height exceeds a contextually set interval that starts from Zhangsan’s height.

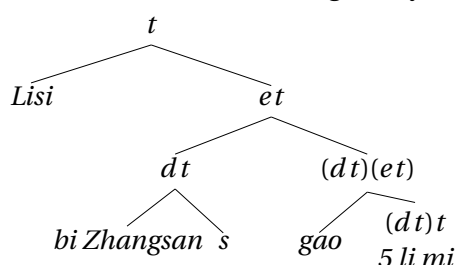
Besides *hen*, we find other pre-adjectival adverbs that restrict the standard interval in one way or another. As an example, we give the lexical entry for *you-xie* / ‘a little’ that reduces the original standard interval.

$$(39) \llbracket you-xie_{C,S} \rrbracket^g = \lambda I. \lambda d \in g(C). \forall d' \in I : d <_{g(S)} d'$$

Turning to the *bi* comparative, we propose that it should also be treated as a contextual comparison construction, as shown in (40). *Bi Zhangsan* / ‘compared to Zhangsan’ is semantically inactive. As a context-setter, it restricts the value of *s*. In our opinion, the fact that *hen* does not occur in the *bi*-construction has a syntactic explanation: its position is already filled by the *bi*-phrase.



(40) *Lisi is taller than Zhangsan by 5 cm.*



An alternative to what we said about context-setters above would be to assume that they modify the variable assignment function in such a way that the standard variable is always set to the degree associated with the mentioned individual, as shown in (41).

(41)  $\llbracket \text{compared to } x_{s,M} p \rrbracket^g = \llbracket p \rrbracket^{g^*}$ ,  
 where  $g^* = g[s/\lambda d. \exists D : D(d) \wedge g(M)(x) \in D]$ ;  $s$  is the standard variable and  $M$  is the salient measure function.

However, the fact that both Japanese and Chinese allow multiple context-setters speaks against this kind of solution, see (42)-(43).

(42) Japanese (Oda, 2007):

John-wa [ Mary-ga yonda yori] [ Bill-ga yonda yori] [ Sue-ga yonda  
 John-TOP Mary-NOM read YORI Bill-NOM read YORI Sue-NOM read  
 yori] motto takusan-no hon-o yonda.  
 YORI more many-NOM book-ACC read

'John read more books than any of Mary, Bill and Sue did.'

(43) Chinese (Nan Li p.c.):

Lisi bi Majing, bi Zhangsan, bi Wangwu dou gao.  
 Lisi BI Majing BI Zhangsan BI Wangwu each tall

'Lisi is taller than any of Majing, Zhangsan and Wangwu is.'

Obviously, one can stack context-setters on top of each other and then compute a standard interval that would satisfy each of them, e.g. in (43) we compare Lisi's height to the interval that contains the heights of Majing, Zhangsan and Wangwu.

Summing up, we proposed an analysis of Chinese degree constructions based on the inherently comparative meaning of gradable predicates. The standard of comparison argument is treated as a free variable of the interval type whose value is inferred from the context. Along with the context-setters that fix the standard, Chinese degree constructions can involve pre-adjectival degree adverbs that can extend or reduce the standard interval.

## 4.2 Analysing Antonyms

According to the lexical entry of *hen* given in (36) above, this adverb has the potential of extending the standard interval with respect to the ordering at hand. The extension

of the standard interval is an important ingredient in the semantics of the positive construction. It results in the comparison with an interval with vague boundaries and is responsible for the context sensitivity of the positives. Importantly, the extension is performed on the scale of the relevant adjective. In this section we will demonstrate how this fits into the analysis of antonyms that we assume to be associated with different scales.

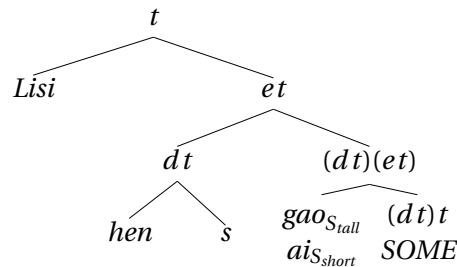
Let us consider the analysis of the positive sentences in (44)-(45) based on a pair of antonyms. If the standard interval is not specified by the context-setter as in these examples, it is set to some default degree, e.g. the average height in the context. We assume that *short* has the same lexical entry as *tall* differing from it only in the ordering that it is associated with, cf. (46).

- (44) Lisi hen gao.  
Lisi very tall  
'Lisi is (very) tall.'

- (45) Lisi hen ai.  
Lisi very short  
'Lisi is (very) short.'

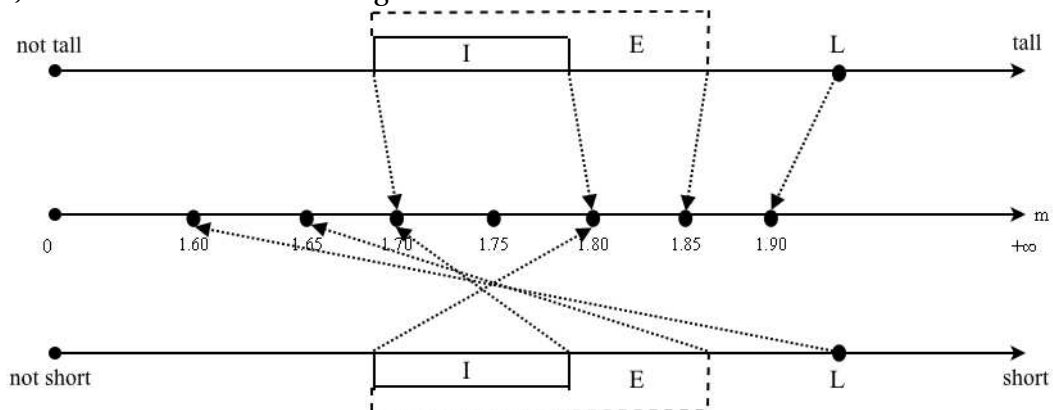
(46)  $\llbracket ai_{S_{short}} \rrbracket^g = \lambda D_{(dt)t} . \lambda I_{dt \in S_{short}} . \lambda x_e . D(\text{Height}(x) -_{S_{short}} \max(I))$ ,  
where  $\forall d, d' (d -_{S_{short}} d') = \{d'' \mid d >_{S_{short}} d'' >_{S_{short}} d'\}$ .

- (47) *Lisi is (very) tall/short.*



According to (47), (44) is true iff Lisi's height is greater than the extended standard interval, whereas (45) is true iff Lisi's height is less than the extended interval, the extension being performed with respect to the given ordering in each case. The following scheme illustrates the truth conditions ( $L = \text{Height}(\text{Lisi})$ ;  $I = \llbracket s \rrbracket^g$ ;  $E = \llbracket hen s \rrbracket^g$ ):

(48) Shortness vs. tallness degrees



The conjoined comparative that we repeat in (49) can now be analysed as involving two different orderings: the sentence is true iff Lisi's height exceeds Zhangsan's height on the tallness scale and the opposite holds on the shortness scale, see (50). We derive these truth conditions if we assume that the context is restricted to two individuals and the values of the standard variables are set to their heights.

- (49) Lisi gao, Zhangsan ai.  
Lisi tall Zhangsan short  
'Lisi is taller than Zhangsan.'
- (50)  $\exists n : \text{Length}(\text{Height}(\text{Lisi}) -_{S_{\text{tall}}} \text{Height}(\text{Zhangsan})) = n \wedge$   
 $\exists n : \text{Length}(\text{Height}(\text{Zhangsan}) -_{S_{\text{short}}} \text{Height}(\text{Lisi})) = n$

To conclude, we assume that antonyms employ the same measure function but different ordering. Thus, *tall* and *short* make use of *Height* that assigns individuals their height degrees, but they are associated with reciprocal scales.

### 4.3 Degree Modifiers

In the previous sections, we argued that two semantically different kinds of degree adverbs are operative in comparative constructions. Differential adverbs measure the length of the gap interval between the standard and the subject of comparison. Adverbs like *hen*/'very' are the standard argument modifiers. In this section we will consider their distribution.

Recall that *hen* is optional in sentences with negation, cf (51). In (51a) *hen* can only be understood as making the standard interval considerably larger, i.e. it corresponds to the English *very*.

- (51) a. Lisi bu hen gao.  
Lisi NEG very tall  
'Lisi is not very tall.'
- b. Lisi bu gao.  
Lisi NEG tall  
'Lisi is not tall.'

Under our analysis, (51a) describes the state of affairs represented in (52), i.e. for the sentence to be true Lisi's height has to lie on the interval that spans from the beginning of the tallness scale up to the maximum of the extended interval.

- (52)  $\text{Height}(\text{Lisi}) \in [0; \max(E)]$   
|-----{ [---I---] -E--- }-----><sub>tall</sub>  
[I] the average height interval  
{E} the extension of [I] by *hen*

(51b) makes a stronger claim, allowing Lisi to have an average height at most, as illustrated in (53).

- (53)  $\text{Height}(\text{Lisi}) \in [0; \max(I)]$   
|-----[---I---]-----><sub>tall</sub>  
[I] the average height interval

Thus, the present account predicts that *hen* leads to a weakening of the truth conditions under negation. In non-negated sentences the absence of *hen* does not produce such effects. In fact, it does not influence the truth conditions at all. We assume that *hen* can be omitted in negative contexts to allow for a stronger claim<sup>2</sup>. In nonnegative contexts it cannot induce any strengthening and is therefore inserted to indicate that an extension of the standard can be made.

According to the analysis that we developed in the previous section, any sentence with a gradable adjective involves a differential degree adverb since the latter is analysed as the argument of the adjective. A positive sentence is assumed to contain the abstract SOME. Note, however, that overt differentials of any kind are unacceptable in positive sentences, as the following examples illustrate:

- (54) \* Lisi *hen* gao yi-xie/de duo/5 li mi.  
 Lisi very tall a little/much/5 cm  
 Intended: ‘Lisi is a little / much / 5 cm taller.’

Why is *hen* incompatible with differential measure phrases? Let us consider what our analysis predicts for (54). To compute the meaning we need to come up with a standard of comparison. The differential then measures the length of the gap between Lisi’s height and the maximum of the inferred standard. *Hen* has the potential of extending the standard and making its boundaries fuzzy. Since in this case the maximum of the standard can never be pinned down precisely, i.e. mapped to a definite degree on the numerical scale, defining the distance from it to Lisi’s height appears impossible. The general problem with sentences like (54) is that they suffer from the clash between the vagueness of the standard and the precision of the distance measurement. This is not a problem specific for Chinese. English positive sentences do not allow measure expressions either.

To sum up, *hen* is obligatory in positives without negation where its role is to extend the boundaries of the standard of comparison and make them vague. It is optional in negated sentences to allow for a stronger claim. Overt differentials are ruled out in positives with *hen* as the result of a conflict between the precision of the gap measurement and the undefined bounds of the extended standard interval.

#### 4.4 Other Degree Constructions

In this section we shall consider how our proposal can deal with Chinese degree constructions other than the positive or the comparative. The focus will be on the interpretation of sentences which are standardly analysed as involving degree operators different from the comparative.

These cases present a good testing ground for the lexical approach to contextual comparison that we pursue in this study. The main idea of this approach is that the comparison is expressed by the adjective, i.e. the degree argument of the adjective is bound lexically. A natural question to ask in this set up is how to analyse degree constructions such as superlatives, equatives or too/enough sentences that are assumed to involve a semantic relation different from simple comparison. We shall demonstrate

<sup>2</sup> We found that *hen* is optional in *if*-clauses, in the restriction of the universal quantifier and other DE contexts. However, a more thorough investigation is needed to support our hypothesis.

the strategy that we adopt for the treatment of these cases by concentrating on the analysis of the superlative. We shall then briefly consider the form and some properties of equatives and measure phrase constructions but their detailed analysis will have to be left for another occasion.

The main claim of this section is that all types of degree constructions in Chinese are based on the comparative relation and the resulting interpretations ultimately depend on the proper choice and restriction of the standard argument. The latter can be modified by degree adverbs like *hen*/'very,' *zui*/'most' and specified by various kinds of context-setters.

The Chinese superlative features the adverb *zui* that occurs before the degree predicate:

- (55) Lisi shi (ta men ban) zui gao de xuesheng.  
 Lisi be his class most tall DE student  
 'Lisi is the tallest student in his class.'

Similarly to *hen*, *zui* does not co-occur with *bi* context setters but it allows for other expressions specifying the comparison class as the following example shows:

- (56) Zai zhe xie ren dang zhong, Lisi yao pa zui gao na zuo shan.  
 in DEF some people among Lisi need climb most tall that CL mountain  
 'Among other people Lisi needs to climb the highest mountain.'

We propose that *zui* can be analysed as a modifier of the standard degree argument, i.e. a function of the type  $(dt)(dt)$  that introduces a certain restriction on the standard interval. Specifically, it requires that the values that the relevant measure function (e.g. Height) assigns to all individuals salient in the context be included in or lie below this interval.

- (57)  $\llbracket zui_{C,M} \rrbracket^g = \lambda I. \lambda d. I(d) \wedge \forall x \in g(C) : d \geq g(M)(x)$ ,  
 where  $C$  and  $M$  are variables ranging over a set of individuals and a measure function respectively.

In other words, *zui* guarantees that the standard interval includes the highest value the relevant measure function returns for individuals in the set  $C$ . If we assume that  $g(M) = \text{Height}$  and  $g(C)$  is a set of mountains salient in the context, modifying the initial standard interval by *zui* gives us an interval that includes the highest mountain in  $g(C)$ . If we now feed this modified standard into the adjective meaning we can derive the superlative interpretation, namely that the height of Lisi's mountain exceeds the height of the highest mountain from the relevant set.

In the contextual approach that we developed, the role of the superlative *zui* can be reduced to modifying the standard degree argument. This option allows us to derive the normal superlative meaning without having to introduce a superlative operator and thus retaining the inherently comparative meaning of the adjective that we introduced in the previous sections.

One more way to specify the standard can be exemplified by the so-called complex stative construction that conveys the meaning paraphrasable by the English *too / enough / so ... that* intensional comparison constructions. The following example is due to Li and Thompson (1981):

- (58) Ta gaoxing de shui bu zhao.  
 she happy DE sleep NEG succeed  
 'She is so happy that she cannot sleep'

We suggest that in (58) the DE-clause is a context setter that restricts the value of the standard variable on the adjective *gaoxing*/'happy'. Informally, the sentence is predicted true iff the degree of her happiness exceeds the happiness interval corresponding to the worlds in which she cannot sleep. This condition naturally implies that she cannot sleep in the actual world.

We find different ways to express the equative. The most common one is shown in (59). Interestingly, this kind of equative can have different realisations: it can involve an explicit standard of comparison accompanied by a differential measure phrase; or else the adjective can be modified by *hen*, see (60)-(61).

- (59) Lisi gen Zhangsan yiyang gao.  
 Lisi with Zhangsan same tall  
 'Lisi is exactly as tall as Zhangsan.'
- (60) Lisi gen Zhangsan yiyang dou bi Majing gao (5 li mi).  
 Lisi with Zhangsan same each BI Majing tall 5 cm  
 'Both Lisi and Zhangsan are taller than Majing by 5 cm.'
- (61) Lisi gen Zhangsan yiyang dou hen gao.  
 Lisi with Zhangsan same each very tall  
 'Both Lisi and Zhangsan are (very) tall.'

A fully spelled out analysis of the *gen ... yiyang* sentences is outside the scope of this paper. It seems unlikely that (59) involves an equative morpheme of the English kind. The data in (59) and (60) rather require a comparative interpretation. Thus, (60) could be analysed as stating that Lisi and Zhangsan are similar to each other with respect to exceeding Majing's height by 5 cm and (59) can be given the analogous paraphrase "Lisi and Zhangsan are similar to each other with respect to the degree by which they exceed some standard of comparison." This would fit into the lexical approach we proposed. However, this is but a speculative remark about what might be going on in (59)-(61).

Another widely used construction involving degree adjectives that we want to comment on briefly comprises the family of the *you ... (name)* sentences exemplified in (62)-(64).

- (62) Zhe xiangzi you \*(5 kg) zhong.  
 DEF suitcase have 5 kg heavy  
 'The suitcase weighs 5 kg.'
- (63) Zhe xiangzi you duo zhong?  
 DEF suitcase have much heavy  
 'How much does the suitcase weigh?'
- (64) Zhe xiangzi you [zhe ge bao (name)] zhong.  
 this suitcase have DEF CL bag that heavy  
 'The suitcase is as heavy as this bag.'

The copula *you*/'have' is a distinctive feature of this type of construction. Note that *you* is not possible in a simple positive sentence without a measure phrase, cf. (62). Therefore we do not think that (62) can be analysed as the English measure phrase construction where the degree argument of the gradable predicate is realised as a measure expression. Our guess is that we are dealing with a resultative construction involving a complex accomplishment predicate where the part before the gradable adjective expresses the resulting state, i.e. (62) means that the suitcase has reached 5 kg in weight. The degree question in (63) and the equative in (64) should obviously be treated in the same way.

To conclude this section, a number of degree constructions, like the superlative, can be analysed based on the comparative relation. The standard interval is modified by pre-adjectival degree adverbs or specified by context setters. This leads to a variety of interpretations. The treatment of other constructions with degree adjectives, like equatives, is rather involved and seems to be based on mechanisms different from those standardly applied to their English counterparts.

## 5 Conclusion

The main goal of this paper was to present evidence from Chinese in favour of the Degree Abstraction Parameter proposed in Beck et al. (2004) and explore a possible source for its negative setting in some languages. The DAP, which draws a binary division between languages with respect to their ability to build degree abstracts in the syntax, can be seen as a descriptive generalisation of some phenomena related to the semantics of degree constructions. We have shown that Chinese comparatives are characterised by the absence of degree abstraction structures. Thus, they confirm that the "minus DAP" pattern discovered in Japanese is not incidental. To reach this conclusion we used the tests identified and applied to Japanese by Beck et al. (2004), namely the availability of scope interactions in the main clause of the comparative sentence, the ability of the comparative clause to host negation and the availability of subcomparatives. The latter two tests revealed that Chinese as well as Japanese does not have English-like comparative clauses with the semantics of degree predicates. Instead, it employs individual type standards. This property has been recently reported for a number of languages, e.g. Hindi-Urdu in Bhatt and Takahashi (2007), Turkish in Hofstetter (2008). One could suppose that either the absence of clausal comparatives due to certain syntactic limitations Bhatt and Takahashi (2007) or the lexical restriction on the type of standard argument of the comparative Kennedy (to appear) is the reason behind the observed cross-linguistic variation. We do not think such an approach is tenable, at least for the languages we considered in this paper. The absence of scope interactions between the comparative and modal operators in the main clause suggests that the source of variation is not located exclusively in the embedded clause. It indeed stems from the absence of degree abstraction, which supports the DAP hypothesis.

One can consider different triggers for the negative setting of the DAP. For example, it is conceivable that the lack of degree abstraction is due to the more general restrictions on semantic binding, operative outside of the degree domain as well. In this study we explored an alternative explanation, namely that the *minus DAP* languages have different lexical semantics for degree predicates. We suggested that the source of

variation is to be looked for in the lexicon; see Chierchia (1998) for the same strategy in the nominal domain.

According to the present proposal, a Chinese comparative sentence does not involve an abstract degree operator but a degree predicate with comparative semantics, i.e. *gao* 'tall' means *taller* incorporating the meaning of the usually independently posited comparative morpheme. This move allows to shift the binding of the degree argument to the lexical level and make the LF free of degree abstraction structures. We assumed, following Beck et al. (2004), that the degree argument is not provided compositionally, but pragmatically by a context-setter that fixes the value of the interval-denoting contextual variable. Thus, Chinese comparatives—as well as Japanese ones—do not provide us with expressions that semantically contribute to the calculation of the standard of comparison like English *than* clauses. For this purpose, context-setters parallel to the English *compared to* phrases can be employed. Otherwise, the standard is set to some default neutral interval in the given context, as it is the case in the positive construction. Consequently, all degree constructions are based on the comparative relation. We showed how this kind of analysis accounts for the comparative, positive and superlative constructions. It remains an open question how exactly other types of degree sentences—like equatives, measure phrase constructions, degree questions—should be treated. We pointed to some properties of those constructions that make the application of the standard analysis problematic and sketched possible analyses compatible with the present approach.

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# Solving the Morpho-Syntactic Puzzle of the Japanese *-Te* Form Complex Predicate: A Multi-Modal Combinatory Categorial Grammar Analysis

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## 1 Introduction

Japanese has a class of verbs that subcategorize for predicates marked by the morpheme *-te*, such as the matrix verb *morat-ta* in (1).<sup>1</sup>

- (1) Mary-ga John-ni piano-o hii-te morat-ta.  
Mary-NOM John-DAT piano-ACC play-TE BENEF-PAST  
'Mary had John play the piano for her.'

The syntactic structure of this construction, which I hereafter call the *-te* form complex predicate, has long been a puzzle in Japanese generative grammar (Shibatani, 1978; McCawley and Momoi, 1986; Sells, 1990). In a nutshell, it has properties of both sentential complementation and lexical complex predicates and exhibits what at first sight seems to be a contradictory set of distributional properties with respect to the morphological wordhood of the sequence of the embedded verb (V1) and the embedding verb (V2). In terms of a certain set of criteria, it appears as if the V1 and V2 form a tight lexical unit like lexical complex predicates (such as the causative construction and compound verbs), whereas in terms of another set of criteria, it lines up with typical sentential complementation, suggesting the existence of an embedded VP constituent headed by the V1.<sup>2</sup>

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<sup>1</sup>The set of verbs that take *-te* marked complements can be roughly classified into two types: benefactive predicates (such as *-te morau* 'have somebody V for the benefit of oneself', *-te kureru* 'V for the benefit of the speaker' and *-te yaru/ageru* 'V for the benefit of somebody else', and modal/aspectual predicates (such as *-te iru* (progressive), *-te oku* (perfect) and *-te simau* (perfect)).

<sup>2</sup>There is a slight oversimplification in this pre-theoretical characterization of the problem. In the literature of complex predicates (especially in HPSG), some constructions have been analyzed as forming *syntactic* complex predicates (see, for example, the analysis of German verbal complexes by Hinrichs and Nakazawa (1994) and the analysis of a certain kind of complex predicate in Korean by Chung (1998)). The *-te* form complex predicate exhibits properties similar to these syntactic complex predicates. I discuss possibilities and limitations of analyzing the *-te* form in terms of *argument composition*—the typical mechanism employed in the analysis of syntactic complex predicates in HPSG—in section 3.

Previous authors such as Sells (1990) and Matsumoto (1996) have generally treated this construction as a special kind of syntactic complementation, but it turns out that such analyses run into problems accounting for the phenomena for which the *-te* form behaves in tandem with lexical complex predicates. An alternative approach that treats the sequence of the V1 and V2 as a lexical unit would obviously suffer from the exact opposite problem, falling short of accounting for cases in which the *-te* form behaves like sentential complementation.

This paper presents a new analysis of this construction in Multi-Modal Combinatory Categorical Grammar (MMCCG) (Baldrige, 2002), in which the duality of the *-te* form complex predicate is captured by a mechanism that constitutes a central feature of the theory. The following two aspects most sharply distinguish the proposed analysis from previous approaches:

- (i) In the MMCCG analysis, the distributional properties of the *-te* form complex predicate are *not* accounted for in terms of syntactic structures (thereby obviating the need to assign mutually inconsistent syntactic structures that different sets of phenomena call for, which is essentially the source of the problem for analyses in other frameworks).
- (ii) Instead, the apparently contradictory set of behaviors of this construction are accounted for in terms of the lexically specified combinatoric properties of the *-te* form complex predicate, whereby the V1 and V2 are put together in a way that is ‘tighter’ (in a sense to be made precise) than the way in which ordinary arguments are combined with the head verb.

The proposed analysis can be seen as taking full advantage of the theoretical architecture of MMCCG since (i) the notion of phrase structure plays no role in categorial grammar in general, where the grammar is viewed as a logical deductive system and not as a structure building system and (ii) a fine-grained control over lexically specified combinatoric properties of linguistic expressions is the major advantage of MMCCG as compared to earlier versions of CCG. As we will see below, this latter property is crucial in giving a precise analysis of this construction in the lexicalist setup of CCG.

## 2 Syntactic patterns

The following table summarizes the behaviors of the *-te* form complex predicate and contrasts them with those of lexical complex predicates and typical sentential/VP complementation.<sup>3,4</sup>

<sup>3</sup>To my knowledge, McCawley and Momoi (1986) were the first to systematically investigate the puzzling nature of the *-te* form complex predicate, including many of the observations that I present below.

<sup>4</sup>CP and SC/VPC stand for ‘complex predicate’ and ‘sentential complementation/VP complementation’, respectively. ‘✓’ in a column means that the pattern in question is possible. ‘\*’ means that the pattern results in ungrammaticality.

(2)

|                                            | <i>-te</i> form | CP | SC/VPC |
|--------------------------------------------|-----------------|----|--------|
| interclausal scrambling                    | ✓               | ✓  | *      |
| adverb between V1 and V2                   | *               | *  | ✓      |
| argument cluster coordination involving V1 | *               | *  | ✓      |
| postposing of 'VP' headed by V1            | *               | *  | ✓      |
| clefing of 'VP' headed by V1               | *               | *  | ✓      |
| coordination of 'VP' headed by V1          | ✓               | *  | ✓      |
| focus particle between V1 and V2           | ✓               | *  | ✓      |
| reduplication of V2 alone                  | ✓               | *  | ✓      |

This section presents relevant data of the *-te* form complex predicate for each of these tests. Due to space limitations, I omit corresponding data for lexical complex predicates and sentential/VP complementation constructions.<sup>5</sup>

## 2.1 Cases in which the *-te* form behaves like a complex predicate

Japanese allows for scrambling of arguments fairly freely within a single clause. In the *-te* form complex predicate, in spite of the fact that the V1 is semantically an argument of the V2, arguments of the V1 can be freely scrambled with arguments of the V2. (3b) is an example in which the accusative object *piano-o* of the V1 is scrambled over a matrix dative argument *John-ni*.

- (3) a. Mary-ga John-ni piano-o hii-te morat-ta.  
 Mary-NOM John-DAT piano-ACC play-TE BENEF-PAST  
 'Mary had John play the piano for her.'
- b. Mary-ga *piano-o* John-ni hii-te morat-ta.

Word orders that are different from the canonical one (in this case, the NOM < DAT < ACC order) are associated with marked information structure (in terms of what is and is not given), but given appropriate contexts, all permutations of the three NPs are possible for sentences like (3a). However, a word order in which an argument of either the V1 or the V2 splits the sequence of the sentence-final verb cluster (i.e. the sequence of the V1 and V2) is strictly ungrammatical, as shown in (4).

- (4) \*Mary-ga piano-o **hii-te** John-ni **morat-ta**.  
 Mary-NOM piano-ACC play-TE John-DAT BENEF-PAST  
 intended: 'Mary had John play the piano for her.'

The distribution of adverbs exhibits essentially the same pattern. That is, in terms of adverb placement, the cluster of the V1 and V2 behaves like a single lexical element. As shown in (5a), an adverb that semantically modifies the V2 can appear closer to the V1 than an embedded argument does, which would be unexpected if there were an embedded VP constituent headed by the V1. But sentences like (5b), in which an adverb splits the sequence of the V1 and V2, are ungrammatical, just like sentences like (4) in which an argument splits the verb cluster are ungrammatical.

<sup>5</sup>I hope to discuss these in a longer version of this paper.

- (5) a. Mary-ga John-ni piano-o *muri-ni hii-te morat-ta.*  
 Mary-NOM John-DAT piano-ACC forcibly play-TE BENEF-PAST  
 ‘Mary forcibly had John play the piano for her.’  
 b. \*Mary-ga John-ni piano-o **hii-te** *muri-ni morat-ta.*

The generalization that can be drawn from the above patterns of argument scrambling and adverb placement is that dependents (arguments and adjuncts) of the V1 and those of the V2 can scramble freely with one another but they cannot split the sentence-final verb cluster.

The pattern of argument cluster coordination (ACC) also provides evidence for the inseparability of the cluster of the V1 and V2. As shown by the following contrast, ACC involving nominal arguments of the V1 and V2 is possible but ACC involving the V1 together with nominal arguments of the V1 and V2 is not:

- (6) a. [John-ni piano-o], [Bill-ni gitaa-o] **hii-te morat-ta.**  
 John-DAT piano-ACC Bill-DAT guitar-ACC play-TE BENEF-PAST  
 ‘I had John play the piano and Bill play the guitar for me.’  
 b. \*[John-ni piano-o **hii-te**], [Bill-ni gitaa-o **hii-te**] **morat-ta.**

(6b) is bad since the cluster of the V1 and V2 is split up for the first conjunct.

Postposing and clefting are the final pieces of evidence for the tight connection between the V1 and V2. Postposing is a construction in which an element of the sentence is segregated to a position following the main verb, with the pragmatic function of making the postposed element an afterthought (Simon, 1989). In clefting, an element is displaced from the rest of the sentence (which gets topicalized) and placed in the focus position immediately preceding the copula. The data in (7) and (8) show that in neither of these constructions can the sequence of the V1 and V2 be split apart.

- (7) a. **Yon-de morat-ta** yo, John-ni sono-hon-o.  
 read-TE BENEF-PAST John-DAT that-book-ACC  
 ‘I had John read that book for me.’  
 b. \*John-ni **morat-ta** yo, sono-hon-o **yon-de.**  
 c. \*John-ni sono-hon-o **morat-ta** yo, **yon-de.**
- (8) a. [John-ga Mary-ni **yon-de morat-ta**] no wa sono-hon-o da.  
 John-NOM Mary-DAT read-TE BENEF-PAST NMLZ TOP that-book-ACC COP  
 ‘What John had Mary read for him was that book.’  
 b. \*[John-ga Mary-ni **morat-ta**] no wa sono-hon-o **yon-de** da.  
 John-NOM Mary-DAT BENEF-PAST NMLZ TOP that-book-ACC read-TE COP  
 intended: lit. ‘What John had Mary do for him was read that book.’  
 c. \*[John-ga Mary-ni sono-hon-o **morat-ta**] no wa **yon-de** da.  
 John-NOM Mary-DAT that-book-ACC BENEF-PAST NMLZ TOP read-TE COP  
 intended: lit. ‘What John had Mary do for him with that book was read it.’

## 2.2 Cases in which the *-te* form behaves like sentential/VP complementation

In apparent contradiction to the data reviewed in the previous subsection, the patterns of VP coordination, focus particle insertion and reduplication suggest that the V1 and

V2 do not form a lexical unit but rather are combined in the syntax.

(9) is a case of VP coordination. In this sentence, two VPs (each composed of an embedded verb and its argument) are coordinated.

- (9) Mary-wa John-ni [[piano-o **hii-te**] [huruuto-o **hui-te**]] **morat-ta**.  
 Mary-TOP John-DAT piano-ACC play-TE flute-ACC play-TE BENEf-PAST  
 ‘Mary had John play the piano and play the flute for her.’

Coordination of this form is not allowed with lexical complex predicates as shown by the ungrammaticality of the following example involving the compound verb construction:

- (10) \*Dono gakusei-mo [piano-o hiki], [uta-o utai]-sugi-ta.  
 every.student piano-ACC play song-ACC sing-overdo-PAST  
 intended: ‘Every student played the piano and sang a song, both excessively.’

It would be very difficult to account for the contrast between the *-te* form complex predicate and lexical complex predicates exemplified in (9) vs. (10) if the V1 and V2 were analyzed as forming one lexical item in both constructions.

Facts about focus particle insertion and reduplication also indicate that the V1 and V2 in the *-te* form complex predicate constitute separate words in the syntax. It is known that focus particles cannot appear inside a word boundary (for example, they cannot appear between the two component verbs in the compound verb construction). As shown in (11), however, the *-te* form complex predicate allows a focus particle to split the sequence of the V1 and V2. (12) shows that the V2 can be independently reduplicated, which would also be impossible if the V1 and V2 formed a morphological word as is the case with the lexical complex predicate constructions.

- (11) John-ni piano-o **hii-te sae morat-ta**.  
 John-DAT piano-ACC play-TE even BENEf-PAST  
 ‘I asked John even the favor of playing the piano for me.’
- (12) Kimi-ni Tookyoo-ni **it-te hosii** koto-wa **hosii** ga, ...  
 you-DAT Tokyo-LOC go-TE want want though  
 ‘Though I do want you to go to Tokyo, ...’

### 3 Previous analyses

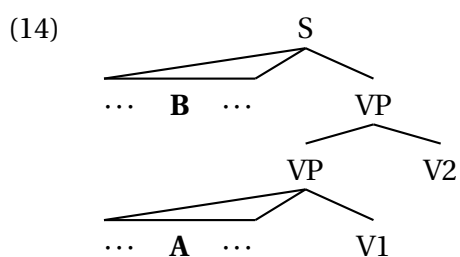
In this section, I discuss three kinds of existing and conceivable analyses of the *-te* form complex predicate in three major syntactic frameworks: Sells’ (1990) ‘co-head’ analysis in LFG, Kageyama’s (1993) verb-raising analysis in the GB theory and an analysis in HPSG based on the argument composition mechanism (Hinrichs and Nakazawa, 1994). For each of these analyses, I point out empirical and theoretical problems. Though these analyses appear to be quite different, they fail for essentially the same reason: because of the ‘contradictory’ nature of the distributional properties of the *-te* form complex predicate, analyses that crucially rely on the notion of phrase structure run into problems that are difficult to reconcile.

### 3.1 Sells' (1990) co-head analysis

Sells' (1990) analysis of the *-te* form complex predicate can be seen as an attempt to capture the duality of this construction by making use of the multi-dimensional architecture of LFG and treating it as monoclausal and biclausal at different levels of syntactic representation at the same time. That is, in his analysis, the V1 and V2 in the *-te* form complex predicate (he treats the latter as an 'auxiliary' verb) share a single f-structure, although, at the level of c-structure, the V1 is embedded under the V2. The sharing of the f-structure by the V1 and V2 is tantamount to the assumption that (as far as predicate-argument structure is concerned) they are co-heads of the construction and for this reason I will henceforth call this assumption the 'co-head assumption'. Sells further introduces a VP rule like the following for combining a projection of the V1 with a lexical V2, in addition to the ordinary S rule and VP rule:

$$(13) \quad \text{VP} \rightarrow \text{VP} \text{ AUX} \\ \quad \quad \quad \uparrow=\downarrow \quad \uparrow=\downarrow$$

These two assumptions in effect make it possible to optionally 'liberate' arguments of the V1 to the structurally higher position headed by the V2. That is, because of the co-head assumption, in terms of the f-structural predicate-argument relationship, any argument of the V1 is automatically an argument of the V2, meaning that it can establish a sisterhood relation to the V2 at c-structure. At the same time, rule (13) still allows for a possibility in which an argument of the V1 is directly realized as a sister of its 'original' head V1 at c-structure. This is because (13) says that the V2 combines with a partially saturated projection of the V1 (in Sells' system VP is a verbal projection in which any number of non-subject arguments are saturated, including zero). Thus, schematically in the picture in (14), for any given argument of the V1, there are potentially two syntactic positions at which it can surface: the hierarchically lower position **A** governed by the V1 or the hierarchically higher position **B** governed by the V2.



The availability of two positions for arguments of the V1 accounts for the patterns of scrambling and VP coordination. Furthermore, since the sequence of the V1 and V2 is not analyzed as a lexical unit, the data of focus particle insertion and reduplication are also unproblematic.

The co-head assumption is the crux of Sells' analysis. This assumption not only drives the optional raising of an embedded argument as described above, but also is crucially made use of in accounting for the distribution of adverbs observed in (5). That is, in Sells' analysis, an independently motivated linear order constraint formulated as in (15) interacts with the co-head assumption to exclude a possibility for the adverb to be linearly positioned between the V1 and V2, accounting for the ungrammaticality of sentences like (5b).



(15)  $\neg \text{HEAD} < \text{HEAD}$  (where HEAD is any category annotated  $\uparrow=\downarrow$ )

Given this linear order constraint, the adverb cannot linearly appear after the V1 when the two get syntactically realized as co-sisters of the V2, since the V1 is annotated as the head ( $\uparrow=\downarrow$ ), being licensed by rule (13).

However, there are some problems for Sells' co-head assumption. First, for at least some of the predicates that take the *-te* marked complements such as *morau* (benefactive) and *hosii* ('want'), the V1 is arguably a semantic argument of the V2 and the co-head assumption seems inappropriate.<sup>6</sup> For example, under Sells' analysis, it is not clear how the ambiguity of adverb interpretation can be distinguished for such predicates (like many other complex predicate constructions, these predicates exhibit scope ambiguity of adverbs between a reading in which the adverb modifies the higher verb and one in which it modifies the lower verb). Second, for a verb such as *morau*, which takes a nominal argument (in the case of *morau*, a dative argument bearing the benefactor semantic role) in addition to the *-te* marked embedded VP, sentences like (6b) would be incorrectly licensed as a case of coordination of embedded VPs where the dative argument of the matrix verb is syntactically realized within the projection of the embedded verb. Given that the f-structures of the V1 and V2 are completely identified in Sells' analysis, it is not clear how such a misanalysis would be ruled out.<sup>7</sup>

Given the above observations, I conclude that Sells' (1990) analysis, while neatly capturing many of the patterns of the *-te* form complex predicate with a relatively simple set of assumptions, does not cover all of the cases adequately.

### 3.2 Head movement analysis in the GB theory

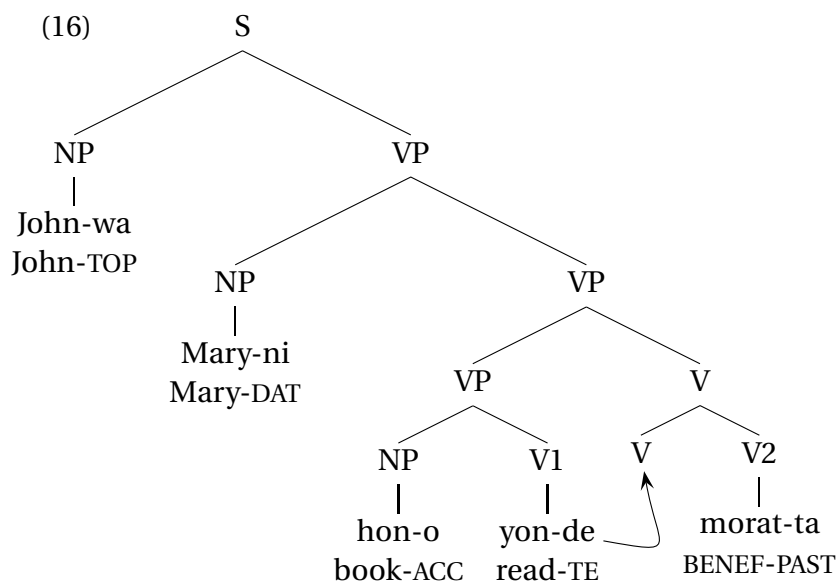
Kageyama (1993) sketches an analysis of the *-te* form complex predicate in the GB theory in terms of head movement. In his suggested analysis (which is not worked out in full detail), the duality of the *-te* form is in effect captured by means of rule ordering. That is, he assumes a biclausal deep structure for the *-te* form complex predicate and further introduces a head movement operation that raises the embedded verb from its base position to a position where it adjoins to the V2 to form a cluster as in (16):

<sup>6</sup>In LFG, semantics is represented at a component called 'semantic structure', which is distinct from f-structure. Thus, in principle, it is conceivable that an f-structurally monoclausal predicate is mapped onto a biclausal semantic structure. However, phenomena like adverb scope that fall within the domain of the syntax-semantics interface have standardly been treated at the level of f-structure in LFG (see, for example, the analysis of complex predicates in Japanese by Matsumoto (1996)). Also, an analysis that assumes a mismatch between a monoclausal f-structure and a biclausal semantic structure would involve a significant complication in the mapping between different levels of syntactic and semantic representation. For a discussion of the technical difficulties of such an approach within LFG, see Andrews and Manning (1999, 11).

<sup>7</sup>One might alternatively assume a flat constituent structure in which both the V1 and the nominal arguments of the V1 and V2 are licensed as sisters of the V2 by a phrase structure rule like the following:

$$(i) \quad S \rightarrow \begin{array}{ccc} \text{XP}^* & \text{V} & \text{AUX} \\ \uparrow \text{GF}=\downarrow & \uparrow=\downarrow & \uparrow=\downarrow \end{array}$$

This analysis, together with the assumption that ACC cannot involve part of a complex predicate, will correctly account for the contrast in (6). However, it is not clear how embedded VP coordination as in (9) is licensed in this kind of analysis with the absence of an embedded VP node in the syntax.



In this analysis, phenomena for which the *-te* form behaves as if it had a complex embedded structure are sensitive to the structure before the head movement takes place and phenomena for which the V1 and V2 behave like a lexical unit are sensitive to the structure after the head movement.

There are two major problems for this type of approach. The first problem is that it cannot account for the pattern of adverb placement straightforwardly. Recall from the discussion in section 2 that arguments and adjuncts of both the V1 and V2 can be freely scrambled with one another. Thus, sentences like (17), in which an adverb that semantically modifies the V1 linearly precedes an argument of the V2 (in this case, the dative argument *Mary-ni*), are perfectly acceptable.


- (17) John-wa *yukkuri* Mary-ni son-hon-o yon-de morat-ta.  
 John-TOP slowly Mary-DAT that-book-ACC read-TE BENEFPAST  
 'John had Mary read the book for him slowly.'

This kind of sentence is difficult to account for in Kageyama's approach. Assuming that the structure of the *-te* form complex predicate is something like (16), and assuming that adverbs are base-generated at positions corresponding to their semantic scope (which is a fairly standard assumption in the theoretical setup adopted by Kageyama (1993)), in the underlying structure the matrix dative argument has to linearly precede the embedded VP which contains the adverb. From the analysis in (16), it should be clear that the head movement does not change the relative linear order between the matrix dative argument and the embedded adverb. Thus, unless some syntactic operation is introduced for scrambling an adverb across a clause boundary, sentences like (17) cannot be licensed in Kageyama's analysis.<sup>8</sup>

<sup>8</sup>Long-distance scrambling of adverbs (except possibly for cases in which the landing site is the sentence-initial position) is impossible in full sentential/VP complementation, suggesting that positing such a scrambling operation would lead to an unwanted overgeneration in Kageyama's (1993) approach.

- (i) a. ??John-wa *yukkuri*<sub>i</sub> Mary-ni [<sub>t<sub>i</sub></sub> son-hon-o yomu koto]-o meizi-ta.  
 John-TOP slowly Mary-DAT that-book-ACC read NMLZ-ACC order-PAST  
 intended: 'John ordered Mary to read the book slowly.'

Second, this analysis runs into problems accounting for the possibility of VP coordination. In Kageyama's analysis, head movement has to be an obligatory operation in order to account for the fact that arguments and adverbs cannot split the sequence of the V1 and V2. Given this, the V1 of the final conjunct alone has to move to adjoin to the V2 in a structure involving coordination in order to satisfy the requirement of obligatory head movement. That is, (9) would be analyzed along the following lines:

- (18) Mary-wa John-ni [<sub>VP</sub> [<sub>VP</sub> piano-o **hii-te**] [<sub>VP</sub> huruuto-o  $t_i$ ]] [<sub>V</sub> **hui-te<sub>i</sub>** **morat-ta**].
- 

This movement operation, however, is dubious since it violates the Coordinate Structure Constraint (CSC). Given that scrambling of arguments out of coordinate structures obeys the CSC (and the ATB exception to it),<sup>9</sup> it is not clear how this exceptional property of head movement is reconciled with the rest of the grammar.

### 3.3 Argument composition approach in HPSG

Quite a lot of analyses of complex predicates have been proposed in the literature of HPSG, building on the idea of argument composition (Hinrichs and Nakazawa, 1994). Thus, it is worthwhile to consider whether a plausible analysis of the *-te* form complex predicate can be formulated along these lines.

In analyses of complex predicates in HPSG in terms of argument composition, two kinds of head-complement rules are distinguished: the ordinary head-complement rule and the head-governee rule (in Chung's (1998) and Kathol's (1998) terminology). The former is used to discharge nominal arguments of the head verb and the latter is used for combining the head verb with a verbal argument, where all the unsaturated arguments of the governee daughter are passed on to the head (i.e. this rule is specifically tailored for complex predicate formation). It is usually assumed<sup>10</sup> that the governee daughter of the head-governee rule is non-phrasal (in the sense that it has not yet combined with the nominal arguments that it subcategorizes for). That is, the verbs that form a complex predicate first combine with one another to form a cluster and then discharge the nominal arguments by the ordinary head-complement rule.

However, it is possible to relax this assumption and allow the governee daughter of the head-governee rule to be phrasal, in which case the governee daughter can have some of its arguments discharged by itself before combining with the governing verb. This analysis will resemble Sells' LFG analysis in that arguments of the V1 can be either discharged within the syntactic projection of the V1 or inherited to the V2 and discharged in the higher projection, allowing for multiple possible structures in many cases. An analysis of the *-te* form complex predicate along these lines can account for scrambling, VP coordination and focus particle insertion facts in much the same way as in Sells' analysis. However, this analysis shares some problems with Sells' (1990)

- b. ?? John-wa *yukkuri<sub>i</sub>* [Mary-ga  $t_i$  son-hon-o yon-da] to it-ta.  
 John-TOP slowly Mary-NOM that-book-ACC read-PAST COMP say-PAST  
 intended: 'John said that Mary read the book slowly.'

<sup>9</sup>For relevant examples, see the contrast between (20) vs. (18b) in Sells (1990, 326).

<sup>10</sup>For example, see Hinrichs and Nakazawa (1994), Kathol (1998) and Chung (1998).

and Kageyama's (1993) approaches. The same problem of adverb placement as in Kageyama's analysis arises if adverbs are analyzed as taking scope at their surface positions.<sup>11</sup> The pattern of ACC, which poses problems for Sells' analysis, does not seem to be readily accounted for in this approach either, given that the *-te* form complex predicate is treated as a case of syntactic complementation just like in Sells' (1990) analysis. Furthermore, given the availability of VP constituents headed by the V1 in the syntactic structure, it is not clear how these constituents escape from the application of syntactic operations like clefting and postposing unlike other ordinary arguments of the V2.

#### 4 A new analysis of the *-te* form complex predicate in Multi-Modal Combinatory Categorical Grammar

In this section, I formulate an analysis of the *-te* form complex predicate in Japanese in Multi-Modal Combinatory Categorical Grammar (MMCCG).<sup>12</sup> MMCCG (see Baldrige (2002) and Steedman and Baldrige (2007) for a more complete and general introduction to the theory) is a recent extension of Combinatory Categorical Grammar (CCG) that is designed to capture cross-linguistic generalizations more adequately and precisely than earlier versions of CCG (Steedman, 1996, 2000).

What distinguishes categorial grammar from other kinds of syntactic theories, most of which recognize the notion of phrase-structure as a theoretical primitive in some way or other, is the identification of the grammar of natural language as a logical deductive system (or an analogy drawn between them). However, in natural language (unlike in ordinary logical systems such as propositional logic), the way in which elements drawn from the lexicon are put together (which is manifested in the linear order and hierarchical structure of linguistic resources) often makes a difference in whether or not a particular proof (of the sentencehood of a string of words) succeeds. In order to accommodate this extra-logical aspect of natural language, Type-Logical Grammar (TLG) (Moortgat, 1997; Oehrle, 1998) recognizes different 'modes' of linguistic composition, each of which is susceptible to a different set of structure-changing operations.<sup>13</sup> MMCCG incorporates this idea from TLG into the setup of CCG by distinguishing different kinds of slashes decorated with modality specifications. The combinatory

<sup>11</sup>It should, however, be noted that if one adopts the adjunct-as-argument approach (Manning et al., 1999) or the nondeterministic scope resolution mechanism for adverbs (first proposed by Cipollone (2001) and applied to a wider range of complex predicate constructions in Japanese by Kubota (2007)), this problem goes away.

<sup>12</sup>Roughly speaking, research of categorial grammar as a linguistic theory is currently split into two camps: Combinatory Categorical Grammar (CCG), a variant that is more concerned with linguistic and computational application, and Type-Logical Grammar (TLG) (Moortgat, 1997; Oehrle, 1998), a variant that is more concerned with studying logical and mathematical properties of the formal systems used for modelling natural language.

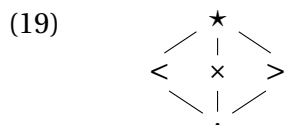
As discussed by Steedman and Baldrige (2007), with the introduction of the notion of modality from TLG into CCG, the two variants have come to resemble each other very closely as far as actual linguistic application is concerned. My choice of MMCCG in this paper is purely for expository convenience and should not be taken as a commitment to any of the theoretical assumptions that sets CCG apart from TLG.

<sup>13</sup>The idea of treating surface morpho-syntactic realization and the functor-argument relationships of linguistic resources separately dates back at least to Dowty (1982). A somewhat informal but a quite insightful demonstration of the utility of the idea of recognizing different kinds of linguistic composition

rule schemata are then redefined accordingly in such a way that the effect of modal control in the logical deductive system of TLG is replicated in the rule-based system of CCG.<sup>14</sup>

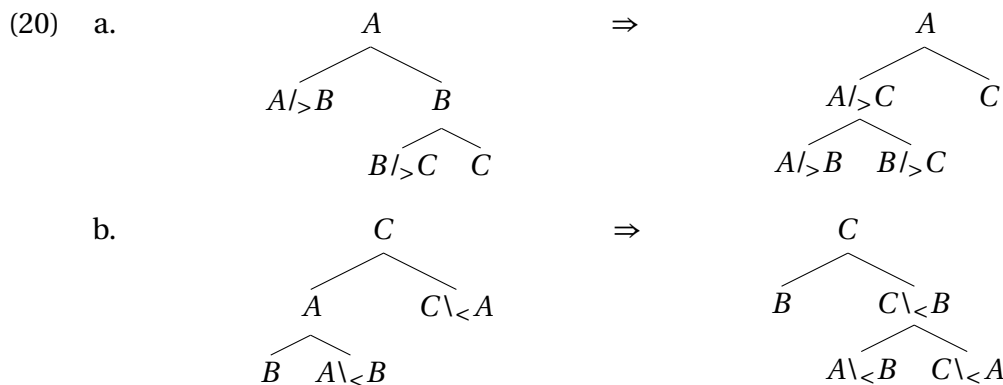
### 4.1 A MMCCG fragment of Japanese

In MMCCG, different modes of linguistic composition are organized in an inheritance hierarchy. For a grammar of Japanese that handles the behaviors of the *-te* form complex predicate, I assume the following inheritance hierarchy of modes:



The modes are arranged from top to bottom by their permissibility; the ★ mode at the top node is the least permissive and is neither permutative nor associative in either direction, while the · mode at the bottom node is the most permissive and is both permutative and associative in both directions. The three modes bearing intermediate permissibility each have a single property: < is left associative, > is right associative, and × is permutative.

The distinction between right and left associative modes (which is not present in Baldridge’s system) is introduced here in order to distinguish two ‘restructuring’ operations illustrated by the following diagrams:<sup>15</sup>



That is, in the right associative mode, if combining the relevant linguistic expressions by function application (the most basic operation for combining two linguistic expressions) to produce a larger expression results in a right-branching derivation, there is an alternative left-branching derivation involving the same linguistic resources where the two functors are combined first into a single functor that takes the argument of the

in syntactic theory can be found in Dowty (1996), where the advantages of such a theoretical architecture is discussed based on an analysis of a wide range of word order-related phenomena in English.

<sup>14</sup>This constitutes a significant improvement of the theoretical architecture of CCG; in earlier versions of CCG, there was no way of distinguishing ‘logical’ and ‘extra logical’ aspects of the grammar of natural language and therefore it was often necessary to introduce language-specific stipulations in the component of combinatory rules. However, such stipulations were dubious given that the component of combinatory rules was supposed to capture linguistic universals.

<sup>15</sup>Following the practice of the CCG literature, I adopt the ‘result leftmost’ notation of slashes. That is,  $A\backslash B$  is a category that combines with a  $B$  to its left to become an  $A$ .

original innermost functor (i.e.  $C$ ) and produces the output of the original outermost functor (i.e.  $A$ ).

Since function composition (FC) is the combinatory rule that makes possible the alternative derivations, Harmonic FC rules are modally constrained as follows to ensure the above effect:<sup>16,17</sup>

$$(21) \quad \text{a. } A /> B \quad B /> C \vdash A /> C \qquad \text{b. } A \setminus < B \quad C \setminus < A \vdash C \setminus < B$$

The distinction of left and right associative modes is motivated by empirical evidence: as we will see below, by assigning the left associative mode as the combinatoric mode for complex predicate formation, the syntactic properties of the *-te* form complex predicate can be neatly captured.

Two remarks are in order regarding the applicability conditions of combinatory rules with modality specifications like the ones in (21). First, following Baldridge (2002), I assume that combinatory rules can apply only when the modality specification on the input is at least as permissive as what is specified in the rule. For example, (21a) is applicable when the mode of the slash of the righthand element of the input (i.e. what instantiates  $B /> C$ ) is the most permissive mode ( $\cdot$ ). Second, the slash of the output category inherits the mode of the slash originally associated with the argument that it is still looking for. That is, in (21), if the righthand side input category instantiates the slash to the most permissive mode, then that mode, and not the mode of the slash of the lefthand side category, is inherited as the mode of the output category (since that's the mode by means of which the category  $C$  is to be looked for throughout). This is due to the Principle of Inheritance as defined in Steedman and Baldridge (2007, 14).

As for the other combinatory rules, function application (FA) is defined in the same way as in non-modalized CCG except that it is specified for the least permissive  $\star$  mode (which ensures that it is applicable to any mode, as guaranteed by the convention of rule schema application described above):

$$(22) \quad \text{a. } A / \star B \quad B \vdash A \qquad \text{b. } B \quad A \setminus \star B \vdash A$$

Type-raising (TR) is defined in the following way:

$$(23) \quad \text{a. } A \vdash B /_i (B \setminus_i A) \qquad \text{b. } A \vdash B \setminus_i (B /_i A)$$

The index  $i$  is a variable for slash modalities. The purpose of this variable index here is to guarantee that the original combinatoric property is preserved after the application of TR. That is, TR reverses the functor-argument relationship between the categories

<sup>16</sup>In this paper, I omit the semantics. However, it should be noted that giving the standard model-theoretic semantics for the proposed syntactic fragment is straightforward. See Kubota and Smith (2006) for an illustration of how that can be done for a CCG fragment of Japanese similar to the present one.

<sup>17</sup>From these definitions of FC, it should be clear that the left and right associative modes introduced in the current system (and notated by the subscripts  $<$  and  $>$  on slashes) are for regulating the flexibility of the order of linguistic composition, that is, the order in which lexical resources having functor-argument relationships to one another are combined in a derivation. This should not be confused with the linear order of functors and arguments manifested in the surface string of words, which is represented by the slanting of slashes—right (/) and left (\)—as is traditionally done in categorial grammar.

involved, but the combinatory mode by means of which the two expressions are combined (which roughly corresponds to the morpho-syntactic cohesion between them) remains unchanged.

In addition to the above rules, I introduce the following unary rules to handle scrambling:<sup>18,19</sup>

$$(24) \quad \text{a. } A/_\times B/_\times C/_\times \$_1 \vdash A/_\times C/_\times B/_\times \$_1 \quad \text{b. } A \setminus_\times B \setminus_\times C \setminus_\times \$_1 \vdash A \setminus_\times C \setminus_\times B \setminus_\times \$_1$$

This enables a functor looking for two categories successively in the same direction to flip the order of these arguments. With this, each verb can be listed only once in the lexicon in its basic word order, with all other orders being obtained from that basic entry by successive applications of (24).<sup>20</sup>

Note the modality restriction on the permutative rules in (24). These rules can apply only when the modalities of the slashes for both arguments are permutative. This makes it possible to lexically specify elements that can be scrambled with one another without introducing too much flexibility for word order possibilities.

Finally, I assume the following lexical entries for the present fragment of Japanese. Note that the verb *morat-ta*, one of the predicates that appear as the higher verb in the *-te* form complex predicate construction, is specified to subcategorize for the embedded verb in the left-associative  $<$  mode. Since this mode is crucial in the analysis of this construction, I call it the ‘complex predicate mode’.

$$(25) \quad \begin{array}{llll} \text{Mary-ga: } & NP_n & \text{piano-o: } & NP_a & \text{gitaa-o: } & NP_a \\ \text{uta-o: } & NP_a & \text{John-ni: } & NP_d & \text{Bill-ni: } & NP_d \\ \text{hii-te: } & VP \setminus NP_a & \text{utat-te: } & VP \setminus NP_a & \text{muri-ni: } & VP / VP \\ \text{morat-ta: } & S \setminus NP_n \setminus NP_d \setminus < VP & \text{sae: } & & & (VP \setminus NP_a) \setminus_\star (VP \setminus NP_a) \end{array}$$

Some remarks are in order regarding the abbreviations of notation adopted in (25) and throughout the paper. First, any slash without a specified modality is an abbreviation of  $/.$  or  $\setminus.$ , the most permissive mode. Second, the subscripts  $n$ ,  $a$  and  $d$  on the category

<sup>18</sup>The semantics for these permutative rules can be defined as follows:

$$(i) \quad \begin{array}{ll} \text{a. } A/_\times B/_\times C/_\times \$_1 : \lambda x_0 \dots x_n yz. \boldsymbol{\varphi} \vdash A/_\times C/_\times B/_\times \$_1 : \lambda x_0 \dots x_n zy. \boldsymbol{\varphi} \\ \text{b. } A \setminus_\times B \setminus_\times C \setminus_\times \$_1 : \lambda x_0 \dots x_n yz. \boldsymbol{\varphi} \vdash A \setminus_\times C \setminus_\times B \setminus_\times \$_1 : \lambda x_0 \dots x_n zy. \boldsymbol{\varphi} \end{array}$$

With these definitions, the straightforward syntax-semantics interface of CCG is maintained.

<sup>19</sup>Here I adopt the  $\$$ -convention as is standardly employed in CCG to define schematized categories. This is needed since the arguments of a verb that are to be scrambled with one another are not necessarily the two outermost ones.

$\setminus_\times \$_1$  in (24b) is to be understood as a metavariable used for category notation that can be instantiated to an arbitrary number (including zero) of iteration of the string ‘ $\setminus_\times X$ ’ (where  $X$  is a variable over categories and multiple tokens of  $X$  does not need to instantiate the same category). The subscript 1 on  $\$$  on the input and output ensures the identity of the string that the metavariable is instantiated to in the input and output category specifications. Thus, given the definition in (24b) and given a ditransitive verb category  $S \setminus NP_n \setminus NP_d \setminus NP_a$ , there are two ways in which the rule can be applied to the input category: (i) instantiating  $B$  and  $C$  as  $NP_d$  and  $NP_a$ , respectively and instantiating  $\setminus_\times \$_1$  as an empty string or (ii) instantiating  $B$  and  $C$  as  $NP_n$  and  $NP_d$ , respectively and instantiating  $\setminus_\times \$_1$  as  $\setminus NP_a$ . (i) yields the output  $S \setminus NP_n \setminus NP_d \setminus NP_a$  (where the dative and accusative arguments are scrambled) and (ii) yields the output  $S \setminus NP_d \setminus NP_n \setminus NP_a$  (where the nominative and dative arguments are scrambled).

<sup>20</sup>An important alternative to this account of scrambling is set-based CCG (Hoffman, 1995). Due to space limitations, I do not discuss this alternative in this paper.

*NP* are abbreviations for case features (nominative, accusative and dative) for nominal categories. For example, *NP<sub>n</sub>* stands for a nominative NP. Third, *VP* is an abbreviation for the complex category  $S \backslash NP_n$ . Finally, regarding the associativity of slashes, where parentheses are omitted, the slashes should be taken to associate to the left. That is,  $S \backslash NP_n \backslash NP_d \backslash VP$  is an abbreviation for  $((S \backslash NP_n) \backslash NP_d) \backslash VP$ . Other aspects of the lexicon will be explained as they become relevant in the next subsection.

## 4.2 Accounting for the patterns of *-te* form complex predicate

With the combinatory rules and the lexicon introduced in the previous subsection, an analysis of the *-te* form complex predicate that captures its intermediate nature is straightforward.

The analysis for sentence (3b), where an embedded accusative argument scrambles over a matrix dative argument, is given in (26):

$$(26) \quad \frac{\frac{\frac{\text{Mary-ga}}{NP_n} \quad \frac{\frac{\text{piano-o}}{NP_a} \quad \frac{\text{John-ni}}{NP_d} \quad \frac{\frac{\frac{\text{hii-te}}{VP \backslash NP_a} \quad \frac{\text{morat-ta}}{S \backslash NP_n \backslash NP_d \backslash VP}}{S \backslash NP_n \backslash NP_d \backslash NP_a}}{S \backslash NP_n \backslash NP_a}}{S \backslash NP_n}}{S} \quad \text{FC} \quad \text{Perm} \quad \text{FA} \quad \text{FA}}{S} \quad \text{FA}$$

The crucial step is the application of the FC rule (21b), which effectively assigns the subcategorization frame of a ditransitive verb to the cluster of the V1 and V2.<sup>21</sup> FC is applicable here since the relevant slashes in the input categories are both left associative, satisfying the requirement on rule application in (21b).

Note also that the slash modality for the embedded accusative NP remains unchanged from the default mode, that is, the mode in which the V1 was originally looking for it. Technically, this is guaranteed by the Principle of Inheritance as discussed above. This yields the empirically desired result: the property associated with this NP with respect to a verbal category that looks for it, namely, that it can scramble with other dependents, is preserved after the application of this FC rule. That is, after the ‘verb cluster formation’ by means of FC, the permutative rule (24b) is applicable to the ‘derived’ ditransitive frame of the verb cluster and can scramble the embedded accusative argument over the matrix dative argument, producing the surface word order of (3b).

Example (4), that is, the example in which a matrix argument splits the sequence of the V1 and V2 is correctly blocked in the present analysis. In order for this sentence to be derived, the dative argument and the V2 would have to combine with one another first. However, that possibility is blocked due to the fact that the complex predicate mode is not permutative. (27) shows a blocked derivation in which an attempt to apply the permutative rule on the V2 fails due to the conflict between the lexical specification of the V2 and the modality restriction imposed on the permutative rule (24b):

<sup>21</sup>The use of FC for forming verb clusters is a standard technique for analyzing complex predicates in CCG (see, for example, the analysis of the Dutch cross-serial dependency construction by Steedman (2000)).



$$(27) \quad \frac{\text{John-ni}}{NP_d} \quad \frac{\text{morat-ta}}{S \backslash NP_n \backslash NP_d \backslash < VP} \quad *Perm$$

Furthermore, an attempt to derive the relevant order by means of type-raising the dative argument does not succeed either. As shown in (28), since the directionalities of the slashes of the two categories do not match after type-raising the dative argument, they cannot be composed by harmonic FC.<sup>22</sup>

$$(28) \quad \frac{\text{John-ni}}{NP_d} \quad \frac{\text{morat-ta}}{S \backslash NP_n \backslash NP_d \backslash < VP}$$

The case of focus particle insertion is accounted for as follows. In the present analysis, the V1 and the V2 are combined in the syntax. Thus, nothing precludes the possibility of there being a still tighter mode of combination by which a focus particle attaches to the V1.<sup>23</sup> Thus, a focus particle is assigned the lexical category  $(VP \backslash NP_a) \backslash \star (VP \backslash NP_a)$  and the derivation for sentence (11) goes as in (29):

$$(29) \quad \frac{\text{piano-o}}{NP_a} \quad \frac{\text{hii-te}}{VP \backslash NP_a} \quad \frac{\text{sae}}{(VP \backslash NP_a) \backslash \star (VP \backslash NP_a)} \quad FA$$

$$\frac{\frac{\frac{\text{piano-o}}{NP_a} \quad \text{hii-te}}{VP} \quad \frac{\text{sae}}{(VP \backslash NP_a) \backslash \star (VP \backslash NP_a)}}{VP} \quad FA \quad \frac{\text{morat-ta}}{S \backslash NP_n \backslash NP_d \backslash < VP} \quad FA$$

$$\frac{\frac{\frac{\frac{\text{piano-o}}{NP_a} \quad \text{hii-te}}{VP} \quad \frac{\text{sae}}{(VP \backslash NP_a) \backslash \star (VP \backslash NP_a)}}{VP} \quad \frac{\text{morat-ta}}{S \backslash NP_n \backslash NP_d \backslash < VP}}{S \backslash NP_n \backslash NP_d} \quad FA$$

$\star$  is the least flexible mode of linguistic composition, which admits only FA. This treatment of focus particles is motivated by the fact that focus particles attach to the head tightly and are not susceptible to any kind of structure-changing operations such as scrambling. The linguistic use of the  $\star$  mode is not limited to focus particles; other particle-like elements such as case markers attaching to nominal expressions can arguably be treated by means of the  $\star$  mode given that they are similarly not susceptible to structure-changing operations.<sup>24</sup>

Phenomena involving coordination are also straightforwardly accounted for. In fact, one of the main advantages of the present analysis is that, when coupled with independently motivated and standardly accepted assumptions about coordination in categorial grammar, it automatically predicts the possibility of VP coordination and the patterns of ACC without any further stipulation. Recall from the discussions in previous sections that the patterns exhibited by ACC and VP coordination apparently

<sup>22</sup>The only remaining possibility is crossed composition of the type-raised dative argument and the verb, but that is also impossible. Even if we assumed the existence of crossed composition rules in the current fragment (see footnote 28 for how crossed composition can be formulated if it turns out that it is needed in the current fragment), there is no danger of overgeneration. Crossed composition, being a kind of rule that affects word order, would require the relevant slash modalities to be permutative. However, one of the slashes, that is, the one by which the V2 is looking for the V1, does not carry a permutative mode. Thus, the rule would not be applicable in cases like (28).

<sup>23</sup>Semantically, the focus particle associates with elements in the 'embedded VP', but not with elements in the 'higher clause', which justifies the present treatment where it syntactically attaches to the V1 rather than the V2. Also, the focus particle forms a phonological unit with the V1 and not with the V2.

<sup>24</sup>However, for simplicity, I do not treat case markers as independent lexical items. In the present fragment, nominal expressions are listed in the lexicon with case markers already attached to them. This treatment is purely for expository ease and should not be taken seriously.

contradict one another in that the former but not the latter suggests a tight connection between the V1 and V2 and that these phenomena were the ones that posed problems for the alternative approaches considered above. Given this, the success of the MM-CCG analysis in this respect is a noteworthy aspect of the present proposal.

I posit the following coordination schema in order to treat cases of coordination that do not involve overt conjunctions without introducing phonologically null elements:<sup>25</sup>

$$(30) \frac{X \quad X}{X} \&$$

With this coordination schema, examples involving VP coordination such as (9) are licensed as in (31). Since the V1 and V2 do not form a lexical unit in the present analysis, two embedded VPs headed by the V1 can be coordinated and then given as argument to the V2.

$$(31) \frac{\frac{\frac{\text{piano-o}}{NP_a} \quad \frac{\text{hii-te}}{VP \setminus NP_a}}{VP} \text{FA} \quad \frac{\frac{\text{uta-o}}{NP_a} \quad \frac{\text{utat-te}}{VP \setminus NP_a}}{VP} \text{FA}}{VP} \& \frac{\text{morat-ta}}{S \setminus NP_n \setminus NP_d \setminus < VP} \text{FA}}{\frac{\text{John-ni}}{NP_d} \quad \frac{S \setminus NP_n \setminus NP_d}{S \setminus NP_n} \text{FA}}$$

Cases of ACC involving arguments of the V1 and V2 such as (6a) are licensed by employing the analysis of nonconstituent coordination proposed by Dowty (1988). First, by successive applications of TR and FC, the embedded accusative argument and the matrix dative argument are combined into a category that is looking for a ditransitive predicate to its right to form a VP. Then, two such categories are coordinated and the resultant category combines with the ‘ditransitive’ predicate that is obtained by function composing the V1 and V2 in the same way as in the case of argument scrambling seen above. The derivation is shown in (32).

$$(32) \frac{\frac{\frac{\text{John-ni}}{NP_d}}{VP / (VP \setminus NP_d)} \text{TR} \quad \frac{\frac{\text{piano-o}}{NP_a}}{(VP \setminus NP_d) / ((VP \setminus NP_d) \setminus NP_a)} \text{TR}}{\frac{VP / ((VP \setminus NP_d) \setminus NP_a)}{VP / ((VP \setminus NP_d) \setminus NP_a)} \text{FC}} \& \frac{\text{Bill-ni gitaa-o}}{VP / ((VP \setminus NP_d) \setminus NP_a)} \text{FC}}{\frac{\text{John-ni piano-o Bill-ni gitaa-o}}{VP / ((VP \setminus NP_d) \setminus NP_a)} \quad \frac{\frac{\frac{\text{hii-te}}{VP \setminus NP_a} \quad \frac{\text{morat-ta}}{VP \setminus NP_d \setminus < VP}}{(VP \setminus NP_d) \setminus NP_a} \text{FC}}{VP} \text{FA}}$$

The ungrammaticality of ACC involving the V1 together with NP arguments of the V1 and V2 is also correctly predicted in the present analysis. In order to see the crucial aspect of the present analysis that rules out such ungrammatical sentences, it is useful to see how such sentences would be overgenerated in a system that does not make use of modality distinctions. In a non-modalized system where the operations of FC and

<sup>25</sup>The variable *X* ranges over categories. In order to prevent overgeneration, the actual categories that *X* can instantiate need to be appropriately constrained, but for the sake of simplicity I gloss over that aspect here.

TR would be freely available for any category, (6b) would be derived much along the same lines as the above analysis of argument cluster coordination for (6a). That is, the string composed of the matrix dative argument and the embedded VP (both of which are arguments of the V2) would be analyzed as a functor that would combine with the V2, which is looking for these two categories, and saturate the argument slots of the V2 corresponding to themselves in one swoop. (33) illustrates the crucial step at which such an argument cluster would be formed by TR and FC:

$$(33) \quad \begin{array}{c} \text{John-ni} \\ \hline NP_d \\ \hline (S \setminus NP_n) / ((S \setminus NP_n) \setminus NP_d) \text{TR} \end{array} \quad \begin{array}{c} \text{piano-o hii-te} \\ \vdots \quad \vdots \\ \hline VP \\ \hline ((S \setminus NP_n) \setminus NP_d) / (((S \setminus NP_n) \setminus NP_d) \setminus VP) \text{TR} \end{array} \\ \hline (S \setminus NP_n) / (((S \setminus NP_n) \setminus NP_d) \setminus VP) \text{FC}$$

Now, in the current analysis formulated in MMCCG, such a derivation is ruled out. Specifically, when the embedded VP is type-raised over the category  $S \setminus NP \setminus NP$ , it has to be type-raised with the  $<$  modality so that the resultant functor can ultimately combine with the matrix verb that has the  $<$  modality specification imposed on the slash for the embedded VP. Thus, instead of (33), we have:

$$(34) \quad \begin{array}{c} \text{John-ni} \\ \hline NP_d \\ \hline (S \setminus NP_n) / ((S \setminus NP_n) \setminus NP_d) \text{TR} \end{array} \quad \begin{array}{c} \text{piano-o hii-te} \\ \vdots \quad \vdots \\ \hline VP \\ \hline ((S \setminus NP_n) \setminus NP_d) /_{<} (((S \setminus NP_n) \setminus NP_d) \setminus_{<} VP) \text{TR} \end{array} \\ \hline \text{*FC}$$

Being in this category, the embedded VP cannot function compose by (21a) with the type-raised matrix dative argument since  $<$  isn't right associative. In other words, the ungrammaticality of sentences like (6b) is predicted as a direct consequence of the intermediate degree of flexibility of the complex predicate mode.

Finally, the phenomenon of adverb scrambling poses an interesting challenge to the proposed MMCCG analysis. Up to this point, except for the unary permutative rules, I have assumed only two types of combinatory rules, namely, FC and TR. These two types of rules are among the set of combinatory rules that Baldrige (2002) assumes to be available in the grammar of natural language, following Steedman (1988; 2000).<sup>26</sup> Furthermore, among the two types of FC rules, the present fragment only made use of harmonic composition, dispensing with crossed composition rules for licensing any of the grammatical sentences seen above. This was possible since a distinct permutative rule was responsible for argument scrambling. However, it seems that these two types of rules, even in conjunction with the permutative rule in the present fragment, are not sufficient for deriving the full range of word order possibilities of adverbs. There are two approaches that one can pursue to deal with the problem of adverb word order: (i) admit crossed composition rules and (ii) extend the set of combinatory rules by introducing Geach rules. The latter solution turns out to be more general and there are cases that can be dealt with only in the latter approach (see footnote 28 for some discussion on this point). Thus, I adopt the latter approach in this paper.

<sup>26</sup>The other ones are FA and substitution; substitution is used for licensing parasitic gaps in languages that allow for them.

Example (5a), an example in which an embedded argument scrambles over an adverb that modifies the matrix predicate, can be derived by introducing the following Geach rule:

$$(35) \quad A/_x B \vdash (A \setminus_x C) /_x (B \setminus_x C)$$

The derivation goes as follows:

$$(36) \quad \frac{\frac{\frac{\text{muri-ni}}{VP/VP}}{(VP \setminus NP_d) / (VP \setminus NP_d)} \mathbf{G}}{((VP \setminus NP_d) \setminus NP_a) / ((VP \setminus NP_d) \setminus NP_a)} \mathbf{G} \quad \frac{\text{hii-te morat-ta}}{\begin{array}{c} \vdots \\ \vdots \end{array}}}{\frac{VP \setminus NP_d \setminus NP_a}{VP \setminus NP_d \setminus NP_a} \mathbf{FA}}$$

Note that the Geach rule has the effect of associating the adverb with multiple categories, each modifying different ‘levels of verbal projection’. Thus, applying this rule twice to a VP modifier yields a ditransitive verb modifier.

The fact that (5b) is ungrammatical is also correctly predicted. (37) shows a failed derivation for this sentence.

$$(37) \quad \frac{\frac{\frac{\text{muri-ni}}{VP/VP}}{(VP \setminus NP_d) / (VP \setminus NP_d)} \mathbf{G}}{((VP \setminus NP_d) \setminus VP) / ((VP \setminus NP_d) \setminus VP)} \mathbf{G} \quad \frac{\text{morat-ta}}{VP \setminus NP_d \setminus < VP}}{\mathbf{*FA}}$$

The derivation in (37) fails at the point where the adverb is supposed to combine with the V2 by FA; the category specification of the V2 does not exactly match the category specification of the argument that the adverb is looking for. Note that the Geach rule, being an order changing rule, requires the relevant slashes to be permutative. Thus, applying the Geach rule (35) with the non-permutative  $<$  modality (which would eliminate the category mismatch problem in (37)) is not possible. In other words, here again, the lexical specification regulating the combinatoric flexibility of the *-te* form complex predicate correctly accounts for the possible word order variation in this construction.

The present fragment also correctly licenses sentences in which an adverb that modifies the embedded predicate scrambles over matrix arguments. Thus, (38) can be derived as in (39):

$$(38) \quad \text{Mary-ga } yukkuri \text{ John-ni piano-o hii-te morat-ta.}$$

Mary-NOM slowly John-DAT piano-ACC play-TE BENEF-PAST  
‘Mary had John play the piano slowly for her.’

$$(39) \quad \frac{\frac{\frac{\text{piano-o}}{NP_a} \quad \frac{\text{hii-te}}{(VP \setminus NP_d)} \mathbf{FA}}{VP} \mathbf{FA}}{\frac{VP \setminus (VP/VP)}{VP \setminus (VP/VP)} \mathbf{TR} \quad \frac{\text{morat-ta}}{VP \setminus NP_d \setminus < VP} \mathbf{FC}}{\frac{\text{John-ni}}{(VP \setminus NP_d) \setminus (VP/VP)} \mathbf{Perm}} \mathbf{FA}$$

$$\frac{\frac{\text{yukkuri}}{(VP/VP)} \quad \frac{\text{John-ni}}{NP_d} \quad \frac{\text{piano-o}}{NP_a} \quad \frac{\text{hii-te}}{(VP \setminus NP_d)} \quad \frac{\text{morat-ta}}{VP \setminus NP_d \setminus < VP}}{VP} \mathbf{FA}$$

The crucial step is the type-raising of the embedded VP to the category  $VP \setminus (VP / VP)$ , which makes the V1 subcategorize for an adverb that modifies it, as it were. The adverb that is ‘reanalyzed’ as an argument is then raised to the clausal domain of the V2 via the usual process of function composition of the V1 and V2 and is further scrambled over the matrix dative argument by means of the permutative rule, resulting in the word order in (38).<sup>27</sup>

Finally, examples like the following can also be derived in the present analysis:

- (40) Mary-ga piano-o yukkuri John-ni hii-te morat-ta.  
 Mary-NOM piano-ACC slowly John-DAT play-TE BENEF-PAST  
 ‘Mary had John play the piano slowly for her.’

The difference between (38) and (40) is that in (40) an embedded argument scrambles over a matrix argument together with an adverb that modifies the embedded verb. The derivation goes as follows:<sup>28</sup>

- (41)
- $$\begin{array}{c}
 \frac{\text{piano-o}}{NP_a} \quad \frac{\frac{\text{yukkuri}}{VP/VP}}{(VP \setminus NP_a) / (VP \setminus NP_a)} \quad \frac{\frac{\text{John-ni}}{NP_a}}{VP \setminus NP_a} \quad \frac{\frac{\frac{\frac{\text{hii-te}}{(VP \setminus NP_a)}}{(VP \setminus NP_a) \setminus ((VP \setminus NP_a) / (VP \setminus NP_a))} \text{TR}}{(VP \setminus NP_a) \setminus NP_a} \setminus ((VP \setminus NP_a) / (VP \setminus NP_a)) \text{FC}}{(VP \setminus NP_a) \setminus ((VP \setminus NP_a) / (VP \setminus NP_a)) \setminus NP_a} \text{Perm}}{(VP \setminus NP_a) \setminus ((VP \setminus NP_a) / (VP \setminus NP_a))} \text{FA}}{VP \setminus NP_a} \text{FA}}{VP}
 \end{array}$$

In this derivation, the V1 is reanalyzed as a verb that subcategorizes for a modifier of a transitive verb and that transitive verb modifier is raised to the ‘domain’ of the V2 and gets scrambled over the matrix dative argument. Then, the Geached adverb in the matrix clause matches the transitive verb modifier category that the complex predicate is looking for and the two are combined to make the derivation go through.

In this section, we have seen that the present analysis of the *-te* form complex predicate accounts for the apparently contradictory set of patterns exhibited by this construction straightforwardly and naturally.<sup>29</sup> The key insight of the proposed analysis is

<sup>27</sup>This analysis of scrambling of embedded adverbs with matrix arguments is somewhat reminiscent of the treatment of the sublexical scope of adverbs by means of the so-called adjunct-as-argument approach in Manning et al.’s (1999) HPSG analysis of the Japanese causative construction. (But note that the present analysis gets the effect by a fully general interaction of TR and FC, whereas Manning et al.’s (1999) HPSG analysis involves a specific lexical rule that introduces an adjunct into the argument structure list of a predicate.)

<sup>28</sup>Examples like (40) cannot be derived with crossed composition and thus seems to motivate the introduction of Geach. By introducing the following crossed composition rule:

(i)  $A / \times B \quad B \setminus \times \$1 \quad \vdash \quad A \setminus \times \$1$

some cases of adverb word order (such as (5a)) can be derived. However, (40) is still underivable; the derivation would proceed in the same way as in (41), but fails at the step where the complex predicate discharges the raised adverb. Without the Geach rule, there is no way to resolve the mismatch between the category specification of the adverb (a VP modifier) and what the complex verb is looking for (a transitive verb modifier).

<sup>29</sup>I have not discussed the cases of clefts, postposing or reduplication. These phenomena are not inconsistent with the proposed analysis, and once specific assumptions about the respective phenomena are spelled out in the current fragment, the patterns of the *-te* form complex predicate with respect to these phenomena will fall out straightforwardly. The analysis of the cleft construction that interacts

that the V1 and V2 in the *-te* form complex predicate are put together in a way that is tighter than the way ordinary arguments and adjuncts are combined with the head but looser than the way in which elements like particles are attached to the head. This idea is formally implemented in the framework of MMCCG by assigning a distinct mode of linguistic composition to the *-te* form complex predicate for which the set of combinatory rules applicable is restricted.

## 5 Conclusion

In this paper, I proposed an analysis of the *-te* form complex predicate in Japanese in Multi-Modal Combinatory Categorical Grammar. The proposed analysis crucially makes use of the multiple modes of syntactic composition of lexical elements available in MMCCG in capturing the intermediate nature of the construction with respect to the tightness of bond between the embedded and embedding verbs. Unlike alternative approaches in other frameworks, since the lexical property of the verbs that take *-te* marked complements fully accounts for the range of seemingly contradictory patterns, the present analysis does not suffer from the dilemma of having to assign conflicting syntactic structures to one and the same string of words. More specifically, in the proposed analysis, the contrast between the complex predicate mode and the default mode (i.e. the mode that allows for scrambling) accounts for the word order patterns found in the scrambling and adverb placement data, where the V1 and V2 cluster together, letting all of their arguments and adjuncts freely scramble with one another. Crucially, this effect is achieved without assuming that the V1 and V2 form a lexical unit. Thus, the phenomena of VP coordination and focus particle insertion do not pose any problems for the present analysis. Finally, we saw that the contrast between VP coordination and ACC, the hardest problem for previous approaches, is given a straightforward solution in the proposed analysis. It was shown that independently motivated assumptions regarding coordination interact with the property of the *-te* form complex predicate to precisely predict the patterns without any additional assumptions.

In closing, I would like to discuss briefly wider implications of the present proposal both theoretically and empirically. First, on the theoretical side, although the present proposal is formulated in MMCCG and is in line with the general assumptions regarding the theoretical architecture outlined in Baldrige (2002), it differs in a nontrivial way from the specific system proposed by Baldrige in the following details:

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properly with the present analysis of the *-te* form complex predicate is presented in Kubota and Smith (2007). The right way to analyze the syntax of postposing is rather unclear and is underinvestigated in the current syntactic literature (with a notable exception of Sells (1999)). However, it seems that at least one of the syntactic restrictions on the postposing construction is that neither the element that appears at the main clause position nor the element that appears at the postposition site can be smaller than full-fledged phrases. Given this, it is expected that the pattern of postposing will be accounted for along similar lines as the cases of ACC and the cleft construction, once the details of the syntax of postposing are worked out. Finally, the case of reduplication can be seen as a case similar to VP coordination. In the reduplication construction, the element that appears twice is the V2 rather than a projection of the V1. Because the V1 and V2 are combined in the syntax rather than in the lexicon in the present proposal, the patterns of reduplication do not pose a problem regardless of whether reduplication is treated as a lexical or a syntactic process.

- (i) The present system assumes a different hierarchy of modes that distinguishes two associative modes but does not distinguish different permutative modes.
- (ii) The present system posits unary permutative rules for handling scrambling unlike Baldrige's system that employs multiset categories originally proposed by Hoffman (1995) for the same purpose.
- (iii) The present system posits a Geach rule that is not recognized as a combinatory rule in standard versions of CCG including Baldrige's.<sup>30</sup>

As far as I can tell, the particular choices made by Baldrige (2002) regarding these aspects mostly come from considerations of the generative capacity of the formalism and not from any theoretical or empirical considerations of MMCCG as a linguistic theory per se. While I do not intend to question these features of Baldrige (2002) solely based on the data from Japanese that I have discussed in this paper, these points of comparison are still interesting in that they highlight some issues that need to be ultimately answered in a theory that does justice to both empirical/theoretical adequacy and computational tractability. I hope that the detailed analysis of a relatively complicated set of data that I have conducted in this paper will serve as a starting point for investigating this issue (i.e. the tension between different kinds of requirements imposed on grammar architecture) in greater depth.<sup>31</sup>

Second, on the empirical side, the analysis that I have proposed in this paper resembles (in some respects) the kind of analysis of complex predicates in terms of argument composition in HPSG. A brief comparison of the present approach and an argument composition-based alternative is in order here. The resemblance between the two approaches is most striking in the way in which function composition is made use of in capturing the complex-predicatehood of the *-te* form complex predicate in the present analysis. Essentially, function composition is used to pass unsaturated arguments of the lower verb to the higher verb. Argument composition in HPSG is basically a mechanism that achieves the same effect within the phrase structure-based setup of HPSG.

However, there are important differences between the two approaches. First, function composition in categorial grammar is a general mechanism that ultimately reflects a property of the underlying logical system, whereas argument composition only indirectly models that effect, as it were, by means of a specifically tailored phrase structure rule. Second, while the present analysis directly captures the intermediate degree of morpho-syntactic combinatoric flexibility of the *-te* form complex predicate by means of a lexically assigned modality specification, there does not seem to be any comparable mechanism within the phrase structure-based setup of HPSG.<sup>32</sup> Thus, in the latter approach, the relevant morpho-syntactic properties (such as the restriction on the

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<sup>30</sup>It should, however, be noted that Jacobson (1999) assumes Geach rules in a CCG-like system for an entirely different reason (quantificational binding) than the present one.

<sup>31</sup>In this connection, it is interesting to note that these specific issues will not arise if one recasts the present analysis in TLG, which has a more general and less constrained overall theoretical architecture than CCG. (For example, note that both FC and Geach are theorems that are derived from more basic principles in TLG and thus having the former without the latter is not even an option.) Thus, the problems considered in this paper can also be seen as providing an empirical basis for a comparison of different variants of categorial grammar.

<sup>32</sup>This is not quite true with linearization-based HPSG. However, the linearization-based analysis of

kinds of elements that can split the sequence of the V1 and V2) can only be indirectly regulated by adjusting phrase structure rules, lexical specifications of relevant items and LP principles to interact properly with one another. Third, as I have pointed out in section 3.3, even with these elaborations in place, empirical problems still seem to remain in the argument composition-based approach, such as the contrast between embedded VP coordination and ACC. Given these considerations, it seems fair to say that the setup of MMCCG allows for a more general and straightforward solution to the problem in question than the phrase structure-based setup of HPSG does, although an analysis in terms of argument composition will share many important analytical insights with the present proposal due to the similarity between the two approaches.

Finally, there is a somewhat more general point pertaining to linguistic theorizing. The proposed analysis of the *-te* form complex predicate crucially makes use of the notion of different ‘modes’ of syntactic composition, which (in some sense) replaces the notion of constituency in more standard syntactic theories. Obviously, in order to see whether such a (radical) reconceptualization of theoretical primitives is justified, the theoretical architecture of the kind embodied by MMCCG needs to be compared thoroughly with alternative theories in terms of a wide range of empirical phenomena. What I have done in this paper should be understood as nothing more or less than a first step in such an investigation.

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complex predicates in HPSG such as is proposed by Reape (1994) misses some important generalizations that the argument composition-based analysis captures, as discussed by Kathol (1998). I think that both the linearization-based analysis and the argument composition-based analysis are right in some respects and that the present analysis in MMCCG can be seen as integrating the insights of these different approaches within a single framework. I hope to discuss this point more thoroughly in a longer version of this paper.



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# Comparative clauses and cross linguistic variation: a syntactic approach

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## 1 Introduction

The architecture of comparatives raises three major related questions: the categorial status of the comparative connector; the correlation between the overt quantificational/ degree element and the comparative connector heading the second term of comparison; and the phrasal or sentential nature of the comparative constituent.

Adopting the current Principles and Parameters approach (Chomsky 2004, 2005), we will concentrate on the first two issues, paying attention to sentential comparatives and contrasting European Portuguese (henceforth, EP) with other languages, especially Spanish and Italian. We will analyse canonical comparatives of superiority and inferiority, involving the expressions *mais ... do que* ‘more...than’, *menos ... do que* ‘less...than’, leaving aside equative comparatives, with the forms *tão/tanto ... como* ‘as...as’.

Mainly focussing on structures where the comparative quantifier affects a nominal constituent, we will show that Romance languages, in particular EP, Italian and Spanish, share the property of exhibiting two sorts of comparative sentences: canonical comparatives, presenting a strong quantificational content (which may be instantiated by (a kind of) Free Relative with an overt quantificational *wh* element, as in Italian, or CPs headed by a null quantifier, as in EP) and relative comparatives, with a weaker quantificational content, which correspond to free or headed relatives without any quantificational item.

We also show that, at least as far as EP is concerned, the dependency relation between the overt quantificational/ degree element and the comparative connector heading the second term of comparison is adequately analysed as a case of correlative coordination involving quantificational correlates. The scope of the overt quantificational/ degree element over the whole comparative construction is captured at the relevant level for semantic interpretation, i.e. at SEM. In this interface level, the quantificational/degree constituent, due to its quantificational nature, is adjoined to the correlative coordination phrase, CoP, thus resulting in a configuration where the

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quantificational constituent and the whole CoP headed by the comparative connector are interpreted as establishing a predication relation.

This paper has by two central aims: to provide an empirically grounded answer to the categorial status of the comparative connector *do que* in EP and to determine the nature of the comparative clauses in this language. Thus, the text is organized as follows: in section 2, we discuss the possibility of analysing the comparative connector *do que* in EP according to the classical approach, which assumes that sentential comparatives are introduced by a preposition followed by a *whP* sentence, close to a relative clause; we will show that there is no evidence for such an analysis in this language. In section 3, we sketch the structural configurations involved in comparative clauses in EP, taking into account that they do not necessarily require the presence of a *whP* and may only present a quantificational head. In section 4, we argue that the analyses proposed in the previous section account for the island effects exhibited by sentential comparatives. In section 5, we focus on the nature of the relation between the quantificational/ degree element and the comparative clause: discussing the arguments for the subordination status of the comparative connector, we provide evidence that they do not account for clausal comparatives in EP and propose an alternative analysis based on correlative coordination. In section 6 we show that this specific kind of coordination, associated to the quantifier nature of the degree constituent, captures the dependency relation between the two parts of the comparative construction, classically subsumed under the notion of subordination. In section 7, we present some concluding remarks.

## 2 The *wh*-approach to sentential comparatives and the comparative connector

Since Chomsky (1977), studies on clausal comparatives in English have analysed them as an instance of subordination, specifically as *wh*-CPs inserted inside PPs, headed by *than*, as represented in (1b) – see Kennedy (1997), Pancheva (2006):<sup>1</sup>

- (1) a. John is taller than Mary is.  
 b. John is taller [<sub>PP</sub> than [<sub>CP</sub> [<sub>wh</sub>Ø]<sub>i</sub> [<sub>TP</sub> Mary is [-]<sub>i</sub>]]]

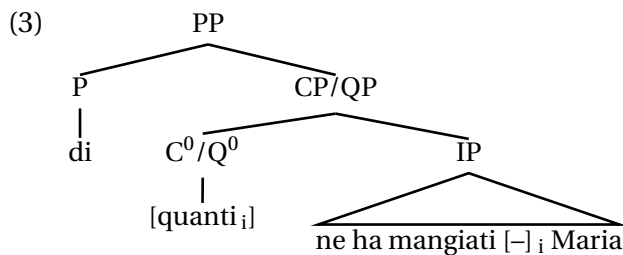
Extending this analysis, several authors assumed that clausal comparatives in other languages also occur inside PPs (e.g. Brucart 2003, Merchant 2006, Pancheva 2006), and may be uniformly characterized as a kind of free relatives (e.g. Donati 1997, Pancheva 2006). They based their proposal on examples like those in (2), for Italian, Spanish and Serbo-Croatian, respectively, where the expressions *los que*, *quanti* and *što* strongly suggest the *wh*-origin of this construction:<sup>2</sup>

<sup>1</sup>The grammatical studies incorporating the Greco-Roman heritage typically analyse comparatives as subordinate clauses and tend to include them among the adverbial clauses, the latter being characterised as sentential adjuncts (see, for instance, Cunha & Cintra 1984, Bechara 1999, and Belletti 1991, who also adopts this approach for most of the cases of sentential comparatives in Italian). Due to a certain number of properties, Generative Syntax has seen them as subordinate clauses more akin to relative than to adverbial clauses.

<sup>2</sup>As we will see later on, *di* and *de* are not the only elements that introduce the comparative clause in Italian and Spanish.

- (2) a. Paolo ha mangiato più biscotti [PP di [CP[<sub>wh</sub> quanti]<sub>i</sub>] ne ha  
 Paolo has eaten more cookies than how much of-them has  
 mangiati [-]<sub>i</sub> Maria]]  
 eaten Maria  
 'Paolo has eaten more cookies than those that Maria has eaten.' (Donati 1997)
- b. Juan compró más periódicos [PP de [CP los que compró  
 Juan bought more newspapers than theMASC.PL that bought  
 Maria]].  
 Maria  
 'Juan bought more newspapers than those that Maria bought.' (Brucart 2003)
- c. Marija je viša [PP nego [whP (što je) Petar]].  
 Marija is taller than what is Petar  
 'Mary is taller than Petar.' (Pancheva 2006)

Donati (1997), for instance, adopts the raising analysis of Kayne (1994) and claims that comparative clauses, like the remaining free relatives, are defective relatives lacking the syntactic layer of the D-phrase embedding the clause. In these circumstances, comparatives involve the movement of a determiner-like head to C, instead of a DP movement to [Spec, CP], as represented in (3), for the comparative clause in (2a):



At first glance, sentential comparatives in EP seem to corroborate the Prep+whP analysis, as can be seen in (4).

- (4) Ele comprou mais jornais do que nós comprámos.  
 he bought more newspapers than we bought  
 'He bought more newspapers than we bought.'

In fact, the comparative connector *do que* is apparently constituted by the preposition *de* 'of' plus the expression *o que*, which also occurs in wh-phrases in this language (cf. Marques 2004), see (5):

- (5) O que te agrada também nos agrada a nós.  
 the what you please also us please to us  
 'What pleases you, also pleases us.'

However, the syntactic behaviour of *do que* in comparatives shows that there is no empirical support for this hypothesis. First of all, in EP comparatives, *de* is not independent from the expression *o que*. Thus, in contrast with (4), the example in (6), which

is apparently the correlate of (2a) in Spanish, does not have a comparative clause reading and is only interpreted as a partitive construction:<sup>3</sup>

- (6) #Ele comprou mais livros d(e) os que nós comprámos.  
 he bought more books of the.MASC.PL that we bought  
 'He bought some more books of those that we bought.'

The non autonomy of *de* in the comparative expression *do que* is corroborated by the fact that an isolated *de* may not introduce phrasal comparatives, see (7). Besides, (7) also shows that *de* in comparatives is not able to assign case.

- (7) \*Ela é mais alta de mim.  
 she is more tall of me  
 'She is taller than me.'

These properties distinguish *de* in EP from *than* in English, as shown by the acceptability of the English translation of (7), *She is taller than me*. We, thus, conclude that *de* in the comparative expression *do que* in EP is not a preposition.

As for *o que*, this expression behaves differently in comparatives, see (8), and in relative clauses, where it may occur both in headed and in free relatives, as illustrated, respectively, in (9a) and (9b):

- (8) Os críticos louvaram mais o quadro [do que o artista].  
 the critics praised more the painting than the artist  
 'The critics praised more the painting than the artist.'
- (9) a. Ele ouviu [tudo o [que tu disseste]].  
 he heard everything theMASC.SG that you said  
 'He heard everything you have said.'
- b. Ele admira [o que é belo].  
 he admires theMASC.SG that is beautifulMASC.SG  
 'He admires what is beautiful.'

In relatives *o que* is structurally ambiguous (Brito 1991). In headed relatives, as in (9a), the form *o* 'the' is interpreted as equivalent to the demonstrative pronoun *aquilo* 'that' and functions as the antecedent of a relative clause headed by the complementizer *que*, as in (10a).<sup>4</sup> In free relatives, like (9b), *o que* is analysed as a single wh-phrase formed by the definite article *o*, plus the relative pronoun *que*, as in (10b):

<sup>3</sup>Sáez del Alamo (1999: 1137) notices that this kind of structures is ambiguous in Spanish, allowing both a comparative and a partitive reading. Hence, he assigns to the example in (i) the paraphrases (ii) and (iii):

- (i) Juan leyó más libros de los que compró Luis.  
 Juan read more books of the.MASC.PL that bought Luis
- (ii) The amount of books read by Juan is greater than the amount of books that Luis bought.
- (iii) Juan read some more books of those that Luis bought.

<sup>4</sup>In (9a), *o* is universally quantified by *tudo* 'everything'. This fact shows that this example must be analysed as a headed relative, *tudo o* 'everything' being interpreted as the antecedent of the relative clause *que tu disseste* 'that you said'.

- (10) a. [... [DP *o*] [CP Op<sub>i</sub> [C *que*] ... [-]<sub>i</sub>...]] (Headed Relative)  
 b. [...[ *o que*<sub>wh</sub> [C-] ... [-]<sub>wh</sub>...]] (Free Relative)

The first property that distinguishes *o que* in relatives and in comparatives is the existence of active  $\phi$ -features affecting the definite article *o*, the', in relatives and their absence in the comparative connector *do que*. In free relatives *o* is the masculine singular form of the definite article, as indicated in (9b) by the agreement features exhibited by the adjective *belo*, beautiful', which also takes the masculine singular form. In turn, in headed relatives, the  $\phi$ -features exhibited by the form *o* vary in accordance with those of the expression it denotes. So, *o* is masculine singular in (9a)<sup>5</sup> and (11a), but takes the form of the masculine plural, *os*, in (11b):

- (11) a. Essa criança lê tudo o que os amigos lhe dão.  
 that child reads everything theMASC.SG that the friends him/her give  
 'That child reads whatever his/her friends give him/her.'  
 b. Livros, ela só lê os que nós lhe compramos.  
 books, she only reads theMASC.PL that we her buy  
 'As for books, she only reads those we buy her.'

On the contrary, *o* in the comparative connector *do que* is not subject to number nor gender variation, as shown by the unacceptability of (12a), in contrast with (12b) – in (12a) the feminine plural form of the definite article occurs instead of the invariable form of *o*:

- (12) a. \*Ela gosta mais das maçãs verdes das que são  
 she likes more of-theFEM.PL apples green of-theFEM.PL that are  
 vermelhas  
 red  
 b. Ela gosta mais das maçãs verdes do que das que são vermelhas.  
 she likes more of-the apples green than of-those that are red.  
 'She likes more the green apples than the red ones.'

A second property distinguishes *o que* in comparatives and in relatives: its distribution. While in comparatives the connector *o que* may coexist with a *wh*-word, see (12b) and (13), in a relative clause two *wh*Ps may not co-occur inside the same single clause, as (14) attests:

- (13) a. Os críticos louvaram mais o quadro [do que] [quem] o pintou.  
 the critics praised more the painting than who [CLit] painted  
 'The critics praised more the painting than who painted it.'  
 b. As crianças comeram mais chocolates num dia [do que] [os que  
 the children eat more chocolates in-a day than theMASC.PL that  
 tu comes numa semana].  
 you eat in-a week  
 'The children eat more chocolates in a day than those that you eat in a week.'

<sup>5</sup>Portuguese does not have a specific form for the neuter gender of the definite article; it uses, instead, the masculine.

- (14) a. \*Os críticos louvaram [o                    que] [quem] pintou.  
           the critics praised theMASC.SG what whom painted  
       b. \*Os críticos louvaram [os                    que] [quem] pintou.  
           the critics praised theMASC.PL that whom painted

Finally, *do que* in comparatives differs from true whP in allowing for gapping, as shown by the contrast in acceptability between (15a) and (15b):

- (15) a. Ele compra menos jornais        do que nós [-]        livros.  
           he buys less newspapers than we books  
           ‘He buys fewer newspapers than we buy books.’  
       b. \*Ele escreve romances e        admira quem [-] poemas.  
           he writes novels and admires who poems

In sum, the data presented in this section show that there is no evidence for analysing the comparative connector *do que* in EP as constituted by a preposition plus a wh phrase.<sup>6</sup> In the type of comparatives we are studying, *do que* behaves like a “fossilized” form where no segmentation seems to be justified in synchronic terms. In the next section, we will show that non-canonical comparative relatives in EP and other Romance languages require a more detailed analysis than they have received in most of the syntactic approaches to comparatives.

### 3 The structure of the comparative clause – a cross linguistic approach

As suggested in the previous section, comparative clauses in EP display two different structural patterns: either they do not exhibit any wh phrase, and present an implicit quantificational element, as proposed in Bresnan (1973) (see (16)); or they are constituted by a headed or free relative clause (cf. (17)).<sup>7</sup> In both cases the comparative

<sup>6</sup>Spanish and Italian also have comparative connectors with a closer behaviour to *do que* in Portuguese, respectively, *que* and *che*:

- (1) (i) Juan compró más libros que los                    que vendía Luis. (Sáez del Álamo 1999: 1138)  
           Juan bought more books than theMASC.PL that sold Luis  
           ‘Juan bought more books than Luís has sold.’  
       (ii) Gianni hà ascoltato più concerti con te che opere con lui. (Belletti 1991 : 848)  
           ‘Gianni has attended more concerts with you than operas with him.’

As shown in (i) *que* in Spanish (as in Portuguese) may also co-occur with a relative clause; similarly, *che* in Italian accepts gapping, in contrast with *di quanti*, cf. \**Gianni hà ascoltato più concerti con te di quante opere con lui*. (Belletti 1991: 848).

<sup>7</sup>The behaviour of these two types of structures with respect to Gapping corroborates this claim: while Gapping is compatible with the former type of comparatives, it produces marginality in the latter one:

- (1) (i) Ela come mais chocolates do que tu [-] biscoitos.  
           she eats more chocolates than you cookies  
           ‘She eats more chocolates than you eat cookies.’  
       (ii) \*?? Ela come mais chocolates num dia do que os        que tu [-] num ano.  
           she eats more chocolates in-a day than those that you in-a year



connector *do que* precedes the comparative clause.

- (16) a. Ela come mais chocolates do que tu comes [[Q-] biscoitos].  
 she eats more chocolates than you eat cookies  
 ‘She eats more chocolates than you eat cookies.’  
 b. Este miúdo é mais preguiçoso do que tu és [Q-] trabalhador.  
 this kid is more lazy than you are hard-working  
 ‘This kid is lazier than you are hard-working.’
- (17) a. Ela come mais chocolates num dia do que os que tu comes [-] num ano.  
 she eats more chocolates in-a day than those that you eat in-a year  
 ‘She eats more chocolates in a day than you eat in a year.’  
 b. Este miúdo é mais esperto do que aquilo que tu és.  
 this kid is more smart than that that you are  
 ‘This kid is smarter than you are.’  
 c. Ela come mais açúcar do que aquilo que devia comer [-].  
 she eats more sugar than that that should eat  
 ‘She eats more sugar than what she should eat.’

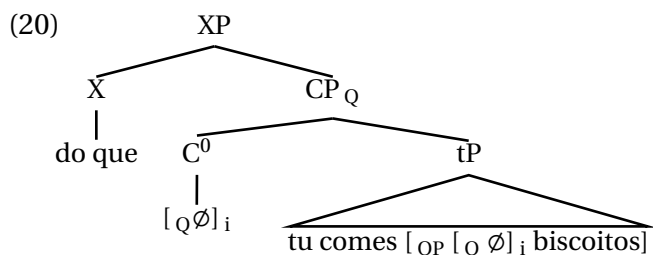
We will refer to the first type as canonical comparatives, and to the second one as relative comparatives, adopting the designations of Brucart (2003:32) for Spanish comparatives respectively in (18a) and (18b):

- (18) a. Juan compró más periódicos que novelas (compró) Maria.  
 Juan bought more newspapers than novels bought Maria  
 ‘Juan bought more newspapers than Mary (bought) novels.’  
 b. Juan compró más periódicos de los que compró Maria.  
 Juan bought more newspapers of theMASC.PL that bought Maria  
 ‘Juan bought more newspapers than Mary bought.’

Italian, as noticed by Donati, on a par with canonical comparatives with the quantificational *wh* head and the consequent occurrence of the clitic *ne*, as in (19a), has also relative comparatives, characterised by the lack of a quantificational head and the consequent non-occurrence of the clitic *ne*, as in (19b):

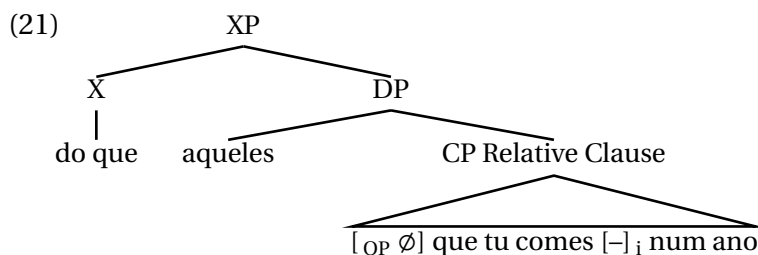
- (19) a. Paolo ha mangiato più biscotti [PP di [CP[wh quanti] ne ha mangiati [-]i Maria eaten Maria  
 Paolo has eaten more cookies than how much of them has eaten Maria  
 ‘Paolo has eaten more cookies than those that Maria has eaten.’  
 b. Maria ha mangiato più biscotti di [quelli [che ha mangiato t<sub>i</sub> Giulia]].  
 Maria has eaten more cookies of those that has eaten Giulia  
 ‘Maria has eaten more cookies than those that Giulia has eaten.’ (Donati 1997)

We assume that, in canonical comparatives in EP (as well as in Spanish and Italian), the structure of the comparative sentence selected by *do que* is represented as in (20) for the sentence in (16a), at SEM, the relevant level for semantic interpretation:



In this representation, the canonical comparative clause is analysed as a CP, i.e. a full tensed Phase (Chomsky 2004, 2005). Internal Merge operates, raising the null quantified head,  $[Q\emptyset]$ , of the quantified phrase  $[_{QP} \emptyset \text{ biscoitos}]$  into C. The quantificational value percolates up to CP, which is interpreted as a quantificational sentence, in (20) represented as  $CP_Q$ .

In contrast, relative comparatives in EP, Spanish or Italian must be assigned a different analysis, since they present distinct properties. In fact, in relative comparatives, the quantity that always characterises the second term of comparison is simply expressed by the number: plural, when countable nouns are involved, as in (17a), (18b) and (19b); and singular when a predicate or a mass noun is at stake (17b and 17c).<sup>8</sup> In these circumstances, we admit that the structure of the *do que* complement in (17a) is represented as in (21), adopting an adjunction analysis for headed relatives<sup>9</sup>:



Accepting this proposal, the structure of the comparative clause does not radically differ in EP, Spanish, or even Italian. These languages have two major syntactic strategies to form comparative clauses: a quantificational comparative construction and a

<sup>8</sup>Spanish is similar to Portuguese in this respect; see the example in (i):

(i) Juan compró más periódicos de los que compró María.

As Brucart (2003: 33) clarifies, the second element in (i) has a value of quantity and it can never appear in the singular if one wants to refer to countable objects, as shown in (ii):

(ii) \* Compró más libros del que le habíamos pedido.

The proof of the non-quantity value of (ii) is the fact that *cuanto* is impossible in the same context (iii), although it is possible in the equivalent of (i), that is (iv):

(iii) \* Compró más libros de cuanto le habíamos pedido.

(iv) Compró más libros de cuantos le habíamos pedido.

The presence of the preposition *de/di* in this sort of comparatives is then explained: the second element is always an expression of quantity, the *de/di* assumes a partitive value and the construction is not far from the so called “additive-subtractive” construction like *contrataron (a) diez personas más de las previstas* (Spanish) or *Il a acheté plus de deux livres* (French).

<sup>9</sup>For a discussion of the analysis of headed relative clauses, see, among others, Alexiadou, Law, Meinunger and Wilder (2000).

non-quantificational one, where the quantity is simply presented in the number (singular or plural) of the antecedent of the relative.

Yet, canonical comparatives in EP differ from Italian ones in two respects: the status of the comparative connector, in Italian, but not in EP, a preposition; and the *wh* nature of the quantificational element in the comparative clause – EP does not use the expression corresponding to the Italian *quanti*, 'how many', in this context.

In this sense, Spanish represents an intermediary stage: as in EP, there are canonical comparatives with the connector *que*, like (22a); like Italian, and differently from Portuguese, Spanish has relative comparatives simply introduced by *de* (22b) and uses quite freely the quantified *wh*-form *cuantos* in canonical comparatives, as in (22c):

- (22) a. Juan compró más periódicos que Maria.  
 Juan bought more newspapers that Maria  
 'Juan bought more newspapers than Maria.'
- b. Juan compró más periódicos de los que compró Maria.  
 Juan bought more newspapers of theMASC.PL that bought Maria  
 'Juan bought more newspapers of those that Maria bought.'
- c. Compró más libros de cuantos le habíamos pedido.  
 Bought more books of how-many him have.1pl asked  
 'I bought more books of those that we have asked him to.'<sup>10</sup>

In sum, having analysed comparative clauses in Romance languages, we have seen that they may resort to different structural strategies and that more than one strategy may occur within the same language. Canonical comparatives, presenting quantificational content, may correspond either to (a kind of) Free Relative with an overt quantificational *wh* element (*quanti*), as in Italian and Spanish (*cuantos*), or to quantificational non-*wh* sentences, as in EP. On a par with the former type, we also find relative comparatives without any quantificational element, which may be analysed as free or headed relatives and where the quantity that always characterises the second term of compar-

<sup>10</sup>Another difference that apparently distinguishes Spanish from Portuguese and French is the degree of focalisation on the second comparative element in canonical clausal comparatives. In fact, in Spanish, the compared constituent very often occurs in first position, immediately after the connector *que*, and the subject is placed in a postverbal position.

- (i) Juan compró más periódicos que novelas (compró) Maria.  
 Juan bought more newspapers than novels (bought) Maria  
 'Juan bought more newspapers than Maria bought novels.'
- (ii) ??O João comprou mais jornais do que romances (comprou) a Maria.  
 The João bought more newspapers than novels (bought) the Maria  
 'João bought more newspapers than Maria bought novels.'
- (iii) \*Le travail est plus difficile que détaillé n' est le contrat.  
 the work is more difficult than detailed NEG is the contract  
 'The work is more difficult than the contract is detailed.'
- (iv) Le travail est plus difficile que le contrat n' est détaillé (Cf. Brucart 2003, p. 37).  
 the work is more difficult than the contract NEG is detailed  
 'The work is more difficult than the contract is detailed.'

Brucart suggests that in (i) the quantified element *novelas* occupies a focus position of CP, favouring an analysis along the lines of Rizzi (1997).

ison in comparative constructions is only given by the number of the antecedent of the relative.

#### 4 Island effects in Canonical Comparative Clauses in EP

In the previous section we have claimed that there is no evidence for the whP nature of canonical comparatives in EP and that only a subtype of sentential comparatives include a relative construction. Thus, our analysis faces the problem of accounting for island effects in comparatives where relative clauses are missing, that is, in the case of canonical comparatives, such as those illustrated in (23b), (24b), (25b) and (26b). In fact, since Chomsky (1977) island effects have constituted a classical argument for the wh-nature of comparatives.

- (23) a. Os alunos compram menos livros do que os professores compram [-].  
 the students buy fewer books than the teachers buy  
 ‘The students buy fewer books than the teachers buy.’  
 b. \*Este aluno compra mais livros do que eu conheço um professor que  
 this student buys more books than I know a teacher that  
 compra [-].  
 buys
- (24) a. Ela é mais alta do que a mãe era [-].  
 she is more tall than the mother was  
 ‘She is taller than her mother was.’  
 b. \*Ela é mais alta do que eu me pergunto qual dos pais  
 she is taller than I [CL<sub>me</sub><sub>refl</sub>] wonder which of-the parents  
 era [-].  
 was
- (25) a. Eles compram menos livros do que tu compras [-] jornais.  
 they buy fewer books than you buy newspapers  
 ‘They buy fewer books than you buy newspapers.’  
 b. \*Ele lê mais jornais do que eu conheço um professor que lê  
 he reads more newspapers than I know a teacher that reads [-]  
 livros.  
 books
- (26) a. Ela é mais alta do que o pai é [-] gordo.  
 she is more tall than the father is fat  
 ‘She is taller than her father is fat.’  
 b. \*Ela é mais alta do que eu me pergunto qual dos pais é [-]  
 she is taller than I [CL<sub>myself</sub>] wonder which of-the parents is  
 gordo.  
 fat

The examples in (23) and (24) are instances of Comparative Deletion, i.e., the compared element, which corresponds to the phrasal constituent selected by the verb in

the degree clause, is omitted. In contrast, those in (25) and (26) are cases of Comparative Subdeletion, since only the quantified head is omitted in the degree clause.

However, island effects are not a strict diagnosis for wh-movement. They have a broader range of occurrence: they show up in cases of wh-movement, but also in cases of A'-movement resulting from Topicalization, Focus Movement (Cinque 1990, Rizzi 1990), and Quantifier Raising (Longobardi 1991, Szabolcsi & Dikken 2003).

Thus, although rejecting that wh-movement is involved in comparatives in EP, following Kennedy (2002) and Matos & Brito (2002), we assume that Comparative Deletion and Comparative Subdeletion are two instances of A'-movement: movement of a maximal projection in Comparative Deletion; movement of a null quantified head in Comparative Subdeletion (e.g., Corver 1993, a.o.).

Notice that these two types of A'-movement are not equally present in clausal comparatives across languages. So, while English and EP exhibit Comparative Deletion, and a gap occurs in the complement position of the verb as a consequence of A-movement (cf. (27)), French and Italian only admit Comparative Subdeletion and require the presence of a clitic pronoun denoting the compared expression, (cf. (28)):

- (27) a. Mary buys more books than  $OP_i$  you buy [-]<sub>i</sub>.  
 b. Ela compra mais livros do que  $OP_i$  tu compras [-]<sub>i</sub>.  
 she buys more books than you buy  
 'She buys more books than you buy.'
- (28) a. Ces jours-ci, il a plus d'argent qu' il n' \*(en) avait.  
 these days, he has more of-money than he NEG (of it) had  
 'Nowadays, he has more money than he used to have.' (Pinkam 1985)  
 b. Ho comprato più libri di quanti \*(ne) hai comprati tu.  
 have bought more books of how-many (of them) have bought you.  
 'I have bought more books than you have bought.' (Donati 1997)

These data show that in French and Italian a single type of A'-movement operates in comparatives, bare quantifier head movement (Donati 1997:152). They also show that bare quantifier head movement is the minimal property shared by clausal comparatives in French, Italian, Spanish, EP and English, and suggest that this movement is present both in Comparative Deletion, cf. (27), and in Comparative Subdeletion, cf. (28)-(29):

- (29) a. This desk is higher than that one is [-] wide. (Chomsky 1977)  
 b. Ela é mais alta do que o pai é [-] gordo.  
 she is more tall than the father is fat  
 'She is taller than her father is fat.'  
 c. Il a acheté plus de bouteilles de vin qu' il n' a acheté [-] de  
 he has bought more of bottles of wine than he NEG has bought of  
 bouteilles de bière.  
 bottles of beer  
 'He bought more bottles of wine than he bought bottles of beer.' (Pinkam 1985)

In sum, island effects exhibited in canonical comparatives in EP and other languages may result from a violation of locality conditions on Quantifier Movement or on the A'-movement of the phrasal compared complement.

## 5 The correlation between the Deg/Q marker and comparative clause and the nature of *do que*

We turn now to the correlation between the degree marker in the first term of comparison and the comparative clause. From the inspection of the involved correlates, we also expect to find an answer to the question of the nature of the comparative connector (*do que*) that selects the comparative clause in EP.

### 5.1 Subordination approaches

In the literature, taking especially into account the case of adjectival comparatives, the correlation between the degree marker in the first member of comparison and the comparative clause has often been treated in terms of subordination, the comparative clause being conceived either as a complement or as an adjunct of the degree marker.

According to Bresnan (1973), Heim (2000), Bhatt & Pancheva (2004), the degree marker selects the degree clause as its argument, and the whole DegP is the specifier of a gradable predicate, as represented in (30):

(30) [AP [DegP Deg CP] A]

The proposal in (30) has the advantage of establishing a straightforward connection between the degree marker and the comparative clause. Still, in this structure, the degree clause (CP) precedes the Adjective. So, in order to prevent the discontinuity between the adjective and the degree clause, Extraposition must obligatorily take place moving the CP into a post-gradable predicate position, as described in (31):

(31) John is [AP [DegP [Deg -er] [than Bill is]] [A tall]] => John is taller than Bill is

However, Extraposition is problematic in current minimalist framework, which assumes that displacement should not be triggered only for obtaining the surface order of the constituents, but for morphosyntactic or discursive interpretative reasons, as emphasised by several authors (e.g., Donati 1997, Matos & Brito 2002, Bhatt & Pancheva 2004, Grosu & Horvath 2006).

At first sight, Abney's (1987) and Kennedy's (1997) proposals overcome this problem. According to these authors the degree word is the head of the whole comparative construction, conceived then as a DegP, and it selects the gradable predicate, AP, as its complement. In Abney's analysis, the degree clause is also a complement of Deg, as specified in (32), while in Kennedy's approach it is conceived as a modifier, as in (33):<sup>11</sup>

<sup>11</sup>Lechner (1999) proposes a different representation, where the Comparative clause is the complement of Deg, and the gradable predicate is the specifier of DegP, as in (i).

(i) [DegP AP [Deg Deg<sup>0</sup>XP]]

We will not discuss this proposal.

(32) [<sub>DegP</sub> Deg AP CP] (Abney 1987)

(33) [<sub>DegP</sub> [<sub>Deg'</sub> [<sub>Deg'</sub> Deg AP] CP] ] (Kennedy 1997)

Notice that the connection between the degree marker and the comparative clause is indirectly established in (33), since in syntax the degree clause is a modifier, hence an adjunct, of Deg'. Kennedy (1997) assumes that the degree marker and the degree clause will form a unit at LF.

Apparently (32) and (33) have no word order problems, because the comparative clause, CP, is already projected in final position. But, in fact, as noticed in Matos & Brito (2002) and Grosu & Horvath (2006), Extraposition is still required to deal with sentences in which constituents not belonging to the DegP intervene between the gradable predicate and the degree clause, as in (34) and (35):

(34) \*[Mais estudantes [do que professores [-] a biblioteca do  
more students than teachers the library of-the  
Departamento]] frequentam a biblioteca central.  
Department attend the library main  
=>

Mais estudantes frequentam a biblioteca central do que professores a  
more students attend the library main than teachers the  
biblioteca do Departamento.  
library of-the Department.

'More students frequent the main library than teachers the Department's library.' (Matos & Brito 2002)

(35) \*John is a [cleverer than Bill is] man. => John is a cleverer man than Bill is.  
(Grosu & Horvath 2006)

In these examples, the alleged sources of the extraposed sentences are unacceptable and involve configurations not allowed in the language – this is the case of (34), since EP is a language that does not allow backwards Gapping.

To avoid Extraposition, Bhatt & Pancheva (2004) present an alternative proposal. They assume that DegP is originally constituted by the degree marker alone, and that the gradable predicate selects DegP as its specifier, as in (36):

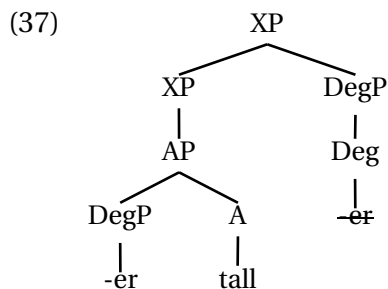
(36)

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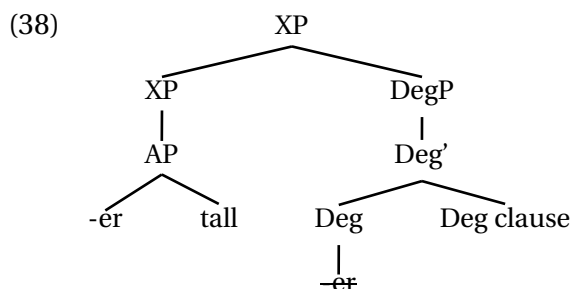
graph TD
 AP --> DegP
 AP --> A
 DegP --> Deg
 Deg --> er["-er"]
 A --> tall

```

Then, the degree marker, being a quantificational element, covertly raises to a scope position, right adjoining to the maximal projection that contains the gradable predicate, and leaves a copy in base position, which is spelled out due to morphological constraints, (37):



Finally, the comparative clause, viewed as a *wh* CP inserted in a PP, is Late Merged as the complement of the raised unpronounced degree marker, as represented in (38):<sup>12</sup>



Although without assuming the *wh* nature of the CP, we could try to accommodate Bhatt & Pancheva's analysis to EP, hypothesising that the CP is a completive clause selected by Deg and headed by *do que*, conceived as a single complementizer instantiating Force, as illustrated in (39):<sup>13</sup>



Yet, this analysis presents two major problems. Firstly, Late Merge does not apply to non *wh*-CP complements, but to *wh*-CPs acting as Adjuncts (Lebaux 1988<sup>14</sup>, Chomsky 2004) or, according to Bhatt & Pancheva (2004), to complements of Deg.

<sup>12</sup>One of the main ideas of this analysis is that the obligatory Late Merge of the Degree Clause is not due to word order but to trace interpretation requirements (Fox 2002). For some criticisms of this analysis see Grosu & Horvath (2006).

<sup>13</sup>We discard the hypothesis that *do que* in current Portuguese occurs in split C projections, in terms of Rizzi's (1997) work, as suggested in (i), where *de* occupies the head of ForceP and *o que* the head of FinP. In fact, under this hypothesis, we would expect that TopP or FocP could occur lexically realized. However, as shown in (iib) and (iic), no overt expression may follow *de* or precede *o que* in comparatives in EP:

- (i) ... [Force *de*] ... (Topic) ... (Focus) ... [Fin IP *o que* ...]
- (ii) a. A Paula compra mais livros do que a Ana compra [-] revistas.  
 the Paula buys more books than the Ana buys magazines  
 'Paula buys more books than Ana buys magazines.'
- b. \*A Paula compra mais livros [ForceP de [TopP revistas<sub>i</sub> [Fin IP *o que* a Ana compra [-] ] ]].  
 the Paula buys more books of magazines that the Ana buys
- c. \*A Paula compra mais livros [ForceP de [FocP revistas<sub>i</sub> [Fin IP *o que* compra a Ana [-] ] ]].  
 the Paula buys more books of magazines that buys the Ana

<sup>14</sup>Lebaux (1988) proposes Late Adjunction to deal with the contrast between relative CPs and N complement CPs, with respect to Binding effects in Reconstruction contexts. Relative clauses admit the



Besides, this hypothesis is inconsistent with the behaviour of clauses headed by other occurrences of the form *que* 'that' as a complementizer, in EP: while the latter excludes infinitival clauses, (40b), and gapping, (41b), *do que* in comparative sentences accepts them, as shown in (40a) and (41a).<sup>15</sup>

- (40) a. Eles apreciam mais PRO descansar do que PRO ganhar o  
 they appreciate more PRO rest<sub>INFINITIVE</sub> than PRO win<sub>INFINITIVE</sub> the  
 concurso.  
 contest  
 'They appreciate more that you rest than that we win the contest.'
- b. Eles apreciam que tu descansas/ \*que tu descansas.  
 they appreciate that you rest / that you rest<sub>INFINITIVE.2SG</sub>  
 'They appreciate that you rest.'
- (41) a. Ela come mais bolos do que eu [-] chocolates.  
 she eats more cakes than I chocolates  
 'She eats more cakes than I eat chocolates.'
- b. \*Eu como chocolates e acho que ela [-] bolos  
 I eat chocolates and think.1SG that she cakes  
 'I eat chocolates and I think that she eats cakes.'

In sum, the comparative connector *do que* in EP is not an instance of the finite complementizer *que*. Since in EP this connector is neither a preposition nor a wh-constituent or a complementizer, its categorial nature remains to be determined.

## 5.2 The correlative coordination hypothesis

Considering the dependency relation that *do que* establishes with the degree word, we hypothesize that it integrates a specific kind of correlative coordination, involving quantificational correlates. In fact, the contrasts in (42) show that the comparative connectors change in accordance with the form of the degree marker — *mais* 'more' and *menos* 'less' determine the occurrence of (*do*) *que* 'than'; *tão* 'as much' and *tanto(s)* 'as many' require the presence of *como* 'as':

- (42) a. O Pedro é mais/menos aplicado do que o irmão.  
 the Pedro is more/less diligent than the brother  
 'Pedro is more/less diligent than his brother.'
- b. O Pedro é tão aplicado como o irmão.  
 the Pedro is as diligent as the brother  
 'Pedro is as diligent as his brother.'

---

co-reference between *he* and *John* in these contexts, (i), while complement clauses do not, (ii):

- (i) Which claim that John<sub>i</sub> made did he<sub>i</sub> later prove t?  
 (ii) \*Whose claim that John<sub>i</sub> like Mary did he<sub>i</sub> deny t? (Lebaux 1988:238)

Lebaux assumes that the complement CP, not being subjected to Late Adjunction, integrates the nominal constituent that is reconstructed at LF in its original place, substituting the t(race); thus, a violation of Principle C arises, because the pronominal, *he*, binds the R-expression, *John*.

<sup>15</sup>Notice that Portuguese has two paradigms of infinitive: invariable infinitive, present in (40a), and inflected infinitive, which occurs in (40b).

- c. \*O Pedro é mais aplicado como o irmão.  
the Pedro is more diligent as the brother
- d. \*O Pedro é tão alto do que o pai é gordo.  
the Pedro is as tall than the father is fat

Assuming that comparative constructions in EP exhibit a specific kind of correlative coordination, we can explain the parallelism between the examples in (42) and those in (43), presenting standard correlative coordination: while *não só* correlates with *mas também* or *como* (cf. (43)), *tanto* only co-occurs with *como* (see the contrast between (43a) and (43b)).

- (43) a. Tanto o Pedro como a Ana gostam desses livros.  
both the Pedro as the Ana like of-these books  
'Both Pedro and Ana like these books.'
- b. Não só o João {mas também / como} a Ana leram esse artigo.  
not only the João but also / as the Ana read that article  
'Not only João but also Ana read that article.'
- c. \*Tanto o Pedro mas também a Ana gostam desses livros.  
both the Pedro but also the Ana like of-these books  
'Both Pedro but also Ana like these books.'

The idea that comparatives, or at least some subtypes of comparatives, are specific cases of coordination is not new (see, a.o., Napoli 1983, Lechner 1999, 2001, Culicover & Jackendoff 1999, Sáez del Álamo 1999, Matos & Brito 2002, Abeillé & Borsley 2006<sup>16</sup>). In fact, several properties argue in favour of the coordinate nature of canonical comparatives in EP.<sup>17</sup>

First of all, the comparative connectors, just like conjunctions, may connect phrasal constituents (as well as sentential constituents). In (44), the interrogative *wh* word *quantos* 'how many' affects the comparative phrase *mais dicionários do que enciclopédias* and not a sentence:

<sup>16</sup>Reconsidering the proposals of Culicover & Jackendoff (1999) with respect to correlative comparatives, Abeillé & Borsley (2006) claim that this construction should be syntactically analysed as an instance of syntactic subordination in English, but either as a case of subordination or coordination in French, according to the speaker's grammar.

<sup>17</sup>Identical behaviour is exhibited, in Spanish, by sentential comparatives making use of the connector *que*, as shown in Sáez del Álamo (1999):

- (i) a. Más libros compró Juan ayer que vendió Luis hoy. (Sáez del Álamo 1999: 1144)  
more books bought Juan yesterday than sold Luis today  
'Juan bought more books yesterday than Luis sold today.'
- b. \*Donde compró Juan más libros que Luis discos en Madrid? (Sáez del Álamo 1999: 1145)  
where bought Juan more books than Luis disks in Madrid
- c. Dónde compró Juan más libros que Luis discos? (Sáez del Álamo 1999: 1145)  
where bought Juan more books than Luis disks  
'Where did Juan buy more books than Luis bought disks?'

- (44) [Quantos [mais dicionários do que enciclopédias]] há nesta biblioteca?  
 'How-many more dictionaries than encyclopaedias are there in-this library?'

Besides, clausal comparatives in EP present Coordinate Structure Constraint effects, (46), and allow Across-the-Board extraction, (47):

- (45) O Luís é mais inteligente do que o João é trabalhador.  
 the Luís is more intelligent than the João is hard-working  
 'Luís is more intelligent than João is hard-working.'
- (46) \*O que<sub>i</sub> é o Luís mais t<sub>i</sub> do que o João é trabalhador?  
 what is the Luís more than the João is hard-working?
- (47) O que<sub>i</sub> é o Luís mais t<sub>i</sub> do que o João é t<sub>i</sub>?  
 what is the Luís more than the João is  
 'What is Luís more than John is?'

Moreover, comparatives, like coordinate sentences, allow Gapping (48), a construction typically banned from subordination, as shown by the unacceptability of *que ela [-] aos filhos* in (49):

- (48) Ele lê mais romances aos alunos do que ela [-] aos filhos.  
 he reads more novels to-the students than she to-the children  
 'He reads more novels to his students than she to her children.'
- (49) \*Ele lê romances aos alunos e pensa que ela [-] aos filhos.  
 He reads novels to-the students and thinks that she to-the children.

Finally, comparative connectors, like conjunctions, are insensitive to the (un)finiteness of the clauses they connect, see (50) and (51):

- (50) a. Eles precisam menos de ler romances do que de trabalhar.  
 they need less of read.<sub>INFINITIVE</sub> novels than of work.<sub>INFINITIVE</sub>  
 'They need less to read novels than to work.'
- b. Eles precisam menos que tu leias romances do que trabalhes.  
 they need less that you read novels than (you) work  
 'They need less that you read novels than that you work.'
- (51) a. Eles precisam de ler romances e de trabalhar.  
 they need of read.<sub>INFINITIVE</sub> novels and of work.<sub>INFINITIVE</sub>  
 'They need to read novels and to work.'
- b. Eles queriam que tu leses romances e que trabalhasses.  
 they want that you read novels and that work  
 'They need you to read novels and to work.'

Adopting this hypothesis, the co-occurrence of the comparative connector with a whP in comparative relative clauses in EP comes as no surprise. In fact, in (52), *do que* relates the expression in the scope of the degree marker, *mais*, with the DP including the relative clause, *aquilo que tu és*, by means of correlative coordination:<sup>18</sup>

<sup>18</sup>In comparative constructions involving free relatives the second term of the correlative coordination would presumably be a CP.

- (52) Este miúdo é mais esperto do que aquilo que tu és.  
 this kid is more smart than that that you are  
 ‘This kid is smarter than you are.’

In sum, the data strongly suggest the coordination status of the comparative connector *do que*. In the next section we will explore the structure to be assigned to canonical comparatives in EP in order to account for the dependency between the quantificational degree marker and the constituent headed by *do que*.

## 6 Comparatives in EP as correlative coordination

Approaches to standard correlative coordination within the Principles and Parameters framework agree in taking the second correlative as the head of the coordinate structure. However, they vary with respect to the position to be assigned to the first correlative, suggesting that the choice between alternatives is a matter of empirical evidence (e.g. Kayne 1994, Johannessen 2005): either the initial correlative selects the whole coordinate structure, as in (53a), or it modifies the first conjunct, as in (53b):

- (53) a. [<sub>ConjP</sub> both [<sub>ConjP</sub> John and Mary]]  
 b. [<sub>ConjP</sub> [either John] [<sub>Conj</sub> or [Mary]]]

Adopting the representation (53a) for Comparatives, we would straightforwardly account for the correlation between the degree marker and the comparative connector, as attested in (54b):

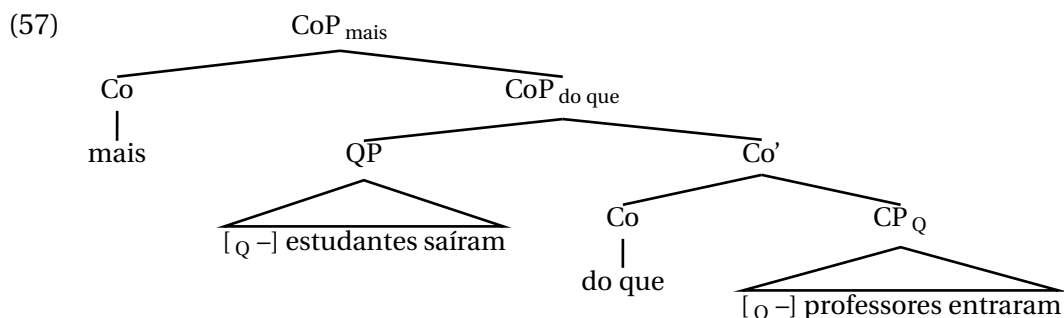
- (54) a. Ela é mais alta do que eu sou.  
 she is more tall than I am  
 ‘She is taller than I am.’  
 b. ... [<sub>CoP</sub> [<sub>Co</sub> mais] [<sub>CoP</sub> AP [<sub>Co'</sub> [<sub>Co</sub> do que] CP] ]]

This analysis is close to Donati’s (1997) proposal for canonical comparatives, though Donati leaves open the categorial nature of the complement of the degree word, XP in (55):

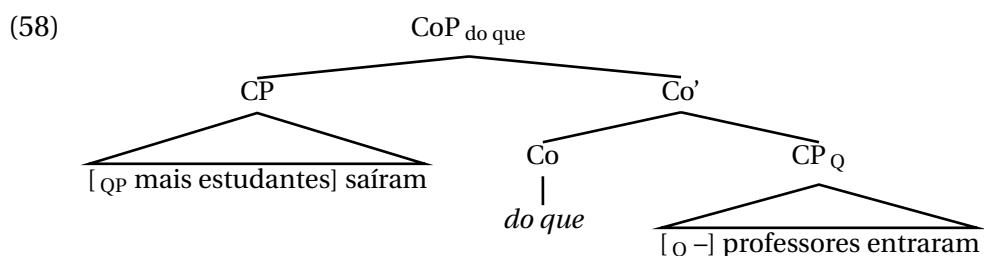
- (55) [<sub>CoP</sub> [<sub>Co</sub> più] [<sub>XP</sub> QP [<sub>X'</sub> [<sub>X</sub> di ] QP/CP ]]] (cf. Donati 1997)

Yet, the representation in (54b) is empirically inadequate to account for examples like (56), because it incorrectly analyses the expression *[[Q-]estudantes saíram]* as a nominal phrase, more precisely a QP (see (57):

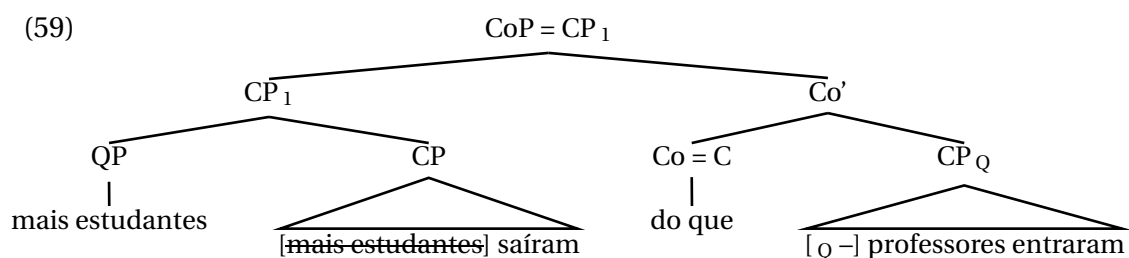
- (56) Mais estudantes saíram do que professores entraram.  
 more students went-out than teachers went-in  
 ‘More students went out than teachers went in.’



Thus, the alternative representation in (58), an extension of the one presented in (53b), seems to be preferable. In this structure, each of the compared elements is included in a full sentence projection, designated as CP and CP<sub>Q</sub> in (58):



Given (58), how to structurally capture the correlation between the degree marker and *do que*-CP<sub>Q</sub>? We believe that the relevant configuration is built in the derivation from Syntax to SEM by Quantifier Raising of the quantifier/ degree marker, as illustrated in (59) for (56a):



As often noticed, Co(nj) is a categorially underspecified head that assumes the categorial nature of its conjuncts by Agree (Johannessen 1998, Matos 1995, 2000). Thus, in (44), Agree operates between the Specifier of CoP and the head Co, setting its value as a projection of C. Since CoP is interpreted as a segment of CP<sub>1</sub>, the QP is understood as the adjunct of the whole CoP = CP<sub>1</sub> and c-commands the entire comparative structure.

Assuming, with Chomsky (2004), that Pair Merge compositionally creates a predication relation, this relation holds between the degree expression, in (59) *mais estudantes* 'more students', and the whole comparative structure which includes *[[Q-] professores entraram]* 'teachers get in' in (59). As a consequence, a dependency relation arises between the degree marker and the comparative clause.

Notice that comparative clauses are not an isolated case of correlative coordination requiring QR. Independent evidence has been presented in Larson (1985), Hendrix (2002) and Johannessen (2005) – the correlatives *either ... or* (cf. (60)):

- (60) a. [ [Mary *either* is driving to the airport] [or she is taking a cab ]].(Larson 1985)  
 b. [*either* [<sub>ConjP</sub> Mary ~~*either*~~ is driving to the airport or she is driving a cab] ]  
 (Johannessen 2005)

In Syntax, *either*, a quantifier-like element, is internal to the first conjunct, as in (59a), but at SEM it must have scope over the whole coordinate structure, as represented in (60b).

In sum, the correlative coordination approach can account for the dependency relation that holds between the degree marker and the CP selected by the comparative connector.

## 7 Concluding remarks

In this paper we have analysed canonical comparatives of superiority and inferiority in EP, mainly focussing on sentential comparatives in which the comparative quantifier affects a nominal constituent.

We have shown that there is no evidence for the fact that the comparative connector *do que* in EP is a preposition followed by a wh-form: neither does the comparative connector behave like a preposition, in contrast with *di* in Italian and *than* in English, nor does it behave like a wh-element. The latter property distinguishes EP from Italian, which, in the canonical form of this type of construction, exhibits a wh-constituent, *quanti*.

Despite these differences, Italian and EP, as well as Spanish, share the existence of two sorts of comparatives: canonical comparatives, presenting a strong quantificational content, which may be instantiated by (a kind of) Free Relatives with an overt quantificational wh-element, as in Italian, or CPs headed by a null quantifier, as in EP and Spanish; and relative comparatives, with a weaker quantificational content, which correspond to free or headed relatives with no quantificational wh-element.

From this perspective, the island effects exhibited by both types of comparatives are not compelling evidence for the systematic presence of a wh-operator, since they also occur in other cases of A'-movement, namely Quantifier Raising, and canonical clausal comparatives in EP (and in Spanish) are quantified CPs.

In order to capture the dependency relation between the degree marker and the comparative connector – the main reason invoked by the grammatical tradition to consider that comparative clauses are an instance of subordination –, we have proposed that canonical comparatives in languages like EP must be viewed as a case of correlative coordination, presenting the quantifier/ degree expression in the first term of comparison as correlative of the *do que* connector that selects the comparative clause. It is this connector that heads the correlative coordinate structure.

The semantic relation between these two constituents is structurally captured at SEM: as a consequence of Quantifier Raising, a Pair Merge configuration arises and a predication relation is established between the quantifier/ degree expression and the whole compared structure headed by the comparative connector.

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# Pseudo-Sloppy Readings in Flat Binding

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## Abstract

The paper presents an additional argument for a specific account of semantic binding: the flat-binding analysis. The argument is based on observations concerning sloppy interpretations in verb phrase ellipsis when the binder is not the subject of the elided VP. In one such case, it is important that one of the binders belong to the domain of the other. This case can be derived from the flat-binding analysis as is shown in the paper, while it is unclear how to account for it within other analyses of semantic binding.

## 1 Introduction

In a recent paper, I introduced a new account of semantic binding (Sauerland, 2007b). The purpose of this paper is to develop an additional argument in favor of the account. The argument is based on an investigation of cases of binding into elided structures extending observations by Takahashi and Fox (2005) and Hardt (2006).

Semantic binding is one of the central concepts of linguistic semantics. But since the mechanisms underlying semantic binding are rarely discussed, it is useful to recapitulate some basic properties of the concept. One core case of the phenomenon is binding of a pronoun by a quantificational expression in the same clause as in *Every boy likes his own father*. When applied to this sentence, the mechanism that establishes semantic binding has to ensure that, if John, Bill, and Harry are the relevant boys, John likes John's father, Bill likes Bill's father, and Harry likes Harry's father. To ensure that the subject and the possessor position co-vary, any account of binding must involve a mechanism of storage and retrieval. Furthermore, the mechanism must have the capacity to store and retrieve more than one item since binding dependencies can overlap as in *Every boy told his mother that he likes her*. The core distinction between the standard logic-based accounts binding and the flat-binding account I advocate concerns the nature of this storage and retrieval mechanism: standard accounts are position-based – the memory is organized in a sequence of positions and access to memory is always by reference to specific position. In the flat-binding model, however, memory is not structured into positions and retrieval of a particular kind of item

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from memory is only possible by making use to an inherent property uniquely identifying the item. The two accounts assume the different logical form representations illustrated in (1) for the example already discussed above, where I assume a version close to Heim and Kratzer's (1998) textbook of the position-based account.<sup>1</sup> In particular, where the position-based account makes reference to specific positions of the memory structure assumed (i.e. the assignment sequence), the flat binding account employs definite descriptions to uniquely identify a referent in memory.<sup>2</sup>

- (1) Every boy likes his own father.
- a. *Position-based*: Every boy  $\lambda 1$   $t_1$  likes  $hi_1$ 's own father.
  - b. *Flat binding*: Every boy: the boy likes the boy's own father.

This paper develops a new prediction the flat binding account makes. The prediction concerns the interaction of ellipsis and pronominal anaphora. I call the phenomenon *Pseudo-Sloppy Readings*. These are similar to *true* sloppy readings that are available in many cases of ellipsis as in *The boy likes his father and the man does too*. However, true sloppy readings on the flat binding analysis are derived on the basis of representations like (2) where the definite descriptions the pronoun corresponds to in the antecedent VP and the elided VP are different (Sauerland, 2007a). The flat binding analysis relies on structure sharing for these cases to get the content of the definite description right, which is indicated by the lines connecting the two NPs in (2) (see section 3.3 below).

- (2) The boy likes hi[the boy]'s father and the man does like [the man]'s father

The flat binding account predicts, however, that there should be some cases where use of the same definite description in both the antecedent VP and the elided VP leads to a sloppy reading – these are what I call *pseudo-sloppy* readings here and in the following. I argue below that (3) is a case of a pseudo-sloppy reading.

- (3) Every boy likes hi[the boy]'s father. Even this boy does like [the boy]'s father

The representation for a normal sloppy reading like (2) differs from the pseudo-sloppy reading (3) only by the presence of structure sharing in (2). Furthermore, the interpretations of a normal sloppy reading and a pseudo-sloppy reading of the same sentence are identical. However, pseudo-sloppy readings are expected to be less constrained than sloppy readings. The argument for pseudo-sloppy readings in this paper is therefore based on cases where the normal sloppy reading is blocked, but we nevertheless observe a sloppy interpretation where a pseudo-sloppy interpretation is predicted to be possible. Specifically, I show in this paper that Hardt's surprising sloppy reading

<sup>1</sup>I added a  $\lambda$  in the representation in (1-a) over the representations of Heim and Kratzer (1998) since this makes the representations easier to read when not given as trees. The most interesting other variant within the class of position-based accounts are accounts based on combinatorial logic where the storage sequence is unified with the sequence of arguments of a predicate (Curry, 1930; Geach, 1972). For my purposes in this paper, however, the differences between the combinatorial logic based account and the standard position based account do not matter, hence, I concentrate on the standard account.

<sup>2</sup>When writing *hi's* as in (1-a), I assume that the possessive pronouns consists of a pronoun (*hi*) and a genitive case marker (*'s*), but sometimes often are spelled out by single, suppletive form.

(Hardt, 2006) are a case where normal sloppy readings are blocked, but pseudo-sloppy readings like (3) are possible. This is indicated by contrast in (4), where (4-a) does not allow a sloppy interpretation, but Hardt's (4-b) does if Bill is a boy:

- (4) a. #Nearly every boy said Mary hit him. But the adult witness didn't say she did.  
 b. Nearly every boy said Mary hit him. But Bill didn't say she did. (Hardt, 2006, (3))

Such contrasts argue for the existence of pseudo-sloppy interpretations. These in turn corroborate the flat-binding analysis since it predicts the existence of pseudo-sloppy interpretations.

Section 2 discusses the constraint exhibited in (4) in more detail and outlines the approaches of Takahashi and Fox (2005) and Hardt (2006). As we will see neither of the two accounts predict the contrast in (4): Takahashi and Fox (2005) predict the sloppy interpretation to be impossible for both examples, while Hardt (2006) predicts the sloppy interpretation to be possible in both cases. Section 3 develops the relevant parts of the flat-binding account to show that the flat-binding account actually predicts the contrast in (4). Section 4 is the conclusion.

## 2 Constraints on Sloppy Interpretations

Sloppy interpretations have played a major role for accounts of VP-ellipsis since at least Sag (1976) and Williams (1977) worked on the topic. The initial problem it presents for the ellipsis theorist is that a pronoun that is not bound like *her* in (5-a) must refer to the same individual in both the antecedent and the elided VP. But, a bound pronoun like *his* in (5-b) can refer to two different individuals; John and Bill.

- (5) a. John likes her father. Bill does ~~like her father~~, too.  
 b. John likes his father. Bill does ~~like his father~~, too.

Working in a framework where pronominal reference is determined by positions of an abstract assignment sequence, Sag (1976), Williams (1977), and Bach and Partee (1980) all drew the following conclusions. (5-a) shows that the indices born by a pronoun in an ellipsis and the corresponding pronoun in the elided phrase must be identical. Bound pronouns, however, could be bound within the elided VP and its antecedent as shown in (6).<sup>3</sup>

- (6) John does  $\underbrace{\lambda x x \text{ like } x\text{'s father}}_{\text{antecedent}}$ . Bill does  $\underbrace{\lambda y y \text{ like } y\text{'s father}}_{\text{elided}}$ .

The formal system derived from predicate logic these author's assumed predicts that alphabetic variants – constituents that are identical except for the indices of bound ele-

<sup>3</sup>The analysis assumes one ingredient first made explicit by Heim (1997) as the *No Vacuous Coindexing* Principle in (i). It blocks reuse of the same binder index.

- (i) If an LF contains an occurrence of a variable  $v$  that is bound by a node  $\alpha$ , then all occurrences of  $v$  in this LF must be bound by the same node  $\alpha$ .





However, the contrasts in (14) and (15) are problematic for Hardt's account. A quantifier is the binder in the first conjunct in all four examples. Nevertheless there is a contrast in grammaticality. I propose that the contrast is due to the fact that the binder in the second conjunct is an element of the domain of quantification of the quantifier in the first conjunct in (14-a) and (15-a), but not in (14-b) and (15-b).

- (14) a. Nearly every boy said Mary hit him. But Bill didn't say she did.  
 b. #Nearly every boy said Mary hit him. But the adult witness didn't say she did.
- (15) a. Almost every boy hopes that Sally will marry him. Even this boy hopes that she will.  
 b. #Almost every boy hopes that Sally will marry him, and even the teacher hopes that she will.

The generalization established is that a sloppy reading in apparent violation of Max-Elide is possible if and only if the nominal binding into the elided VP denotes an individual that is an element of the domain of the quantifier binding into the antecedent VP. In the following section, I derive this generalization from the flat binding account.

### 3 Pseudo-Sloppy Readings

#### 3.1 Flat Binding

The flat-binding account assumes that pronouns are always reduced definite descriptions. More specifically, pronouns are agreement heads followed by an elided DP in the structure shown in (16). In the following, pronouns are represented as him ~~(the boy)~~.

- (16) him =
- $$\begin{array}{c}
 \phi P \\
 \swarrow \quad \searrow \\
 \phi \quad \quad \text{DP} \\
 | \quad \quad \triangle \\
 [3.SG] \quad \text{the boy}
 \end{array}$$

Languages that assign nouns to grammatical gender or noun classes provide one piece of direct evidence for the presence of a noun in pronouns. For example, a German speaker must use the appropriate gender when referring deictically to a piece of silverware: feminine *sie* for a fork, masculine *er* for a spoon, and neuter *es* for a knife. The appropriate gender is determined by the grammatical gender of the noun: *Gabel* ('fork') is feminine, *Löffel* ('spoon') masculine, and *Messer* ('knife') neuter. The same generalization – the noun class of deictic pronouns is determined by the noun class of the appropriate noun – is also observed in Bantu (Laura Downing, p.c.) and argues directly for the obligatory presence of a noun in every pronoun. Further evidence is presented elsewhere (Sauerland, 2007b, 2008).

The flat binding analysis seems suitable for capturing the generalization developed at the end of the preceding section in a straightforward way: For (15-a), the representation in (17) can capture the sloppy interpretation, where VP-ellipsis should be licensed since antecedent VP and elided VP are identical. I call a sloppy reading resulting from



identity of antecedent VP and elided VP as in (17) *pseudo-sloppy* since for the more familiar cases of sloppy interpretations such as (5-b) a different representation is necessary (see below).

- (17) Almost every boy hopes that Sally will marry him~~{the boy}~~. Even this boy hopes that she will marry him~~{the boy}~~.

Note that a representation like (17) would not predict a pseudo-sloppy interpretation for (15-b) since the subject of the second conjunct there, *the teacher*, is not a possible referent for *the boy*. The division between sloppy and pseudo-sloppy leads me to an account of the facts presented in the previous section where Takahashi and Fox's analysis is essentially maintained as a constraint only on sloppy readings, while Hardt's exceptions are analyzed as pseudo-sloppy readings. The goal of the remainder of this section is to integrate the flat binding account of (17) with general principles of DP and VP-ellipsis and to thereby delineate between cases where sloppy readings are available, where pseudo-sloppy readings are available, and where no sloppy interpretation is possible. This requires a more detailed understanding of the flat binding analysis.

The main concern of my 2007 paper (Sauerland, 2007b) was to show that, in any case of semantic binding, there are appropriate definite descriptions to allow the flat binding account to go through and that furthermore a general account of ellipsis would license DP-ellipsis of the definite description in all cases. Consider the two following examples:

- (18) a. Every actress wrote about every singer that she likes her singing.  
b. Every actress wrote about every actress that she likes her singing.

Example (18-a) raises the problem of individuals like Jennifer Lopez who is both an actress and a singer. (18) has an interpretation that is only true if Jennifer Lopez wrote to herself that she likes her singing in addition to many other acts of writing, which seems to result in non-uniqueness in representation (19).

- (19) Every actress wrote about every singer that she~~{the actress}~~ likes her~~{the singer}~~'s singing

For this reason, individual concepts (i.e. functions from a set of worlds to individuals) and not bare individuals are the items stored in memory. In particular, I made use of the following definition: An individual concept  $x$  is *maximal for property  $P$* , if and only if a)  $x$  is defined for all words  $w$  where at least one individual with property  $P$  exists and b) wherever defined  $x$  yields an individual with property  $P$  as value.<sup>7</sup> Now it is possible to capture Jennifer Lopez as a actress and Jennifer Lopez as a singer by using different concepts, one maximal for *actress*, the other maximal for *singer*, which both yield Jennifer Lopez as value for those worlds that are part of the common ground.

Example (18-b) leads to a further question since both quantifiers range over actresses. I (Sauerland, 2007b) argue though that the second noun phrase *actress* in examples similar to (18-b) can contain additional lexical material in the restrictors of the quantifiers. The representation (20) elaborates this proposal for (18-b).

<sup>7</sup>Properties are of type  $\langle e, \langle s, t \rangle \rangle$  and adopt the convention a concept  $x$  has property  $P$  if and only if for all  $w \in \text{domain}(P)$  the statement  $P(x(w))(w)$  holds.

- (20) Every actress wrote about every [actress]<sub>F</sub> ~~[of interest to the actress]~~ that she ~~[the actress]~~ likes her ~~[the actress of interest to the actress]~~'s singing.

Note that because the property *actress of interest to the actress* is logically strictly stronger than the property *actress*, the maximal concepts corresponding to the former property are always defined for a smaller set of worlds than the later. However, any maximal concept for the property *actress of interest to the actress* also has the property *actress*. The definite *the actress* always chooses the maximal concept introduced by the quantifier *every actress* because a definite always chooses the concept with the biggest domain. Only *contextual* concepts, whose domain is exactly the context set, can be entered into discourse storage, while maximal concepts only remain in memory within a sentence. In sum, the partial salience order among concepts a definite description refers to is the following:<sup>8</sup>

1. maximal concept in memory with wide domain, i.e. maximal *actress*-concept
2. maximal concept in memory with small domain, i.e. maximal *actress of interest to the actress*-concept
3. contextual concepts in memory, i.e. set of *actress*-concept corresponding to the actresses under discussion
4. concept not in memory, i.e. concepts of actresses in the current context set

As representation (19) illustrates, I assume that there may be both partial ellipsis or total ellipsis applying at the DP level. Both kinds of ellipsis may be licensed by a bigger parallelism domain like VP-ellipsis in Rooth's analysis (see above). For ellipsis licensing in DP, I apply the principle of deletion up to recoverability (Chomsky and Lasnik 1993 and others), where I assume that what needs to be recovered is the referent of the DP. Spelling out the condition requires several case distinctions depending on the category of the parallelism domain: definite DPs, other NPs and finally TPs. First consider definite DPs that do not contain a focus: Two structures are defined to be *Ellipsis Alternatives* if their phonological representations are identical. Then, a definite DP that contains no focus is licensed as a parallelism domain if and only if there is no ellipsis alternative DP' such that DP' refers grammatically to a concept  $x'$  that has as its domain a superset of the domain of the concept that DP refers to. This case is for example relevant to pronouns, which are elided DPs and therefore must not contain any focus. For example, ellipsis in ~~she~~~~[the actress]~~ in (19) is licensed by this principle because the quantifier *every actress* introduces a maximal actress concept, which has maximal salience for *actress*. However, licensing of the two other ellipses in (19) does not fall under this case because the first contains a focus and the second cannot be licensed at the DP-level since we just saw that the most salient concept for a feminine pronoun to refer is actress-concept introduced by the first universal quantifier *every actress*.

<sup>8</sup>I added the case of a concept not yet in memory where I assume a definite *the P* picks out the contextual concept referring to the plurality of all entities with property *P* in each world of the context set. Sauerland (2007b) uses a second concept of salience in the account of number agreement. This is not relevant in the following. The concept of salience use here corresponds to d-salience

The third condition licenses a definite DP that contains a focus as a parallelism domain: the most salient focus alternative of XP must be more salient than the most salient focus alternative for any focus alternative of XP. This condition is relevant for licensing ellipsis in *every [actress]<sub>F</sub> ~~of interest to the actress~~*. Two further assumptions I make are the following: One, the processing of *x write about* makes salient the set of people *x* might write about, i.e. the set of people that are of interest to *x* is added to memory. Two, ellipsis with NP as parallelism domain is licensed if ellipsis of the definite DP consisting of *the* and the NP is licensed. With these assumptions, ellipsis of the adjunct in *every [actress]<sub>F</sub> ~~of interest to the actress~~* is licensed: The focus alternative *the people of interest to the actress* refers to the concept of people of interest to the actress. And furthermore, though there is one ellipsis alternative referring to a more salient concept, namely *the actress* referring to the maximal actress-concept, using *the actress* to refer to the maximal actress concept is ruled out by MaxElide.

Finally, consider the ellipsis in *her ~~the actress of interest to the actress~~*. Why is the ellipsis alternative *strikeout[the actress]* not preferred though it refers to a more salient concept? In this case, ellipsis must be licensed with TP as a parallelism domain. The antecedent for *she ~~the actress~~ [likes]<sub>F</sub> her ~~the actress of interest to the actress~~ [singing]<sub>F</sub>* can be the sentence *Every actress wrote about every actress ~~of interest to the actress~~ that ... since write that ... about* is a focus alternative to *like* via the inference from *x writes about y* to *x knows y*.<sup>9</sup>

### 3.2 Deriving Pseudo-Sloppy Readings

The system derives pseudo-sloppy readings in a different way from normal sloppy readings. Consider first case (15-a) of a pseudo-sloppy reading. The representation of this reading is shown in (21).

- (21) Almost every boy hopes that Sally will marry him ~~the boy~~.  
Even the [demonstrative] boy hopes that she will marry him ~~the boy~~.

The universal quantifier *every boy* adds a maximal boy-concept, but also the contextual concept of all the boys to the memory. The pronoun *him ~~the boy~~* refers to the maximal concept resulting in the bound interpretation. Then in the second clause, *the [demonstrative] boy* selects a contextual *boy*-concept – I assume that the feature *[demonstrative]* is interpreted as the property of being indicated by the center of a possible world through a gesture. Therefore, two contextual *boy*-concepts – that of all boys and that of the demonstrated boy – are contained in the memory set when *him ~~the boy~~* is interpreted.<sup>10</sup> However, the singular marking of the pronoun *him* in the antecedent

<sup>9</sup>Fox (1999) argues that inferencing can be involved in ellipsis licensing. That elided material that is part of the antecedent does not block ellipsis in this case because the parallelism domain containing the ellipsis contains a focus in a relevant position (cf. Sauerland 2004).

<sup>10</sup>The concept contributed by the quantifier seems to be available, too: Examples like (i) at least in German allow an interpretation where the store-keeper hopes that Mary will buy all the cats. A possible scenario for (i) is the following: In an animation movie, a pet store-keeper does not treat his cats very well. Mary enters the store and is looking at the cats. All the cats want to be bought and the store-keeper is hoping to make a lot of money.

- (i) Every cat hopes that Mary will buy it. And the store-keeper does  $\Delta$ , too.



except for the constituents dominated by an focus marking F. With this definition, the first conjunct of (25) is a focus alternative of the second conjunct because *man* is dominated by an F. Therefore, ellipsis is predicted to be licensed in (25) applying the ellipsis licensing assumptions of Rooth (1992).

Without the structure sharing relationship the sloppy interpretation of (24) cannot be licensed as the two candidate representations in (26) show: Representation (26-a) would receive the right interpretation, but because only the first occurrence of *man* is focussed (i.e. dominated by an F-mark), the first conjunct is not a focus alternative of the second. In (26-b) ellipsis is licensed, but in the second conjunct there is no unique salient boy that the definite description *the boy* could refer to as I argue in the following paragraph.

- (26) a. Every [boy] likes hi<sub>F</sub>{~~the boy~~'s father and  
the [man]<sub>F</sub> does like hi<sub>F</sub>{~~the man~~'s father, too.
- b. Every [boy] likes hi<sub>F</sub>{~~the boy~~'s father and  
the [man]<sub>F</sub> does like hi<sub>F</sub>{~~the boy~~'s father, too.

Furthermore the account predicts precisely the MaxElide constraint for true sloppy readings (Sauerland, 2007a). This can be seen quite easily: The key mechanism of the account of Takahashi and Fox (2005) is that ellipsis is not licensed in parallelism domains that do not include the binder of a sloppy pronoun. We can verify that this property is a corollary of the present account by looking at representation (25), specifically by considering the parallelism domain that consists of only the elided VP in (27). In this VP, the lexical item *man* is only dominated by one position and it is not dominated by an F-feature in this position. The mechanism of forming focus alternatives only can see the focus dominating the other position *man* is linked to if that position is part of the parallelism domain. Therefore the first conjunct of (24) does not provide an antecedent that would license (27) as a parallelism domain.

- (27) ~~like hi<sub>F</sub>{the YYY}'s father~~  
|  
man

It follows that parallelism domains must include the binding DP when ellipsis in a true sloppy interpretation is licensed. If we then adopt MaxElide from Takahashi and Fox (2005), all their results follow as constraints on true sloppy readings. Pseudosloppy readings, on the other hand, are not expected to be subject to the MaxElide constraint in the same way since Pseudosloppy readings are compatible with narrow parallelism domains.

## 4 Gender and Sloppy Interpretations

This section presents an additional argument for the existence of pseudo-sloppy readings and the explanation of them within the flat binding proposal. The argument is based on an interaction between sloppy interpretations and grammatical gender that was first observed by Spathas (2007) first observed in Modern Greek and I refer to it as Spathas's Generalization in the following. Since the same generalization holds in German, I assume that Spathas's Generalization requires a general explanation.

In languages with grammatical gender, pronominals in most cases show the same grammatical gender as their antecedent (see Corbett (1991) for typological discussion). As I mentioned above, I assume that the presence of an elided noun in the pronoun explains this apparent agreement. Specifically, I assume that the grammatical gender is due to a gender feature on the noun with which the other gender inflected words in the noun phrase agree with as shown in (29) for (28): The  $\phi$ -head has to contain a gender feature that can agree with the feature on the noun. Hence, a semantically vacuous gender feature is inserted in  $\phi$  for this purpose – NEUT in (29). Other words in the noun phrase that are inflected for gender like the determiner *to* in (28) must then agree with the gender feature on  $\phi$ , and thereby also exhibit the same grammatical gender as the head noun though there is no direct agreement relation.

(28) To koritsi (GREEK)  
the.NEUT girl[NEUT]

(29)

```

graph TD
 phiP[phiP] --- phi[phi]
 phiP --- DP[DP]
 phi --- phi_feats["[3.SG.NEUT]"]
 DP --- to["to.NEUT"]
 DP --- koritsi["koritsi[NEUT]"]

```

A pronoun that exhibits an appropriate grammatical gender, I claim, also involves a full definite NP in the LF-representation, but the DP is deleted and instead the content of  $\phi$  is pronounced. For example, when the neuter, possessive pronoun *tu* in Greek is used to refer to a girl, I analyze it as in (30).

(30)

```

graph TD
 phiP[phiP] --- phi[phi]
 phiP --- DP[DP]
 phi --- tu["tu.3.SG.NEUT"]
 DP --- to["to.NEUT"]
 DP --- koritsi["koritsi[NEUT]"]

```

This explains what is called agreement in grammatical gender in examples like (31) without any syntactic agreement relation between the subject and the possessive pronoun.

(31) GREEK (Spathas 2007: (40-a))  
To koritsi pi je sto jrafio tu  
the.NEUT girl[NEUT] went to-the office its

‘The girl went to her office.’

As mentioned above, an appropriate grammatical gender must also be used when pronouns or demonstratives are used without an overt nominal antecedent – for instance, deictically. In such cases, grammatical gender could not be explained by an agreement relation with a nominal antecedent. Therefore my proposal covers a broader range of cases of grammatical gender marking on pronouns compared to an analysis based on agreement.

Agreement in grammatical gender, however, is in some cases not obligatory. Both

Greek and German allow pronouns to not agree, but instead express the natural gender of their antecedent. (32) shows that the pronoun that exhibits neuter gender in (31) can instead also exhibit feminine gender with exactly the same interpretation.

(32) GREEK (Spathas 2007: (40-b))

To koritsi piġe sto jrafio tis  
the.NEUT girl[NEUT] went to-the office her's

'The girl went to her office.'

Hence, Greek allows a switch to the natural gender of the referent of the pronoun instead of use of grammatical gender. While I do not know what class of nouns in Greek allows such a gender switch, in German the switch to the natural gender is possible with human referents of non-infant age.<sup>12</sup> (33) shows the literal translation of Greek (31) and (32) to German. As in Greek, both the grammatical gender and the natural gender are possible.

(33) GERMAN

a. Das Mädchen ging in sein Büro.  
the.NEUT girl[NEUT] went in its.NEUT office

b. Das Mädchen ging in ihr Büro.  
the.NEUT girl[NEUT] went in her.FEM office

It is also possible in German to switch to the natural gender if the grammatical gender itself is a gender typically associated with animate referents like MASC, as (34) shows with a switch from masculine to feminine.

(34) GERMAN

Jeder weibliche Star hat direkt nach der Auszeichnung  
every.MASC female star[MASC] has directly after the award  
seine/ihre Eltern angerufen.  
his.MASC/her.FEM parents called

'Every female star called her parents right after the award.'

Examples like (34) are slightly awkward because neither choice of gender for the pronoun is fully appropriate, but in my judgement both genders of the pronoun are grammatical, while use of the third gender NEUT is clearly ungrammatical. Furthermore, there is no contrast in acceptability between the two.

**Spathas's Generalization** Spathas (2007) discovered an interesting generalization concerning the interaction of gender choice and ellipsis in Greek. He observes that a sloppy interpretation is possible in (35) with grammatical gender, but not in (36) with natural gender. In (35), the pronoun in the first conjunct agrees in grammatical gender.

<sup>12</sup>For *Säugling* ('infant'), which is grammatically masculine, only some speakers allow a switch to female gender pronouns when the infant is in fact female. For other native speaker, for example myself, it is odd.

Even though the grammatical gender NEUT is not the gender an overt pronoun bound by the subject of the elided IP, *Janis*, would receive, a sloppy interpretation is possible.

(35) GREEK:

To koritsi pi je sto jrafio tu ke o Janis episis  
the.NEUT girl[NEUT] went to-the office its and the Janis too

‘The girl went to her office and John too.’ (strict/sloppy)

In (36), however, the pronoun in the first conjunct exhibits the natural gender, FEM, of its antecedent. This is also not the correct gender for *Janis* and in this case the sloppy interpretation is not available.

(36) To koritsi pi je sto jrafio tis ke o Janis episis  
the.NEUT girl[NEUT] went to-the office her’s and the Janis too

‘The girl went to her office and John too.’ (strict/\*sloppy)

The contrast between (35) and (36) shows that despite the identical interpretation of the first conjuncts, the difference in agreement has effects on ellipsis interpretation. When the pronoun is agreeing in grammatical gender, the gender feature does not impose any restriction on ellipsis interpretation. But when the pronoun exhibits the natural gender of its antecedent, sloppy interpretation are restriction to those binders with matching natural gender. (37) demonstrates that a sloppy interpretation indeed is available in an example similar to (36) where the subject of the second conjunct has the matching natural gender.

(37) To koritsi pi je sto jrafio tis ke i Maria episis  
the.NEUT girl[NEUT] went to-the office her’s and the Maria too

‘The girl went to her office and Mary too.’ (strict/sloppy)

Therefore, I state Spatas’s Generalization as follows:

(38) *Spathas’s Generalization*: A sloppy interpretation for a pronoun that receives a bound variable inpretation is allowed if

- a. either the pronoun agrees in grammatical gender with its antecedent
- b. or the pronoun exhibits the natural gender of its antecedent and the binder of the elided pronoun has the same natural gender.

Spathas’s Generalization also holds for German. The German data is exactly parallel to Greek: (39-a) shows the availability the unrestricted sloppy raiding of (38-a) with agreement in grammatical gender. (39-b) and (39-c) show that the choice of natural gender restricts sloppy readings to binders with the same natural gender.

(39) GERMAN:

a. Das Mädchen soll seine Zähne putzen und der Junge auch.  
the.NEUT girl[NEUT] should its.NEUT teeth clean and the boy too

‘The girl should brush her teeth and the boy should brush his teeth, too.’

‘The girl should brush her teeth and the boy should brush her teeth, too.’



- b. #Das Mädchen soll ihre Zähne putzen und der Junge auch.  
 the.NEUT girl[NEUT] should her.FEM teeth clean and the boy too  
 \*‘The girl should brush her teeth and the boy should brush his teeth, too.’  
 ‘The.NEUT girl[NEUT] should brush her teeth and the boy should brush her teeth, too.’
- c. Das Mädchen soll ihre Zähne putzen und die Mutter auch.  
 the girl should her.FEM teeth clean and the mother too  
 ‘The.NEUT girl[NEUT]<sub>i</sub> should brush her teeth and the mother<sub>j</sub> should brush her<sub>i/j</sub> teeth, too.’

**Explanation of the Generalization** To describe the variation in agreement on bound pronouns that both Greek and German exhibit, I assume that two different logical forms underly the two different agreement patterns. I assume that a bound interpretation can arise from two kinds of representations: one that involves structure-sharing and a second one that involves two independent NPs. The structure sharing representation is shown in (40):

- (40) the — should its {~~—~~} teeth clean  
 Mädchen.[NEUT]

Since here the same noun—*Mädchen* in (40)—occupies both the NP position in the bound pronoun and in the antecedent, both DPs must exhibit the grammatical gender of this noun, i.e. NEUT in (40).

The second class of representations possessing the bound interpretation do not involve structure sharing, but two independent occurrences of an NP as is illustrated in (41). The two NPs can be identical as in (41-a), but need not be. In particular, it is possible that an interpretable feminine feature FEM occupies the noun position as in (41-b).

- (41) a. the Mädchen.[NEUT] should its {Mädchen.[NEUT]} teeth clean  
 b. the Mädchen.[NEUT] should her{FEM} teeth clean

Both representations in (41) receive the same interpretation as (40): The subject introduces the individual concept of a girl into the memory set as a maximal girl concept. This girl concept will be the most salient concept for both *the girl* and *the FEM* to refer to.<sup>13</sup>

In interaction with ellipsis, however, the representations in (40) and (41) behave differently. The structure sharing representation in (40) as antecedent licenses another representation with structure sharing and therefore a true sloppy reading. For exam-

<sup>13</sup>In example (i), there is an intervening second female referent, even one with grammatical gender [FEM]. A feminine pronoun in the scope of both is ambiguous between the two referents and could also refer to discourse salient individual that is feminine either by natural or grammatical gender.

- (i) Ein Mädchen hat einer Frau erzählt, dass sie sie mag.  
 a.NEUT girl.[NEUT] has a.FEM woman.[FEM] told that she her likes

I assume that the pronoun *sie* can contain in addition to the interpretable FEM feature addition lexical material that uniquely identifies the girl in (i).

ple, ellipsis of the IP in (42) is licensed with (40) as antecedent because replacement of the noun *Junge* with the focus alternative *Mädchen* yields a representation with the interpretation as (40). It is irrelevant that the elided pronoun bears a different grammatical gender since this feature does not affect interpretation, which is the only thing ellipsis licensing is sensitive to.

- (42) the — ~~should his [ ] teeth clean~~  
└──────────┘  
Junge<sub>F.</sub>[MASC]

The representations in (41), however, can only license pseudo-sloppy readings. Specifically, (41-b) predicts a pseudo-sloppy reading when the subject of the elided IP has feminine natural gender while (41-a) predicts a pseudo-sloppy reading for a subset of the same cases. For example, IP-ellipsis in (43-a) is licensed because the focus alternative derived by replacing *Frau* with *Mädchen* is (41-b). And because the woman the subject refers to is the most salient referent with feminine gender when the elided pronoun *her*, a sloppy interpretation arises. IP-ellipsis is also licensed by representation (43-b), but in this case a sloppy reading does not arise because the subject is masculine and therefore the elided pronoun cannot refer to it.

- (43) a. the Frau<sub>F.</sub>[FEM] ~~should her[FEM] teeth clean~~  
 b. the Junge<sub>F.</sub>[MASC] ~~should her[FEM] teeth clean~~

**Further Predictions** The approach predicts that for the availability of the pseudo-sloppy interpretation the grammatical gender of the subject of the elided IP is irrelevant, as long as the natural gender is FEM. This is confirmed by the availability of sloppy interpretation in both (44-a) and (44-b), where the grammatical gender of the subject of the elided IP is respectively MASC and NEUT.

- (44) a. Das Mädchen hat ihre Zähne geputzt und der weibliche  
 the.NEUT girl.[NEUT] has her.FEM teeth cleaned and the.MASC female  
 Star auch. (strict/sloppy)  
 star.[MASC] also
- b. Das kleine Mädchen hat ihre Eltern angerufen und das  
 the.NEUT little girl.[NEUT] has her.FEM parents called and the.NEUT  
 weibliche Opfer auch (strict/sloppy)  
 female victim.[NEUT] too

A second, theoretical prediction arises from the interaction of the material presented in the first section concerning non-local ellipsis and in the present one. We derive that the mechanism yielding pseudo-sloppy readings discussed above must be further restricted.

Recall from (4) that a sloppy interpretation is not available in example (45) and other examples like it.

- (45) #Nearly every boy said Mary hit him. But the adult witness didn't say she did.

We can conclude, therefore, that representation (46) cannot be available from (45) since otherwise a pseudo-sloppy interpretation would be possible for (45).

- (46) Nearly every boy said Mary hit him ~~{the male}~~. But the adult witness didn't say she did ~~hit the male~~.

I propose that the contrast between (45) and examples with a gender mismatch and use of the natural gender is that in the later case only a representation with a interpreted gender feature in place of the noun is forced. In (46), replacement of MALE with the noun *boy* in the first conjunct yields the same grammatical interpretation and overt form. I assume that the general principle in (47) for the resolution of DP-ellipsis in pronouns:

- (47) The elided material must be as restrictive as possible for a given interpretation, but consistent with the gender marking on the pronoun.

## 5 Conclusion

The argument in this paper is based on data from the availability of sloppy interpretations with VP-ellipsis in English. In particular, it explained the contrast in (48): (48-a) allows a sloppy interpretation, while (48-b) does not.

- (48) a. Nearly every boy said Mary hit him. But Bill didn't say she did. (Hardt, 2006, (3))  
 b. Nearly every boy said Mary hit him. But the adult witness didn't say she did.

The generalization underlying contrast (48) was shown to hinge on the question whether the subject of the second conjunct was an element of the domain of quantification in the first conjunct: *Bill* in (48-a) must be understood to refer to one of the boys quantified over in the first conjunct for the sloppy interpretation to be possible, but *the adult witness* in (48-b) cannot refer to a boy.

The generalization does not as far as I can see follows on position based accounts of binding. It follows however on the flat binding account of Sauerland (2007b). On this account, all pronouns are analyzed as covert definite descriptions. In particular, the first conjunct in (48) would be analyzed as *Nearly every boy said Mary hit him~~{the boy}~~*. The difference between (48-a) and (48-b) then derives from the fact that, if we insert in the second conjunct in (48-a) a VP exactly identical to VP in the first conjunct, an apparently bound reading results: *him* in *Bill didn't say Mary hit him~~{the boy}~~* can be interpreted as Bill if Bill is a boy. Since this mechanism does not derive true sloppy readings, I call the sloppy readings of example like (48-a) pseudo-sloppy. I furthermore showed that the mechanism deriving true sloppy readings within the flat binding analysis does not predict a sloppy reading for either example in (48). Therefore the contrast is accounted for completely. Since I do not know of a similar account on other analyses of binding than the flat binding analysis, the result supports the flat binding analysis.

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# Resolving scope in manner modification

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## 1 Introduction

Standard semantic analyses of manner modification usually a) use event variables in their representation and b) use a conjunctive format, cf. the sentence and its formal representation in (1).<sup>1</sup>

- (1) Sarah runs fast.  
 $\exists e[\text{AGENT}(\text{sarah}, e) \ \& \ \text{RUN}(e) \ \& \ \text{FAST}(e)]$

If more than one manner modifier is present, this is straightforwardly dealt with through the addition of another conjunct, cf. (2).

- (2) Sarah loudly answered stupidly.  
 $\exists e[\text{AGENT}(\text{sarah}, e) \ \& \ \text{ANSWER}(e) \ \& \ \text{LOUD}(e) \ \& \ \text{STUPID}(e)]$

The representation in (2) accounts for the entailments in (3), which can be derived from the semantic representation through conjunction reduction.

- (3) Sarah loudly answered stupidly.  
a. Sarah answered stupidly.  
b. Sarah loudly answered.  
c. Sarah answered.

In addition, the conjunctive format of the representation leads one to suspect that the conjunction of the two modifiers in the surface sentence would lead to the same interpretation, which is indeed the case, cf. (4).

- (4) Sarah answered loudly and stupidly ( $\approx$  (3))

However, this account runs into problems when it is used for sentences like the ones in (5).

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<sup>1</sup>I use the Neo-Davidsonian notation (cf. Parsons (1990)). For the problem addressed in this paper, this is of no relevance, and a notation following Davidson's original proposal (cf. Davidson (1967)), e.g.  $\exists e[\text{RUN}(e, s) \ \& \ \text{FAST}(e)]$ , could just as well be used.

- (5) a. John painstakingly wrote illegibly.  
 b. Malika carefully spoke softly.  
 Cf. for [a] Parsons (1972), for [b] Piñón (2007)

(5-a) must be interpreted so that the illegibility of the writing is part of what John took pains to do (cf. Parsons (1972)). Similarly, for (5-b), the speaking softly was what Malika was doing carefully. Neither (5-a) nor (5-b) display the entailment pattern predicted by the standard account, cf. (6), nor are they equivalent to sentences where the two modifiers are conjoined, cf. (7).

- (6) a. John painstakingly wrote illegibly.  $\nrightarrow$  John wrote painstakingly.  
 b. Malika carefully spoke softly.  $\nrightarrow$  Malika spoke carefully.  
 (7) a. John wrote painstakingly and illegibly. ( $\neq$  (5-a))  
 b. Malika spoke carefully and softly. ( $\neq$  (5-b))

Note that the scope-taking adverbials do not serve as sentence adverbials. A typical example for the use of *carefully* as a sentence or clausal adverbial is given in (8), the difference between clausal usages and the readings under discussion here will be discussed in more detail in section 3.

- (8) Carefully, Malika turned off the gas before lighting her cigarette.

In this paper, I will investigate a) what kind of adverbials give rise to these scopal manner readings and b) how sentences showing these two readings can be formally represented.

I argue that the scope-taking manner adverbials belong to a different subtype of manner modification than the adverbials in their scope. In the formal analysis, only the scope-taking adverbials are analyzed as predicates of events, and the adverbials in the lower position lead to predications over manners.

The paper is organized as follows: section 2 presents data from German involving scope-taking manner adverbials. Section 3 takes a look at the semantics and syntax involved, section 4 presents previous approaches, and section 5 gives my formal analysis. In section 6, this analysis is set into a broader perspective of analyzing adverbial modification with the help of approaches using underspecification, and section 7 gives a short conclusion.

## 2 Data

Data which parallels the *painstakingly*-sentence from Parsons (1972) is rare and does often require contextual support. In addition, the differences between the readings of interest and other possible adverbial readings are often very subtle, requiring native speaker competence. Therefore, I will base my discussion and analysis on German data and only point to English data when appropriate.

To start with, Parsons' original example has a German translation equivalent exhibiting the same properties, cf. (9).<sup>2</sup>

<sup>2</sup>Note that German uses adjectival forms instead of adverbs to express manner modification. This



- (9) Fritz hat sorgfältig unleserlich geschrieben.  
 F. has painstaking illegible written  
 'Fritz painstakingly wrote illegibly.'

As already noticed by Bartsch (1972)<sup>3</sup>, the same scope effect also occurs when the lower adverbial is changed to a more standard manner adverbial like *langsam* 'slowly', cf. (10).

- (10) x schreibt sorgfältig langsam.  
 x writes painstaking slowly  
 'x painstakingly writes slowly'  
 From Bartsch (1976, p. 299)

Again, the interpretation that we want here is the one where the agent takes care to write slowly, the writing itself might not have been particularly careful.

Another example comes from Frey and Pittner (cf. Frey and Pittner (1999) and Frey (2003)), cf. (12).<sup>4</sup>

- (11) Hans hat geschickt die Fragen dumm beantwortet.  
 H. has skilful the questions stupid answered  
 'Hans skilfully answered the questions stupidly.'  
 = (76a) in Frey (2003)

The reading we are interested in is one where the answering stupidly is done in a clever way. Again, we are not interested in the clausal reading, which would lead to an interpretation like *It was skilful of Hans, that he answered the questions stupidly*. A context providing the pragmatics for the reading under discussion is given in (12).

- (12) Even after seven days of solitary confinement did Hans answer the questions so cleverly stupidly, that no one could possibly suspect that he knew the answers by heart. Unfortunately, it turned out that to answer at all was already a stupid mistake.

Other examples from German are given in (13). To get the correct reading, imagine a robbery-context, where the thief aims at not being noticed.

- (13) a. Peter ist geschickt leise die Treppe hochgeschlichen.  
 Peter is skilful quiet the stairs crept\_up  
 'Peter skilfully crept up the stairs quietly.'  
 b. Fritz hat vorsichtig die Tür leise geschlossen.  
 F. has careful the door quiet closed

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leads to the mismatches between the forms in the English glosses and the free translations.

<sup>3</sup>Bartsch's work exists in the original German version, Bartsch (1972), and in a slightly revised English translation, Bartsch (1976). All following references will be made to the English version.

<sup>4</sup>Frey and Pittner point to the the English example given in Cinque (1999, p. 19), reproduced here as (i), as the source for their example.

- (i) John has been cleverly answering their questions cleverly/stupidly.  
 =(88) Cinque (1999, p. 19)

‘Fritz carefully closed the door quietly.’

### 3 The usages of the adverbials

Before embarking on the quest for an adequate formalization of scope-taking manner adverbials, we must ensure that the scope-taking adverbials as well as those in their scope are in fact serving as manner adverbials and do not belong to some other subclass of adverbials.<sup>5</sup> And, even given that both serve as manner adverbials, we will investigate whether or not they belong to different subclasses of manner adverbials. Thus, Parsons (1990, p. 289f., fn 17,22) claims that *painstakingly* in (5-a) is not a manner adverbial but a subject-oriented or sentence adverbial. If this were true, the scopal behavior would be predicted, since it is generally assumed that sentence and subject-oriented adverbials stand for relations to the propositions expressed by their sentential base (cf. e.g. the remark in Parsons (1990, p. 64)).

In the following four sections, we will first establish that in all cases both adverbials serve as manner adverbials. Secondly, we focus on the semantic differences between the scope-taking adverbials and the adverbials in the scope. In the last two sections, we will look at the syntactic positions of the adverbials involved and at the lexical semantics of the items serving as scope-taking adverbials.

#### 3.1 Two instances of manner modification

The term *manner adverbial* is not clearly defined in the literature. Here, we will assume that the availability of the two standard paraphrases suffices for the classification as a manner adverbial.<sup>6</sup> The two standard paraphrases for manner adverbials, the *How-that-is-* and the *In-X-manner-*paraphrase, are exemplified in (14).

- (14) Petra tanzt wunderbar. ( $\approx$  a, b)  
 Petra dances wonderful
- a. Wie Petra tanzt, das ist wunderbar.  
 ‘How Malika dances, that is beautiful.’
  - b. Petra tanzt auf wunderbare Art und Weise.  
 ‘Malika dances in a beautiful manner.’

The scope-taking adverbials in the German sentences all allow both paraphrases, cf. the following examples.

- (15) Fritz hat sorgfältig unleserlich geschrieben. ( $\approx$  a, b)  
 ‘Fritz painstakingly wrote illegibly.’
- a. Fritz hat auf sorgfältige Art und Weise unleserlich geschrieben.  
 ‘Fritz wrote illegible in a careful manner.’

<sup>5</sup>That the scope-taking adverbials in the examples under discussion are manner adverbials is a point made in Bartsch (1972, pp. 270ff), Peterson (1997, p. 241ff), Cinque (1999, p. 19), Schäfer (2005, chapter 6) and Piñón (2007).

<sup>6</sup>For these tests, cf. Bartsch (1972) and the discussion in Schäfer (2005, chapter 3).

- b. Wie Fritz unleserlich geschrieben hat, das war sorgfältig.  
'How Fritz wrote illegible, that was careful.'
- (16) Hans hat geschickt die Frage dumm beantwortet. ( $\approx$  a, b)  
'Hans skilfully answered the question stupidly.'
- a. Hans hat auf geschickte Art und Weise die Frage dumm beantwortet.  
'Hans answered the question in a skilful manner stupidly.'
- b. Wie Hans die Frage dumm beantwortet hat, das war geschickt.  
'The way in which Hans answered the question stupidly was skilful.'
- (17) Peter hat vorsichtig leise die Tür geschlossen. ( $\approx$  a, b)  
'Peter cautiously closed the door quietly.'
- a. Wie Peter die Tür leise geschlossen hat, das war vorsichtig.  
'How Peter closed the door quietly, that was cautious.'
- b. Peter hat die Tür auf vorsichtige Art und Weise leise geschlossen.  
'Peter in a cautious manner quietly closed the door.'

The possibility to add an agentive *by*-phrase to the *How-that-is* paraphrase shows that the scope-taking adverbials all function as agent-oriented manner adverbials (for this terminology, cf. Ernst (2002), who speaks of the manner usage of agent-oriented adverbs, and Schäfer (2005)).

- (15b') Es war sorgfältig von Fritz, wie er unleserlich geschrieben hat.  
'How he wrote illegible, that was careful of Fritz.'
- (16b') Wie er die Frage dumm beantwortet hat, das war geschickt von Hans.  
'How he answered the question stupidly, that was skilful of Hans.'
- (17b') Wie er leise die Tür geschlossen hat, das war vorsichtig von Peter.  
'How he quietly closed the door, that was cautious of Peter.'

In German, the morphology clearly indicates that the adjectives serving as the scope-taking adverbials are not clausal adverbials, since a morphologically marked adverb-form, *ADJ-erweise*, has to be used for the sentential readings, cf. the examples in (18).<sup>7</sup>

- (18) a. Fritz hat sorgfältigerweise unleserlich geschrieben.  
F. has carefully illegible written.  
'Carefully, Fritz wrote illegibly.'
- b. John hat geschickterweise die Frage dumm beantwortet.  
J. has skillfully the question stupid answered

<sup>7</sup>With comma intonation, it seems possible to get the clausal readings even with the adjectival forms, cf. e.g. (i-a), which can get the same interpretation as (i-b).

- (i) a. Peter hat, intelligent, die Fragen erst garnicht beantwortet.  
Peter has, intelligent, the question MOD\_PART not at all answered.  
'Peter, intelligently, didn't even bother to answer the questions.'
- b. Peter hat intelligenterweise die Fragen erst garnicht beantwortet.  
Peter has, intelligent, the question MOD\_PART not at all answered.  
'Peter, intelligently, didn't even bother to answer the questions.'

- ‘Carefully, John answered the question stupidly.’
- c. Anna hat vorsichtigerweise die Tür leise geschlossen.  
 A. has cautiously the door quiet closed  
 ‘Cautiously, Anna quietly closed the door.’

This contrasts with English, where clausal readings are also realized with help of *-ly*-adverbs, as is shown by the free translations in (18). Besides the morphological difference in German, clausal adverbs never allow the standard manner paraphrases. Instead, they can be paraphrased parallel to the pattern in (19), which gives a paraphrase for (18-a).

- (19) Es war sorgfältig (von Fritz), dass er unleserlich geschrieben hat.  
 ‘It was careful (of Fritz), that he wrote illegibly.’

In this context, note that Potts (2005, p. 139ff.) in his examples for *supplementary adverbs* also distinguishes two different manner-adverbial readings. However, as his discussion shows, only one of the two readings corresponds to what we have called manner adverbials here. The other reading corresponds to a sentence-adverbial usage.

The other adverbials in the three sentences, that is, *unleserlich* ‘illegibly’, *dumm* ‘stupidly’ and *leise* ‘softly’, also all allow the standard manner paraphrases, cf. (20) through (22). Note that, due to the presence of the scope-taking adverbial, the *How-that is*-paraphrase cannot be used on the original sentence. To avoid confusion, the two paraphrases are all given for the sentences without the scope-taking adverbial.

- (20) Peter hat unleserlich geschrieben. (≈ a,b)  
 ‘Peter wrote illegibly.’
- a. Wie Peter geschrieben hat, das war unleserlich.  
 ‘The manner in which Peter wrote was illegible.’
- b. Peter hat auf unleserlich Art und Weise geschrieben.  
 ‘Peter wrote in an illegible manner.’
- (21) Hans hat die Frage dumm beantwortet. (≈ a,b)  
 ‘Hans answered the question stupidly.’
- a. Wie Hans die Frage beantwortet hat, das war dumm.  
 ‘How Hans answered the question, that was stupid.’
- b. Hans hat die Frage auf dumme Art und Weise beantwortet.  
 ‘Hans answered the question in a stupid manner.’
- (22) Anna hat die Tür leise geschlossen. (≈ a,b)  
 ‘Anna closed the door quietly.’
- a. Wie Anna die Tür geschlossen hat, das war leise.  
 ‘How Anna closed the door, that was quiet.’
- b. Anna hat die Tür auf leise Art und Weise geschlossen.  
 ‘Anna closed the door in a quiet manner.’

The three adverbials are all slightly different in their relationship to the event referred to by the verbal predicate. The first adverbial, *illegibly*, only indirectly characterizes the manner. As Dik (1975, p. 119) puts it: “What we want to express, rather, is that the man-

ner in which John writes is such that what he writes is illegible.”<sup>8</sup> The second adverbial, *stupidly*, belongs to the class of agent-oriented manner adverbials. These adverbials express that an action is executed in a way one would expect of someone who is ADJ. The third adverbial, *softly*, is a pure manner adverbial, directly specifying the manner in which the action is carried out.

### 3.2 The differences between the two adverbials

Already Bartsch (1976, pp. 296ff) argues that the key to the analysis of the sentences containing scope-taking manner adverbial lies in recognizing that the scope-taking and the adverbial in the scope do not belong to the same class of manner adverbials. Frey and Pittner (1999) and Frey (2003) follow Bartsch in this, classifying the scope-taking adverbial and the adverbial in the scope into different adverbial classes. Paraphrases are used to show the difference in adverbial use. The relevant paraphrase patterns are reproduced in (23).

- (23) Petra kocht sorgfältig. (≈ a,b)  
 ‘Petra is cooking carefully.’
- a. Petra kocht, wobei sie sorgfältig ist.  
 ‘Petra is cooking; in doing this she is careful.’
  - b. Petra kocht, wobei sie sich sorgfältig verhält.  
 ‘Petra is cooking; in doing so she acts carefully.’
  - c. Petra kocht, wobei sie sorgfältig handelt.  
 ‘Petra is cooking; in doing so she acts carefully.’
- Cf. Bartsch (1976, p. 155)

If we use this paraphrase pattern for the sentence under discussion, it is very clear that it is only available for the scope-taking adverbials, never for the other adverbials, cf. as an illustration (24) vs (25).<sup>9</sup>

- (24) a. Hans hat geschickt die Frage dumm beantwortet. (≈ b)  
 Hans has skilful the question stupid answered  
 b. Hans hat die Frage dumm beantwortet, wobei er geschickt war.  
 ‘Hans answered the question stupidly. In doing so, he was skilful.’
- (25) a. Hans hat die Frage dumm beantwortet. (≠ b)  
 Hans has the question stupid answered  
 b. Hans hat die Frage beantwortet, wobei er dumm war.  
 ‘Hans answered the question. In doing so, he was stupid.’

The crucial question is now the following: what exactly does the availability of the paraphrase tell us about the adverbials and, more specifically, how should this difference in paraphraseability be reflected in the formal representation. Both Bartsch and Frey and Pittner share the intuition that the usages that do not allow the *wobei*-paraphrase pre-

<sup>8</sup>This corresponds to the comments made in Bartsch (1972, p. 273) on the same sentence. In Schäfer (2005, p. 158) I classify *illegibly* in this usage as an *implicit resultative*.

<sup>9</sup>It seems that the three paraphrases offered by Bartsch all express slightly different things. This is ignored in the following, and, for simplicity’s sake, only the (a)-paraphrase is used.

dicade of (Bartsch) respective characterize (Frey and Pittner) a process, whereas adverbials allowing the paraphrases do something more. As Frey (2003) puts it in discussing *careful* on a *wobei*-reading, they are used ‘to characterize the subject in relation to the whole action described by the sentence.’ (p. 191) (For Bartsch’s view, cf. the discussion of her formal analysis in the next section). This intuitive account raises some more questions, e.g., which process, and what is the relation of this process to the whole action, and what does it mean to be characterized in relation to the whole action? I propose that we should simply analyze those adverbials that allow the *wobei*-paraphrases as predicates of events, whereas the other adverbials only characterize a specific aspect of an event. What specific aspect? Here, I will assume that we do not have to specify this in any more detail at the level of formal semantics, but simply assume that this aspect is tied to the event argument through some underspecified relation. To flesh out this idea a little bit, look at the following two examples, the first again involving manner modification, the second involving local modifiers.

First, the example involving manner modification. Consider the two pairs of sentences below, (26) and (27).

- (26) a. Peter hat laut das Lied gesungen.  
He has loudly the song sung
- b. Peter hat das Lied laut gesungen.  
Peter has the song loudly sung  
‘Peter loudly sang the song.’
- (27) a. \*Fritz hat forte die Einleitung gesungen.  
Fritz has forte the introduction sung
- b. Fritz hat die Einleitung forte gesungen.  
Fritz has the introduction forte sung  
‘Fritz sang the introduction forte.’

To sing something *forte* is not necessarily to sing something loudly, but at least there are contexts where (26-b) and (27-b) can mean the exact same thing. However, (27-a) is ungrammatical, while (26-a) is OK. A further difference between *laut* and *forte* is that only the former can have a reading where the *wobei*-paraphrase is appropriate, whereas this paraphrase can never be used for *forte*. I suggest the reason for this is that the lexical meaning of *forte* is much more restricted than that of *loudly*: *forte* can only be used to specify a certain aspect of performing music, but it cannot be used to predicate of a music-performance-event. This is different for *laut*, which allows both readings: as already mentioned, it can mean exactly the same as *forte*, but it can also characterize the event globally, on this usage allowing the *wobei*-paraphrase.

This also allows to account for an interesting difference reported in Cresswell (1985, p. 186ff). Cresswell compared the sentence in (28) with those in (29).

- (28) Isolde audibly precedes Jeremy.  
= (4) in Cresswell (1985, p. 186)
- (29) a. Kiri sings audibly.  
b. Kiri dances audibly.  
= (10,11) in Cresswell (1985, p. 188)

According to Cresswell, what is actually audible in (29) must be the singing or dancing itself, whereas in (28) it could be the movements involved in the action of preceding or even some accompanying activity which leads to the audibility. This contrast does not depend on a particularity of the adverb *audibly*, as can be seen when it is exchanged to a garden-variety manner adverb like *loudly*, cf. (30) and (31).

(30) Isolde loudly precedes Jeremy.

- (31) a. Kiri sings loudly.  
b. Kiri dances loudly.

For (30) vs (31), we get exactly the same effects as for the *audibly*-sentence. The reason for this seems to go back to the same observation made with respect to the other manner readings discussed earlier in this section: In (30), the event is globally characterized as loud, and the *wobei*-paraphrase is again available for the corresponding German sentence, cf. (32).

- (32) a. Isolde geht laut Jeremy voran.  
I. walks loud J. ahead  
b. Isolde geht Jeremy voran, wobei sie laut ist.  
'Isolde precedes Jeremy. In doing so, she is loud.'

The *loudly* in the singing/dancing sentences, in contrast, characterizes aspects of the singing/dancing, and a *wobei*-paraphrase is not appropriate.

The second example involves local modifiers. Maienborn (2003) discusses data like (33).

- (33) a. Luise hat auf der Treppe gepfiffen.  
Luise has on the stairs whistled  
'Luise whistled on the stairs.'  
b. Luise hat auf den Fingern gepfiffen.  
Luise has on the fingers whistled  
'Luise whistled with her fingers.'  
= (24) in Maienborn (2003)

On Maienborn's account, the locative modifier in (33-a) locates the event, the locative modifier in (33-b) locates some 'integral constituent' of the event. These two types of locative modifiers seem thus to exhibit the very same basic pattern of global modification vs the characterization of a smaller aspect of the action as exhibited in manner modification.

### 3.3 The syntactic positions of the two adverbials

The scope-taking adverbials must precede the second adverbial in the sentences under discussion. This is true for the English as well as the German data. A different ordering can result in a) a different interpretation of the sentence b) ungrammaticality. An example for the former case is given in Peterson (1997, p.243), cf. (34).

- (34) a. John carefully sliced the meat quietly.

- b. John quietly sliced the meat carefully.  
= 51 in Peterson (1997, p.243)

Only (34-a) can be interpreted as saying that John's carefulness was directed towards the keeping the meat-slicing quiet and leaving open whether or not he was careful in the slicing itself.<sup>10</sup>

For German, Frey and Pittner (1999, pp. 20f) and Frey (2003) argue that the scope-taking adverbials, in their terminology *event-internal adverbials*, need to be minimally c-commanded by the argument they relate to, whereas the adverbials in the scope, in their terminology *process-related adverbials*, minimally c-command the verb or the predicate complex. These two different conditions result not only in a different linear ordering but also in a different ordering relative to the direct object, cf. (35).

- (35) event-internal adverbials > direct object > process-related adverbials  
Cf. Frey and Pittner (1999), their terminology

Although this analysis is not uncontroversial (cf. in particular Eckardt (1998), Eckardt (2003)), I will adopt it in the following.

### 3.4 Lexical semantics

The number of lexical items that can serve as scope taking manner adverbials is quite restricted.<sup>11</sup> For German, we have three different adjectives, *vorsichtig* 'cautious', *geschickt* 'skilful' and *sorgfältig* 'careful', outnumbering the English *ly*-adverbs reported to be able to serve as scope-taking adverbials (*painstakingly*, *carefully*) by one. I think the commonality in the lexical semantics of these items lies in their unclear status with regard to predications over individuals vs predications over events. Thus, we can usually classify adjectives into two groups: (a) adjectives that prototypically predicate of individuals and (b) adjectives that prototypically predicate over events. The question whether a certain adjective is an object- or an event-predicate is by no means trivial, although this issue is seldomly explicitly discussed (exceptions are Geuder (2000, pp. 9f) and Hansson (2007)). If we look at the adjectival bases of the wordforms serving as scope-taking adverbials from this perspective, it appears at the outset that they all are object predicates, or more specifically, object predicates denoting a certain disposition of an individual (cf. Geuder (2000, p. 9), who uses *careful* and *intelligent* as examples for these types of word meaning). Interestingly, Hansson (2007, pp. 123ff) classifies the corresponding German items as event-oriented. Her argumentation is that in many cases, only a concrete and perceivable manifestation of a property licenses ascribing that property to an individual. In other words, we can say *Peter is careful* only because we know that he is acting carefully. And this holds in both ways. If we are told that *Peter is careful*, we expect him to conduct his actions carefully. Other adjectives, e.g. *elegant*, behave differently: *Peter is elegant* is not related to Peter conducting his affairs in an

<sup>10</sup>Note that both (34-a) and (34-b) can be interpreted as expressing exactly the same meaning, which would then correspond to the meaning of (i).

- (i) John sliced the meat quietly and carefully.

<sup>11</sup>This is also noted in Parsons (1990, p.289, fn. 17).



elegant way. Even *intelligent*, although in Hansson (2007) treated on par with *careful*, is different, in that a statement like *Peter is intelligent* is not necessarily connected to Peter conducting his affairs intelligently.<sup>12</sup>

## 4 Previous formal semantic analyses

Here I discuss the analyses proposed in the literature for these kind of sentences.<sup>13</sup> The first discussion of these types of sentences can be found in Parsons (1972). His analysis corresponds to a formal representation along the lines of (36).

- (36) John painstakingly wrote illegibly.  
PAINSTAKINGLY(ILLEGIBLY(WROTE))(john)

He used this example sentence to argue against the conjunctive, event-based format proposed in Davidson (1967). His analysis is one variant of the *predicate modifier theory*, at that time independently proposed by several authors (cf. Clark (1970), Montague (1970), Thomason and Stalnaker (1973), Kamp (1975)). While this approach can easily account for the scopal effects, it does not offer an explanation for why a) the scope effects are so rare b) what the internal semantic difference between the two adverbials concerned is or c) in how far this account would allow a differentiation of the semantics of *painstakingly* vs adverbs of the *intentional* or *allegedly* type.

The example from Parsons (1972) is taken up in Bartsch (1972), who adds another example from German and gives the formal representation in (38).

- (37) x schreibt sorgfältig langsam.  
x carefully writes slowly  
= (d) in Bartsch (1972, p. 273)
- (38) painstaking ( $r'_1$ ).  $r'_1 = (ir')(Q(r_1, r'))$ .  
slowly( $r_1$ ). Acting( $r'$ ).  $r_1 = (ir) (P(x, r). \text{Writing-Process}(r))$

We will not go into all the details of this representation, but instead focus on the points most relevant to the difference between the scope-taking and the second manner adverbial. In (38), *i* stands for a variant of the iota-operator, *r* is a variable for processes, and *r'* a variable for actions. That is, both *sorgfältig* and *langsam* are analyzed as one-place predicates: *sorgfältig* predicates over an action, *slowly* over a process. The relation *Q* expresses that “the process *r* constitutes an aspect of the action *r'*, or is contained in it as one of its components” (p. 301). Importantly, none of the two adverbials is analyzed as a predicate of events, which are used by Bartsch in the analysis of other adverbials. A second point to note is that actions are, in Bartsch’s account, subclasses of processes. The reason for the introduction of this subclass is the availability of the *wobei*-paraphrases for this subclass of adverbials (cf. Bartsch (1976, p. 73)). I will come back to this proposal in the discussion of my own analysis.

Peterson (1997) offers an approach that adapts Davidson’s original treatment in order to handle embedded adverbial modification. He demonstrates this with a formal

<sup>12</sup>In fact, it is often safe to expect to the contrary.

<sup>13</sup>Note that I restrict myself here to only those authors explicitly addressing these kinds of sentences.

analysis of the sentence in (39), cf. (40).

(39) John carefully sliced the meat quietly.

= 51a in Peterson (1997, p. 243)

(40)  $\exists e_3[\text{Careful}(t_1 e_2 [\text{Quiet}$

$(t_1 e_1 [\text{Sliced}(\text{John, the meat, } e_1)], e_2)], e_3)]$

Cf. 58" in Peterson (1997, p. 243) where he uses x,y,z instead of  $e_{1-3}$

On this approach, the two adverbials are treated as one-place predicates of events, which are the referents of the definite descriptions. Both adverbials are analyzed as predicates of different events, where the difference lies in the complexity of the events: *quietly* is analyzed as a predicate of a *John\_slicing\_the\_meat*-event, *carefully* is analyzed as a predicate of a *John\_slicing\_the\_meat\_quietly*-event. This approach, similar to Parsons' proposal, gets the scope facts right, but fails to offer any insight into why not all adverbials lead to these scopal readings. In addition, it is hard to see how the formal representation in (40) could plausibly be derived compositionally.

Note that Peterson's approach leads to the introduction of a number of different events into the semantic representation, which is often scorned at by the philosophically minded semanticist (cf. Bennett (1988, p. 177) and Maienborn (2005)), but is as often taken as a matter of course in syntactic approaches (Cf. e.g. Ernst (2002) or the response on Maienborn (2005) in Ramchand (2005)<sup>14</sup>).

In Schäfer (2005), I propose to adapt the approach as presented in Parsons (1990) to the problem at hand. To deal with the fact that adverbials like *quickly* and *slowly* can simultaneously hold of the same event, cf. the sentence pair in (41), Parsons introduced a contextual parameter specifying the relevant comparison classes, compare the representation (42) for (41-a), where C represents the contextual parameter.

(41) a. Elsi ran quickly. [in comparison to her friends]

b. Elsi ran slowly. [in comparison to professional runners]

(42)  $\exists e[\text{RUNNING}(e) \ \& \ \text{SUBJECT}(\text{Elsi, } e) \ \& \ \text{SLOW}(e, C_{\text{Elsi's friends}})]$

Adjectives of the *carefully*, *cautiously* type typically can be contextually specified in the same way as *quickly*, but in addition, they can be evaluated against scales in different domains, which can often be made explicit by using *for* and *as*-phrases simultaneously, cf. *Peter is careful as a mountaineer for a 44-year-old*. Assuming that these adjectives always come with two instead of one parameter (cf. for the usage of two parameters also the remarks in Bierwisch (1989, p. 236f.)), the *skilfully-stupidly*-sentence can be represented as in (43).

<sup>14</sup>The formal representation adduced by Ramchand (2005) as an illustration in fact bears much resemblance to Peterson's approach, cf. (i).

(i) jones butter the toast quickly with a tiny knife  
 $\lambda e'' \exists e' \exists e [\text{BUTTERING}(e) \ \& \ \text{AGENT}(e, \text{Jones} \ \& \ \text{THEME}(e, \text{the\_toast}) \ \& \ \text{CONSTITUTIVE-EVENT}(e', e) \ \& \ \text{QUICKLY}(e') \ \& \ \text{CONSTITUTIVE-EVENT}(e'', e') \ \& \ \text{WITH\_A\_TINY\_KNIFE}(e'')]$   
 = (16) in Ramchand (2005)

- (43) Hans skilfully answered the question stupidly.  
 $\exists e$  [ANSWER( $e$ ) & SUBJ( $e$ , *Hans*) &  
 SKILFUL( $e$ ,  $C_{adults}^U$ ,  $C_{answering\_the\_question\_stupidly}^S$ ) &  
 STUPID( $e$ ,  $C_{adults}^U$ ,  $C_{answering}^S$ )]  
 Cf. (95) in Schäfer (2005, p. 174)

To cover the scope data, I argued that the parameter  $C^S$  is sensitive to syntactic scope, while the other parameter covers the remaining contextual effects. I believe now that this approach is problematic for several reasons. Firstly, we do not want to map the writing event onto some scale, but the writing\_illegibly event. Secondly, building the two parameters into the lexical entry of the adjective seems to overgenerate. Thirdly, syntactic scope does not always seem to be responsible for the correct interpretation, cf. e.g. an example from the domain of attributive modification, *the skilful French magician*, where *French* is in the scope of *skilful* but does not necessarily have anything to do with the interpretation (cf. Kennedy (2007) and Bierwisch (1989, p. 236f.)). Finally, no explanation is given why these readings are restricted to only a few lexical items or why there would be differences in paraphraseability.

The most recent treatment of these kind of sentences is the one given in Piñón (2007), cf. (44).

- (44) Rebecca painstakingly writes illegibly.  
 $\lambda e$ .agent(rebecca)( $e$ ) & write( $e$ ) & illegible(form(write)( $e$ )) &  
 painstaking(effort ( $\lambda e'$ .write( $e'$ ) & illegible(form(write)( $e'$ ))) ( $e$ ))

Here, manners are treated as concrete particulars which are ontologically dependent on events (Cf. for this the remarks on Dik (1975) in the next section). In addition, there are different types of manners, e.g. form-manners for, in this case, 'the trajectory of motion of the point of the writing event (e.g., a pen) in a writing event', and effort-manners, do deal with the sort of manners *painstakingly* is predicated of. As with Bartsch's account, I will come back to aspects of this analysis in the presentation of my own analysis.

## 5 Analysis

In my analysis, I will propose the following: a) manner adverbials can be interpreted either as predicates of events or as predicates of manners b) whether we have a predicate of manners or of events is syntactically determined c) adverbials analyzed as predicates of events automatically have scope over the manner-predicating adverbials.

### 5.1 Events and manners

While, as mentioned in the introduction, the analysis of manner adverbials as predicates of events is nowadays very much the standard view, a natural alternative is to treat manner adverbials as predicates of manners. The first proponent of this view was Dik (1975, pp. 117ff) (but cf. the analysis by Piñón (2007) mentioned above). He argues that all situations which involve control on part of the agent or a change, that is, which are

dynamic (e.g. processes and activities) do possess an implicit manner in which they are carried out. If a situation fulfills these criteria, manners are introduced with the help of meaning postulates (Dik refers to them as *redundancy rules*).

- (45) Annette dances beautifully.  
 $s_1 \text{ dance(Annette)}_{s_1} \& \text{ beautiful}(M_{s_1})$   
 = 146 in Dik (1975)

For Dik (1975), it is a matter of the lexical semantics of the verb whether a manner variable is available or not. I will here suggest a different pathway: the discussion in section 3 has shown that manner modification can either lead to the global characterization of an event or to the specification of some aspect of the event. This will be formally captured by the assumption that the former is realized through a predication over the event variable, and the latter through a predication over a manner variable. Since the adverbial use depends on the syntactic position of the adverbial, I assume that the availability of a manner variable is guided by syntax and results from the application of templates at specific syntactic positions. In the formal presentation, the manner variables are connected to the event variable by the underspecified relation MANNER. We therefore get the following representation for (45):

- (46)  $\exists e[\text{SUBJECT}(e, a) \& \text{DANCE}(e) \& \exists m[\text{MANNER}(e, m) \& \text{BEAUTIFUL}(m)]]$ <sup>15</sup>

Piñón (2007) gives good further arguments for the assumption of manners as concrete particulars. Firstly, assuming manners as concrete particulars allows a formal analysis that captures the difference between (47-a) and (47-b):

- (47) a. Malika saw Rebecca write illegibly.  
 b. Malika saw how Rebecca wrote.  
 =(5) in Piñón (2007)

In (47-a), an event is perceived, in (47-b), the manners of an event are perceived.

Secondly, once we have manners as concrete particulars, we also have an explanation for why the *in an X manner*-paraphrase can be used.

For the derivation of both readings, I assume that we start out from the lexical entry of the adjective, that is, for *illegible* we assume (48).<sup>16</sup>

- (48)  $\lambda x[\text{ILLEGIBLE}(x)]$

<sup>15</sup>I have already used a similar representation format in Schäfer (2003), but there the whole argumentation is based on far weaker evidence.

<sup>16</sup>This lexical entry is simplified, since all the adjectives discussed are gradable and therefore need to be able to interact with further degree semantics, cf. for one popular implementation Kennedy (2007). In that framework, a degree phrase is used to turn the adjective from a function mapping entities into degrees into a function from entities into truth values and providing the appropriate further semantics, here those of the positive form, so that [DegP [Deg pos] [AP illegible]] is analyzed as (i), where “s” is a context-sensitive function that chooses a standard of comparison in such a way as to ensure that the objects that the positive form is true of ‘stand out’ in the context of utterance, relative to the kind of measurement that the adjective encodes” Kennedy (2007, p. 17) .

(i)  $\lambda x. \text{ILLEGIBLE}(x) \geq \mathbf{s}(\text{SKILFUL})$

These considerations play no role for the problems at hand.

In addition, we need a template to introduce the manner variable and to turn the predicate of type  $\langle e, t \rangle$  into a modifier of type  $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$ , cf. (49).

- (49) Template for manner adverbials:  
 $\lambda Q \lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ Q(m) ]]$

If this template is applied to the lexical entry of the adjective, we get (50).

- (50) Template Manner Adverbial applied to the lexical entry of the adjective:  
 a.  $\lambda Q \lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ Q(m) ]] (\lambda x [ \text{ILLEGIBLE}(x) ])$   
 b.  $\lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ]]$

Finally, assuming for simplicity's sake that we add the rest in one chunk, cf. (51), we get the representation in (52).

- (51) John wrote.  
 $\lambda e [ \text{SUBJECT}(\text{John}, e) \ \& \ \text{WRITE}(e) ]$
- (52) John wrote illegibly.  
 a.  $\lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ]]$   
 $(\lambda e [ \text{SUBJECT}(\text{John}, e) \ \& \ \text{WRITE}(e) ])$   
 b.  $\lambda x [ \text{SUBJECT}(\text{John}, x) \ \& \ \text{WRITE}(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ]]$

## 5.2 Representing the scope-taking manner adverbial

For the other reading, we have assumed that the modifier predicates over the event variable.<sup>17</sup> However, it is obviously not enough to simply analyze the scope-taking manner adverbial as a predicate over the event variable introduced by the verbal predicate, which would lead to the representation in (53).

- (53) John painstakingly wrote illegibly.  
 $\exists e [ \text{SUBJECT}(\text{John}, e) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] \ \& \ \text{PAINSTAKING}(e) ]$

This is not an adequate representation, because it does not indicate that the manner variable is supposed to be tied to the event-predicate WRITE more tightly than to the event-predicate PAINSTAKING, nor does it indicate that *painstakingly* has scope over the second adverbial. Since the impossibility to represent scope in a flat conjunctive format also plays a role for other phenomena, different solutions to handle scope already exist in the literature, typically involving event summation (cf. Eckardt (1998) and Rothstein (2003)). Here, I will adapt the big event-approach by Eckardt (1998), which is used in order to account for the scope facts for sentences with quantified direct objects.

<sup>17</sup>Note that the two supporting arguments for a manner-based representation mentioned in the previous section, that is, the perceivability and the availability of the *In-X-manner*-paraphrase, can also be used to argue for a manner-based analysis of the scope taking adverbials, as in fact is done by Piñón (2007). I opt for the event-predicate analysis, because I believe it accounts better for the availability of the *wobei*-paraphrase and the intuition, discussed in detail in section 3, that somehow the action respectively the event as a whole is characterized by the scope-taking adverbials.

Basically, a big event, represent by the variable  $e^*$ , is a complex event, that is, it consist of smaller event objects. It is introduced into the semantic representation with the help of the big event clause, a template of the form  $\lambda P \lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \& P(e)]$ . This clause is added before VP, where  $e$  is existentially bound.<sup>18</sup> Everything else is quite straightforward: to turn the lexical entry of the adjectives into a modifier, we need a simple modification template, cf. (54).

- (54) Modification template MOD:  
 $\lambda Q \lambda P \lambda x [P(x) \& Q(x)]$   
 Cf. for similar operators Maienborn (2001), Dölling (2003)

Using again only a simplified lexical entry for the adjectives themselves, e.g. (55) for *painstakingly*, the derivation is given below.

- (55)  $\lambda x [\text{PAINSTAKING}(x)]$
- (56) Modification template applied to the lexical entry of the adjective:  
 a.  $\lambda Q \lambda P \lambda x [P(x) \& Q(x)]$   
 b.  $\lambda P \lambda x [P(x) \& \text{PAINSTAKING}(x)]$
- (57) Big event template applied at V'  
 a.  $\lambda P \lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \& P(e)] (\lambda e [\text{WRITE}(e)])$   
 b.  $\lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \& \text{WRITE}(e)]$
- (58) [VP painstakingly [VP ... ]  
 a.  $\lambda P \lambda x [P(x) \& \text{PAINSTAKING}(x)] (\lambda e^* \exists e [\text{PART\_OF}(e, e^*) \& \text{WRITE}(e)])$   
 b.  $\lambda x [\exists e [\text{PART\_OF}(e, x) \& \text{WRITE}(e)] \& \text{PAINSTAKING}(x)]$
- (59) John painstakingly wrote.  
 $\lambda x [\text{SUBJECT}(\text{John}, x) \& \exists e [\text{PART\_OF}(e, x) \& \text{WRITE}(e)] \& \text{PAINSTAKING}(x)]$

Note that for both adverbial usages, we need at one point in the derivation to turn an individual predicate into a modifier. This is very clear in the case of the event-related usage, where the sole purpose of the modification template is to achieve this. For the manner modification template, this fact is a bit obscured because the template (49) combines a) the change from predicate to modifier and b) the introduction of a manner variable. For more transparency, we can split the template given in (49) into the modification template, corresponding to the one introduced in (54), and into a template for the manner variable, as in (60).

- (60) Template manner variable MA:  
 $\lambda P \lambda x \exists m [\text{MANNER}(m, x) \& P(m)]$

We will simply assume that the modification-template is applied per default whenever items of type  $\langle e, t \rangle$  are used adverbially.

<sup>18</sup>Note that Eckardt assumes that the subjects are generated inside VP, while I do not. A consequence of this is that in my account, the subject is related to the big event, and the object to the small event. I do not think that this creates a major problem.

### 5.3 Deriving the starter example

Deriving appropriate formal representations for the sentences under discussion is now straightforward and is demonstrated below for Parson's *John painstakingly wrote illegibly*-sentence, cf. e.g. (61) through (63) for everything but the subject.

- (61) ((MOD(MA(illegibly))) (write)) (Cf. (50) for MOD(MA(illegibly))):
- $\lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ] ] (\lambda x [\text{WRITE}(x)])$
  - $\lambda x [\text{WRITE}(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ] ]$
- (62) Addition of the big event clause and existential quantification:
- $\lambda P \lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \ \& \ P(e)]$   
 $(\lambda x [\text{WRITE}(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ] ])$
  - $\lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ]$
  - $\lambda e^* \exists e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ]$
- (63) MOD(painstaking) applied to the result of the last step:
- $\lambda P \lambda x [P(x) \ \& \ \text{PAINSTAKING}(x)]$   
 $\lambda e^* \exists e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ]$
  - $\lambda x [\exists e [\text{PART\_OF}(e, x) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ] \ \& \ \text{PAINSTAKING}(x)]$

The subject can now be introduced with the help of some standard template, cf. (64) and its application in (65).

- (64) Template SUBJ  
 $\lambda P \lambda y \lambda x [\text{SUBJECT}(y, x) \ \& \ P(x)]$
- (65) Template SUBJ applied to the result of the derivation in (64)
- $\lambda P \lambda y \lambda x [\text{SUBJECT}(y, x) \ \& \ P(x)]$   
 $(\lambda x [\exists e [\text{PART\_OF}(e, x) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ] \ \& \ \text{PAINSTAKING}(x)])$
  - $\lambda y \lambda x [\text{SUBJECT}(y, x) \ \& \ \exists e [\text{PART\_OF}(e, x) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ] \ \& \ \text{PAINSTAKING}(x)]$

This leads to the final representation in (66).

- (66)  $\exists e^* [\text{SUBJECT}(\text{John}, e^*) \ \& \ \exists e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ] \ \& \ \text{PAINSTAKING}(e^*)]$

This representation captures the scope facts and gives a natural explanation for the possibility of *wobei*-paraphrases for the scope-taking adverbials.

## 6 Underspecification and the syntax-semantics interface

The manner modification template as given in (49) is modeled after templates that have been used elsewhere in the formal analysis of adverbial modification, namely the template MOD\* in Maienborn (2003) and the template MET' in Dölling (2003).

The data that lead Maienborn (2003) to introduce her template MOD\* appeared already in section 3 and is repeated as (67) for convenience.

- (67) a. Luise hat auf der Treppe gepfiffen.  
 Luise has on the stairs whistled  
 'Luise whistled on the stairs.'  
 b. Luise hat auf den Fingern gepfiffen.  
 Luise has on the fingers whistled  
 'Luise whistled with her fingers.'  
 = (24) in Maienborn (2003)

As mentioned earlier, Maienborn takes (67-a) to locate the event, whereas she assumes that the locative modifier in (67-b) locates some 'integral constituent' of the event.<sup>19</sup> To formally capture the two different readings, Maienborn (2003) introduces the template MOD\*, cf. (68).

- (68) MOD\*:  $\lambda Q\lambda P\lambda x[P(x) \ \& \ R(x, v) \ \& \ Q(v)]$

This is structurally very similar to the template for manner adverbials given above, cf. the repeated (49) in (69).

- (69)  $\lambda Q\lambda P\lambda x[ P(x) \ \& \ \exists m[ \text{MANNER}(m, x) \ \& \ P(m) ]]$

Instead of the relation MANNER, Maienborn uses the relational parameter R, and she does not existentially bind the variable v. Just as we assume here that the two different uses of manner modifiers are tied to different syntactic positions, Maienborn shows that the different readings of local modifiers are also linked to different syntactic environments, cf. (70).

- (70) a. Luise hat <sub>[VP [PP auf der Treppe] [VP [V gepfiffen]]]</sub>  
 b. Luise hat <sub>[VP [V [PP auf den Fingern] [V gepfiffen]]]</sub>  
 = (24') in Maienborn (2003)

Given this, Maienborn postulates the following condition on the realization of the free relational parameter R, cf. (71).

- (71) Condition on the application of MOD\*: If MOD\* is applied in a structural environment of categorial type X, then R = PART-OF, otherwise (i.e. in an XP-environment) R is the identity function.  
 = (30b) Maienborn (2003)

If we assume the semantic forms in (72) and (73) for the two PPs, and the semantic form in (74) for the verb, then we can derive the representations for the two different

<sup>19</sup>In Maienborn's terminology, the former serves as an event-external modifier, the latter as an event-internal modifier.



VPs, cf. (75) and (76), respectively.

- (72) [PP auf der Treppe]:  $\lambda x[\text{LOC}(x, \text{ON}(t) \ \& \ \text{STAIRCASE}(t))]$   
 (73) [PP auf den Fingern]:  $\lambda x[\text{LOC}(x, \text{ON}(f) \ \& \ \text{FINGERS}(f))]$   
 (74) [V gepfiffen]:  $\lambda e[\text{WHISTLE}(e)]$   
 (75) [VP [PP auf der Treppe] [VP [V gepfiffen]]]  
 a.  $\lambda x[\text{WHISTLE}(x) \ \& \ R(x, v) \ \& \ \text{LOC}(v, \text{ON}(t) \ \& \ \text{STAIRCASE}(t))]$   
 b.  $\lambda x[\text{WHISTLE}(x) \ \& \ = (x, v) \ \& \ \text{LOC}(v, \text{ON}(t) \ \& \ \text{STAIRCASE}(t))]$   
 c.  $\lambda x[\text{WHISTLE}(x) \ \& \ \text{LOC}(x, \text{ON}(t) \ \& \ \text{STAIRCASE}(t))]$   
 (76) [VP [PP auf den Fingern] [V gepfiffen]]  
 a.  $\lambda x[\text{WHISTLE}(x) \ \& \ R(x, v) \ \& \ \text{LOC}(v, \text{ON}(f) \ \& \ \text{FINGERS}(f))]$   
 b.  $\lambda x[\text{WHISTLE}(x) \ \& \ \text{PART\_OF}(x, v) \ \& \ \text{LOC}(v, \text{ON}(f) \ \& \ \text{FINGERS}(f))]$

For (75), the effect of using the operator MOD\* instead of the operator MOD introduced earlier is, due to the syntactic position of the adverbial, non-existent, i.e., the resulting representation is the same. In (76), however, the parameter R introduced by MOD\* is specified as PART\_OF. The exact nature of the free variable *v* and its relationship to the event variable will then be specified with the help of pragmatics.

Dölling (2003) also uses templates in his account of adverbial modification. He separates the templates into templates introducing the free parameters, labeled MET, cf. (77), and the general modification template MOD, discussed above.

- (77) Operator MET':  $\lambda P \lambda x. Q y [R(y, x) \ C \ P(y)]$   
 Cf. (13) in Dölling (2003)

Dölling uses R as a parameter for relations between elements of ontological sorts, and Q and C are paired parameters, which can be realized by either  $\exists \&$  or  $\forall \rightarrow$ .

By setting the paired parameters Q and C to  $\exists$  and  $\&$ , it can be seen that this operator is the underspecified model for the manner template, cf. (78).

- (78) a.  $\lambda P \lambda x. \exists y [R(y, x) \ \& \ P(y)]$   
 [Partially filled Template Met']  
 b.  $\lambda P \lambda x \exists m [ \text{MANNER}(m, x) \ \& \ P(m) ]$  [Template manner variable]

This kind of underspecified template can also be used as the basis for the template proposed by Maienborn.

In addition, we can adopt Maienborn's proposal to make the specific instantiation of the R relation sensitive to the syntactic environment in which the template appears.<sup>20</sup> This does not need much further work (at least for German), as the two different syntactic positions that Maienborn distinguishes correspond to the syntactic positions identified for the two usages under discussion by Frey and Pittner (cf. above). Thus we have e.g. (79-a), with the syntactic structure in (79-b).

- (79) weil Fritz sorgfältig unleserlich schreibt.

<sup>20</sup>This step is already suggested in Shaer (2003, p. 233)

(80) weil Fritz [<sub>VP</sub> sorgfältig [<sub>VP</sub> [<sub>V</sub> unleserlich [<sub>V</sub> schreibt]]]]

Adopting the condition proposed by Maienborn for MOD\*, cf. (71), for the template MA, we automatically derive the correct representation.

## 7 Conclusion

The analysis for scope-taking manner adverbials proposed here assumes that manner modification can be realized either through event-predicates or through manner-predicates. In particular, whenever a manner adverbial has scope over another manner adverbial, the higher adverbial is analyzed as a predicate of events, and the lower adverbial as a predicate of manners. The formal representation for sentences containing scope-taking adverbials can be automatically derived if we assume, following Maienborn (2003), that the specification of the semantic templates which are used is sensitive to the syntactic environment in which the template appears. In addition, the template used can be seen as one instance of an underspecified scheme for templates in the style of Dölling (2003).

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# Relevance Conditionals as Utterance Modifying Adverbials

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## 1 Introduction

Relevance conditionals (RCs) such as (1) have puzzled semanticists for decades. In contrast to the case of a regular conditional like (2), the *if*-clause in a relevance conditional does not state a condition under which the consequent is claimed to hold. Instead, the consequent seems to be put forward absolutely, and the *if*-clause appears to express a situation under which it may be relevant.

- (1) If you're hungry, there's pizza in the fridge.
- (2) If you're hungry, then I will get you a pizza.

The goal of this paper is to explain the syntactic and semantic properties of relevance conditionals (RCs) in the light of existing analyses of sentence adverbials. Adverbs like *unfortunately*, *bizarrely*, or *frankly* are sentence adjuncts that are used to make comments on the main assertion of the utterance.

- (3) Unfortunately, John lost the game.
- (4) Frankly, you're not the best Poker player.

I demonstrate that RCs share two core properties with a subclass of these adverbs: First, that they may not be semantically embedded, and second, that they are not integrated into the verb-second (V2) clause in German: the anteposed RC does not count for V2. I argue that relevance conditionals can be analysed as conventional implicature items, as has been shown before for evaluative and utterance modifying adverbs. I show that the fact that RCs and utterance modifying adverbs share the two core properties of semantic unembeddability and failure to count for V2 in the syntax follows from their common analysis as conventional implicature items.

The paper is structured as follows: Section 2 demonstrates semantic unembeddability of RCs and evaluative and utterance modifying adverbs. Section 3 shows that in German for RCs and sentence adverbials modifying the utterance relation are preposed to a complete V2-clause. In section 4 I propose a common analysis of relevance conditionals and utterance modifying adverbs as conventional implicature items. Some previous analyses of relevance conditionals are discussed in section 5. Finally, section 6 concludes.

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## 2 Semantic Unembeddability

In this section, I show that, just as has been previously demonstrated for evaluative adverbs (Bonami and Godard, 2005) and utterance modifying adverbs (Potts, 2005, section 4.7), relevance conditionals are unembeddable under semantic operators.

### 2.1 Unembeddability of Sentence Adverbials

Potts (2005) has given an analysis of the semantics of a range of adverbials such as *unfortunately*, *thoughtfully*, and *frankly* as part of his research on conventional implicature (CI). He shows that these adverbs are conventional implicature items, and as such unembeddable under semantic operators.

#### 2.1.1 Conventional Implicature

The class of meanings called Conventional Implicatures (CIs) originates in Grice (1975). He briefly discussed the sentence (5), and noted that it commits the speaker to the claim that being brave follows from being an Englishman.

- (5) He is an Englishman: He is, therefore, brave. (Grice, 1975, p. 44)

Although Grice does not elaborate the properties of this class of meanings, he notes that they are separate from ordinary assertions (“what is said”), as well as from conversational implicatures. A precise definition of CIs was developed by Potts (2005). Potts identifies the following distinctive properties for CIs: (i) CIs are meanings conventionally associated with words or phrases; (ii) CIs are commitments made by the speaker of the utterance; (iii) they are logically independent of the assertions. CIs can thus be usually thought of as side comments by the speaker on the main assertion of the utterance.

Potts (2005) then introduces a logic for conventional implicature items, according to which an utterance can trigger any number of independent entailments as CIs. Potts’ logic guarantees that CIs cannot be embedded under any other operators, since it doesn’t allow for operators that take CI-type meanings as their arguments. Conversely, conventional implicature items regularly take assertion-type meanings as their arguments.

Conventional implicature items can be either words, such as *unfortunately* (6), or certain constructions like nominal appositives (7).

- (6) Unfortunately, John lost the election.  
 Assertion: John lost the election  
 CI: Unfortunate (John lost the election)
- (7) Ames, the former spy, is now behind bars. (Potts, 2005, (2.13c))  
 Assertion: Ames is now behind bars  
 CI: Ames is a former spy

The utterance in (6) introduces two independent entailments. First, the assertion that John lost the election. And second, the conventional implicature that the speaker considers this fact unfortunate.

In (7), the nominal appositive *the former spy* is a CI-type meaning, which is ignored in the computation of the assertion. The assertion is therefore just that Ames is now behind bars. That he is a former spy is a side comment contributed by the speaker as a conventional implicature. No individual lexical item in the construction causes the meaning to be a conventional implicature. Instead, this is due to the construction of nominal appositives, and Potts uses a special COMMA operator (Potts, 2005, p. 98) to lift regular meanings (such as the meaning of the NP *the former spy*) into CI-type meanings (such as the nominal appositive in (7)). Since CI-type meanings can never be the argument of a function in Potts' logic, he achieves a "widest scope"-effect for CIs, predicting that they can never be semantically embedded under another operator.

### 2.1.2 Semantic Unembeddability of Utterance Modifying Adverbs

Semantic unembeddability is maybe the most striking property of conventional implicatures. Therefore, it has become the basis of a range of tests for CI-hood developed by Bonami and Godard (2005) for evaluative adverbs in French. They show that adverbs like *malheureusement* ('unfortunately') cannot be embedded in the antecedent of a conditional, in questions, under negation, and in the consequent of a counterfactual; and that they cannot be openly denied. Another type of adverbs for which semantic unembeddability has been shown are utterance modifying adverbs (Potts, 2005, p. 145ff). Since it is this class of adverbs which will become important in my analysis of relevance conditionals, I apply Bonami and Godard's embeddability tests to these adverbs in this section.

**Antecedent of Conditionals** Utterance modifying adverbs may not be embedded in the antecedent of a conditional.

- (8) # Si les otages sont, malheureusement, libérés, la France aura dû  
 If the hostages are unfortunately freed, the France will have had to  
 accepter des tractations avec les terroristes.  
 accepted the dealings with the terrorists.  
 'If the hostages are, unfortunately, freed, France will have had to accept trans-  
 actions with the terrorists.' (Bonami and Godard, 2005, ex.  
 (16b))
- (9) # If John is, frankly, an idiot, then I'm just being honest.

According to Bonami and Godard, (8) is not natural, because it would imply that liberating hostages is unfortunate. The sentence cannot have a reading that "If it is unfortunate that the hostages are freed, then France will have had to accept transactions with the terrorists", because the adverb doesn't embed under the *if*-clause. Similarly, sentence (9) cannot have the sensible reading "If I'm frankly saying that John is an idiot, then I'm just being honest", where *frankly* is embedded within the *if*-clause.

**Questions** In a question, evaluative adverbs are interpreted outside of the interrogative operator:

- (10) Qui est, bizarrement, arrivé à l'heure?  
Who is, strangely, arrived on time?  
'Who has, strangely, arrived on time?' (Bonami and Godard, 2005, ex. (11a))
- (11) Honestly, has Ed fled? (Potts, 2005, ex. (4.152b))

The authors claim that this question can only be interpreted as "Who was on time? And if there was someone who was on time, it's strange that that person was on time."

Utterance modifiers have an addressee-oriented meaning in questions, as demonstrated by Potts' example (11). Potts concludes that utterance modifying adverbs are ambiguous between a declarative and a question meaning. However, both of these readings are semantically unembeddable (since they are CIs).

**Negation** If a sentence contains negation as well as an evaluative adverb, only one word order is possible in French, leading to only one scopal reading.

- (12) \* Paul n'est pas malheureusement / bizarrement venu.  
Paul CI is not unfortunately / strangely come.  
'Paul didn't unfortunately / strangely come.' (Bonami and Godard, 2005, ex. (22a))

Bonami and Godard observe that sentence (12) is impossible because it would commit the speaker to two contradictory propositions: that Paul didn't come, and that it is unfortunate / strange that Paul came.

For utterance modifying adverbs, it is clear that a sentence with negation allows only the scope adverb >> not.

- (13) John frankly isn't the best poker player.

**Consequent of Counterfactuals** Evaluative adverbs are also semantically unembeddable in the consequent of a counterfactual:

- (14) ?? Si Paul avait été là, il aurait bizarrement été gagnant.  
If Paul had been there, he would strangely have won.  
'If Paul had been there, he would have strangely won.'
- (15) If Paul had been there, he would have, honestly, won.

The same is true for utterance modifiers. (15) cannot mean that Paul would have won in an honest way, had he been there. The speaker may well be expressing that Paul would have won under any circumstances (maybe because he is such a good cheater).

**Denial** CIs like *unfortunately* or the utterance modifier *man to man* cannot be overtly contradicted in the same way as assertions:

- (16) A: Paul a malheureusement perdu l'élection.  
Paul has unfortunately lost the election.  
'Paul unfortunately lost the election.'
- B: # C'est faux, je trouve que c'est une très bonne nouvelle!  
That's false, I find that this is a very good news!  
'That's false, I think those are very good news!'



- (17) A: Democrat to democrat, I really thought that recent speech wasn't so good.  
 B: # That's false, I'm an independent!

**Attitude Verbs** Bonami and Godard (2005, section 3.2) also discuss embedding of evaluative adverbs under attitude verbs. According to Potts' 2005 logic, CI items are generally unembeddable, including embedding under attitude verbs. This is what he finds for the CIs he studies, for example for expressive items like *damn* (Potts, 2005, p. 17). Potts notes that expressives that are syntactically embedded under attitude verbs nevertheless are understood as opinions of the matrix speaker. For example, in the following utterance, it is not implied that the clothes dryer company has a negative attitude towards its products:

- (18) We bought a new electric clothes dryer. [...] Nowhere did it say that the damn thing didn't come with an electric plug! (Potts, 2005, ex. (2.19))

However, Bonami and Godard (2005, ex. (26)) find that the French adverbs are in fact embeddable under certain attitude verbs, most notably saying verbs like *expliquer* ('explain'):

- (19) Marie expliquait que le prêtre, bizarrement, avait perdu la foi.  
 Marie explained that the priest, strangely, had lost the faith.  
 'Marie said that, strangely, the priest has lost his faith.'

Bonami and Godard (2005) claim that in (19), the speaker does not have to share the judgment that the priest's losing his faith is strange. It could be entirely Marie's opinion. This seems to suggest that at least two different kinds of CI items exist, of which one can embed under certain attitudes, and the other one cannot.

## 2.2 Unembeddability of Relevance Conditionals

For RCs, unembeddability under certain semantic operators has been noted in some of the previous literature (e.g., see Iatridou 1991 for denial and Bhatt and Pancheva 2006 for embedding under *believe*). However, this unembeddability has not been systematically documented yet. In the following, I show that RCs, unlike regular conditionals, categorically resist semantic embedding, with the exception of a few attitude verbs like *say*. Thus, they pattern exactly like the adverbs I discussed in the previous section.

**Antecedent of Conditionals** Embedding an RC syntactically in the antecedent of another conditional (20) also yields interesting results. The semantic embedding of the RC is impossible. Consider:

- (20) # If there's pizza in the fridge if you're hungry later, you should eat it.

In English, it is impossible to distinguish regular and relevance conditionals by their syntactic form.<sup>1</sup> Consequently, a given RC usually has a regular conditional reading. This reading is often very odd – most often only a 'magic' interpretation remains. For example, consider the RC embedded in (20):

<sup>1</sup>In other languages, this is not necessarily the case: For example in German, RCs and regular conditionals are always unambiguously distinguished by their word order.

(21) If you're hungry, there's pizza in the fridge.

This sentence has a marginal reading according to which pizza will magically appear in the fridge if (and possibly only if) you're hungry. This is the regular conditional or 'magic' reading.

We can observe now that true embedding of the RC within another *if*-clause is impossible: the only possible interpretation of (20) is the one where the RC is interpreted in its 'magic' reading, that is as a regular conditional. The unembeddability of RCs makes the RC under another operator (the conditional) bad, so that only the regular conditional reading remains (which is normally only marginally available).

**Questions** Embedding an RC in a question does not necessarily lead to ungrammaticality. In (22), the RC is syntactically embedded under a spelled out version of the question morpheme. The only available interpretation is one where only the consequent of the conditional is actually part of the question. The RC is therefore outside of the question, with the same interpretation as (23). That is, the question in (22–23) is whether or not there is pizza in the fridge (now), the truth of which is understood as independent of the possibility of me being hungry later. Possible hungryness (later) may only be understood as the reason why the question is being asked (now).

(22) Tell me whether if I'm hungry later, there's pizza in the fridge.

(23) If I'm hungry later, is there pizza in the fridge?

This data contrasts with the behavior of regular conditionals in questions. Embedding of regular conditionals in a question is straightforward:

(24) Will the street be flooded if it rains?

This utterance asks for the validity of a certain conditional statement.

**Negation** Regular conditional utterances can be semantically embedded under negation:

(25) She won't help you if you really need her.

Here, there exists an interpretation where the conditional "She'll help you if you really need her" is being negated by the speaker, claiming that "she" is merely neglectful. Clearly, this is distinct from the other reading according to which "If you need her, then she won't help you" (where "she" is particularly spiteful in only helping people that don't need help).

In contrast, RCs cannot be embedded under negation in this way:

(26) There is no pizza in the fridge, if you're hungry.

(26) only has the narrow-scope reading for negation, uttered possibly by an unhelpful host.

**Denial** In order to show that the *if*-clause of RCs is outside of the assertion associated with the sentence, Iatridou (1991) observed that in contrast to regular conditionals, RCs cannot be straightforwardly denied.

- (27) A: If it rains, she'll be happy.  
 B: That's not true. She'll be happy if it snows.
- (28) A: If I may be honest you're looking awful  
 B: That's not true. # I look awful if you may be deceitful

(Iatridou, 1991, p. 53)

For regular conditionals, the causal link they express can be negated (27). This leads to infelicity in the case of relevance conditionals (28).

**Attitude Verbs** Bhatt and Pancheva (2006) note that RCs can not be embedded under *believe*:

- (29) # John believes that if you are thirsty there is beer in the fridge.  
 (Bhatt and Pancheva, 2006, ex. (102b))

In addition, true factives such as *surprise* and *regret* (30) also are not able to embed RCs.

- (30) \* The children were surprised that if they're hungry, there's pizza in the fridge.

Bhatt and Pancheva (2006) do observe that RCs can appear properly embedded under *say*. For example, in (31), the RC is actually embedded under *say*: the whole RC is what John uttered. The sentence differs from (32), where John only uttered the consequent, and the *if*-clause is added by the speaker.

- (31) John said that if you need him later he'll be in 418.  
 (32) If you need your TA John later, he said he'll be in 418.

Further, Siegel (2006) notes that although RCs are prohibited as complements of most attitude verbs, they are possible under *remind*, *remember*, and *realize* (she doesn't mention *say*). See for example:

- (33) Dad called to remind us that if we're hungry there's pizza in the fridge.  
 (Siegel, 2006, ex. (31a))

I conclude that RCs are unembeddable under most attitude verbs. Embedding is possible under two types of verbs: speech act verbs such as *say* or *ask* (34), and the cognitive factive verbs (Beaver, 2004) *realize*, *remind*, *remember*, and also *know* (35).

- (34) Peter asked me whether if he's hungry, there's pizza in the fridge.  
 (35) The children already know that if they're hungry there's pizza in the fridge.

### 2.3 Unembeddability of RCs and Sentence Adverbials

To sum up, I have demonstrated here that relevance conditionals, in contrast to regular conditionals, are generally not semantically embeddable under other operators. This includes negation, questions, conditionals, as well as most attitude verbs. It appears that RCs can only be successfully embedded under speech act verbs and semi-factives.

The same properties have been claimed for a range of sentence adverbials, including evaluative and utterance-modifying adverbs. For these adverbs, the semantic unembeddability has been argued to follow from their status as conventional implicature

items. In section 4, I will make the same argument for relevance conditionals. First, however, I will consider additional evidence for the parallelism between a class of sentence adverbials and relevance conditionals, based on the lack of integration to the V2-clause in V2-languages like German with these phenomena.

### 3 Syntactic Disintegration

The verb-second word order (V2) in German main clauses is defined by the fact that in main clauses the finite verb occupies the second position, with an argument or an adjunct occupying the pre-verbal position.

In German, regular hypothetical conditionals count for V2: if they are preposed, the verb immediately follows the *if*-clause. Propositional adverbs also count for V2. In this section, I show that relevance conditionals and a class of sentence adverbials do not count for V2 in German. Instead, these adjuncts appear non-integrated into the main clause.

#### 3.1 Syntactic Disintegration and Relevance Conditionals

In English, conditional sentences are structurally ambiguous between a hypothetical conditional and a relevance conditional, and they are usually disambiguated by context. Truly ambiguous utterances are also possible, for example:

(36) If you need me later, I'll stay at home all day.

Here, the speaker could be trying to convey that they will stay at home just in case the hearer might need them later (the hypothetical reading). Or the speaker could be staying at home in any case, and they might be informing the hearer because the hearer might need them later (the relevance reading).

In some languages like German and Dutch there is no ambiguity, because hypothetical and relevance conditionals are distinguished by the syntax. In German, the *if*-clauses in hypothetical conditionals are integrated into the main clause in that they occupy the first position in the main clause with verb-second order (37). In other words, they count as occupying the pre-verbal position before the verb in second position, just like other adjuncts do. Relevance conditionals, on the other hand, do not count for V2 (38) (König and van der Auwera, 1988; Köpcke and Panther, 1989; Günthner, 1999). They are not integrated into the main clause syntax, and the finite verb doesn't immediately follow.<sup>2</sup> The ambiguous English example above (36) is disambiguated by the German syntax as follows (Handke, 1984):

(37) Wenn du mich brauchst, bleibe ich den ganzen Tag zuhause.  
 If you me need, stay I the whole day at home.  
 'If you need me, I'll stay at home all day.' (hypothetical conditional only)

<sup>2</sup>This clear-cut distinction of integrated hypothetical conditionals and non-integrated relevance conditionals only holds for regular, non-counterfactual *if*-clauses. Counterfactual *if*-clauses can also optionally appear non-integrated in German. For more detailed discussion of subjunctive/counterfactual conditionals and RCs, see (Scheffler, in preparation).

- (38) Wenn du mich brauchst, ich bleibe den ganzen Tag zuhause.  
 If you me need, I stay the whole day at home.  
 ‘If you need me, I’ll stay at home all day.’ (relevance conditional only)

### 3.2 Syntactic Disintegration and Sentence Adverbials

German sentence adverbials are syntactically and semantically rich and interesting. In this section, I want to show that there are three types of sentence adverbials in German: (i) the *probably*-type of adverbs, which can be semantically embedded and are syntactically integrated into the V2-clause; (ii) the *unfortunately*-type, which cannot be semantically embedded but still are part of the V2-clause, and (iii) the *frankly*-type, which can neither be semantically embedded nor integrated into the V2-clause. I will argue that relevance conditionals behave like this third type of adverbials in German, and should receive a parallel analysis (which I propose in the following section).

#### 3.2.1 The *probably* Type

The first type of adverbials are propositional adverbs like *wahrscheinlich* (‘probably’). This class of adverbs is obligatorily integrated into the V2-clause in German, they have to be followed by the finite verb:

- (39) Wahrscheinlich hat er es nicht ernst gemeint.  
 Probably has he it not seriously meant.  
 ‘He probably didn’t mean it seriously.’
- (40) \*Wahrscheinlich er hat es nicht ernst gemeint.  
 Probably he has it not seriously meant.  
 ‘He probably didn’t mean it seriously.’

These are regular assertion-level adverbs that are semantically embeddable. Example (41) shows *wahrscheinlich* (‘probably’) embedded in the antecedent of a conditional.

- (41) Wenn Peter wahrscheinlich morgen kommt, müssen wir heute einkaufen.  
 If Peter probably tomorrow comes, must we today go shopping.  
 ‘If it is probable that Peter will come tomorrow, we have to go shopping today.’

Regular conditionals behave in parallel to this type of adverbials: they are part of the V2-clause, and they are semantically embeddable.

#### 3.2.2 The *unfortunately* Type

The second class of adverbials includes speaker-oriented evaluative adverbs like *leider* (‘unfortunately’). These adverbials also form part of the V2-clause in German:

- (42) Leider hat er es nicht ernst gemeint.  
 Unfortunately has he it not seriously meant.  
 ‘Unfortunately he didn’t mean it.’

- (43) \* Leider er hat es nicht ernst gemeint.  
 Unfortunately he has it not seriously meant.  
 ‘Unfortunately he didn’t mean it.’

These adverbials cannot be semantically embedded, as noted by Lang (1979), and documented above in section 3 for the French adverbs. The same can be demonstrated for German by comparing for example the evaluative (unembeddable) adverb *leider* (‘unfortunately’) with the semantically related (embeddable) phrase *es ist schade* (‘it is unfortunate’). Consider these two mini-dialogues:

- (44) Schade, dass du schon morgen kommen willst. — Wenn es  
 Unfortunate, that you already tomorrow come want. — If it  
 schade ist, dass ich morgen kommen will, dann komme ich eben  
 unfortunate is, that I tomorrow come want, then come I (part.)  
 später.  
 later.  
 ‘It’s unfortunate that you already want to come tomorrow. — If it’s unfortu-  
 nate that I want to come tomorrow, then I’ll come later.’
- (45) # Leider willst du schon morgen kommen. — Wenn ich  
 Unfortunately want you already tomorrow come. — If I  
 leider schon morgen kommen will, dann komme ich eben  
 unfortunately already tomorrow come want, then come I (part.)  
 später.  
 later.  
 ‘Unfortunately you want to come already tomorrow. — If I unfortunately  
 want to come tomorrow, then I will come later.’

While the first interaction is fine and coherent, the second using *leider* (‘unfortunately’) fails for several reasons. It implies that the speaker considers their own plans unfortunate (since the evaluative adverb ‘unfortunately’ is attributed back to the speaker), and it states that if the speaker wants to come tomorrow, then they will come later, which is incoherent. Both effects are due to the fact that *leider* (‘unfortunately’) is semantically unembeddable.

### 3.2.3 The *frankly* Type

Finally, the third class of sentence adverbials are utterance modifiers like *mal ehrlich* (‘frankly, honestly’) and *von Frau zu Frau* (‘from woman to woman’). These adverbials are preposed to a full V2 clause in German: they cannot be followed by the finite verb in a declarative main clause.

- (46) \* Mal ehrlich / Von Frau zu Frau ist er wirklich nicht so schlau.  
 Honestly / From woman to woman, is he really not so smart.  
 ‘Honestly / From woman to woman, he really isn’t that smart.’
- (47) Mal ehrlich / Von Frau zu Frau, er ist wirklich nicht so schlau.  
 Honestly / From woman to woman, he is really not so smart.  
 ‘Honestly / From woman to woman, he really isn’t that smart.’

Just like the evaluative adverbs, and as has been documented in detail above, this type of adverbials may not be embedded under semantic operators. In fact, Potts (2005, p. 146) argues for English utterance modifiers that they are not even syntactically embeddable. He gives the following as evidence:

- (48) # Bill said to Al that, man to man, his wife was having an affair.  
(Potts, 2005, ex. (4.140d))

According to Potts, the only available interpretation for this sentence is that *man to man* is a propositional modifier on *Al's wife is having an affair*.

It is true that the utterance adverbials cannot be semantically embedded. Syntactic embedding is however sometimes possible, if the speaker is the embedded subject:

- (49) I have to go now, because I'm frankly tired of this discussion.  
(50) Ich gehe jetzt, weil ich hiervon ganz ehrlich die Nase voll habe.  
I leave now, because I of this really honestly the nose full have.  
'I'm leaving now, because I'm frankly done with this.'

In these examples, *frankly/ganz ehrlich* seems syntactically embedded in a *because*-clause. It is not semantically embedded however, since the honesty is not the reason for why the speaker has to leave. Rather, the fact that the speaker is being frank in giving their reason is contributed as a side comment.

So if these adverbials can be syntactically under other operators, why is an utterance modifier reading impossible for (48), as Potts claims? Potts argues (p. 149) that the reading obtained is odd because the speaker is attributing the utterance "His wife was having an affair" to Bill, and the speaker is not actually uttering it himself, so that it cannot be modified by *man to man*. This is because the utterance modifier *man to man* is not semantically embedded under *say*, and contributes its own side comment. Further, as I will discuss below, the utterance modifier is in fact not part of the syntactic structure of its host clause, so it is not even syntactically embedded in these cases.

In the *frankly*-type of adverbials, the utterance modifiers, we have therefore found a class of adverbials that is not syntactically integrated into the V2-clause, and cannot be semantically embedded.<sup>3</sup> This class shares exactly the properties of relevance con-

<sup>3</sup>There is a group of adverbials in German with similar meaning as *frankly* that does optionally allow syntactic integration into the V2-clause. The adverbials in this group all contain an overt participle of a saying verb, such as *ehrlich gesagt* ('honestly speaking') and *offen gestanden* ('openly admitted').

- i. Ehrlich gesagt habe ich keine Lust auf Eis.  
Honestly said have I no mood for icecream.  
'Honestly, I'm not in the mood for icecream.'
- ii. Ehrlich gesagt, ich habe keine Lust auf Eis.  
Honestly said, I have no mood for icecream.  
'Honestly, I'm not in the mood for icecream.'

It is not entirely clear to me why this group of adverbials is an exception with regard to syntactic integration into the V2-structure. I think two things may be happening here: First, these phrases may have gotten frozen into a general sentence modifier and lost their special syntax. And second, the 'speaking' part may be important here. The crucial difference between (*mal/ganz*) *ehrlich* ('(once/very) honestly') and *ehrlich gesagt* ('honestly speaking') is the presence of 'speaking' in the second case. This may lead to the adverbial being not a true utterance modifier, but instead taking a propositional argument just like the evaluative adverbs of the 'probably'-type. An argument for this is the fact that these adverbials

ditionals. So much so, that discussions of the syntactic properties of utterance modifying adverbials in German often includes the German relevance conditionals (Pittner, 1999). In the following section, I will give a semantic analysis of relevance conditionals based on their parallelism with utterance modifying adverbials.

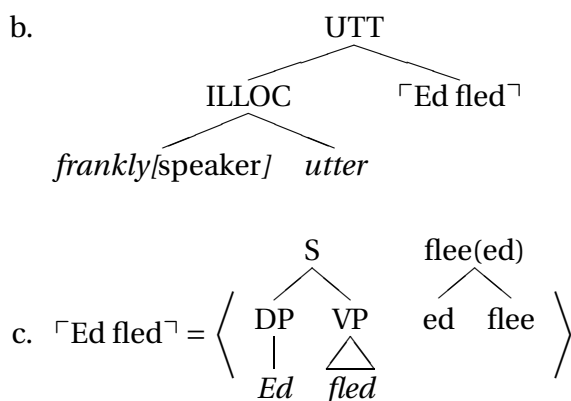
## 4 Relevance Conditionals and Utterance Modifying Adverbials

### 4.1 Utterance Modifying Adverbials

It is well known that certain adverbials modify not the proposition to which they are adjoined, but the utterance (or speech act) expressed in their host sentence (for German, see e.g., Mittwoch 1977; Thim-Mabrey 1988; Pittner 1999). This includes speech act adverbs like *frankly*, as well as certain sentential adverbials. As discussed above, it has also been noted in some of the previous discussions that these adverbials are semantically unembeddable.

These two observations are put together by Potts' (2005) analysis of utterance modifying adverbs. He analyses them as conventional implicature items. Potts argues that adverbs like *frankly* modify the relation between a speaker and an utterance. He introduces trees like the following (adapted from Potts 2005, ex. (4.148)<sup>4</sup>):

(51) a. Frankly, Ed fled.



d. Assertion: Ed fled

Conventional Implicature: I frankly utter 'Ed fled'

This kind of structure takes the intuition that *frankly* is a modifier of an utterance relation seriously. Note that according to Potts, the assertion of the sentence in (51a) is the one that is obtained by interpreting the parse tree (51b–c) up to the highest S node.

can be embedded under *say* even with a third-person subject:

- (iii) Paul meinte zu Peter, dass er ehrlich gesagt keine Lust mehr hat.  
 Paul said to Peter, that he honestly said no interest anymore hat.  
 'Paul said to Peter that he honestly wasn't interested anymore.'

<sup>4</sup>I have stripped off the semantics to make the underlying syntactic structure clearer.



The adverb *frankly* modifies the relation between the speaker and the utterance, but this is located in the conventional implicature dimension.

Furthermore, it is important to note that *frankly* is, according to Potts, not part of the sentence it appears in, neither in the syntactic nor semantic sense. It modifies the relation between the speaker and the utterance of “Ed fled”, but it is not part of this utterance.

Contributing its meaning in the CI dimension makes the utterance available as an argument for *frankly*. An assertion-level predicate (such as the adverb *probably*) must attach below the highest S node, because this is where the assertion of the sentence is computed. Only a CI predicate can attach higher and thus modify the utterance relation.

Finally, Potts’ analysis of *frankly* explains why it is semantically unembeddable. First, CI items are never semantically embeddable, since there are no operators that can take CI type arguments. But more importantly, Potts (2005, p. 149) argues that utterance modifiers must be CI types and cannot be semantically embeddable, because they modify the relation between the speaker and an utterance. However, in a sentence such as (48), the speaker is not in an utterance relation with the embedded clause “Al’s wife is having an affair”, so *frankly* or *man to man* cannot modify it. Potts cites possible embedding examples with first-person subjects (49–50) as further evidence, since in these cases the utterance relation holds between the speaker and the embedded clause, so that this utterance relation may sometimes be modified by an adverbial.

## 4.2 A New Analysis of Relevance Conditionals

In light of the two major properties that relevance conditionals share with utterance modifying adverbials, I propose here a new analysis of the semantics of relevance conditionals. In regular conditional sentences, the conditional meaning is contributed as an assertion. In contrast, I argue that the conditional meaning (the *if*-clause) is contributed as a conventional implicature in the case of relevance conditionals. I propose the following schema for the two-dimensional meaning of relevance conditionals:

- (52) Semantics of a Relevance Conditional “If<sub>RC</sub> p, q”:
- a. Assertion: q
  - b. Conventional Implicature: If(p, I utter(q))

According to this analysis, the assertion of “If<sub>RC</sub> p, q” is taken to be exactly the same as just uttering “q”. In addition, the conditional relation between the contents of p and q is contributed as a CI. The crucial innovation in my proposal is the split of the RC meaning into two dimensions. This step yields a semantics that correctly captures our intuitions about the meaning of RCs, as follows.

First, the truth or execution of the speech act of q does not depend on the *if*-clause. This is exactly the relevance conditional feeling: in a relevance conditional, the truth of the consequent does not depend on the antecedent, as is well known from previous studies of RCs (Iatridou, 1991; DeRose and Grandy, 1999, p. 406). For example, Iatridou (1991, p. 51) explains that (53) cannot be paraphrased as (54).

(53) If you want to know, 4 isn’t a prime number.

(54) In any circumstance in which you want to know, 4 isn’t a prime number.

In my proposal, the consequent of a relevance conditional is straightforwardly asserted (52a). Thus, it is independent of the *if*-clause, just as required by our intuition.

Second, as we have seen above, the *if*-clause contributes an unembeddable side-comment. This is reflected in my analysis, since the *if*-clause is contributed on the conventional implicature dimension (52b). Thus, if a relevance conditional appears syntactically under another operator, only the consequent of the RC (52a) is semantically embedded under that operator, and the CI part of the meaning is always contributed at the top level.

Furthermore, note that the conditional in the CI (52b) is necessarily true given the assertion (52a). I claim that, assuming an epistemic modal base for ‘if’, we obtain a third result: the net effect of the *if*-clause in RCs is the contribution that *p* is epistemically possible. In other words, what distinguishes the plain utterance of “*q*” from the RC utterance “if *p* then *q*” is that the latter has the additional presupposition that *p* is epistemically possible.<sup>5</sup>

We can see this epistemic net effect at work in (55). The sentence is odd if the speaker knows that Peter wasn’t hungry in the past. The reason for the oddness is that the RC “If *p*, *q*” introduces a presupposition that the speaker considers *p* possible.

(55) If Peter was hungry, there was pizza in the fridge.

In some previous work it has been claimed that, intuitively, the antecedent of an RC provides a condition for the relevance of the consequent to the discussion at hand (DeRose and Grandy, 1999; Franke, 2007), without clear formal discussion of this point. Relevance does not directly come into play in my analysis proposed above. However, there is good evidence for one notion of relevance: RCs are only felicitous if the antecedent is relevant to the consequent, as demonstrated in (56).

(56) # If you’re hungry later, 2 plus 2 is 4.

I take this fact to follow from the general application of the Maxim of Relevance (Grice, 1989). Clearly, if I choose to utter (56) instead of just “2 plus 2 is 4”, the additional *if*-clause should be relevant to the conversation at hand. No special mechanism is needed to rule out (56). The example is odd just as (57) is odd, where two unrelated assertions are provided together.

(57) # You may be hungry later and 2 plus 2 is 4.

For an illustration of the proposed analysis, (58–60) show example RCs with their meaning, for a declarative (58), question (59), and a wish (60) in the consequent.

(58)  $\alpha$ : “[If you need me later]<sub>RC</sub>, I’ll stay at home all day.”  
 Assertion:  $\alpha$  will stay at home all day.  
 CI: If (Addressee needs  $\alpha$  later,  $\alpha$  utters ( $\alpha$  will stay home all day))  
 $\Rightarrow$  According to  $\alpha$ ’s knowledge, it may be that Addressee needs  $\alpha$  later.

<sup>5</sup>Scheffler in preparation provides a detailed exposition of how to obtain this net effect. In addition, it is shown there that the impossibility of subjunctive relevance conditionals such as (i) also follows from this proposal for the semantics of RCs.

i. # If you had been hungry, there would have been pizza in the fridge. (‘magic’ reading only)

- (59)  $\alpha$ : “If you’re so smart, when was the constitution signed?”  
 Assertion: When was the constitution signed?  
 CI: If (Addressee is so smart,  $\alpha$  asks (when was the constitution signed?))  
 $\Rightarrow \alpha$  considers it possible that Addressee is so smart.
- (60)  $\alpha$ : “If I don’t see you anymore, have a great vacation!”  
 Assertion: Have a great vacation!  
 CI: If ( $\alpha$  doesn’t see Addressee later,  $\alpha$  wishes (Addressee to have a great vacation))  
 $\Rightarrow$  According to  $\alpha$ ’s knowledge, it may be that  $\alpha$  doesn’t see Addressee anymore.

### 4.3 Conventional Implicature and Syntactic Disintegration

Given this new analysis of relevance conditionals proposed here, the connection between the special semantics of relevance conditionals and their special syntax in German becomes clear, as well. I showed that relevance conditionals are utterance modifiers just like the adverbs such as *frankly* discussed in (Potts, 2005). The structure of a relevance conditional is therefore the following:

- (61) a. Wenn du Hunger hast, es ist noch Pizza im Kühlschrank.  
 If you hunger have, it is still pizza in fridge.  
 ‘If you’re hungry, there’s pizza in the fridge.’
- b.
- c.
 

CP  
 Es C'  
 C IP  
 | △  
 ist ...

in-fridge(pizza)  
 pizza in fridge

}
- d. Assertion: There’s pizza in the fridge  
 CI: If you’re hungry, I utter ‘There’s pizza in the fridge’

According to the structure in (61), the relevance conditional *if*-clause is neither part of the semantics, nor the syntax of the main clause. It merely modifies the utterance relation. Since the *if*-clause is outside of the syntax of the main clause, it cannot fill the syntactic position before the finite verb in second position. Thus, just like the utterance modifying adverbials, relevance conditionals are non-integrated in German.

The cause for non-integrated syntax cannot be just the fact that relevance conditionals contribute their meaning on the conventional implicature dimension, since CI adverbs such as *leider* (‘unfortunately’) appear integrated in German (see section 3.2).

But contributing its meaning on the CI dimension makes the utterance relation available as an argument for relevance conditionals (as well as adverbs). Assertion-level predicates cannot target the utterance relation because the assertion of a sentence is computed at its highest S-node. The utterance relation comes in higher than that. However, if a predicate is located on the CI dimension, it is outside of the assertion and can thus target the utterance which is located outside of the assertion as well. Targeting the utterance relation as an argument, then, leads to unintegrated syntax, as Potts (2005, p. 149) has shown. An utterance modifier cannot be part of the syntax or semantics of the clause it appears in.

## 5 Relevance Conditionals in Previous Analyses

In the over 40 years that relevance conditionals (RCs) have been studied in linguistics, many accounts have been proposed for their syntactic and semantic properties. Often, these proposals differ only slightly from one another, if viewed from the neutral ground of several decades after the fact. In this section, I review some approaches to RCs. I show that the earlier accounts fail to characterize the semantics of RCs accurately.

### 5.1 Conditional Assertion Accounts

A range of proposed analyses of RCs have employed a variant of a “Conditional Assertion” account (see for example (van der Auwera, 1986; DeRose and Grandy, 1999)). Roughly, these analyses predict a meaning as in (62) for RCs.

(62) If you’re hungry, ASSERT ( there’s pizza in the fridge ).

This approach claims that what is dependent on the antecedent is the performance of the speech act in the consequent (Franke, 2007). The speech act is only performed if the antecedent is true. Thus, the truth of the consequent does not depend on the antecedent in RCs, as it does in regular conditionals.

It is relatively easy to see that this “conditional assertion” cannot be the correct semantics for RCs. Clearly, in (63), the waiter’s name has been successfully stated even if the guests won’t need anything later.

(63) If you need anything else later, my name is James. (Siegel, 2006, ex. (4))

(64) If I don’t see you anymore, have a great vacation!

Similarly, the wish expressed in the consequent of (64) has been felicitously carried out, even if the speaker runs into the addressee a week later. The conditional assertion approach predicts the wrong semantics for these and other cases. For a closer discussion of the inadequacy of conditional assertion accounts, see also (Siegel, 2006).

### 5.2 Quantification over Potential Literal Acts

In a recent paper, Siegel (2006) analyses RCs as existential quantification over potential literal acts (potential assertions, potential questions, etc.). According to her account, the RC in (65) is paraphrased as in (66).

(65) If you're hungry, there's pizza in the fridge.

(66) If you're hungry, there is a (relevant/salient) assertion that there's pizza in the fridge.

(66) claims that in case you're hungry, a certain assertion exists. This assertion is, according to Siegel, not necessarily an actual (carried-out) speech act, but merely a potential literal act. It is my understanding that any potential assertion must exist in this sense, even false assertions or assertions that never happen. Therefore, the meaning of (65) under Siegel's account reduces to the following:

(67) If you're hungry, there exists a potential assertion 'There's pizza in the fridge' and this assertion is relevant/salient.

It is obvious from this paraphrase, that since the potential assertion always exists, the second claim (relevance/salience of this assertion) is the main contribution of the RC.

To sum up, Siegel's analysis has two main ingredients. First, the *if*-clause is a regular *if*-clause, and part of the assertion made by the RC. Second, for the consequent, Siegel motivates the introduction of existential quantification over potential speech acts. She justifies this move with her claim that the consequent of an RC is not straightforwardly asserted.

In fact, the consequent of an RC must be taken to be uttered straightforwardly. This is especially clear in cases where the speech act involved is not merely an assertion, such as for the wish in (64). By uttering (64), the wish in the consequent has been offered no matter what. This yields the move to potential assertions introduced by Siegel unnecessary. In fact, it is unclear to me how Siegel (2006) would guarantee that the speech act in the consequent of an RC is actually carried out. Another good example of this is found in RCs with question complements (68): these RCs compell the hearer to answer in just the way that unembedded questions do.

(68) If you're so smart, when was the constitution signed?

More importantly, Siegel's proposal cannot account for the striking property of RCs demonstrated in section 2.2: RCs cannot be embedded under semantic operators (including negation, questions, conditionals, and most attitude verbs). If RCs are simply regular conditional sentences that involve quantification over potential assertions, unembeddability is completely unexpected. For Siegel, the meaning of an RC is simply the assertion that under some condition, a potential speech act is relevant (see (67)). We can therefore check the predicted meaning of a RC (syntactically) embedded under negation, such as (69).

(69) It's not the case that, if you're hungry, there's pizza in the fridge.

Keeping the meaning for the RC constant, one would predict approximately the meaning in (70).

(70) The following is not the case: If you're hungry, there is a potential assertion 'There's pizza in the fridge' and this assertion is relevant/salient.

As we have seen, a potential assertion "There's pizza in the fridge" definitely exists. Still, the interpretation in (70) is neither trivial or meaningless. The fact that there is

pizza in the fridge could be irrelevant if it has gone bad or you don't like pizza anyway, so asserting the irrelevance of such an utterance is informative. However, no such meaning can actually be conveyed with (69), since the RC is impossible embedded under negation. As Siegel's account predicts a non-existent meaning for (69), it cannot derive the unembeddability of RCs.

The same point can be made with regard to RCs that appear syntactically embedded within another conditional. The example discussed earlier is repeated here, along with its predicted meaning according to Siegel (2006).

- (71) If there's pizza in the fridge if you're hungry later, you should eat it.  
 (72) If there is a potential assertion 'There's pizza in the fridge' and this assertion is relevant if you're hungry later, then you should eat the pizza.

The paraphrase (72) could be reasonably used to express that if there being pizza in the fridge would be relevant to you if you're hungry later (e.g., because you like pizza), then you should eat it. However, since the RC cannot in fact be semantically embedded within another *if*-clause, this meaning is not conveyed by (71).

Finally, Siegel's semantics would also predict a non-existent reading for RCs properly embedded under questions, such as (22), repeated here with its predicted meaning.

- (73) Tell me whether if I'm hungry later, there's pizza in the fridge.  
 (74) Tell me whether if I'm hungry later, there is a potential assertion 'There's pizza in the fridge' and this assertion is relevant.

However, the only available reading for (73) is the one where the RC is not actually embedded under the question, and the *if*-clause is taken to be outside of the question operator.

In general, we can observe that Siegel's proposal for the meaning of RCs makes them regular assertions (of some conditional circumstance). Accordingly, RCs should then behave exactly like other conditionals when embedded. We have seen that this is not the case. While regular conditionals are readily embedded, RCs cannot be semantically embedded.

To sum up, I have pointed out two shortcomings in the most promising recent account of relevance conditionals: First, I have argued that the move to potential literal acts is unnecessary, because the consequent of an RC can, contra Siegel (2006), be taken as a straightforwardly executed – not just potential – speech act. Second and more importantly, I have shown that the analysis does not account for the semantic unembeddability of RCs. My proposal for the semantics of RCs, which analyses them as conventional implicature items in parallel with the utterance modifying adverbials they resemble, accounts for both of these properties straightforwardly.

## 6 Conclusion

In this paper, I have shown a syntactic and semantic parallelism between utterance modifying adverbials and relevance conditionals. I have shown that both share two major properties: unembeddability under semantic operators, and the failure to count

for V2 in German. A formal analysis of utterance modifying adverbials exists as part of Potts 2005: they are conventional implicature items. Consequently, I have proposed here a new analysis of relevance conditionals, arguing that they contribute the conditional meaning on the conventional implicature dimension. This explains their semantic unembeddability, since conventional implicatures resist embedding. Further, I have argued that contributing their meaning on the conventional implicature dimension allows items such as relevance conditional clauses and certain adverbs to attach to higher constituents, such as the utterance. This higher attachment is reflected in the syntax by disintegration, that is, the lack of V2 with these elements. Finally, since the *if*-clause meaning is located on the conventional implicature dimension, the consequent is asserted straightforwardly in relevance conditionals, which is why the consequent is not felt to depend on the truth of the antecedent.

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# Subevental structure and non-culmination

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## 1 Introduction: Predicate decomposition

Since Dowty (1979) accomplishments are analyzed as involving at least two components: an activity/process performed by the agent/causer and change of state of the theme induced by this activity/process. Taking a non-decompositional event-based analysis in (1) as a point of departure, in (2)-(7) I provide a few illustrations about how (the relevant part of the meaning of) the sentence *John closed the door* would be analyzed within different theories of predicate decomposition, putting tense and grammatical aspect aside.

- (1)  $\| \text{John close the door} \| = \lambda e[\text{agent}(\text{John})(e) \wedge \text{close}(\text{door})(e)]$

In (1), I use the neo-Davidsonian association of the external argument with events via the Agent thematic role, but the Davidsonian association of the internal argument, see Kratzer (2003) for discussion. This choice plays no role in what follows, however. For simplicity, I represent arguments as individual constants.

- (2) Dowty 1979  
 $[[\text{DO}(\text{John}, [\text{close}(\text{John})])] \text{CAUSE} [\text{BECOME} [\text{closed}(\text{door})]]]$
- (3) Rappaport Hovav, Levin 1998  
 $[[\text{John ACT}] \text{CAUSE} [\text{BECOME} [\text{door} <\text{closed}>]]]$
- (4) Kratzer 2000 and elsewhere, Paslawska, von Stechow, 2003  
 $\| \text{John close the door} \| =$   
 $\lambda e \exists s[\text{agent}(\text{John})(e) \wedge \text{close}(e) \wedge \text{CAUSE}(s)(e) \wedge \text{closed}(\text{the door})(s)]$
- (5) Pylkkänen 2002  
 $\| \text{John close the door} \| =$   
 $\lambda e[\text{agent}(\text{John})(e) \wedge \exists e'[\text{closing}(e') \wedge \text{Theme}(\text{the door})(e) \wedge \text{CAUSE}(e')(e)]]$

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## (6) Rothstein 2004

|| John close the door || =

$\lambda e \exists e_1 \exists e_2 [e = {}^s(e_1 \cup e_2) \wedge \text{Activity}(e_1) \wedge \text{Agent}(e_1) = \text{John} \wedge \text{Theme}(e_1) = \text{door}$

$\wedge \text{Become}_{\langle \text{closed} \rangle}(e_2) \wedge \text{Arg}(e_2) = \text{Theme}(e_1) \wedge \text{INCR}(e_1, e_2, C(e_2))]$ ,

where  ${}^s(e_1 \cup e_2)$  is a singular entity created out of  $e_1$  and  $e_2$ , INCR is an incremental relation between events with respect to the incremental chain C.

## (7) Ramchand 2003, 2008 with a few adjustments

|| John close the door || =

$\lambda e \exists e_2 \exists e_3 \exists e_4 \exists e_5 [\text{close-a}(e_2) \wedge \text{Causing}(e_2) \wedge e = e_2 \rightarrow e_3 \wedge \text{Subject}(\text{John})(e_2)$

$\wedge \text{close-p}(e_4) \wedge \text{Process}(e_4) \wedge e_3 = (e_4 \rightarrow e_5) \wedge \text{Subject}(\text{the door})(e_4)$

$\wedge \text{close-s}(e_5) \wedge \text{State}(e_5) \wedge \text{Subject}(\text{the door})(e_5)]^1$

where “ $\rightarrow$ ” is a “lead to” or “cause” relation on events, close-a, close-p, and close-s are predicates denoting closing activities, processes of getting closed, and states of being closed, respectively.

As is evident from (2)-(7), theories of predicate decomposition vary along different dimensions. Firstly, proposals represented in (4)-(7) exploit event semantics, while (2)-(3) are eventless. Secondly, the relation between components of decompositional structure in (2)-(5), (7) is causal, while that in (6) is not. The causal relation in (4), (5), (7) is a relation between events, while CAUSE in (2)-(3) is a two-place sentential operator. Thirdly, and most significantly for the purposes of this paper, (2)-(7) differ as to how many propositional/ eventive components the decompositional structure involves. Ramchand (2003, 2008) suggests that accomplishments consist of three sub-events, activity ( $e_2$ ), process ( $e_4$ ) and result state ( $e_5$ ). Other proposals offer different versions of a two-component decomposition. Dowty (1979) and Rappaport Hovav and Levin (1998) assume that the caused component is a state embedded under BECOME, while the causing component is essentially an activity. Kratzer (2000 and elsewhere) suggests that the causing activity and result state are directly connected by CAUSE with no BECOME. Pylkkänen (2002) and Rothstein (2004) develop structures with two eventive components but no result state.

In the literature, one can find extensive evidence showing that accomplishments involve **more than one** component. Essentially, most of this evidence is related to the same general observation: there exist operators that can take scope over one of the components of accomplishment structure, not affecting other component(s). Operators most thoroughly examined in this respect include negation and adverbials like *almost* and *again*. However the question of how many components accomplishments **exactly** have, two or three, has seldom been addressed (unless in relation to the problem of the intermediate scope of *again*, e.g., von Stechow 1996 and Pylkkänen 2002: 102-103).

Given this general background, in what follows I will try to construct a novel empirical argument supporting a rich predicate decomposition along the lines of (7), which is based on evidence from **non-culminating readings** of accomplishment verbs. In a

<sup>1</sup>The representation in (7) contains equations of the form  $e = (e' \rightarrow e'')$ . Literally, the left-hand and right-hand parts of the equation do not have matching logical types ( $e$  is of type  $s$ ,  $e' \rightarrow e''$  is of type  $t$ ), so this expression should apparently be interpreted as a shorthand for  $e = e' \oplus e'' \wedge e' \rightarrow e''$ , where  $e' \oplus e''$  is the sum of events  $e'$  and  $e''$ .

nutshell, I will argue that in a language where accomplishments do not entail culmination (i.e., where sentences like *John opened the door for two hours* ‘For two hours, John was involved in opening-the-door activity’ are grammatical), the whole range of non-culminating interpretations is adequately accounted for by a three-component decompositional theory. Specifically, two subclasses of accomplishments that differ with respect to non-culmination can be kept distinct if they receive three-component, but not two-component representations.

The rest of the paper is organized as follows. In **Section 2** I introduce data on which the proposal is based. I discuss the phenomenon of non-culmination and observe that non-culminating readings of accomplishments fall into two types which I call failed attempts and partially successful actions. Accordingly, I distinguish between at least two classes of non-culminating accomplishments. In **Section 3**, I develop semantic representations of both types of non-culminating readings within three-component decompositional framework, discussing and rejecting two-component and non-decompositional alternatives. In **Section 4**, main results of Section 3 are implemented within a constructionalist theory of event structure. Finally, **Section 5** offers a few related observations on the lexical semantics of main types of accomplishments discussed in the preceding sections.

## 2 Non-culminating accomplishments

### 2.1 Basic examples

The phenomenon of non-culmination can be illustrated by examples like (8a-b) from Karachay-Balkar, a Turkic language spoken in the Caucasus.<sup>2</sup>

- (8) a. *kerim eki minut-xa ešik-ni ac-xan-di.*  
 Kerim two minute-DAT door-ACC open-PFCT-3SG  
 ‘Kerim opened the door in two minutes.’
- b. *kerim eki saʒat ešik-ni ac-xan-di.*  
 Kerim two hour door-ACC open-PFCT-3SG  
 ‘Kerim tried to open the door for two hours’  
 (lit. ‘Kerim opened the door for two hours.’)

As the examples in (8) illustrate, Balkar differs from languages like English in that accomplishment predicates like ‘open the door’ can yield two interpretations. (8a) accepts a time span adverbial, hence is telic: the opening event culminates, and the theme argument enters the result state of being open. For *Kerim opened the door*, the English counterpart of (8), this is the only available interpretation. But *ešik-ni ac-* ‘open the door’ in Balkar allows for another interpretation, not attested in English, as illustrated in (8b). (8b) is compatible with a measure adverbial ‘for two hours’, so to the extent that this co-occurrence restriction is characteristic of atelic predicates, (8b) is atelic. The event referred to in (8b) does not culminate, and all (8b) indicates is that

<sup>2</sup>In the literature, a variety of other languages are mentioned in which accomplishment verbs do not entail culmination (see Ikegami 1985, Koenig and Muansuwan 2001, Tatevosov 2002, Bar-el et al. 2005, Bar-el 2006, Ivanov and Tatevosov, to appear).

the Agent performs activity that aims at changing a state of the Theme. However, this activity terminates before the culmination.

Not surprisingly, given (8b), accomplishment sentences in Balkar are positive with respect to any other tests indicating explicitly that the culmination is not attained:

- (9) *kerim ešik-ni ac-xan-dï, alaj boša-ma-~~van~~-dï.*  
 Kerim door-ACC open-PFCT-3SG but finish-NEG-PFCT-3SG  
 Lit. ‘Kerim opened the door, but (he) did not finish.’

In (9), the second clause containing the aspectual verb ‘finish’ is negated, but this does not yield contradiction with the first clause.

The next significant characteristic of sentences like (8b) is that non-culmination does not imply imperfective grammatical (viewpoint) aspect. Right the other way round, clauses containing verbs in the Perfect form are perfective regardless of whether eventualities referred to culminate or not:

- (10) a. *men kel-gen-de kerim (on minut-xa) ešik-ni ac-xan-dï.*  
 I come-PFCT-TEMP Kerim ten minute-DAT door-ACC open-PFCT-3SG  
 1. ‘When I came, Kerim opened the door (in ten minutes).’  
 2. \*‘When I came, Kerim was opening the door’
- b. *men kel-gen-de kerim (on minut) ešik-ni ac-xan-dï.*  
 I come-PFCT-TEMP Kerim ten hour door-ACC open-PFCT-3SG  
 1. ‘When I came, Kerim spent ten minutes trying to open the door.’  
 2. \*‘When I came, Kerim was opening the door’

(10a-b) do not support interpretations in (10a.2) and (10b.2) in which the running time of the opening event includes that of the coming event referred to by the adverbial clause. (10a-b) are only true if coming temporally precedes opening, as in (10a.1) and (10b.1). This could not have been the case if the imperfective/progressive grammatical aspect were a part of the meaning of the main clause. In contrast, temporal sequencing of events in (10) follows naturally if *ac-xan-dï* ‘opened’ is perfective.

Bar-el et al. (2005) independently make a similar point about non-culminating predicates in St’át’imcets: the authors show that they possess perfective grammatical aspect whereby the running time of an event is included into the reference time.

These observations strongly suggest that non-culmination is distinct from imperfectivity and cannot be reduced to it. If one assumes a conceptual distinction between grammatical aspect and eventuality type, as commonly done within two-component theories of aspect (e.g., Smith 1991/1997, cf. also Depraetere 1995), non-culmination must be a part of the computation of eventuality type, not of grammatical aspect. As soon as a non-culminating eventuality description is built, it can serve as the input to the perfective aspectual operator yielding perfective non-culminating clauses like (8b), (9), and (10b). In what follows, I will pursue exactly this type of approach.

Finally, it is worth noting that the non-culminating interpretation is not restricted to the verbal form of Perfect in (8b) and (9)<sup>3</sup> but is readily available for any form in-

<sup>3</sup>I follow the practice established by Comrie (1976) in capitalizing labels for language-specific categories. Labels for corresponding semantic entities come without capitalization. Hence “Perfect” refers to a particular verb form in *-van* in Balkar, while “perfect” is taken to denote a (cross-linguistic) semantic category. Language-specific “Perfects” need not necessarily express the perfect meaning: labels like this may only reflect nothing but a traditional way to refer to a particular verb form in reference grammars.

volving perfective viewpoint aspect. (11a-b) illustrate this for the Preterite and Simple Future of *ac* 'open', respectively.

- (11) a. kerim eki saβat eřik-ni ac-ti.  
 Kerim two hour door-ACC open-PST.3SG  
 Lit. 'Kerim opened the door for two hours.'
- b. kerim eki saβat eřik-ni ac-ar-di.  
 Kerim two hour door-ACC open-FUT-3SG  
 Lit. 'Kerim will open the door for two hours.'

(11a-b) strongly suggest that it is not specific semantic characteristics of Perfect/Preterite/Simple Future<sup>4</sup> that are responsible for the non-culminating interpretation. Rather, what makes this interpretation possible should exist at the level of uninflected *vP/VP* where the eventuality type of a predicate is computed, before functional structure hosting inflectional morphemes is projected. I will return to this issue shortly, but first a finer look at the non-culminating interpretation is due.

## 2.2 Failed attempts and partially successful actions

In this section I will make two main observations. First, non-culminating interpretations fall into two types which I will refer to as failed attempt (FA) and partial success (PS) interpretations. Secondly, accomplishment verbs differ as to whether they only license FA, or both FA and PS.<sup>5</sup>

What we see in (8b) is an activity that terminates producing no change in the theme at all: attempts to make the theme enter a new state fail completely, hence the term failed attempt. Another accomplishment that patterns with 'open a door' is 'tear a thread' in (12).

- (12) fatima eki minut xali-ni zirt-xan-di.  
 Fatima two minute thread-ACC tear-PFCT-3SG  
 'Fatima tried to tear a thread for two minutes.'  
 (lit. Fatima tore a thread for two minutes.)

Let us look at two tearing scenarios in (13):

- (13) Scenarios for (12):

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<sup>4</sup>Perfect in *-βan* in Balkar does not contrast with Preterite in *-di* as to the tests distinguishing perfects and past perfectives/simple pasts (for further details see Lyutikova et al. 2006). Specifically, Perfect accepts temporal adverbials ('At two o'clock, Kerim open-PFCT the door') and is readily available in the main line of narratives (Kibrik 2002). Overall, Perfect is much more frequent than Preterite, the latter being mostly used as a narrative tense for historical narratives and fairy tales. Apparently, this distribution is an outcome of the diachronic development extensively discussed in typological literature (e.g., Bybee et al. 1994): there is a path of development "perfect → perfective past → simple past", and Perfect in Balkar has developed along this path, entering (and winning) the competition with the older simple past category, Preterite. Therefore, the grammatical system of Balkar is comparable to that of French with its *Passé Simple/Passé composé* distinction. The similar development of the Perfect in *-gan* is attested in a wide variety of other Kypchak Turkic languages, especially in Siberian Turkic, e.g., Ojrot.

<sup>5</sup>In section 5.1 we will discuss a class of verbs that only license the PS interpretation. These verbs are not directly relevant for the argument developed in sections 3-4, however.

- a. **Failed attempt:** For two minutes, Fatima was trying to tear a thread, but the thread was so firm that she was unable to tear it.
- b. **\*Partial success:** For two minutes, Fatima was tearing a thread, so when she stopped, the thread was partly torn.

Speakers' judgments about (12) are pretty clear: the non-culminating reading in (12) implies the **failed attempt scenario** in (13a) where no process in the thread occurs. The **partial success scenario** in (13b) whereby the thread undergoes some change yet not attaining the state of being torn does not correspond to a possible tearing event. Therefore, accomplishments like 'tear' and 'open', when referring to a non-culminating eventuality, only allow for the failed attempt interpretation. Verbs like these will be referred to as **failed attempt verbs** (FA-verbs) hereafter.

Verbs like *oj* 'destroy, crumble, take down, demolish' are different: they accept both the failed attempt and partial success scenarios, as shown in (14)-(15):

- (14) *işci eki kün üj-nü oj-ɾan-di.*  
 worker two day house-ACC demolish-PFCT-3SG  
 'The worker was involved in taking down the house for two days.' (lit. 'The worker took down the house for two days.')

(15) Scenarios for (14):

- a. **Failed attempt:** For two days, the worker was trying to take down the house, but the house was so firm that he gave up, not being able to remove a single brick.
- b. **Partial success:** For two days, the worker was taking down the house; he removed the roof and one of the walls, but then was asked to stop.

On the partial success scenario in (15b), the event does not culminate, but in a strikingly different way than in (15a): the theme is not completely destroyed when the event terminates, but it definitely undergoes some change. From now on verbs like *oj* 'demolish, take down, crumble' which are compatible with the partial success scenario, will be referred to as **partial success verbs**, or **PS-verbs**.

For PS-verbs like *oj*, it is the context that determines what kind of non-culminating interpretation we get. Imagine a big medieval house made of huge heavy rocks and a worker only equipped with a pickaxe. Here we are most likely to get (15a). If, on the other hand, the house is a small shack and the worker came with a pneumatic chipper, (15b) would be most probable. Crucially, FA-verbs are not dependent on the context in a comparable way: no kind of context can improve (12) under the partial success scenario.

Finally, it should be pointed out that the FA/PS contrast is not an accidental property of individual lexical entries like 'open' and 'tear' vs. 'crumble, demolish': it is characteristic of the whole class of accomplishment predicates. A few more instances of each class come in (16):

- (16) a. PS-verbs: *buz* 'spoil', *quj* 'pour out', *soz* 'stretch', *tazala* 'clean', *tög* 'spill out',...
- b. FA-verbs: *ac* 'open', *ij* 'untie, release', *ujat* 'wake up', *sindir* 'break',...

Let us take stock of what we have observed so far. There are languages where accomplishment predicates do not entail culmination, and Karachay-Balkar is among them. In such languages, two types of non-culminating readings are available: the partial success reading whereby the theme undergoes a distinguishable change before the eventuality terminates, and the failed attempt reading whereby the theme undergoes no change at all. Accomplishment verbs fall into two classes as to what type of non-culminating readings they produce: FA-verbs, which are only compatible with the failed attempt reading, and PS-verbs, that can also have the partial success reading.<sup>6</sup>

Therefore, empirically, we have two questions to answer. First, how to capture the difference between failed attempt and partial success readings? Secondly, how to account for the difference between FA- and PS-accomplishments? In what follows, I will argue that answers to both questions rely essentially on rich predicate decomposition.

### 3 Approaching non-culmination

The main intuition that emerges at this point is that accomplishment predicates like ‘tear’ and ‘destroy, take down, crumble’ are to be viewed as denoting complex events consisting of a number of subevental components such as the agent’s activity, process in the theme and the result state of the theme. Different types of non-culmination, then, can be related to different components. One type, the failed attempt, is, in a sense, an activity-related non-culmination: agent’s activity does occur in the actual world, but the rest of the complex eventuality does not. Another type, the partial success, is process-related: the process in the theme induced by the agent’s activity does exist in the actual world, but the culmination of this process as well as the result state immediately following the culmination do not. Given that the failed attempt interpretation is available for both PS- and FA-accomplishments listed in (16a-b), the activity-related non-culmination is what they share. In contrast, availability of the process-related non-culmination makes PS-accomplishments in (16a) different from FA-accomplishments in (16b), as represented in (17)-(18):

|      |                     |                 |                 |              |
|------|---------------------|-----------------|-----------------|--------------|
| (17) | FA-accomplishments: | Activity –      | Process –       | Result State |
|      |                     | ↑               | ‡               |              |
|      |                     | Non-culmination | Non-culmination |              |

<sup>6</sup>In Lyutikova & Tatevosov 2008 we discuss one further grammatical manifestation of PS/FA distinction — the different behavior of these two classes of accomplishments under anticausativization, as exemplified in (i)-(ii):

- (i) \*xali eki minut zirt-il-ban-di.  
 thread two minute-ACC tear-ANTICAUS-PFCT-3SG  
 Lit. ‘The thread tore for two minutes.’
- (ii) üj eki zil oj-ul-ban-di.  
 house two year destroy-ANTICAUS-PFCT-3SG  
 ‘The house was decaying for two years.’ (lit. ‘The house went into ruin for two years.’)

Examples in (i)-(ii) indicate that unlike FA-verbs like ‘tear’, PS-verbs like ‘destroy, take down’ retain the non-culminating interpretation when anticausativized. Lyutikova and Tatevosov (2008) argue that this contrast can fully be reduced to different event structures of FA- and PS-accomplishments, hence accounted for.





what happens with all non-culminating accomplishments discussed above, regardless of whether they refer to failed attempts or to partially successful actions.

(20) suggests that non-culminating event predicates denote eventualities that are literally parts of eventualities from corresponding culminating ones. However, this extensional analysis appears to run into a complication familiar from extensional analyses of the progressive. What non-culminating accomplishments and progressives have in common is the Imperfective Paradox: a proposition in, e.g., (8b) can be true in the actual world without a corresponding proposition in (8a) being true. A semantic representation of the non-culminating reading based on (20) fails to capture this characteristic, since a «complete» event, according to (20), must exist in the actual world.

This suggests that main arguments for the intensional analysis of the progressive put forward in Dowty 1977, 1979 as well as in later developments of the intensional approach (e.g., Landman 1992, Portner 1998) are applicable to non-culminating accomplishments, too. These (or similar) observations led Koenig and Muansuwan (2001) and Bar-el et al. (2005) to offer analyses of non-culmination based on inertia worlds. Both proposals rely on the same idea: non-culmination implies that the complete eventuality exists in inertia worlds, that is, in all worlds which are exactly like the given world but where the future course of events develops in ways most compatible with the past course of events, to use Dowty's (1979:128) original formulation.

Specifically, Bar-el et al. (2005) analyze non-culminating event predicates occurring in sentences like (21) as in (22):

(21) St'át'imcets (Bar-el et al. 2005)

máys-en-lhkan ti q'láxan-a, t'u7 cw7aoy t'u7 kw-s  
fix-TRANS-1SG.SUBJ DET fence-DET but NEG just DET-NOM  
tsúkw-s-an.  
finish-CAUS-1ERG

Lit. 'I fixed the fence, but I didn't finish.'

(22) The denotation of tenseless and aspectless  $\nu P$  in (21):

$\| \text{máys-en-lhkan ti q'láxan-a} \|^{w,g} = \lambda e [I \text{ am the agent of } e \text{ in } w \wedge e \text{ is controlled by me in } w \wedge \forall w' [w' \text{ is an inertia world w.r.t. } w \text{ at the beginning of } e \rightarrow \exists e' [\text{the fence gets fixed in } w'(e') \wedge e \text{ causes } e' \text{ in } w']]]$

(22) is (a characteristic function of) a set of events in which the speaker is an agent who exercises control over their development in the actual world. In every inertia world, these events bring about a change of state of the fence, the fence getting fixed.

Koenig and Muansuwan (2001) deal with non-culminating accomplishments in Thai, suggesting that accomplishment verb stems in Thai are fundamentally imperfective. In their system, lexical entries for all accomplishment stems contain a built-in imperfective operator, based the notion of inertia worlds, too.

(23) Semantics for the imperfective operator (Koenig and Muansuwan 2001).

- a.  $\alpha = \text{Impfv}(ev, \phi)$
- b. An eventuality  $ev$  and an event description  $\phi$  satisfy condition  $\alpha$  iff there is an  $e'$  which (non-necessarily properly) includes  $ev$  and satisfies  $\phi$  in all inertia worlds, i. e. in all worlds compatible with what it would mean to complete  $ev$  without being interrupted.

Accordingly, non-culminating accomplishments would be analyzed as in (24):

$$(24) \quad \|\text{John open the door}\|^{w, g} = \\ \lambda e. \text{Impfv}(e, \lambda e' [\text{write}(e') \wedge \text{agent}(\text{John})(e') \wedge \text{theme}(\text{door})(e')])$$

I suggest that an analysis along the lines of (22)-(24) is basically correct but is not sufficient by itself to capture the difference between FA- and PS- accomplishments.<sup>7</sup> In the next section, I will isolate the main problem for non-decompositional analyses like that in (24) as well as for the theories that assume the two-component decomposition, an instance of which is (22).

### 3.2 Partial success vis-à-vis failed attempt

On the modal approach to non-culmination, the informal notions of failed attempt (=activity-related non-culmination) vs. partial success (=process-related non-culmination) introduced in section 2 can be given the following sense. These two types of non-culmination are different ways of distributing subevental components of accomplishment event structure between the actual and inertia worlds, as represented in Table 1.

|                      | CULMINATING  | NON-CULMINATING       |                       |
|----------------------|--------------|-----------------------|-----------------------|
|                      |              | partial success       | failed attempt        |
| Agent's activity     | Actual world | Actual world          | Actual world          |
| Process in the Theme | Actual world | Actual world          | <b>Inertia worlds</b> |
| Result state         | Actual world | <b>Inertia worlds</b> | <b>Inertia worlds</b> |

Table 1. Culminating and non-culminating readings

Table 1 makes the preliminary hypothesis in (19) more explicit. The culminating reading obtains if all the three components of a complex eventuality occur in the actual world. Accordingly, for an eventuality not to culminate means that at least the result state occurs in inertia worlds. The partial success and failed attempt interpretations differ in whether the process in the theme occurs in inertia worlds, too. In this way, Table 1 captures generalizations represented informally in (17)-(18).

The crucial thing to note at this point is that the distribution of subevental components between actual and inertia worlds in Table 1 cannot be easily captured either by Koenig and Muansuwan and Bar-el et al. theories of non-culmination, nor by alternative theories assuming a non-decompositional representation of accomplishments or a two-way predicate decomposition.

To see this, let us first try a non-decompositional theory along the lines of Koenig and Muansuwan (for the sake of simplicity I represent arguments as individual constants, as before). The major complication is that, given (23), PS- and FA-accomplishments are treated on a par, as in (25a-b).

<sup>7</sup>Below I will not challenge Koenig and Muansuwan (2001) and Bar-el et al.'s (2005) assumption that non-culmination has to do with inertia worlds. I am aware of a variety of problems this notion introduces into the analysis of the progressive, of course. Given parallelism between non-culminating and progressive interpretations, refinements of the analysis along the lines of Landman 1992 or Portner 1998 may be in order. However, I believe that nothing in the below line of reasoning relies on any specific assumptions about what the modal analysis has to look like. It should be compatible with whatever reasonable modal theory solving the imperfective paradox.

- (25) a.  $\| \text{John tear the thread} \|^{w, g}$   
 $= \lambda e. \text{Impfv}(e, \lambda e' [\text{tear}(e') \wedge \text{agent}(\text{John})(e') \wedge \text{theme}(\text{thead})(e')])$
- b.  $\| \text{John take down the house} \|^{w, g}$   
 $= \lambda e. \text{Impfv}(e, \lambda e' [\text{demolish}(e') \wedge \text{agent}(\text{John})(e') \wedge \text{theme}(\text{house})(e')])$

Under the non-decompositional analysis in (25a-b), events accomplishments denote are conceived of as an indivisible whole. Neither (25a) nor (25b) separate activity performed by the external argument and change of state undergone by the internal argument. As a consequence, (25a-b) do not impose any explicit restrictions on how activity is related to the change of state.

Therefore, the denotation of event predicates like  $P = \lambda e' [\text{demolish}(e') \wedge \text{agent}(\text{John})(e') \wedge \text{theme}(\text{house})(e')]$  would contain different kinds of demolishing events. First, those will be events of “gradual destruction” in which the agent’s activity induces a gradual change in the house such that the house finally enters the result state of being destroyed. Secondly,  $P$  will also denote events of “instant destruction” in which all the change of state occurs at the minimal final part of the activity, while non-final parts of the activity bring about no identifiable change of the house at all. (Imagine a worker equipped with a chopper who crashes a supporting wall for a certain time. At some point, the wall collapses all at once, and the house immediately collapses, too).

Applying Impfv to  $P$  in (25b) extracts (non-final) parts of events from the denotation of  $P$  and “moves” the remainder to inertia worlds.<sup>8</sup> It is not difficult to see that extracted parts denoted by (25b) will be different for the above two kinds of demolishing events. Parts of events of “gradual destruction” still involve some agent’s activity and some change in the theme. This is, of course, the partial success reading discussed above. On the other hand, parts of events of “instant destruction” are those in which only agent’s activity is going on: since the change of state occurs at the minimal final part of the event, and we are dealing with its proper non-final parts, the whole change of state will be forced out from the actual world. It is in this way, one can argue, that the failed attempt interpretation emerges.

The crucial problem, then, is that there is no principled explanation for why exactly the same possibilities are not available for the identical event predicate in (25a). Specifically, why should tearing events in (25a) be incompatible with the “gradual tearing” scenario whereby the agent tears a thread gradually, parts of the change of state being mapped onto parts of the activity? Common sense suggests that this would not be a possible tearing event, and (12)-(13) show that the partial success interpretation is not in fact available for ‘tear a thread’, but (25) where ‘tear’ and ‘demolish’ are analyzed in the same way do not tell us why this should be the case. PS- and FA- accomplishments are therefore not distinguished by the non-decompositional analysis.

Now consider Bar-el et al.’s decompositional analysis in (26). In (26), the overall eventuality is analyzed as consisting of the agent’s activity and the change of state of the theme:

<sup>8</sup>K&M use a part relation “ $\leq$ ”, not a proper part relation “ $<$ ” in the semantic representation of Impfv to allow a predicate denote eventualities that culminate in the actual world. For the sake of argument I focus on the case where extracted parts are *proper* non-final parts of events from the denotation of  $P$  and ignore the case of identity, irrelevant for the argument.

- (26) a.  $\| \text{John tear the thread} \|^{w,g} = \lambda e[\text{agent}(\text{John})(e) \text{ in } w \wedge e \text{ is controlled by John in } w \wedge \forall w' [w' \text{ is an inertia world w.r.t. } w \text{ at the beginning of } e \rightarrow \exists e' [\text{tear}(\text{thread})(e') \text{ in } w' \wedge \text{cause}(e')(e) \text{ in } w']]]$
- b.  $\| \text{John take down the house} \|^{w,g} = \lambda e[\text{agent}(\text{John})(e) \text{ in } w \wedge e \text{ is controlled by John in } w \wedge \forall w' [w' \text{ is an inertia world w.r.t. } w \text{ at the beginning of } e \rightarrow \exists e' [\text{get.destroyed}(\text{house})(e') \text{ in } w' \wedge \text{cause}(e')(e) \text{ in } w']]]$

Under this analysis, uninflected *vPs* [*John tear the thread*] and [*John take down the house*] denote events in the actual world in which John is the agent who exercises control over their development. In all inertia worlds, these events bring about the change of state of the theme, the thread getting torn, the house getting destroyed.

The problem of inseparability of PS- and FA-accomplishments we encountered above is still here, however. Let us take a closer look at the range of interpretations (26a-b) could have. Most obviously, one of these interpretations is a failed attempt: it obtains if the agent activity occurs in the actual world, whereas the rest of eventuality does not. (26a-b) therefore, correctly predict that both types of accomplishments do allow for this interpretation.

Both (26a-b), then, allow events to culminate in the actual world. This happens because Bar-el. et al. define inertia worlds with respect to the beginning of the activity. As a consequence, the actual world as it is happens to be at the end of the activity can (although need not) be identical to one of those inertia worlds, and this is how the culminating interpretation obtains.

The problem, then, still has to do with the partial success interpretation. Suppose that at the end of the activity the event did not culminate (i.e. the actual world is not in the set of inertia worlds defined with respect to the beginning of the activity). Nothing in (26a-b) suggests, however, that in such a case no process in the theme is possible. For instance, (26b) only entails that in the actual world the proposition  $\exists e' [\text{get.destroyed}(\text{house})(e')]$  does not hold, that is, that the house is not completely destroyed. (26b) thus does not entail that it undergoes no change at all. (26a-b) should therefore both be compatible with the partial success interpretation. Obviously, at this point the same complication as before emerges: we do not want to have a partial success interpretation for FA-accomplishments like 'tear the thread', but the semantic representation in (26) does not offer a natural way of excluding this interpretation. Even worse: if one finds a way to guarantee that that FA-accomplishments do not have the PS-reading, it is not clear how to avoid obtaining the same result for 'take down a house'.

Abandoning the assumption that inertia worlds are defined with respect to the beginning of the activity does not solve the problem. Assume that inertia worlds are identical to the base world up to the moment where the activity stops (cf. Dowty 1979:146):

- (27) a.  $\| \text{John tear the thread} \|^{w,g} = \lambda e[\text{agent}(\text{John})(e) \text{ in } w \wedge e \text{ is controlled by John in } w \wedge \forall w' [w' \text{ is an inertia world w.r.t. } w \text{ at the end of } e \rightarrow \exists e' \exists e'' [\text{tear}(\text{thread})(e'') \text{ in } w' \wedge \text{cause}(e'')(e') \text{ in } w' \wedge e < e' \text{ in } w']]]$
- b.  $\| \text{John take down the house} \|^{w,g} = \lambda e[\text{agent}(\text{John})(e) \text{ in } w \wedge e \text{ is controlled by John in } w \wedge \forall w' [w' \text{ is an inertia world w.r.t. } w \text{ at the end of } e \rightarrow \exists e' \exists e'' [\text{get.destroyed}(\text{house})(e'') \text{ in } w' \wedge \text{cause}(e'')(e') \text{ in } w' \wedge e < e' \text{ in } w']]]$

(27a-b) denote agent's activities  $e$  occurring in our world. In every inertia world  $w'$ , identical to our world up to the moment where  $e$  stops, there is an activity  $e'$ , of which  $e$  is a part, and  $e'$  brings about a change of state,  $e''$ , in  $w'$ . In (27a-b), events culminating in the base world are no longer part of the denotation of event predicates, since worlds start branching when the activity stops. Yet, the fact that no process in the theme goes on in the base world is not guaranteed. While it cannot be the case that the house gets destroyed in the actual world, it still can be the case that it undergoes at least some change, and it still is not clear how to get rid of the same possibility for 'tear a thread'.

Generalizing over this case, one can observe that all theories involving two-component decomposition into activity and change of state (e.g., Pylkkänen 2002) inevitably run into the same problem of inseparability.

Let us try another type of the two-way decomposition whereby activity is connected to the result state directly, as in Kratzer 2000.

- (28) a. kerim eşik-ni ac-xan-di.  
Kerim door-ACC open-PFCT-3SG  
'Kerim opened the door.'
- b. Agent's activity vs. result state of the theme, cf. Kratzer 2000  
 $\| [{}_{VP} \text{kerim eşik ac-}] \|^{w,g} =$   
 $\lambda e \exists s [\text{agent}(\text{Kerim})(e) \wedge \text{opening}(e) \wedge \text{open } S(\text{door})(s) \wedge \text{cause}(s)(e)]$   
 where **open**<sub>s</sub> is a predicate denoting states of being open.

Now consider non-culminating versions of *John tear the thread* and *John take down the house*:

- (29) Agent's activity vs. result state of the theme
- a.  $\| [{}_{VP} \text{fatima xalı zirt-}] \|^{w,g} = \lambda e [\text{agent}(\text{fatima})(e) \text{ in } w \wedge \text{tear}(e) \text{ in } w \wedge \forall w' [w' \text{ is an i-world w.r.t. } w \text{ at the end of } e \rightarrow \exists e' \exists s [\text{torn}_s(\text{thread})(s) \text{ in } w' \wedge \text{cause}(s)(e') \text{ in } w' \wedge e < e' \text{ in } w']] ]$
- b.  $\| [{}_{VP} \text{işci üj oj-}] \|^{w,g} = \lambda e [\text{agent}(\text{worker})(e) \text{ in } w \wedge \text{demolishing}(e) \text{ in } w \wedge \forall w' [w' \text{ is an i-world w.r.t. } w \text{ at the end of } e \rightarrow \exists e' \exists s [\text{demolished}_s(\text{house})(s) \text{ in } w' \wedge \text{cause}(s)(e') \text{ in } w' \wedge e < e' \text{ in } w']] ]$

(29a-b) differ from (27a-b) in that the second subevental component of a complex eventuality is a state, not a change of state. (29a-b) do not make explicit if any process happens to the theme in the actual world. Since for (29) it is only obligatory that the result state occurs in inertia worlds, (29a-b) would again be compatible with both failed attempt and partial success scenarios. As a result, if, according to (29), the partial success reading is available for *oj*, the same should hold for *zirt*.

To sum up, whatever strategy we adopt, the distribution in Table 1 cannot be derived, because FA-verbs like *zirt* 'tear' and PS-verbs like *oj* 'demolish, take down, crumble' are inevitably treated on a par: both are predicted to be compatible with both FA- and PS- readings. As we saw earlier, this prediction is not borne out.

Given the above observations, the source of the complication seems to be clear: the partial success and failed attempt interpretations are not distinguished explicitly by different semantic representations. They both "live" within the same event predicate, either non-decompositional, as in (25), or involving two-component decomposition,

as in (26), (27), (29). Therefore, neither analysis is able to capture the difference between failed attempt and partial success interpretations, hence between PA- and PS-verbs: these versions of the theory do not provide us with enough subevental structure.

### 3.3 Three-way decomposition

If, as I tried to show, the problem of inseparability has to do with the insufficient subevental structure, what we need is a more articulated predicate decomposition, making explicit a three-way distinction between activity, process and result state. With such a distinction, complications discussed in the previous section do not emerge. Most significantly, the difference between two non-culminating readings of the PS-accomplishment *oj* can be represented as in (30)-(31).

(30) Failed attempt

$$\| [\nu_P \text{ i}\check{s}ci \text{ } \check{u}j \text{ } oj- ] \|^{w,g} = \lambda e [\text{agent}(\text{worker})(e) \text{ in } w \wedge \text{demolish}_A(e) \text{ in } w \wedge \forall w' [w' \text{ is an i-world for } w \text{ w.r.t. } e \rightarrow \exists e' \exists e'' \exists s [\text{demolish}_P(\text{house})(e'') \text{ in } w' \wedge \text{cause}(e'')(e') \text{ in } w' \wedge e < e' \text{ in } w' \wedge \text{demolish}_R(\text{house})(s) \text{ in } w' \wedge \text{cause}(s)(e'') \text{ in } w']] ]$$

where *demolish<sub>A</sub>*, *demolish<sub>P</sub>*, and *demolish<sub>S</sub>* denote demolishing activities, processes of getting demolished, and states of being demolished, respectively.

(30) denotes the agent's demolishing activities occurring in the actual world. In all inertia worlds, the agent's activity causes a process of destruction in the theme that leads to a result state of being destroyed.

(31) Partial success

$$\| [\nu_P \text{ i}\check{s}ci \text{ } \check{u}j \text{ } oj- ] \|^{w,g} = \lambda e \exists e' [\text{agent}(\text{worker})(e) \text{ in } w \wedge \text{demolish}_A(e) \text{ in } w \wedge \text{demolish}_P(\text{house})(e') \text{ in } w \wedge \text{cause}(e')(e) \text{ in } w \wedge \forall w' [w' \text{ is an i-world for } w \text{ w.r.t. } e' \rightarrow \exists e'' \exists s [\text{demolish}_S(\text{house})(s) \text{ in } w' \wedge \text{cause}(s)(e'') \text{ in } w' \wedge e' < e'' \text{ in } w']] ]$$

(31) denotes the agent's demolishing activities that cause a process of destruction in the theme in the actual world. In all inertia worlds, this process leads to a result state of being destroyed.

In representations in (30)-(31) the difference between FA-verbs and PS-verbs is fully revealed: on the non-culminating interpretation, uninflected  $\nu$ Ps based on FA-verbs can only denote events that do not cause any process in the theme in the actual world:

(32) Failed attempt

$$\| [\nu_P \text{ fatima } xali \text{ } zirt- ] \|^{w,g} = \lambda e [\text{agent}(\text{fatima})(e) \text{ in } w \wedge \text{tear}_A(e) \text{ in } w \wedge \forall w' [w' \text{ is an inertia world for } w \text{ w.r.t. } e \rightarrow \exists e' \exists e'' \exists s [\text{tear}_P(\text{thread})(e'') \text{ in } w' \wedge \text{cause}(e'')(e') \text{ in } w' \wedge e < e' \text{ in } w' \wedge \text{tear}_R(\text{thread})(s) \text{ in } w' \wedge \text{cause}(s)(e'') \text{ in } w']] ]$$

(32) denotes the agent's tearing activities occurring in the actual world. In all inertia worlds, these activities cause a tearing process in the theme that leads to a result state of being torn. In contrast, events in which the agent's activity brings about the process in the theme in the actual worlds, with the culmination of this process as well as a subsequent result state only being moved to inertia worlds, do not fall under the denotation of  $\nu$ P [Fatima tear a thread]:<sup>9</sup>

<sup>9</sup>The CSSP anonymous reviewer has suggested that a possible alternative to the analysis in (30)-(33) can look as follows. Whereas the event structure of predicates 'take down the house', which do distin-

(33) \*Partial success: not available

$$\lambda e \exists e' [\text{agent}(\text{fatima})(e) \text{ in } w \wedge \text{tear}_A(e) \text{ in } w \wedge \text{tear}_P(\text{thread})(e') \text{ in } w \wedge \text{cause}(e')(e) \text{ in } w \wedge \forall w' [w' \text{ is an inertia world for } w \text{ w.r.t. } e \rightarrow \exists e'' \exists s [\text{tear}_S(\text{thread})(s) \text{ in } w' \wedge e' < e'' \text{ in } w' \wedge \text{cause}(s)(e') \text{ in } w']] \not\subseteq \llbracket [{}_{\nu P} \text{ fatima xalı zirt-}] \rrbracket^{w, g}$$

As is clear from (30)-(33), non-culmination can be introduced at different levels of subevental structure. For the failed attempt interpretation, it is a level of agent's activity, with all the rest being removed to inertia worlds. For the partial success it is a level of a process the theme undergoes, with the result state only being forced out from the actual world. In this way, the distribution in Table 1 is captured, and the first part of the preliminary hypothesis in (19) is made explicit: the failed attempt in (30) and (32) is treated as an activity-related non-culmination, while the partial success in (31) comes out as a process-related non-culmination.

I am in a position of summarizing main results of this section. Partially successful actions differ from failed attempts in how parts of eventualities are distributed between the actual and inertia worlds. This difference is successfully captured by the three-component decomposition into activity, process, and result state subevents, but not by the twocomponent decomposition, nor by a non-decompositional theory. The partial success reading obtains if the result state is attained in inertia worlds, but two other subevents occur in the actual world. The failed attempt reading obtains if both the process and result state occur in inertia worlds, while the activity still occurs in the actual world. Therefore, if an overall eventuality consists of three subevents, the difference boils down to whether a process subevent occurs in the actual world. Finally, FA-verbs are only associated with the activity-related non-culmination; for PS-verbs both sources are available.

So far, semantic representations of different readings of  $\nu$ Ps containing FA- and PS-verbs are provided but not compositionally derived. This task is accomplished in the next section.

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guish between PS and FA readings, consists of three subevents, as in (30)-(31), that of predicates like 'tear a thread', which only allow for one non-culminating interpretation, is simpler: it contains two subevents, hence only one possible source of non-culmination. In such a system the number of non-culminating interpretations reflect the number of subevental components directly. I have two reasons to believe that the analysis of in (30)-(33) is more tenable. Firstly, if predicates like 'tear a thread' undergo two-component decomposition, the problem discussed in section 3.2 re-emerges. For a single non-culminating interpretation one gets event predicates either like (i) (cf. 27a) or like (ii) (cf. 29a), but neither tells us why this single interpretation is a failed attempt but not a partial success:

- (i) a.  $\llbracket [{}_{\nu P} \text{ fatima xalı zirt-}] \rrbracket^{w, g} = \lambda e [\text{agent}(\text{fatima})(e) \text{ in } w \wedge \text{tear}_A(e) \text{ in } w \wedge \forall w' [w' \text{ is an i-world w.r.t. } w \text{ at the end of } e \rightarrow \exists e'' \exists e''' [\text{tear}_P(\text{thread})(e'') \text{ in } w' \wedge \text{cause}(e''')(e') \text{ in } w' \wedge e < e' \text{ in } w']]]$
- b.  $\llbracket [{}_{\nu P} \text{ fatima xalı zirt-}] \rrbracket^{w, g} = \lambda e [\text{agent}(\text{fatima})(e) \text{ in } w \wedge \text{tear}_A(e) \text{ in } w \wedge \forall w' [w' \text{ is an i-world w.r.t. } w \text{ at the end of } e \rightarrow \exists e'' \exists s [\text{torn}_S(\text{thread})(s) \text{ in } w' \wedge \text{cause}(s)(e') \text{ in } w' \wedge e < e' \text{ in } w']]]$

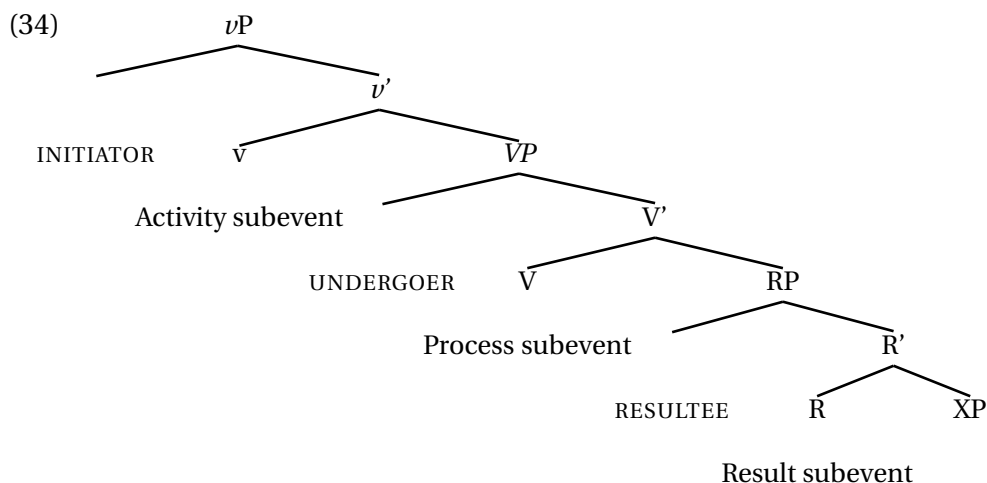
Secondly, putting non-culminating phenomena aside, accomplishments like 'tear a thread' and 'take down a house' pattern together as to a bulk of other semantic and syntactic characteristics (Lyutikova & Tatevosov 2008). Assuming that they are associated with different subevental structure would inevitable miss a number of generalizations about this parallelism.

## 4 Implementation: a constructionalist approach

At the moment, the only fully elaborated theory I am aware of that relies explicitly on the three-component decomposition is Ramchand's (2002, 2003, 2008 and elsewhere) First Phase Syntax. In what follows, I build on and extend this theory by incorporating non-culminating eventive heads into syntactic representations.

### 4.1 Event structure

Ramchand assumes a radical constructionalist approach whereby the whole event structure is built syntactically, with no independent level(s) identical or comparable to lexical conceptual structure, argument structure or so. All information an individual lexical item carries is that about syntactic heads projected by that item within the  $\nu P$  phase. Interpretation of the event structure is determined by syntactic heads themselves:  $v$  introduces an initiation/activity subevent,  $V$  refers to a process induced by that activity, and  $R$ (esult) head denotes the result state brought about by the process. Thematic relations arguments in the specifier positions of  $v$ ,  $V$ , and  $R$  bear to corresponding subevents are fully determined by their structural position: Spec,  $\nu P$  is a position of the initiator of the activity, spec,  $VP$  is where the undergoer of the process is located, and the spec,  $RP$  position is automatically interpreted as hosting the holder of result state. The overall architecture of the articulated  $\nu P$  is represented in (34):



Ramchand's (2002, 2003, 2008) semantics for  $v$ ,  $V$ , and  $R$  heads is given in (35a-c) with minor simplifications and adjustments:

- (35) a.  $\|v\| = \lambda P \lambda x \lambda e \exists e' [v(e) \wedge \text{initiator}(x)(e) \wedge \text{cause}(e')(e) \wedge P(e')]$   
 b.  $\|V\| = \lambda P \lambda x \lambda e \exists s [V(e) \wedge \text{undergoer}(x)(e) \wedge \text{cause}(s)(e) \wedge P(s)]$   
 c.  $\|R\| = \lambda x \lambda s [R(s) \wedge \text{resultee}(x)(s)]$   
 where  $v$ ,  $V$ , and  $R$  are event predicates associated with a given head by the Encyclopedia, and  $P$  is an event predicate denoted by its complement.

Examples of individual lexical entries are shown in (36), where coindexation of heads indicates that they share a participant:

- (36) a. defuse:  $[v, V_i, R_i]$



- b. push: [v, V]  
 c. dance: [v<sub>i</sub>, V<sub>i</sub>]

Thus, for instance, *push* is a transitive activity verb that projects an activity event structure consisting of two subevents, activity and process, with two distinct arguments, initiator and undergoer. *Dance* creates the same event structure, the only difference being that the initiator of the activity and undergoer of the process are identical, hence the event structure is unergative. Finally, encyclopedia entries associated with lexical items like those in (36) provide descriptive content for the event structure, that is, specify event predicates involved in the interpretation (**v**, **V** and **R** in (35)).

Accomplishment verbs like ‘tear’ or ‘destroy’ are all [v, V<sub>i</sub>, R<sub>i</sub>] in this system. For culminating clauses like (37a) and (38a), projecting *vP*, saturating all argument positions, and combining denotations of eventive heads and their complements via functional application yields event predicates in (37b) and (38b).

- (37) a. alim üj-nü oj-ɣan-di.  
 Alim house-ACC demolish-PFCT-3SG  
 ‘Alim took down the house.’  
 b.  $\| [{}_{vP} \text{ Alim take down house}] \| = \lambda e \exists e' \exists s [\text{demolish}_A(e) \wedge \text{initiator}(\text{Alim})(e) \wedge \text{cause}(e')(e) \wedge \text{demolish}_P(e') \wedge \text{undergoer}(\text{house})(e') \wedge \text{cause}(s)(e') \wedge \text{demolish}_S(s) \wedge \text{resultee}(\text{house})(s)]$
- (38) a. alim xali-ni zirt-xan-di.  
 Alim thread-ACC tear-PFCT-3SG  
 ‘Alim tore a thread’  
 b.  $\| [{}_{vP} \text{ Alim tear thread}] \| = \lambda e \exists e' \exists s [\text{tear}_A(e) \wedge \text{initiator}(\text{Alim})(e) \wedge \text{cause}(e')(e) \wedge \text{tear}_P(e') \wedge \text{undergoer}(\text{thread})(e') \wedge \text{cause}(s)(e') \wedge \text{tear}_S(s) \wedge \text{resultee}(\text{thread})(s)]$

(37b) and (38b) only derive the culminating interpretation, however. To account for the non-culmination the theory is to be extended in a way compatible with the generalizations in (19) and results of section 2.

## 4.2 Non-culminating eventive heads

I see two possible directions to take at this juncture. First, one can assume that activity-related and process-related non-culmination is introduced by an operator *Op* that adjoins VP and RP respectively:

- (39) a. Activity-related non-culmination (failed attempt):  
 $[{}_{vP} \dots v \dots [{}_{VP} \text{ Op } [{}_{VP} \dots V \dots [{}_{RP} \dots R \dots ]]]$   
 b. Process-related non-culmination (partial success):  
 $[{}_{vP} \dots v \dots [{}_{VP} \dots V \dots [{}_{RP} \text{ Op } [{}_{RP} \dots R \dots ]]]$

- (40)  $\| \text{Op} \| = \lambda P \lambda e. \text{IM}(P)(e)$

where IM is an inertia modality, a relation between event predicates and events such that  $\| \text{IM}(P)(e) \|^{w, g} = 1$  iff in all inertia worlds *w'* for *w* w.r.t. *e* there is an eventuality(event or state) *e'* such that *e* causes *e'* and *e'* satisfies the event description *P* in *w'*.

In such a system, languages that allow for non-culminating accomplishments differ from languages that do not in that the former but not the latter possess a modifier *Op*. There is a problem with this approach, however. Look at the derivation of the process-related non-culmination in (41). If RP denotes a property of states like that in (41a), adjoining *Op* to RP yields an event predicate in (41b):

- (41) a.  $\| [\text{RP destroy the house}] \|^{w,g} = \lambda s[\text{destroy}_s(s) \wedge \text{resultee}(\text{the house})(s)]$   
 b.  $\| [\text{RP Op } [\text{RP destroy the house}]] \|^{w,g} = \lambda e.\text{IM}(\lambda s[\text{destroy}_s(s) \wedge \text{resultee}(\text{the house})(s)])(e)$

Merging V with RP in (41b) and applying the denotation of V in (35b) to the denotation of that RP creates an event predicate in (42). (42) is clearly not a kind of semantic representation we would like to derive, since it contains, given semantics of IM in (40), one extra subevent and one extra cause relation. We need rather something like (43), but then we have, first, to modify  $\| V \|$  as in (44), and, secondly, to combine V with RP in (41b) by conjunction:

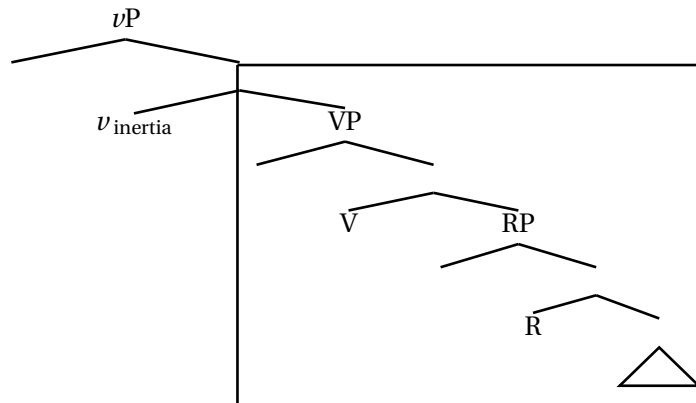
- (42)  $\| [V' V [\text{RP Op RP}]] = \lambda x \lambda e \exists e' [\text{destroy}_p(e) \wedge \text{undergoer}(x)(e) \wedge \text{cause}(e')(e) \wedge \text{IM}(\lambda s[\text{destroy}_s(s) \wedge \text{resultee}(\text{the house})(s)])(e')]$   
 (43)  $\| [V' V [\text{RP Op RP}]] = \lambda x \lambda e [\text{destroy}_p(e) \wedge \text{undergoer}(x)(e) \wedge \text{IM}(\lambda s[\text{destroy}_s(s) \wedge \text{resultee}(\text{the house})(s)])(e)]$   
 (44)  $\| V \| = \lambda x \lambda e [\text{destroy}_p(e) \wedge \text{undergoer}(x)(e)]$

Therefore, having assumed an adjunction approach, we end up by having different semantic representations for eventive heads entering derivations of culminating and non-culminating event structures. The source of this complication is clear: whereas in a culminating structure (e.g., (37b)) the cause relation of a higher subevent to an embedded subevent is introduced by the head itself (as, e.g., in (35b)), in non-culminating structures it has to fall under the scope of inertia modality operator, hence comes out as a part of its denotation. For these reasons, I opt for a different approach: non-culmination is a part of the denotation of eventive heads themselves. *v* and *V* thus come in two varieties: culminating, as in (35a-b), and non-culminating, as in (45a-b):

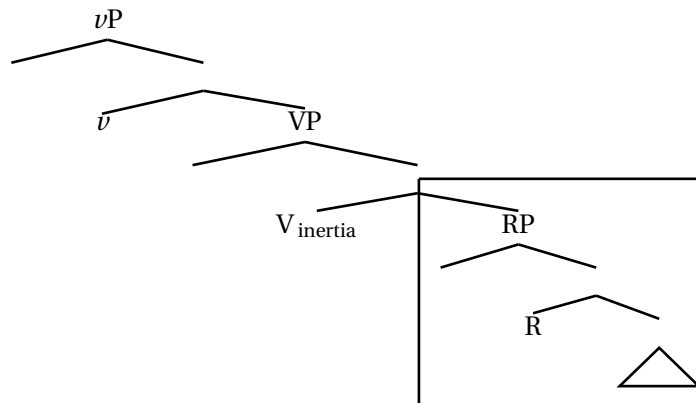
- (45) a.  $\| v_{\text{inertia}} \|^{w,g} = \lambda P \lambda x \lambda e [v'(e) \text{ in } w \wedge \text{initiator}(x)(e) \text{ in } w \wedge \forall w' [w' \text{ is an i-world for } w \text{ w.r.t. } e \rightarrow \exists e' \exists e'' [\text{cause}(e')(e'') \text{ in } w' \wedge e < e'' \text{ in } w' \wedge P(e') \text{ in } w']]]$   
 b.  $\| V_{\text{inertia}} \|^{w,g} = \lambda P \lambda x \lambda e [V'(e) \text{ in } w \wedge \text{undergoer}(x)(e) \text{ in } w \wedge \forall w' [w' \text{ is an i-world for } w \text{ w.r.t. } e \rightarrow \exists e' \exists e'' [\text{cause}(e')(e'') \text{ in } w' \wedge e < e'' \text{ in } w' \wedge P(e') \text{ in } w']]]$

In (45a), the denotation of non-culminating *v* involves the agent's activity occurring in the actual world, while the rest of the eventuality only exists in inertia worlds; in this way, the failed attempt interpretation obtains.  $V_{\text{inertia}}$  in (45b) introduces the process occurring in the actual world, the result state only being "moved" to inertia worlds. This is represented in (46a-b) where the non-culminating part of the overall eventuality is boxed:

- (46) a. failed attempts  $[v_{\text{inertia}}, V_i, R_i]$



b. partially successful actions  $[v, V_i, \text{inertia}, R_i]$



Therefore, the distribution in Table 1 is reduced to different configurations of culminating and non-culminating eventive heads, as represented in Table 2:

|                          | CULMINATING     | NON-CULMINATING                |                                  |
|--------------------------|-----------------|--------------------------------|----------------------------------|
|                          |                 | partial success                | failed attempt                   |
| Agent's activity         | Actual world    | Actual world                   | Actual world                     |
| Process in the undergoer | Actual world    | Actual world                   | <b>Inertia worlds</b>            |
| Result state             | Actual world    | <b>Inertia worlds</b>          | <b>Inertia worlds</b>            |
| Event structure          | $[v, V_i, R_i]$ | $[v, V_i \text{inertia}, R_i]$ | $[V_i \text{inertia}, V_i, R_i]$ |

Table 2. Event structures of non-culminating accomplishments

In such a system, languages with non-culminating accomplishments (e.g., Balkar) differ from those without non-culminating accomplishments (e.g., English) as to the vocabulary of eventive heads. This difference is thus rooted at the level where the denotation of event predicates is computed, not at the higher level of aspectual and temporal functional structure. In this way, the present proposal recapitulates the fundamental insight of Koenig and Muansuwan's and Bar-el et al.'s approach to non-culmination: the non-culmination is built into the semantics of uninflected verbal predicates before they combine with tense/aspect morphology.

### 4.3 Representing FA/PS distinction

If (45a-b) are correct, the difference between verbs like *oj* and *zirt* can be captured by assuming the following lexical specifications:

- (47) a. *oj* [ $v_{(\pm\text{inertia})}$ ,  $V_{i(\pm\text{inertia})}$ ,  $R_i$ ]  
 b. *zirt* [ $v_{(\pm\text{inertia})}$ ,  $V_{i(-\text{inertia})}$ ,  $R_i$ ]

Given (47a-b), *oj* have two possible sources of non-culmination,  $v_{\text{inertia}}$  and  $V_{\text{inertia}}$ . For *zirt*, the single source,  $v_{\text{inertia}}$ , is only available.

Semantic representations of two non-culminating readings of *oj* are given in (48b-c); the single non-culminating reading of *zirt* is represented in (49b).

- (48) a. *išci eki kün üj-nü oj-βan-di.*  
 worker two day house-ACC demolish-PFCT-3SG  
 ‘The worker was involved in taking down the house for two days’  
 b. [ $v_{\text{inertia}}$ ,  $V_i$ ,  $R_i$ ] (failed attempt):  
 $\|\nu P\|^{w,g} = \lambda e [\text{demolish}_A(e) \text{ in } w \wedge \text{initiator}(\text{worker})(e) \text{ in } w \wedge \forall w' [w' \text{ is an } i\text{-world for } w \text{ w.r.t. } e \rightarrow \exists e' \exists e'' \exists s [\text{cause}(e')(e'') \text{ in } w' \wedge \text{demolish}_P(e') \text{ in } w' \wedge \text{undergoer}(\text{house})(e') \text{ in } w' \wedge e < e'' \text{ in } w' \wedge \text{cause}(s)(e') \text{ in } w' \wedge \text{demolish}_S(s) \text{ in } w' \wedge \text{resultee}(\text{house})(s) \text{ in } w']] ]$   
 c. [ $v$ ,  $V_{\text{inertia } i}$ ,  $R_i$ ] (partial success):  
 $\|\nu P\|^{w,g} = \lambda e \exists e' [\text{demolish}_A(e) \text{ in } w \wedge \text{initiator}(\text{worker})(e) \text{ in } w \wedge \text{cause}(e')(e) \text{ in } w \wedge \text{demolish}_P(e') \text{ in } w \wedge \text{undergoer}(\text{house})(e') \text{ in } w \wedge \forall w' [w' \text{ is an } i\text{-world for } w \text{ w.r.t. } e \rightarrow \exists e'' \exists s [\text{cause}(s)(e'') \text{ in } w' \wedge e' < e'' \text{ in } w' \wedge \text{demolish}_S(s) \text{ in } w' \wedge \text{resultee}(\text{house})(s) \text{ in } w']] ]$
- (49) a. *fatima eki minut xali-ni zirt-xan-di.*  
 Fatima two minute thread-ACC tear-PFCT-3SG  
 ‘Fatima tried to tear a thread for two minutes’  
 b. [ $v_{\text{inertia}}$ ,  $V_i$ ,  $R_i$ ] (failed attempt):  
 $\|\nu P\|^{w,g} = \lambda e [\text{tear}_A(e) \text{ in } w \wedge \text{initiator}(\text{fatima})(e) \text{ in } w \wedge \forall w' [w' \text{ is an } i\text{-world for } w \text{ w.r.t. } e \rightarrow \exists e' \exists e'' \exists s [\text{cause}(e')(e'') \text{ in } w' \wedge e < e'' \text{ in } w' \wedge \text{tear}_P(e') \text{ in } w' \wedge \text{undergoer}(\text{thread})(e') \text{ in } w' \wedge \text{cause}(s)(e') \text{ in } w' \wedge \text{tear}_S(s) \text{ in } w' \wedge \text{resultee}(\text{thread})(s) \text{ in } w']] ]$

(48)-(49) account for the range of interpretations of PS- and FA-verbs like *oj* ‘demolish, take down, crumble’ and *zirt* ‘tear’.

Therefore, what accomplishments like ‘destroy’ or ‘tear’ in Balkar have in common is that VP can be merged with either  $v$  or  $v_{\text{inertia}}$ . What tells them apart is  $[\pm\text{inertia}]$  vs.  $[-\text{inertia}]$  specifications assigned to the V head.

#### 4.4 Aspectual structure

So far, I have been dealing with uninflected, that is, tensless and aspectless  $\nu$ Ps. In fully inflected clauses non-culminating accomplishments occurring in the Perfect/ Preterite/Simple Future form (see (8b) and (11a-b)), display perfective grammatical (viewpoint) aspect. Following much recent literature on aspect, I assume that uninflected  $\nu$ Ps merge with the Aspect head creating AspectP, as in (50a); the Aspect head hosts aspectual operators in (50b-c):

- (50) a. [ $_{\text{AspectP}}$  PFV/IPFV [ $_{\nu P}$  ... ]]  
 b.  $\|\text{PFV}\| = \lambda P \lambda t \exists e [t \supset \tau(e) \wedge P(e)]$

$$c. \quad \|\text{IPFV}\| = \lambda P \lambda t \exists e [t \subset \tau(e) \wedge P(e)]$$

As standardly assumed, aspectual operators take event predicates denoted by the complement  $\nu P$  and map them onto predicates over times, existentially binding the event variable. Specifically, perfective AspectPs denote times that include the running time of an event from the denotation of  $\nu P$ , whereas the imperfective viewpoint aspect involves times that are included in the running time. The crucial characteristic of this architecture is that the Aspect head does not change the denotation of their  $\nu P$  complements, only introducing reference time and relating it to the running time of an event. The reader can easily check that combining the PFV operator in (50b) with event predicates in (48b-c) and (49b) would yield right interpretations for corresponding perfective clauses in (48a) and (48b).

A straightforward prediction emerges at this point.<sup>10</sup> Since perfective and imperfective clauses share  $\nu P$ , one can expect that the latter exhibit exactly the same range of non-culminating interpretations as the former. Imperfective PS-accomplishments would produce both FA and PS interpretations, while imperfective FA-accomplishments should only be compatible with failed attempt scenarios. Examples in (51a-b) show that this is indeed the case:

- (51) a. *išci üj-nü oj-a-di.*  
 worker house-ACC demolish-IPFV-3SG  
 ‘The worker is taking down the house.’  
 Scenario 1 <partial success>: He has already removed the roof.  
 Scenario 2 <failed attempt>: He is striking the wall with a pick-axe but has not yet removed a single brick.
- b. *fatima eki minut xali-ni zirt-a-di.*  
 Fatima two minute thread-ACC tear-IPFV-3SG  
 ‘Fatima is tearing a thread.’  
 Only available scenario <failed attempt>: She is tugging the thread, but has not yet succeeded.

Concluding this section, I have to mention one problematic aspect of the analysis developed so far: representations in (47) are clearly a stipulation. While they do capture the difference between PS- and FA-accomplishments, one may be wondering if properties like [ $\pm$ inertia] can be reduced to some more basic semantic characteristics and thus receive a more fundamental explanation. In the next section, not offering a complete solution to this problem, I will present a few observations and generalizations that bear on the issue.

## 5 Restricting distribution of non-culminating eventive heads

A simple answer to the question asked in the previous section would be that not only [ $\pm$ inertia], but any lexical specification is a stipulation to some extent.

One example of this could be thematic properties of arguments specified lexically in most theories of argument structure (see the recent survey by Levin and Rappaport

<sup>10</sup>I am grateful to the CSSP anonymous reviewer who encouraged me to discuss this issue.

Hovav (2005)). For instance, we know that for some verbs the external argument must be the agent, while others allow in addition natural forces, instruments or events (cf. the celebrated distinction between *murder* and *kill*). This information, as many semanticists tend to believe, is ultimately about lexical items, not about syntactic structure they project or are inserted into. Hence thematic properties are to be specified in the lexicon in some way or other, being by no means less stipulative that the [ $\pm$ inertia] distinction introduced above.

Besides, on the constructionalist approach to event structure one tends to reduce information stored in the lexicon to the absolute minimum, only specifying lexical items for the properties visible in the course of the syntactic derivation. The [ $\pm$ inertia] specification accomplishes exactly this task. Under the present set of assumptions deriving  $\nu$ P and building the denotation of an event predicate it denotes only relies on two types of information: what subevents are present in the structure of this predicate and how these subevents can and cannot be distributed between actual and inertia worlds. In this respect, reducing the whole range of interpretations we observed in Sections 2-3 just to one lexical characteristic does not seem to be an undesired result.

Nevertheless, I believe that a more comprehensive answer to the question of where [ $\pm$ inertia] specifications come from seems to be possible, too. There are two fundamental observations about what makes [+inertia] specifications not available for certain lexical items that will be discussed in the two final subsections below.

### 5.1 The $v_{\text{inertia}}$ head and the incremental relation

The first observation is related to the distribution of the  $v_{\text{inertia}}$  head. So far we were only dealing with accomplishment verbs that can be merged with  $v_{\text{inertia}}$  freely. This not so for other verb classes, however. Specifically, incremental manner verbs like ‘write’, ‘read’, or ‘plow’ do not allow for the failed attempt interpretation, hence do not combine with  $v_{\text{inertia}}$ :

- (52) a. alim eki saʒat-xa baxca-ni sür-gen-di.  
 A. two hour-DAT field-ACC plow-PFCT-3SG  
 ‘Alim plowed a/the field in two hours.’
- b. alim eki saʒat baxca-ni sür-gen-di.  
 A. two hour field-ACC plow-PFCT-3SG  
 1. ‘Alim was involved in plowing the field for two hours.’  
 2. \*‘Alim tried to plow the field for two hours(, but did not make a single furrow).’

As (52b) shows, ‘plow’ produces the partial success interpretation in (52b.1), but not the failed attempt interpretation in (52b.2) (in addition to the telic culminating interpretation in (52a), of course). If verbs like *sür* ‘plow’ are analyzed as associated with accomplishment event structure, that is, are [+v], [+V], [+R], they should be specified as [ $v_{\text{inertia}}$ ,  $V_{i(\pm\text{inertia})}$ ,  $R_i$ ]. (In terms of the [ $\pm$ inertia] specification, such verbs are a mirror-image of FA-accomplishments like *zirt* ‘tear’, of type [ $v_{\pm\text{inertia}}$ ,  $V_{i(-\text{inertia})}$ ,  $R_i$ ].) One can be wondering, therefore, what restricts the distribution of  $v_{\text{inertia}}$  and how the class of verbs that do not cooccur with this non-culminating head can be singled out.

First, it should be mentioned that the absence of  $v_{\text{inertia}}$  characterizes a natural class of predicates in Balkar. These are verbs that denote complex eventualities where activ-

ity and process subevents necessarily coincide in time and where there a one-to-one mapping between parts of the process and parts of the activity (e.g., ‘plow the field’, ‘read the paper’, ‘paint the wall’, ‘eat the sandwich’). For verbs like ‘plow’ in (52) it is necessary that for any part  $e'$  of the process  $e$  of getting plowed there be a corresponding piece of activity  $f$  that brings  $e'$  about, and that the running time of  $e'$  and  $f$  be identical. More precisely, the relation between activity and process subevents is a mapping to subordinate subevents with temporal coincidence:

- (53) The relation  $R$  on events is a mapping to subordinate subevents with temporal coincidence, MSbSE( $R$ ), iff  
 $\forall e \forall e' \forall e'' [R(e')(e) \wedge e'' < e \rightarrow \exists e''' [e''' < e' \wedge R(e''')(e'') \wedge \tau(e''') = \tau(e'')]]$

If the relation between activity and process subevents is causative, as many semantists including Ramchand suggest (see Rothstein 2004 for the alternative, and Ivanov, Tatevosov, to appear for discussion), one can assume a postulate in (54) associated with such verbs in the Encyclopedia:

- (54) *sür* ‘plow’: MSbSE(cause)

The opposite property, mapping to superordinate subevents in (55), holds for such verbs as well, as (56) makes explicit:

- (55) The relation  $R$  on events is a mapping to superordinate subevents with temporal coincidence, MSoSE( $R$ ), iff  
 $\forall e \forall e' \forall e'' [R(e')(e) \wedge e'' < e' \rightarrow \exists e''' [e''' < e \wedge R(e''')(e'') \wedge \tau(e''') = \tau(e'')]]$
- (56) *sür* ‘plow’: MSoSE(cause)

(53) is of course a certain idealization. While normally any part of plowing activity induces a process in the theme, there may be eventualities that do count as components of the activity, but are not mapped onto any part of the process. For instance, in the course of plowing the plowman can spend some time fixing and adjusting his equipment, and this part of plowing activity makes no contribution to the change of state of the theme. One way of improving (53) is to assume a contextually salient function  $\mu$  that picks out a set of proper parts of the superordinate event,  $\mu(e)$ , that does not contain subevents irrelevant for bringing about a change of state:

- (57)  $\forall e \forall e' \forall e'' [R(e')(e) \wedge e'' \in \mu(e) \rightarrow \exists e''' [e''' < e' \wedge R(e''')(e'') \wedge \tau(e''') = \tau(e'')]]$

Whatever the ultimate solution for this problem is, it does not seem to affect the present line of reasoning. Assume that (54) and (56) are correct, that is, the causal relation between activity and process subevents for verbs like ‘plow’ satisfies both MSbSE and MSoSE. What we get is a special type of causation whereby two eventualities are causally related down to their proper parts and temporally coincident. If so, in no world any part of the activity in  $\mu(e)$  is allowed to be left unassociated with a corresponding part of the process. This is exactly what makes ‘plow’ incompatible with  $v_{inertia}$ , because it is  $v_{inertia}$  that creates event predicates like that in (49b), where the base world does not contain a process caused by the activity, but do contain pieces of activity that cause no process.<sup>11</sup>

<sup>11</sup>One can claim that the above argument would actually predict that  $v_{inertia}$  can combine with VPs like ‘plow the field’ provided that only those parts of the activity that are non members of  $\mu(e)$  occur

Therefore, the fact that incremental verbs like ‘plow’ do not accept  $v_{inertia}$  hence do not produce the failed attempt interpretation falls out from the constraints on the relation between activity and process subevents. Crucially, these (or similar) constraints are independently required for proper characterization of lexical semantics of such verbs.

## 5.2 The $V_{inertia}$ head and near-punctual eventualities

Now, let us look at what component of verbal lexical semantics can be incompatible with  $V_{inertia}$ , preventing FA-verbs from possessing the partial success interpretation. The list of FA-verbs and PS-verbs is repeated in (58):

- (58) a. PS-verbs: *buz* ‘spoil’, *quj* ‘pour out’, *soz* ‘stretch’, *tazala* ‘clean’, *tög* ‘spill out’,...  
 b. FA-verbs: *ac* ‘open’, *ij* ‘untie, release’, *ujat* ‘wake up’, *sindir* ‘break’,...

The main observation here is that FA-verbs in (58b) have a property that tells them apart from PS-verbs in (58a): their change of state component is a near-punctual process. Whereas the amount of activity necessary to bring about a change of state is not determined by the lexical semantics of such verbs (in case of ‘break’, imagine a person who attempts to break a vase made of unbreakable glass), the change that happens to the theme is a process of extremely short (yet non-zero) duration (imagine the transition of the vase to the state of being broken). Let us take a closer look at near-punctuality, therefore.

Comrie (1976), among others, observes that near-punctual processes cannot normally be combined with the progressive. Out of the blue, sentences like *John is coughing* cannot refer to a single quantum of cough going on at the reference time; the only available interpretation involves a series of atomic coughing events. Informally, this restriction has to do with the fact that the duration of near-punctual processes (e.g., of a single quantum of cough) is too short: they do not possess identifiable phases, and their temporal progress does not involve observable change. As Comrie argues, this is what makes them incompatible with the progressive, whose function is exactly to refer to the internal developmental structure of events. Comrie’s argument supporting this view is that in slowing down contexts, the single event reading of *John is coughing* becomes felicitous. The speaker watching a slowed down record can use this sentence to refer to what is going on between the temporal boundaries of a single quantum of cough. In a sense, slowing-down makes the internal structure of an atomic coughing event ‘visible’ for the progressive: the duration of coughing increases, its internal structure is made observable, the progressive becomes appropriate.

In Balkar, lexical verbs that denote near-punctual processes, e.g., *zötel et* ‘cough’, *aɣ* ‘drip’, *bulɣa* ‘flap, flutter’, *qaq* ‘knock’, are strictly parallel to their English counterparts. Out of the blue, their imperfective forms refer to ongoing processes like ‘be coughing’

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in the actual world, while the rest of the activity along with the process it incrementally brings about is in inertia worlds. Recall, however, that  $\mu(e)$  is a subset of all parts of  $e$ ,  $Part(e)$ . The complement of  $\mu(e)$  in  $Part(e)$  are exactly those parts of  $e$  that do not count as plowing — those are various kinds of accompanying eventualities (e.g., fixing the plow). A sequence only consisting of such eventualities in not a plowing activity, and thus does not fall under the denotation of the event predicate  $plow_A$ , which has to hold in the actual world.



that consist of sums of atomic events. In slowing down contexts they demonstrate the same effect as in English, admitting the single event reading (see Lyutikova et al. 2006: 189-190 for examples and discussion). The precise analysis of lexical near-punctuals goes beyond the scope of this paper.<sup>12</sup> What I am interested in for the moment is a mere descriptive generalization: near-punctuality is not semantically compatible with the progressive.

At this point, we can make two crucial observations. First,  $V_{inertia}$  is an inertia modal operator whose semantics is similar to that of the progressive, hence one can expect that restrictions on their distribution are similar, too. Secondly, process subevents that are components of FA-verbs like ‘open’, ‘untie’ or ‘wake up’ in (58b) (i.e., transitions from being shut to being not shut, from being tied to being untied, from being asleep to being awake, etc.) are near-punctual in much the same way as events denoted by *cough* and other near-punctual lexical items. Given these observations, if it is near-punctuality that makes the progressive combined with verbs like *cough* infelicitous, we have every reason to suggest that incompatibility of  $V_{inertia}$  with the process component of FA-verbs can be accounted for in a similar fashion — through the near-instantaneous character of the process and nonobservability of its internal structure. When a thread tears, we do not perceive the difference between the thread not affected by the tearing process at all and that affected to some extent, hence no partial success interpretation.

If this line of reasoning is on the right track, the question is: What does it mean for a process to have a “too short duration” and to produce “no observable effect in the actual world”?

Approaching a problem of near-punctual predicates that denote events whose duration is too short to make their internal structure observable, let us first take a look at events that possess an opposite property. Apresjan (2006) isolates a class of imperfective verbs in Russian that he calls (long-term) activities, e.g. *vospiťvat’* ‘bring up’, *rukovodit’* ‘supervise’, *knjažit’* ‘reign as a prince, exercise the power of prince’. A characteristic property of such verbs is that they resist adverbial modification specifying precise temporal or spatial location of a situation. Consider (59):

- (59) a. <sup>??</sup>Segodnja v 12.00 Vasja rukovodi-l  
 today at 12 o'clock V. supervise.IPFV-PST.M  
 aspirant-om.  
 graduate.student-INSTR  
 ‘Today at 12 p.m Basil was supervising his graduate student.’
- b. <sup>??</sup>On sejčas knjaži-t u seb-ja v kabinet-e.  
 he now reign.IPFV-PRS.3SG at REFL-GEN in office-LOC  
 ‘He is now reigning in his office.’

Apresjan (2006) suggests that the reason for awkwardness of (59a-b) has to do with observability: events from the denotation of verbs like *rukovodit’* ‘supervise’ or *knjažit’* ‘reign as a prince’ are too protracted in time and consist of too many distinct activities, hence cannot be observed all at once. Whatever eventuality happens at a certain time

<sup>12</sup>One possibility has recently been discussed by Susan Rothstein (2007) who treats verbs like ‘cough’ as simplex naturally atomic predicates.

and place, it is too short and too particular to be identified as a realization of supervising or reigning.

To make this intuition more precise, Apresjan introduces a notion of round of observation. If a person sits in the chair, runs in the garden, eats an apple, draws a circle, finds a wallet, all these events can be observed all at once. Things are different for long-term activities: these activities, Apresjan indicates, cannot fall within a single round of observation, they necessarily require a number of such rounds.<sup>13</sup>

Distinct rounds of observation necessarily occur at different times and, possibly, at different locations. But adverbials specifying the precise time or location presuppose that we are dealing with exactly one round of observation. If events in the denotation of an event predicate can be observed all at once and do not require more than one round, which is the case with most predicates, such adverbials are fine. With long term activities, however, the uniqueness-of-round-of-observation presupposition introduced by the adverbial fails, and that is the reason why (59a-b) are inappropriate.

Apresjan's (2006) view is further supported by the fact that if temporal adverbials are associated with a time measurement scale with lower density of representation points, their combinations with long-term activities improve considerably. Unlike (59a-b), (60), where the measurement scale involves years, not hours/minutes, is felicitous:

- (60) V 2004 god-u Vasja rukovodi-l aspirant-om.  
 in year-LOC V. supervise.IPFV-PST.M graduate.student-INSTR  
 'In 2004, Basil was supervising a graduate student.'

Measuring time in years does not presuppose the uniqueness of round of observation. On the contrary, a one-year period provides sufficient time for as many rounds as is required by the meaning of *rukovodit'* 'supervise'. Apresjan's intuition thus provides an elegant explanation for the contrast between (59) and (60).

Implicit in the above characterization of long-term activities is the notion of typical duration of events of particular event type. Indeed, the duration of individual events in the denotation of any event predicate can vary substantially. What makes predicates like 'supervise a graduate student' and, say, 'eat a sandwich' different is that, typically, supervising lasts much longer than eating. Discussing coercion phenomena, Egg (2005) and Bary, Egg (2007) independently make out a case for introducing the notion of typical duration into the theory. As he shows, aspectual coercion is at least partially sensitive to mismatches between semantic requirements of aspectual operators and the typical duration of events in the denotation of event predicates these operators apply to. Let us elaborate on this in more detail.

Assume that a typical duration is an average duration. On this assumption, a typical duration function, TD, can be conceived of as a measure function of type  $\langle \langle s, t \rangle, d \rangle$  that applies to an event predicate and yields the mean of the duration of running times of events in its extension:

$$(61) \quad TD(P) = \text{mean}\{n \mid \exists e[P(e) \wedge |\tau(e)| = n]\}$$

<sup>13</sup>Apresjan does not discuss his notion of round of observation in any detail. However, as I understand it, a metaphysical appeal behind this notion is to establish a cognitive basis for the granularity of time measurements implicit in the lexical meaning of natural language predicates. The default level of granularity is determined by the length of an abstract round-of-observation event. Events that can be observed all at once match this level of granularity, but longer events like 'supervise' or 'reign' do not.

The notions of typical duration coupled with the notion of the round of observation gives us a way of characterizing a condition necessary to single out long-term activities. Long-term activities are those activities whose typical duration exceeds the maximal duration of round-of-observation events:

- (62) If  $P$  is a long-term activity, then  

$$TD(P) > \max\{n \mid \exists e'[\text{round\_of\_observation}(e') \wedge |\tau(e')| = n]\}$$

Note that the typical duration function characterizes event predicates, not individual events in their extension. Accordingly, (62) does not exclude the possibility that an event predicate  $P$  contains events in its extension whose duration does match that of round-of-observation events, and this seems to be a welcome consequence of (61)-(62). Suppose that a prince is assassinated at the inauguration ceremony five minutes after he have assumed the power. In such a context (63) is felicitous, since the duration of reigning is short enough to be observed all at once:

- (63) V 12.05      Vladimir knjaži-l                      v Kiev-e.  
           at 5 past 12 V.                      reign.IPFV-PST.M in K.-LOC  
           'At 12.05, Vladimir was reigning in Kiev.'

Therefore, the condition in (62) identifies the class of long-term activities in terms of their mean duration rather than in terms of the duration of a shortest event from the extension of a predicate. Typically, (62) says, long-term activities cannot fall within a single round of observation.

Having discussed how long-term processes can be treated, we can go back to short-term processes that, by hypothesis, are denoted by near-punctual lexical predicates like 'cough' and form a part of the denotation of FA-accomplishments like 'tear a thread' or 'wake up a person'. Taking the duration of the observation event as the standard against which the typical duration of events is evaluated, one can suggest that in terms of observability coughing, tearing or waking up processes are a mirror-image of long-term activities:

- (64) Short-term processes:  

$$TD(P) < \min\{n \mid \exists e'[\text{round\_of\_observation}(e') \wedge |\tau(e)| = n]\}$$

According to (64), short-term processes are too short to match the minimal duration of an observation event. It is in this sense that they fail to produce identifiable changes in the course of their development: while physically a thread can tear gradually, this happens too quickly for this graduality to be observable.

Among other things, (64) provides an explanation of what happens in slowing down contexts. Slowing-down contexts increase the duration of all events in the denotation of an event predicates, hence the typical duration increases, too. As a result, the typical duration associated with the predicate matches the duration of an observation event, thus becoming 'visible' for inertia modal operators like the progressive or  $V_{\text{inertia}}$ .

If these suggestions are correct and FA-accomplishments are indeed incompatible with  $V_{\text{inertia}}$  because the process component of their denotation involves near-punctual eventualities, one more expectation arises immediately. Take telic unaccusatives, i.e., intransitives that involve the process and result state components but no initiating activity ( $[V_i, R_i]$  verbs in terms of the First Phase Syntax theory). If the  $[\pm V_{\text{inertia}}]$

specification is sensitive to near-punctuality, we expect that just like accomplishments of type  $[v, V_i, R_i]$ , unaccusatives of type  $[V_i, R_i]$  fall into two parts: those that can combine with  $V_{inertia}$ , and those that cannot. Unaccusatives of the latter type will exactly be those whose process component is near-punctual.

This prediction is borne out precisely. Compare (65a-b):

- (65) a. kusok buz eki sabat eri-gen-di.  
 piece ice two hour melt-PFCT-3SG  
 'The piece of ice melted for two hours.'
- b. \*illev eki minut sin-ʒan-di.  
 toy two minute break-PFCT-3SG  
 'The toy broke for two minutes.'

(65a-b) contrast in that the former but not the latter allows for the non-culminating interpretation. (65a) indicates that the piece of ice has been affected by the melting process, but has not entered the result state of being melted. This interpretation is essentially a partial success, since (65a) entails that the piece of ice has partially melted. In the present system, it obtains due to  $V_{inertia}$  that merges as the V head. No non-culminating interpretation is attested for (65b), however, suggesting that verbs like the intransitive 'break' are incompatible with  $V_{inertia}$ . Crucially, 'break' is a near punctual process (just like a tearing process that serves as a component of the FA-accomplishment 'tear a thread'), but 'melt' is not. And if it is near-punctuality that rules  $V_{inertia}$  out, the pattern observed in (65) is exactly what we should find.

## 6 Conclusion

This study seems to achieve one main result. It contributes to a long-standing debate on how many subevents should be represented in event structures of accomplishment verbal predicates. Having identified two distinct types of non-culminating accomplishments, I argued that at least for languages like Karachay-Balkar the three-component decomposition provides significant advantages in accounting for the whole range of their interpretations.

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# Comparatives and quantifiers

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## 1 Introduction

A traditional issue in the analysis of comparatives is whether or not degrees are essential. In the first part of this paper I discuss the traditional analyses that account for comparatives with (Seuren, von Stechow) and without (Klein) degrees, and remind the reader that these are very similar to each other. A more recent issue is how to account for quantifiers in the *than*-clause. The traditional analyses account well for Negative Polarity Items in comparative clauses, but have problems with conjunctive quantifiers. The strength of the proposals of Larson (1988) and Schwarzschild & Wilkinson (2002), on the other hand, goes exactly in the opposite direction. I will discuss two types of strategies so as to account for both types of quantifiers: (i) one based on the traditional analysis, but by making use of more coarse-grained models or of intervals, (ii) one where comparatives are taken to be ambiguous between the traditional reading and the Larson-reading, and where the actual reading is selected with the help of the strongest meaning hypothesis.

## 2 The traditional analyses of comparatives

There exist two major types of approaches to the analysis of gradable adjectives: comparison class approaches and degree-based approaches. In this section I sketch the traditional approaches along these lines, and show how close they are to each other.

Intuitively, John can be counted as tall when we compare him with other men, but not tall when we compare him with (other) basketball players. Thus, whether someone of 1.80 meters is tall or not is *context dependent*. Wheeler (1972) and Klein (1980) propose that every adjective should be interpreted with respect to a *comparison class*. A comparison class is just a set of objects/individuals and is contextually given. In particular if the adjective stands alone, we might assume that the contextually given comparison class helps to determine what counts as being *tall*. Klein (1980) assumed that with respect to a given comparison class, some elements of this set are considered to be definitely tall, some definitely not tall, and the others are borderline cases. The truth of the positive sentence (1)

- (1) John is tall.

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depends on the contextually given comparison class: (1) is true in context (or comparison class)  $c$  iff John is counted as tall in this class. The proposition expressed by a comparative like (2) is context *independent*.

(2) John is taller than Mary.

and the sentence is true iff there is a comparison class according to which John counts as tall, while Mary does not:  $\exists c[T(j, c) \wedge \neg T(m, c)]$ .<sup>1</sup>

According to the degree-based approaches (e.g. Seuren, 1973; Cresswell, 1976; Bierwisch, 1984; von Stechow, 1984, Kennedy, 1999, 2007), relative adjectives are analyzed as relations between individuals and degrees, where these degrees are associated with the dimension referred to by the adjective. Individuals can possess a property to a certain measurable degree, and the truth conditions of comparative and absolute sentences are stated in terms of degrees. According to the most straightforward degree-based approach, the absolute (1) is true iff the degree to which John is tall is (significantly) greater than a (contextually given) standard of length, while the comparative (2) is true iff *the* degree to which John is tall is greater than *the* degree to which Mary is tall. But this straightforward degree-based approach has a problem with examples where the scope of the comparative contains a disjunction, an indefinite ('any'), or existential modal:

- (3) a. John is taller than Mary or Sue.  
 b. John is taller than anyone else.  
 c. John is taller than allowed.

It is not easy to see how the above degree-based approach can account for the intuition that from (3-b), for instance, we infer that John is taller than *everybody* else. To account for this, and the other examples above, Von Stechow (1984) introduced a maximality operator. Example (3-a) is predicted to be true iff the degree to which John is tall is higher than *the maximal* degree to which Mary or Sue is tall.

(4)  $\max\{d \in D : T(j, d)\} > \max\{d' \in D | T(m, d') \vee T(s, d')\}$ .

Such an analysis predicts correctly for examples (3-a), (3-b), and (3-c).

According to Seuren (1973), (2) 'John is taller than Mary' is true iff there is a degree  $d$  of tallness that John has but Mary does not:  $\exists d[Tall(j, d) \wedge \neg Tall(m, d)]$ . In this for-

<sup>1</sup>Equatives can be analyzed in terms of comparison classes as well. Klein (1980) proposes that (i-a) should be interpreted as (i-b).

- (i) a. John is *as tall as* Mary.  
 b. In every context where Mary is tall, John is tall as well.

Klein (1980) notes that on this analysis, the negation of (i-a), i.e. (ii-a), is correctly predicted to be equivalent with (ii-b):

- (ii) a. John is *not as tall as* Mary.  
 b. Mary is taller than John.

Standard pragmatics can explain why in the context of question *How tall is John?*, (i-a) would come to mean that John and Mary are equally tall.



malization,  $T(j, d)$  means that John's degree of tallness includes *at least*  $d$ .<sup>2</sup> This analysis easily accounts for the intuition concerning (3-a), (3-b), and (3-c), by representing them by (5-a), (5-b), and (5-c) respectively (treating 'any' as an existential quantifier):

- (5) a.  $\exists d[T(j, d) \wedge \neg(T(m, d) \vee T(s, d))]$ .  
 b.  $\exists d[T(j, d) \wedge \neg\exists x[x \neq j \wedge T(x, d)]]$ .  
 c.  $\exists d[T(j, d) \wedge \neg\Diamond T(j, d)]$ .

It is obvious that von Stechow's analysis is very close to Seuren's analysis if the formula ' $T(j, d)$ ' means that John's degree of tallness includes *at least*  $d$ . On this assumption, Seuren's analysis of *John is taller than Mary* is true iff  $\{d \in D : T(j, d)\} \supset \{d \in D : T(m, d)\}$ . Now assume that the sentence is true on von Stechow's analysis:  $\text{Max}\{d \in D : T(j, d)\} > \text{Max}\{d \in D : T(m, d)\}$ . Because of the 'at least' reading of tallness, it follows that  $\forall d \in \{d \in D : T(m, d)\} : d \in \{d \in D : T(j, d)\}$ , i.e.,  $\{d \in D : T(m, d)\} \subseteq \{d \in D : T(j, d)\}$ . Because  $\text{Max}\{d \in D : T(j, d)\} > \text{Max}\{d \in D : T(m, d)\}$ , it is immediate that  $\text{Max}\{d \in D : T(j, d)\} \notin \{d \in D : T(m, d)\}$ . Thus we can conclude  $\{d \in D : T(m, d)\} \subset \{d \in D : T(j, d)\}$ , which is Seuren's analysis.

Seuren's analysis – and thus von Stechow's analysis – is obviously close to Klein's comparison-class account. And indeed, also Klein has no problem with examples like (3-a), (3-b), and (3-c).<sup>3</sup> This is obvious for (3-a) and (3-b). To see why the comparison-class approach accounts successfully for (3-c), represented by  $\exists c[T(j, c) \wedge \neg\Diamond T(j, c)]$ , notice that this sentence is predicted to be true iff there is a context in  $\{c \in C | T(j, c)\}$  that is not an element of  $\{c \in C | \Diamond T(j, c)\}$ . Suppose that we have five individuals, John, Mary, Sue, Bill, and Lucy, such that  $\text{Bill} > \text{Mary} > \text{Sue} > \text{Lucy}$ . To be allowed (to become an astronaut, for instance), one has to be taller than Lucy, but one may not be taller than Bill. In that case, the set of contexts (containing 2 individuals) where John's tallness is allowed,  $\{c \in C | \Diamond T(j, c)\}$ , is  $\{\{j, m\}, \{j, s\}, \{j, l\}\}$ . But this means that (3-c) is

<sup>2</sup>According to the delineation account of adjectives due to Lewis (1970) and Kamp (1975), the worlds, or supervaluations, of a vagueness model  $\mathcal{M}$  differ from each other in the cutoff point of vague predicates. The comparative 'John is taller than Mary' is considered to be true in  $\mathcal{M}$  iff  $\exists w \in W_{\mathcal{M}} : \mathcal{M}, w \models T(j) \wedge \neg T(m)$ , which means that there is a cutoff point for 'tall' such that John is above it, while Mary is not. In standard modal logic, we don't explicitly quantify over worlds in the object language, but sometimes it is convenient to do so. In that case, the comparative is true iff  $\mathcal{M} \models \exists w[T(j, w) \wedge \neg T(m, w)]$ . A world in a vagueness frame has a cutoff point for each vague predicate, and we might identify the cutoff point for 'tall' in  $w$  by  $w_T$ . The easiest way to think of the cutoff point of 'tall' in a world is as a particular *number*, a *degree*. But then we can assume that the predicate denotes a relation between individuals and degrees, and the delineation approach just claims that the comparative is true iff  $\mathcal{M} \models \exists w[T(j, w_T) \wedge \neg T(m, w_T)]$ , meaning that John has a degree of tallness that Mary does not have. This, of course, is exactly Seuren's analysis of comparatives. It should be noted, though, that to account for comparatives in this way, Lewis and Kamp can't allow for all refinements (worlds) of a partial interpretation function being part of their vagueness model. In fact, in contrast to standard supervaluation theory only very few refinements are allowed, and the set of these refinements should come with an independently given ordering as well. Realizing this makes, in my opinion, the delineation account much less attractive than standardly assumed, and by adopting it one can certainly not claim – and this in contrast with the comparison class-account (see van Benthem, 1982) – that one has *derived* the comparative meaning from the positive use of the adjective, because the comparative meaning was already presupposed.

<sup>3</sup>Just like Seuren, also Klein proposes that the *than*-clause should be represented within the scope of a negation. This use of negation in comparatives goes back to Jespersen (1917), who proposed it to license Negative Polarity Items in these environments.

predicted to be true according to the comparison-class account iff John is taller than Bill, i.e. taller than the *tallest* individual that is allowed. Similarly, the set of contexts denoted by  $\{c \in C \mid \Box T(j, c)\}$  in this example would be  $\{\{j, l\}\}$ , and it is predicted that ‘John is taller than required’ is true iff John is taller (or equally tall) than the *smallest* individual that is allowed. These predictions are the same as those made by the degree-based approach.

One of the obvious requirements for any theory of comparatives is that they should account for the converse relation that holds between the comparatives of antonyms: (2) ‘John is taller than Mary’ is true iff ‘Mary is shorter than John’ is true. Seuren’s degree-based approach seems to have no problem with this. The straightforward proposal is simply to define ‘short’ as ‘not tall’. ‘Mary is shorter than John’ is then true iff  $\exists d[\neg T(m, d) \wedge \neg \neg T(j, d)]$ , meaning that  $\exists d[T(j, d) \wedge \neg T(m, d)]$  and thus that (2) is true. Notice, moreover, that on the assumption that degrees have an ‘at least’ reading, one immediately predicts what Kennedy (1999) calls cases of ‘cross polar anomaly’.<sup>4</sup> That is, it is correctly predicted that ‘John is taller than Mary is short’ and ‘Mary is shorter than John is tall’ are inappropriate. To see this, notice that  $T(j, d)$  is true iff John is at least as tall as  $\mathbf{d}$ :  $j \geq_T \mathbf{d}$ , where  $\mathbf{d}$  is the degree (or an individual in the equivalence class) ‘corresponding’ with  $d$ . Assuming that  $x \geq_T y$  iff  $y \geq_S x$ , it follows that  $S(m, d)$  is true iff  $m \geq_S \mathbf{d}$  iff  $m \leq_T \mathbf{d}$ . But this means that  $\neg S(m, d)$  is true iff  $m >_T \mathbf{d}$ . From this it follows that it is predicted that both ‘John is taller than Mary is short’ ( $\exists d[T(j, d) \wedge \neg S(m, d)]$ ) and ‘Mary is shorter than John is tall’ ( $\exists d[S(m, d) \wedge \neg T(j, d)]$ ) denote the (almost) trivial proposition.

It seems that analyzing ‘short’ as ‘not tall’ within a degree-based analysis gives rise to the wrong prediction that ‘John is tall and short’ and ‘John is neither tall nor short’ are equivalent. This problem does not exist for Klein’s comparison class-based analysis: if there is any comparison class in which John but not Mary counts as tall, this is also the case in the comparison class containing just John and Mary. But this means that *in this context* Mary is short, while John is not. From this we can conclude that we can account for the intuition that (2) *John is taller than Mary* and *Mary is shorter than John* have the same truth conditions without assuming that we should analyze *short* as meaning *not tall*. But in fact, also the degree-based account need not generate this problem.<sup>5</sup> Recall that according to degree-based approaches, the positive use of adjectives is treated in a somewhat different way from adjectives occurring in comparatives. For positive uses, an additional POS-operator is assumed, and ‘John is tall’, for instance, is represented as  $\exists d[POS(T)(j, d)]$ , where  $POS(T)(j, d)$  is true iff John has the degree of tallness  $d$  and  $d$  is higher than the contextually given standard of tallness. The sentence ‘John is short’ is then analyzed as  $\exists d[POS(\neg T)(j, d)]$ , where  $POS(\neg T)(j, d)$  is true iff John has degree  $d$  of  $\neg T$  and  $d$  is higher than the contextually given standard of not-tallness. If we then assume that the orderings of tallness and not-tallness are duals of each other, and that the standards of tallness and not-tallness need not be the same, also a degree-based approach does not predict that ‘John is tall and short’ and ‘John is neither tall nor short’ are equivalent.

There has been a lot of discussion about the pro’s and con’s of the comparison class-

<sup>4</sup>It is somewhat surprising to see that this is not the standard explanation of this anomaly, and not even considered (as far as I know) in the literature.

<sup>5</sup>Thanks to Chris Kennedy (p.c.) for this.

based analysis versus the degree-based analysis. According to wide-spread opinion, the comparison class analysis is conceptually more appealing because it assumes that the positive use of the adjective is basic, and it better reflects our basic ability to draw comparisons.<sup>6</sup> On the other hand, the degree-based analysis can account for more examples. In particular examples where we explicitly talk about degrees.

Von Stechow (1984) and Kennedy (1999) argue that even if we don't explicitly talk about degrees, we are still required to have degrees at our disposal to account for so-called *subdeletion* examples like (6-a) and (6-b) that involve two different types of adjectives:

- (6) a. This table is longer than that table is wide.  
b. This table is longer than it is wide.

But, actually, Klein (1980) himself already suggested an analysis of subdeletion comparatives. His final analysis is somewhat more complicated than I suggested until now: rather than quantifying over comparison classes, he existentially quantifies over (the meanings of) *modifiers of adjectives*, like *very* and *fairly*. One motivation for quantifying over such modifiers is to be able to account for subdeletion comparatives like (7-a),<sup>7</sup> which are interpreted as something like (7-b) as suggested earlier by McConnell-Ginet (1973).

- (7) a. John is more happy than Mary is sad.  
b.  $\exists \mathbf{f} \in \{\text{very, fairly, quite, ...}\} [\mathbf{f}(\text{Tall})(j) \wedge \neg \mathbf{f}(\text{Sad})(m)].$

Klein (1980) accounts for modifiers of adjectives in terms of comparison classes and shows that existentially quantifying over comparison classes is only a special case of quantifying over these modifiers. To illustrate this, suppose we have a set of 4 individuals:  $I = \{w, x, y, z\}$ . One comparison-class, call it  $c_0$ , is  $I$ . Suppose now that  $P(c_0) = \{w, x\}$ , and (thus)  $\overline{P}(c_0) = \{y, z\}$ . We can now think of  $P(c_0)$  and  $\overline{P}(c_0)$  as new comparison classes, i.e.,  $P(c_0) = c_1$ , and  $\overline{P}(c_0) = c_2$ . Let us now assume that  $P(c_1) = \{w\}$  and  $P(c_2) = \{y\}$ . If so, this generates the following ordering via Klein's definition of the comparative we used before:  $w >_P x >_P y >_P z$ . Let us now assume that  $\mathbf{f}$  is an expression of type  $\langle \langle e, t \rangle, \langle e, t \rangle \rangle, \langle \langle e, t \rangle, \langle e, t \rangle \rangle$ , i.e., as a modifier of adjectives. According to Klein's (1980) final analysis, he represents comparatives of the form ' $x$  is  $P$ -er than  $y$ ' as follows:

- (8)  $\exists \mathbf{f} [\mathbf{f}(P)(c_0)(x) \wedge \neg \mathbf{f}(P)(c_0)(y)]$

To continue our illustration, we can define the following set of modifier functions on domain  $I$  in terms of the behavior of  $P$  with respect to different comparison classes:  $\mathbf{f}_1(P)(c_0) = P(c)$ ,  $\mathbf{f}_2(P)(c_0) = P(P(c_0))$ ,  $\mathbf{f}_3(P)(c_0) = P(\overline{P}(c_0))$ , and  $\mathbf{f}_4(P)(c_0) = c_0$ . Take  $\mathbf{F}$  to

<sup>6</sup>This is in accordance of the last sentences of Klein (1991): 'Presumably the linguistic complexity of comparatives partially reflects the complexity of measurement devices, both conceptual and technological, that the linguistic community has at its disposal. A good theory should be able to show how both kinds of complexity are incrementally built up from our basic ability to draw comparisons.'

<sup>7</sup>Notice that this example is exactly parallel to the 'cross polar anomaly' cases like *John is taller than Mary is short* discussed by Kennedy (1999). Indeed, I believe with Klein that such examples are appropriate, though perhaps only under a non-standard 'evaluative' interpretation. See footnote 9 for more discussion.

be  $\{\mathbf{f}_1, \mathbf{f}_2, \mathbf{f}_3, \mathbf{f}_4\}$ . Obviously, this new analysis of the comparative gives rise to the same order:  $w >_P x >_P y >_P z$ . Moreover, any of those comparatives can only be true according to the new analysis, if it is true according to the old analysis: The statement ‘ $w >_P x$ ’ is true, for instance, because of function  $\mathbf{f}_2$ . But  $\mathbf{f}_2(P)(c_0)(w) \wedge \neg \mathbf{f}_2(P)(c_0)(x)$  holds iff  $P(c_1)(w) \wedge \neg(P)(c_1)(x)$ , which demonstrates (for this special case) that the old analysis is indeed a special case of the new analysis.

Klein (1980, 1991) suggests, furthermore, that measure phrases can be thought of as modifiers of adjectives, which means that Seuren’s (1973) analysis is a special case of what Klein (1980) proposed. To do so, we have to assume an ‘at least’ meaning of adjective modifiers, i.e. that if  $x \in \mathbf{f}(P)(c_0)$  and  $y \geq_P x$ , then it has to be that  $y \in \mathbf{f}(P)(c_0)$ , if  $x, y \in c_0$ . The function  $\mathbf{f}_3$  defined above does not satisfy this constraint, but we can define a similar function that does so:  $\mathbf{f}'_3(P)(c_0) =_{def} P(c_0) \cup P(\overline{P}(c_0))$ . Something like this can be done in general. If we do so, it holds for every  $\mathbf{f} \in \mathbf{F}$  that  $\mathbf{f}(P)(c_0)$  denotes the set of all individuals at least as  $P$  as a particular individual, which might, but need not, have property  $P$  (w.r.t. comparison class  $c_0$ ). Indeed, by the construction of set  $\mathbf{F}$  it doesn’t follow that for all  $\mathbf{f}$ :  $\mathbf{f}(P)(c_0) \subseteq P(c_0)$ . But this means that if we limit ourselves to one adjective and its antonym, we can think of the  $\mathbf{f}$ s, intuitively, as degrees. In that case we might as well forget about the comparison class and reduce (8) to  $\exists \mathbf{f}[\mathbf{f}(P)(x) \wedge \neg \mathbf{f}(P)(y)]$ , which indeed is (very close to) Seuren’s degree-based analysis.

One might think that once we have these ‘degrees’, we can immediately account for (6-a) and (6-b). But there is still a problem: there need not be any relation between any  $\mathbf{f}$  applied to  $L(\text{ong})$ , and the same  $\mathbf{f}$  applied to  $W(\text{ide})$ . As noted by Kennedy (1999), as a result it is not clear how Klein (1980) could make a distinction between the appropriateness of (6-a) versus the inappropriateness of ‘John is longer than Mary is clever’ on at least one of its readings. What this points to is that we have to assume that on the normal reading, the modifier functions have to have more structure, and be partial.<sup>8</sup> The functions that take ‘Long’ as argument should take ‘Wide’ as argument as well, but not ‘clever’ or ‘ugly’. The obvious intuition for this is that in contrast to cleverness, length and width are *commensurable*, i.e., have the same dimension. Notice, however, that according to natural language, commensurability is a flexible term. Not only do we have examples like *John is more happy than Mary is sad*, even examples like *Little John is more centimeters tall than Big Pete is meters wide*, and *John is more centimeters tall than it is °C warm in Amsterdam* don’t seem to be totally out. In the last two comparatives, we only compare numbers, not degrees of any more concrete type. Perhaps this is all we ever do, and the reason why sentences like *John is taller than it is warm in Amsterdam* are inappropriate is that it is unclear what the units and zero-points of measurements are to measure tallness and warmth. For standard comparatives like *John is taller than Mary* the unit and zero-point are irrelevant, and standard subdeletion cases like *This table is longer than it is wide* are so natural because it is very natural to assume that the units and zero-points of tallness and width are the same.

How does this relate with the analysis of (7-a) as suggested by McConnell-Ginet (1973) and taken over by Klein (1980)? I believe that these cases are good in case happiness and sadness have obvious zero-points and clear units. Notice first that in case

<sup>8</sup>Klein (1991) already noted that a similar problem holds for degrees. We cannot assume that degrees are simply real numbers, because in that case it doesn’t explain incommensurability.

(7-a) is true, we intuitively infer that John is happy and that Mary is sad.<sup>9</sup> This suggests that ‘normal’ happiness and ‘normal’ sadness are now the contextually salient zero-points. In terms of Klein’s semantics this means that with respect to the contextually salient comparison class  $c$ , John is an element of  $Happy(c)$  and Mary an element of  $Sad(c)$ . As for units, let us assume that we take with McConnell-Ginet and Klein a function that models the meaning of an adjective modifier, like *very*. It sounds in accordance with our intuition to say that *John is more happy than Mary is sad* is true iff John is, for instance, very very happy, but Mary is only very sad. More in general, we can say that the sentence is true iff there is an intersective function  $\mathbf{f}$  that can be applied more times to happiness such that John is an element of it, than it can be applied to sadness such that Mary is an element of it.

### 3 Quantifiers in than-clauses

#### 3.1 The problem

Although Klein’s account of comparatives is in some respect crucially different from the standard degree-based approaches, we have seen that they have a lot in common. Many examples treated appropriately in one theory are treated appropriately in the other theory as well. Unfortunately, all these traditional approaches have some problems as well.

The approaches discussed in section 2 all have problems with conjunctive quantifiers in the *than*-clause. As noted already by Von Stechow (1984), these approaches give rise to the wrong predictions for sentences of the following form:

- (9) a. John is taller than *everybody* else is.  
 b. John is taller than Mary *and* Sue.

Intuitively, (9-b) is true iff John is taller than Mary *and* John is taller than Sue. But on the analyses discussed above, this doesn’t come out:

- (10) a.  $\exists c[T(j, c) \wedge \neg(T(m, c) \wedge T(s, c))].$  (Klein)  
 $\equiv \exists c[T(j, c) \wedge (\neg T(m, c) \vee \neg T(s, c))].$

<sup>9</sup>As noted by Kennedy (1999), however, there is nothing in Klein’s (1980) original analysis that guarantees that this is the case. Sapir (1944) noticed already that for some types of adjectives,  $P$ , we can conclude from its use in the comparative ‘ $x$  is  $P$ -er than  $y$ ’, that both  $x$  and  $y$  have property  $P$ . This is not the case for ‘tall’ and ‘wide’, but is so for so-called ‘evaluative adjectives’ like ‘brilliant’. One (non-presuppositional) proposal to account for evaluative readings of adjectives within Klein’s analysis is to assume that comparatives like ‘ $x$  is  $P$ -er than  $y$ ’ can be interpreted as follows with respect to comparison class  $c_0$ :

- (i)  $\exists \mathbf{f} \in \mathbf{F}^* [\mathbf{f}(P)(c_0)(x) \wedge ((NEG(\mathbf{f}(P)))(c_0)(y))]$  EVALUATIVE

In this formula, we use the same typing as before, but we assume that for each adjective  $P$  and modifier  $\mathbf{f} \in \mathbf{F}^* : (\mathbf{f}(P))(c) \subseteq P(c)$ . We assume that NEG is a function from adjective modifiers to objects of the same type (is of a type too long to give here) with meaning:  $NEG = \lambda \mathbf{f}. \lambda P. \lambda c. (P(c) - (\mathbf{f}(P))(c))$ . Recall that from (i) and our assumptions it follows immediately that both  $x$  and  $y$  have property  $P$  with respect to comparison class  $c_0$ , which accounts for the intuition that from (7-a) we entail that John is happy and Mary is sad, just as desired.

- b.  $\exists d[T(j, d) \wedge \neg(T(m, d) \wedge T(s, d))]$ . (Seuren)  
 $\equiv \exists d[T(j, d) \wedge (\neg T(m, d) \vee \neg T(s, d))]$ .
- c.  $\max(T(j)) > \max\{d \in D : T(m, d) \wedge T(s, d)\}$  (von Stechow)  
 $\equiv \max(T(j)) > \max(T(m)) \vee \max(T(j)) > \max(T(s))$ .

For suppose that John is taller than Sue, but that Mary is taller than John. In that case, (9-b) is predicted to be true on the comparison-class approach because there is a context,  $\{j, s\}$ , where John is tall but not Sue, while (9-b) is predicted to be true on the degree-approaches because there is a degree of tallness that John has, but not Sue. Of course, this prediction is false. Obviously, (9-a) gives rise to the same problem.

A second well-known problem involves *existential* quantification. The traditional approaches can account for the fact that (3-b) is interpreted in the intuitively correct way.

(3-b) John is taller than *anybody* else.

But all these approaches have a problem with examples where the NPI *anybody* is replaced by a standard existential quantifier like *somebody*, as in (11).<sup>10</sup>

(11) John is taller than *somebody* is.

An obvious suggestion to account for this kind of example is to assume that the universal effect is not observed because the domain of quantification of the existential quantifier is strongly restricted. Alternatively, one can argue that *somebody* in (11) has a *referential* instead of a quantification reading. Arguably, however, neither of these suggestions solves all of our problems, because there exist similar examples that certainly don't involve referential uses of the indefinite and where domain selection seems out of the question:<sup>11</sup>

(12) John is taller than *at least one woman* is.

Moreover, as noted by Schwarzschild & Wilkinson (2002), other examples like (13) involving existential quantification over worlds with *might* are predicted falsely as well.

(13) Today it is warmer than it *might* be tomorrow.

Von Stechow (1984) suggested the straightforward solution to solve such problems by assuming that quantifiers in *than*-clauses might undergo quantifier raising: The universal quantifier and the conjunction in (9-a) and (9-b), and the existential quantifiers in (11), (12), and (13) can then simply take scope over the subject term.

Larson (1988) posed a number of problems for von Stechow's straightforward scoping solution to the problems discussed above. A first argument is that on such a move the parallelism between well-known constraints imposed on Wh-movement and quantifier raising has to be given up. The following example shows that Wh-words may not be moved from inside a clause under *than*, which suggests – by parallelism — that the

<sup>10</sup>It has been argued that not all non-NPI existential quantifiers give rise to this problem. Beck (manuscript), for instance, notes that *Knut is bigger than a black bear pup is* intuitively means that Knut is bigger than the largest black bear pup.

<sup>11</sup>Thanks to Schwarzschild (p.c.) for this.

same holds for quantifiers in such clauses:

- (14) \*[Which bird]<sub>i</sub> are you taller than *t<sub>i</sub>* was?

A second problem is that the following sentences are on the standard scopal analysis predicted to have a reading that does not exist:

- (15) Someone is taller than everybody else is.  
 (11) John is taller than *somebody* else.  
 (9-a) John is taller than *everybody* else.

A standard quantifier scope analysis predicts that (15) has a reading where *everyone* takes scope over *someone*. Larson claims this sentence does not have such a reading. The standard scopal analyses also predicts that (11) has a reading saying that for everybody, John is taller than that person, and that (9-a) can mean that there is somebody that is shorter than John. Again, Larson rightly claims that these sentences don't have these readings. Similar problems arise with modals used in the comparative clause.

### 3.2 Larson's scopal account

Larson (1988) concludes from the arguments given above that the quantifier in the *than*-clause is not allowed to quantify over the whole sentence (as standard scopal accounts would predict). He proposes, instead, that the quantifier takes *obligatory* scope over the negation (and only the negation). For generality – but still in accordance with Larson's proposal – I will work with degree functions that 'correspond' with degrees. Larson's proposal then comes down to assuming that 'is taller than' has the following meaning:  $\lambda x_e. \lambda Q_{\langle\langle e,t \rangle, t \rangle}. \exists \mathbf{d}[\mathbf{d}(T)(x) \wedge Q(\lambda y. \neg \mathbf{d}(T)(y))]$ .<sup>12</sup> Thus, (15), (11), and (9-a) will be represented as (16-a), (16-b), and (16-c), respectively:

- (16) a.  $\exists x \exists \mathbf{d}[\mathbf{d}(T)(x) \wedge \forall y[x \neq y \rightarrow \neg \mathbf{d}(T)(y)]]$ .  
 b.  $\exists \mathbf{d}[\mathbf{d}(T)(j) \wedge \exists y[j \neq y \wedge \neg \mathbf{d}(T)(y)]]$ .  
 c.  $\exists \mathbf{d}[\mathbf{d}(T)(j) \wedge \forall y[j \neq y \rightarrow \neg \mathbf{d}(T)(y)]]$ .

These representations give rise to the correct predictions. In fact, Larson's proposal also makes the correct predictions for the following examples (discussed, for example, by Scharzchild & Wilkinson (2002)):

- (13) Today it is warmer than it *might* be tomorrow.  
 (17) John is taller than he *ought* to be.

The only readings available for these sentences are the ones where the modals take scope over the negation.

<sup>12</sup>One might propose to generalize this such that it also accounts for subdeletion complements like *This table is longer than that table is wide* as follows:  $[[\dots \text{is} \dots \text{er than} \dots \text{is} \dots]] = \lambda P_1 \lambda P_2. \lambda Q. \lambda x. \exists \mathbf{d}[\mathbf{d}(P_1)(x) \wedge Q(\lambda y. (\neg \mathbf{d}(P_2))(y))]$  (or – depending on your favorite syntactic analysis – with the lambda's in a different order). Kennedy (p,c) pointed out to me that Larson's analysis can indeed account for such constructions (Larson (1988) himself has claimed that these constructions 'require a rather different treatment', but I don't understand why he thinks so).

Notice also that Larson (1988) predicts well for some examples discussed by Schwarzschild & Wilkinson (2002) that are taken to be problematic for scopal accounts. First, consider example (18-a) which Larson (1988) would represent as (18-b):

- (18) a. It is colder in Paris today than it *usually* is in Amsterdam.  
 b.  $\exists \mathbf{d}[\mathbf{d}(C)(p_0) \wedge \text{Most}_a(\text{Day}(a), \neg \mathbf{d}(C)(a))]$ .

Larson (1988) correctly predicts that this sentence can be true even if there is no single temperature that characterizes Amsterdam most of the time.

Now consider an example of Schwarzschild and Wilkinson (2002) that involves another scope taking element that lies between the quantifier and the comparative over which it will take scope:

- (19) John is older than Bill thinks most of his students are.

Suppose that Bill believes that most of his students are between 20 and 24 years old, that John is 25 years old, but also that Bill has no particular belief of the age of any specific student. In this scenario, (19) is intuitively true, although (20) is not:

- (20) For most of Bill's students  $x$ : John is older than Bill believes  $x$  is.

But this is predicted, because on Larson's account, there exists a wide scope reading that is intuitively the correct one:

- (21)  $\exists \mathbf{d}[\mathbf{d}(O)(j) \wedge \text{Bel}(b, \text{Most}_x(\text{Stud-of}(x, b), \neg \mathbf{d}(O)(x)))]$ .

Second, let's look at some examples not involving upward-monotonic quantifiers. First, a non-monotonic quantifier:

- (22) a. John is taller than *exactly* 3 of the others.  
 b.  $\exists \mathbf{d}[\mathbf{d}(T)(j) \wedge |\{x \in I : x \neq j \wedge \neg \mathbf{d}(T)(x)\}| \neq 3]$ .

Unfortunately, (22-b) doesn't really represent the meaning of (22-a). It might be, for instance, that there are only three others that are less than 1.70 meters, although there are 10 other that are less than John's actual length, 1.90 meters. To account for this I propose to follow Jon Gajewski's (ms)<sup>13</sup> suggestion to look in this case at the *most informative* degree that John has (i.e. the *maximal* one), instead of just an arbitrary one. Other examples involving monotone decreasing quantifiers could be analyzed similarly

- (23) John is taller than *at most* 5 of the others.

On Larson's analysis the predicted reading of (23) is given by (24),

- (24)  $\exists \mathbf{d}[\mathbf{d}(T)(j) \wedge |\{x \in I : x \neq j \wedge \neg \mathbf{d}(T)(x)\}| \leq 5]$ .

<sup>13</sup>When I wrote the first version of this paper, I was not aware of Jon Gajewski's work on comparatives. He defends an analysis of comparatives very close to Larson's, and compares it with the more recent one of Schwarzschild & Wilkinson. Gajewski's proposal is very close to a suggestion made by Schwarzschild & Wilkinson (2002) themselves as well.



which is not correct for the same reason. The suggestion made by Gajewski (ms) would be to use the trick here as well.

I conclude that Larson's account makes pretty good predictions. These predictions are in fact very similar to the predictions made by the interval-based approach developed by Schwarzchild & Wilkinson (2002) – an approach also motivated by the problems observed by Larson (1988) for the traditional approaches. Both type of approaches give – intuitively (though not technically) speaking – quantified phrases in the *than*-clause obligatory 'wide scope' over the *than*-clause. However, as noted by Larson (1988) himself already, such an 'obligatory wide scope'-analysis predicts wrongly for sentences analyzed correctly by the standard approaches:

- (3-a) John is taller than Mary or Sue.
- (3-b) John is taller than anyone else.
- (25) John is taller than allowed/required.

Examples (3-b) and (25) only have readings where the quantifier or modal has narrow scope with respect to the negation, while the most natural reading (although perhaps not the only one) of (3-a) is the one where negation scopes over the disjunction.

One strategy to solve this problem would be to still adopt Larson's proposal (or the one of Schwarzchild & Wilkinson (2002)), and try to 'explain away' the mispredictions of the Larsonian analysis. One might do so by suggesting that the meaning of *any* in (3-b), for instance, should not be represented in terms of an existential, but rather in terms of a universal quantifier. And perhaps 'or' has a special 'conjunctive NPI-reading' as well. Finally, we might follow Schwarzchild (ms), who suggests that *allowed* and *required* have special scopal properties. He proposes that in contrast to *might* and *should*, *allowed* and *required* are scope splitters, that take scope *over* the (in our terms) negation. Although I am not sure how to make sense of this idea compositionally within a Larsonian approach, the result would be as desired:  $\exists \mathbf{d}[\mathbf{d}(T)(j) \wedge \neg \diamond / \square \mathbf{d}(T)(j)]$ .

Another strategy would be to stay close to the Seuren/Klein/von Stechow account, and to 'explain away' the problems of the traditional approach. The main challenge here is to be able to account for, for instance, universal quantifiers in the *than*-clause.

According to a yet different strategy, one can propose that comparatives are *ambiguous* between the reading proposed by the traditional analyses and the Larson-reading. This proposal gives rise to a new task: explain why (15), (11), and (9-a) could only be interpreted as (16-a), (16-b), and (16-c), while (3-b) and (3-c) should be interpreted as originally proposed by Seuren (1973), Klein (1980), and von Stechow (1984).

In the rest of this paper I would like to sketch ways in which the second and third strategies might be worked out. I will spend most time on describing two versions of the second strategy, but I take the third strategy to be a viable option as well.

## 4 Modifying Klein

The strategy to solve the problem how to account for quantifiers in *than*-clauses I will discuss in this section is the one where we stay close to the Seuren/Klein/von Stechow account, and to 'explain away' the problems of the traditional approach. To meet the

challenge how to account for conjunctive *than*-clauses, I will first suggest to make use of a notion of ‘fine-grainedness’, and then reformulate the analysis by making use of intervals.

#### 4.1 Fine-grainedness

One idea to account for comparatives with conjunctive ‘than’-clauses is to allow for several standards of precision, and analyze such comparatives with respect to a standard of precision such that it blurs any differences between individuals that ‘witness’ the comparative clause.

According to the degree-based approach towards comparatives, we start with an ordering relation between degrees, and derive from that an ordering between individuals. According to the comparison class approach, instead, we start with the meaning of predicate  $P$  with respect to a set of comparison classes and derive from that the meaning of the relation ‘ $>_P$ ’. Let us assume that both approaches give rise to the same ordering between individuals. In terms of such an ordering relation we can define a new relation ‘ $\approx_P$ ’ as follows:  $x \approx_P y$  iff<sub>def</sub>  $x \not>_P y$  and  $y \not>_P x$ . If the ordering relation ‘ $>_P$ ’ is a so-called *weak order*,<sup>14</sup> the new relation ‘ $\approx_P$ ’ is an equivalence relation. For different weak ordering relations ‘ $>_P$ ’, however, ‘ $\approx_P$ ’ might come out very differently.

Let us now look at a *set* of weak ordering relations ‘ $>_P$ ’, represented by a set of models  $\mathcal{M}$ . Let us say that in all models  $M, M'$  of  $\mathcal{M}$ , the set of individuals,  $I$  is the same:  $I_M = I_{M'}$ , but that the relations ‘ $>_P$ ’ and ‘ $\approx_P$ ’ might differ. Now we can define a *refinement* relation between models  $M$  and  $M'$  as follows: we say that model  $M'$  is a refinement of model  $M$  with respect to predicate  $P$  only if  $\exists x, y \in I, M \models x \approx_P y$ , but  $M' \not\models x \approx_P y$ . So,  $M'$  is more fine-grained than  $M$  with respect to predicate  $P$  iff there is at least one pair of individuals equally  $P$  in  $M$  that is not equally  $P$  in  $M'$ . There is a natural constraint on the ordering between models: if Mary is taller than Sue, but smaller than John in fine-grained model  $M'$ , it cannot be the case that John is counted as equally tall as Sue in the more course-grained model  $M$ , but still taller than Mary. Formally:  $M'$  is a refinement of  $M$  w.r.t.  $P$ ,  $M' \geq_P M$ , only if  $\forall x, y, z \in I$ : if  $M' \models x \geq_P y \wedge y \geq_P z$  and  $M \models x \approx_P z$ , then  $M \models x \approx_P y \wedge y \approx_P z$ . This follows if we define refinements w.r.t. predicate  $P$  as follows:  $M'$  is a refinement of  $M$  with respect to  $P$ ,  $M \leq_P M'$ , iff  $V_M(>_P) \subseteq V_{M'}(>_P)$ . It follows that if  $M \leq_P M'$ , then  $V_M(\approx_P) \supseteq V_{M'}(\approx_P)$ .<sup>15</sup>

Now we say that (9-b) *John is taller than Mary and Sue* is true in  $M \in \mathcal{M}$  iff there is a model  $M'$  at least as coarse-grained as  $M$  where Mary and Sue are (considered to be) equally tall, but where John is taller than any of them, i.e.,  $\exists M' \leq_T M$  and  $M' \models m \approx_T s$  and  $\exists x[M' \models T(j, x) \wedge \neg(T(m, x) \wedge T(s, x))]$ , with  $x$  either a degree or a comparison class. From this we can conclude that in  $M$  it cannot be that John is either shorter than Mary or shorter than Sue. By our new suggested truth conditions for comparatives this means that both *John is taller than Mary* and *John is taller than Sue* are predicted to be true in  $M$ , just as desired. The reasoning goes as follows: Because  $M' \models m \approx_T s$ ,

<sup>14</sup>A relation  $R$  gives rise to a weak order, if the relation is (i) *irreflexive*, (ii) *transitive*, and (iii) *negatively transitive*, i.e.  $\forall x, y, z : (\neg R(x, z) \wedge \neg R(z, y)) \rightarrow \neg R(x, y)$ .

<sup>15</sup>From  $V_M(>_P) \subseteq V_{M'}(>_P)$  it follows that  $\forall x, y \in I$ : if  $\langle x, y \rangle \notin V_{M'}(>_P)$ , then  $\langle x, y \rangle \notin V_M(>_P)$ . Now suppose  $M' \models x \approx_P y$ . This means that (a)  $\langle x, y \rangle \notin V_{M'}(>_P)$  and (ii)  $\langle y, x \rangle \notin V_{M'}(>_P)$ . By (i) it now follows that both (a')  $\langle x, y \rangle \notin V_M(>_P)$  and (b')  $\langle y, x \rangle \notin V_M(>_P)$ . But that means that  $M \models x \approx_P y$ .

it follows by our constraint on models that  $\forall x \in I : \text{if } M \models m \geq_T x \geq_T s, \text{ then } M' \models m \approx_T x \approx_T s$ . Now suppose that in  $M$  John is counted as being taller than Sue, but not as being taller than Mary. It follows by our above reasoning that in the more coarse-grained model  $M'$ , John must be counted as being equally tall as Mary and Sue. But that means that  $\exists x[M' \models T(j, x) \wedge \neg(T(m, x) \wedge T(s, x))]$  is false, which is in contradiction with what we assumed.

It is obvious that this solution extends to the following examples that are considered to be problematic for simple degree and comparison-class approaches to comparatives as well:

- (26) a. John is taller than the girls are.  
 b. John is taller than (a) dog(s) is (are). (generic reading).

One might suspect that any solution that solves (9-b), (9-a), and the above examples gives rise to problems for sentences like (3-a).

- (3-a) John is taller than Mary *or* Sue.

But this is not the case, because the *than*-clause of this comparative sentence doesn't require us to consider coarser-grained models, and the analysis for (3-a) remains thus the same as we assumed before. To make this more formal, say that  $M \in \mathcal{M}$  is an appropriate model to analyze a comparative with quantifier  $Q$  denoted by the noun phrase in the *than*-clause if there is an element  $X$  in  $Q$  such that  $\forall x, y \in X : x \approx_T^M y$ . The idea is now to analyze the sentence with respect to the most fine-grained appropriate model where the following condition holds:  $\forall X \in \text{Min}(Q) : \forall x, y \in X : x \approx_T^M y$ .<sup>16</sup> Because in contrast to conjunctive noun phrases, the minimal elements of the quantifiers denoted by disjunctive noun phrases are singleton sets,<sup>17</sup> (3-a) can be interpreted with respect to the most fine-grained model in  $\mathcal{M}$ .

The traditional analyses predicted that the *than*-clause was a Downward Entailing context, and thus correctly predicts that it allows for negative polarity items like *any* and *ever* (Ladusaw, 1979).

- (3-b) John is taller than *anybody* else.

- (27) John is stronger now than he was *ever* before.

Can our new proposal still account for this? Well, in a sense our new proposal still predicts that the *than*-clause is a DE context: from (3-a) we can still conclude that John is taller than Mary, and from (3-b) we can still conclude that everybody else is smaller than John. On the other hand, we have seen that from (9-b) *John is taller than Mary and Sue* we can conclude that John is taller than Mary, and we cannot conclude that John is taller than Mary, Sue, and Lucy. For this example, the *than*-clause behaves like an Upward Entailing context! So, it seems that we cannot say that the *than*-clause is always a DE context, or always a U(pwards) E(ntailing) context: it depends on the example (and the fine-grainedness of the model) we have to consider. But if our analysis sometimes predicts the *than*-clause to behave downward entailing, and at other times

<sup>16</sup>Thanks to Makoto Kanazawa for pointing out a problem in my earlier formalization.

<sup>17</sup>Whereas  $\text{Min}(\text{John and Mary}) = \{\{\text{John}, \text{Mary}\}\}$ ,  $\text{Min}(\text{John or Mary}) = \{\{\text{John}\}, \{\text{Mary}\}\}$ .

upward entailing, it seems impossible to come up with a correct logic for comparatives, which would be a surprisingly negative result.

Fortunately, we can claim that the *than*-clause of a comparative is *always* downward entailing, but only when the standard of precision is such that the difference in *P*-ness between the individuals that ‘witness’ the comparative clause is blurred. So, the standard cases of NPIs can be accounted for without a problem. But what about our reasoning from (9-b) *John is taller than Mary and Sue* to *John is taller than Mary*? Well, we have just seen that (9-b) is analyzed in a model *M* where Mary is (considered to be) equally tall as Sue. But in such a model, the sentence *Mary is tall* is true iff *Mary is tall and Sue is tall* is true (in contexts that contain at least Mary and Sue). But that means that in *M* the conditional *If Mary is tall, Mary and Sue are tall* is true. And this is enough to show that the inference from *John is taller than Mary and Sue* to *John is taller than Mary* is not in conflict with the *than*-clause of the comparative to be Downward Entailing.<sup>18</sup>

The analysis proposed in this section gives rise to some desirable empirical predictions. But at least to some,<sup>19</sup> the analysis is already problematic from a *conceptual* point of view. The reason is that my proposed ‘granularity’-ordering between models doesn’t capture the intuition we have about granularity refinements. If each model that I use wants to capture the idea that it represents the tallness relation at a particular level of granularity, it should be the case, intuitively, that all degrees, or equivalence classes, of tallness in coarser-grained models represent the same number of degrees of tallness in finer-grained models. But that idea is not captured at all in this analysis. In fact, it *should* not be captured, if it wants to predict that the sentence *John is taller than Mary and Sue* is true in case John is, for instance, 2 cm taller than Mary, but 40 cm taller than Sue. I have to admit that I am not too worried by this complaint: all that I need is the refinement relation between models that I mentioned, and I only used the term ‘granularity’ for lack of a better name. On the other hand, it is perhaps useful to reformulate the main idea of the proposed analysis in such a way that don’t give rise to such misleading interpretations. I will do so in the next section, making use of intervals.

## 4.2 An interval-based reformulation

Since Schwarzschild & Wilkinson (2002) it is widely assumed that to account for comparatives, we need to make use of intervals. A comparative like *John is taller than Mary and Sue* is predicted to be true iff there is an interval of tallness that John’s tallness is on and an interval of tallness that Mary’s and Sue’s tallness are on such that any point

<sup>18</sup>There are at least three kinds of examples discussed by Schwarzschild & Wilkinson (2002) that cannot be accounted for in this way:

- (i) a. John is *2cm* taller than the others are.
- b. John is taller than Bill expected most students would be.
- c. John is taller than *exactly* 3 others are.

I believe that these examples can be accounted for in terms of the analysis proposed in this section in rather straightforward ways, but won’t bother you with it, because I believe there are some serious problems with the proposal made in this section.

<sup>19</sup>The first person who objected to this proposal on this ground was Remko Scha, during a Lego-talk in spring 2007 at the University of Amsterdam.

in the first interval is higher than any point in the second interval. I already claimed in section 3.2 that this type of analysis is in fact very similar to Larson's analysis, and thus very different from the traditional analyses due to Seuren, Klein, and von Stechow. In this section, however, I will make use of intervals to reformulate the main idea presented in the previous section, which is much more in the spirit of the traditional analyses. One can guess immediately that the interval-based analysis I will present in this section will be very different from the one of Schwarzschild & Wilkinson (2002). In fact, it turns out that the resulting analysis will be very close to a recent one due to Beck (manuscript).

In linguistics it is standard to think of intervals as *convex sets* of (time)points, with the 'later than' and 'part-of' relations defined in terms of the later-than-relation between points. What I will do here, instead, is to follow the philosophical tradition and start with the primitive notion of an interval, and put some constraints on the 'later than' relation between them. I will say that an *Interval order* is a structure  $\langle I, > \rangle$ , with ' $>$ ' a binary relation on  $I$  that is irreflexive, and satisfies the so-called 'Interval Order' condition, (IO):  $\forall x, y, v, w : (x > y \wedge v > w) \rightarrow (x > w \vee v > y)$ . One can easily show that in case  $\langle I, > \rangle$  is an interval order, ' $>$ ' is also transitive.<sup>20</sup> From this fact it follows immediately that an interval order is stronger than a strict partial order, but weaker than a weak order:<sup>21</sup> every interval order is a strict partial order, but not every strict partial order is an interval order, and every weak order is an interval order, but not every interval order is a weak order. Let us now define the *indifference relation*, ' $\sim$ ', as follows:  $x \sim y$  iff<sub>def</sub> neither  $x > y$  nor  $y > x$ . It is easy to see that if  $\langle I, > \rangle$  is a weak order, ' $\sim$ ' is reflexive, symmetric, and transitive, and thus an equivalence relation. If  $\langle I, > \rangle$  is an interval order, however,  $I$  is still reflexive and symmetric, but need not be transitive anymore. In terms of relations ' $>$ ' and ' $\sim$ ' we can define two new relations ' $>^*$ ' and ' $>_*$ ' as follows:  $x >^* y$  iff<sub>def</sub>  $\exists z[x \sim z > y]$ , and  $x >_* y$  iff<sub>def</sub>  $\exists z[x > z \sim y]$ . If ' $>$ ' is an interval-order (or stronger), one can show that ' $>^*$ ' and ' $>_*$ ' are weak orders.<sup>22</sup>

Both weak orders and interval orders are used a lot in semantics, and also for the analysis of comparatives. Lewis (1973), for instance, uses weak orders in his analysis of counterfactuals, and any standard degree-based analysis of comparatives is based on the assumption that relations like *taller than* are weak orders (between individuals). Interval-based semantics is standardly based on (something like) what I defined above to be an interval order (see especially Thomason (1984), who uses interval orders as I defined them above). The elements of  $I$  are assumed to be intervals, and the relations

<sup>20</sup>Suppose  $x > y$  and  $y > z$ . By (IO) it follows that either  $x > z$  or  $y > y$ . Because the latter is ruled out by irreflexivity, we conclude that  $x > z$ .

<sup>21</sup>The structure  $\langle I, > \rangle$  is a *strict partial order* iff ' $>$ ' is (i) irreflexive and (ii) transitive.  $\langle I, > \rangle$  is a *weak order* if ' $>$ ' is (i) irreflexive, (ii) transitive, and (iii) negatively transitive.

<sup>22</sup>Proof: Irreflexive: Suppose  $x >^* x$ , then  $\exists z[x \sim z > x]$ , which is a contradiction. Transitivity. Suppose  $x >^* y$ , meaning that  $\exists v_1[x \sim v_1 > y]$ , and  $y >_* z$  meaning that  $\exists v_2[y \sim v_2 > z]$ . We have to prove that  $x >^* z$ , i.e.,  $\exists w[x \sim w > z]$ . Because  $v_1 > y$  and  $v_2 > z$  it follows by (IO) that either  $v_1 > z$  or  $v_2 > y$ . But because  $y \sim v_2$ , it has to be the case that  $v_1 > z$ , which means that  $x \sim v_1 > z$ , and thus  $\exists w[x \sim w > z]$  and thus  $x >^* z$ .

Negatively transitive: Suppose  $x >^* y$  that is,  $\exists v[x \sim v > y]$ . To show  $\exists w_1[x \sim w_1 > z]$  or  $\exists w_2[z \sim w_2 > y]$ . Assume that neither of them is true. Because  $\neg \exists v[x \sim v > z]$  and  $x \sim v$  it must be that  $v \not> z$ . Because  $\neg \exists v[z \sim v > y]$  and  $v > z$  it must be that  $z \not> v$ . Because  $v \not> z$  and  $z \not> v$  it must be that  $z > v$ . From  $v > y$  and  $z > v$  it follows with (IO) that either  $v > v$  or  $y > z$ . Because the former is false, we conclude  $y > z$ . By transitivity it follows that  $x > z$  which contradicts our assumption that neither  $x >^* z$  nor  $z >_* y$ .

'>' and '~' are interpreted as 'completely before' (or 'completely after') and 'overlap'. The relations '>\*' and '>\*' now mean 'ends later' and 'ends before', respectively. To assure that we should think of the elements of  $I$  really as intervals, define the relation '⊆' as follows:  $x \sqsubseteq y$  iff<sub>def</sub>  $\forall z[y > z \rightarrow x > z] \wedge \forall z[z > y \rightarrow z > x]$ . It is easy to prove that '⊆' is a partial order, but it also satisfies the following *convexity* condition,  $\forall x, y, z[x > y > z \rightarrow \forall u[x \sqsubseteq u \wedge z \sqsubseteq u \rightarrow y \sqsubseteq u]]$ ,<sup>23</sup> a condition that is typical for intervals.

Making use of interval orders we will say that  $x$  is  $P$ -er than  $y$  iff  $x >^*_p y$ , i.e.  $\exists z[x \sim z \wedge z >_p y]$ . However, this only makes sense if all real individuals 'start' at the same point. In order to capture that intuition, we make use of the relation '=\_\*'. If '>\*' means 'ends before', '=\_\*' means 'ends simultaneously', and if '>\*' means 'has a smaller lowest-point', '=\_\*' means 'have an equal lowest-point'. The relation is defined as follows:  $x =_* y$  iff<sub>def</sub>  $x \not>^*_p y$ , and  $y \not>^*_p x$ , and is an equivalence relation. We assume that all real individuals (John, Mary, Sue, etc.) – though not all elements in the domain  $I$  – have the same 'lowest' point, and are thus '=\_\*'-related to one another. Combining our analysis of the ' $P$ -er than'-relation between real individuals with the above assumption concerning '=\_\*' just means that  $x$  is  $P$ -er than  $y$  is true iff the interval associated with  $P$ -ness of  $x$  is larger than the interval associated with  $P$ -ness of  $y$ , just as desired. The intervals in  $I$  that are not used to represent (the  $P$ -ness of) 'real' individuals are just there to determine the '>\*\_p'-relation for 'real' individuals in terms of the relation '>\_p'.<sup>24</sup>

To prepare the way to account for more complex comparatives, we will first reformulate the analysis in a Seuren/Klein-like way as follows: for real individuals  $x$  and  $y$ , we say that  $x$  is  $P$ -er than  $y$  iff  $\exists z[x \sim z \wedge \neg(y \sim z)]$ . Given our assumption on how to represent 'real' individuals, this is equivalent to the analysis above. To account for negative polarity items in the than-clause, we will say that  $x$  is  $P$ -er than  $Q$  iff  $\exists z[x \sim z \wedge \neg\exists\{y\} \in \text{Min}(Q)(y \sim z)]$ , where  $Q$  is a quantifier over real individuals, and  $\text{Min}(Q)$  the set of its minimal elements.<sup>25</sup> It immediately follows from this analysis that from *John is taller than Mary or Sue*, or *John is taller than any girl*, we conclude that John is taller than Mary, and that John is taller than Sue.<sup>26</sup> The analysis given so far is indeed very similar to the analyses proposed by Seuren and Klein, but is obviously wrong in general. This is so in particular because *conjunctive quantifiers* occurring in the than-clause don't have singleton sets as elements. To account for them, our final analysis will be a modification of the analysis above as follows (where  $\text{Max}_P(Y) = \{y \in Y : \forall z \in Y : y \geq^*_p z\}$ , and where  $\downarrow Z$  is an arbitrary element of  $Z$ ):

$$x \text{ is } P\text{-er than } Q \quad \text{iff} \quad \exists z[x \sim z \wedge \neg\exists Y \in \text{Min}(Q)(\downarrow \text{Max}_P(Y) \sim z)]$$

Notice, first, that this analysis gives rise to the same truth conditions as what I discussed above for comparatives like *John is taller than Mary or Sue* or *John is taller than anybody else*. Things are different for a conjunctive quantifier like *Mary and Sue*, however. The reason is that such a quantifier has only one minimal element. It follows that our analysis correctly predicts that from *John is taller than Mary and Sue* we conclude

<sup>23</sup>Proof. Suppose  $x > y > z$  and  $x \sqsubseteq u$  and  $z \sqsubseteq u$ . Consider any  $v > u$ . Because  $x \sqsubseteq u$ , it follows that  $v > x$ , and thus  $v > y$  (i). Likewise, if  $u > v$ , then  $z > v$ , and hence  $y > v$  (ii). From (i) and (ii) we conclude  $y \sqsubseteq u$  by the above definition.

<sup>24</sup>From now on, I will mostly ignore the subscript ' $P$ '.

<sup>25</sup>Recall that  $\text{Min}(\text{John and Mary}) = \{\{\text{John}, \text{Mary}\}\}$ , while  $\text{Min}(\text{John or Mary}) = \{\{\text{John}\}, \{\text{Mary}\}\}$ .

<sup>26</sup>Assuming again that *any girl* should be represented by an existential quantifier.

that John is taller than Mary *and* John is taller than Sue. Something similar holds for other examples like *John is taller than everybody else*. In fact, this analysis is really very similar to the analysis I presented in the previous section:<sup>27</sup> it correctly predicts the conjunctive reading for both disjunctive and conjunctive quantifiers, but still takes the than-clause to be, in a sense, a downward entailing environment. As a result, and perhaps more clearly now, the analysis is again very close to Beck's (manuscript) recent minimax-proposal.<sup>28</sup> Unfortunately, it also has similar problems.

### 4.3 Problems for Modified Klein

In the previous section I proposed to stick with the traditional Seuren/Klein/von Stechow proposal and tried to 'explain away' some of the unwelcome predictions by making use either of coarser grained models or of intervals. One problem of the original analysis that cannot be explained away in this manner is that it still predicts that the existential quantifier 'somebody' in (11) 'John is taller than somebody else' receives a universal interpretation. I suggested in section 3.1 that this problem might be solved by domain restriction, or by assuming that 'somebody' has a referential reading. Unfortunately, we have seen already that there exist similar examples where this strategy seems less natural:

(11) John is taller than *at least somebody* else.

(13) Today it is warmer than it *might* be tomorrow.

A second problem is that it is not very clear how to account for comparative clauses involving downward-entailing quantifiers like (28):

(28) John is taller than *at most* 5 of the others are.

One could suggest that because the downward entailing quantifier *at most 5* occurs in a downward entailing position, one should re-interpret it as its complement *at least 6*. Although this suggestion predicts remarkably well, it is hard to give any motivation for this type of move.

A final problem is that in case we would like to take degrees seriously, we should be able to account for the following example:<sup>29</sup>

(29) John is an even centimeter taller than Mary and Sue.

Intuitively, this sentence can be true if John is 2 centimeters taller than Mary, and 10 centimeters taller than Sue. It is not clear at all how to account for this intuition on the proposals discussed here.

Obviously, however, the problems discussed in this section can all be accounted for if we adopt Larson's (1988) analysis. Perhaps, then, we should analyze some examples

<sup>27</sup>There is a formal reason for this similarity, of course. Intuitively, there exists a one-to-one relation between the intervals in the interval-based approach and the set of equivalence classes of 'equally tall' individuals when one looks at all models coarser grained than a finest grained model *M*.

<sup>28</sup>Whereas my proposal is based more on the analyses of Seuren and Klein, her analysis is more reminiscent to von Stechow (1984).

<sup>29</sup>This similar example is due to Sauerland (p.c.).

as proposed by Larson after all. This is a suggestion we will discuss in the final main part of this paper.

## 5 Resolving ambiguity by strength

In this section I will discuss the proposal that quantifiers (including modals and connectives) in the *than*-clause can be interpreted in two ways: either as originally proposed by Seuren/Klein, or as proposed by Larson.<sup>30</sup> This proposal gives rise to a new task: how can we explain that most, if not all, comparative sentences only give rise to one interpretation?

It is easy to explain why (9-a) and (9-b)

(9-a) John is taller than everybody else is.

(9-b) John is taller than Mary *and* Sue.

are predicted to give rise to the wide scope reading of the universal quantifier and conjunction with respect to negation: scoping them over the negation gives rise to a stronger reading. This suggests that we should select always the *strongest* reading of the two, in accordance with the strongest meaning hypothesis of Dalrymple et al. (1998) for reciprocals. Making use of this hypothesis, it is clear why (3-a), (3-b), and (3-c)

(3-a) John is taller than Mary or Sue.

(3-b) John is taller than anyone else.

(3-c) John is taller than allowed.

are now predicted to give rise to the reading proposed by Seuren and Klein: small scope of disjunction or existential quantifier with respect to negation gives rise to a stronger meaning than wide scope. What about sentences with a monotone decreasing quantifier like (30-a) and (30-b), and with a non-monotonic quantifier like (30-c)?

- (30) a. John is taller than *nobody else*.  
 b. John is taller than *at most 3* others.  
 c. John is taller than *exactly 3* others.

Notice first that the Seuren/Klein-reading of (30-a) and (30-b), i.e., (31-a) and (31-b), are trivial (because ‘tall’ is monotone decreasing in degrees, and everybody shares the same ‘minimal’ degrees):

- (31) a.  $\exists \mathbf{d}[\mathbf{d}(T)(j) \wedge \neg \neg \exists x[x \neq j \wedge \mathbf{d}(T)(x)]]$   
 $\equiv \exists \mathbf{d}[\mathbf{d}(T)(j) \wedge \exists x[x \neq j \wedge \mathbf{d}(T)(x)]]$   
 b.  $\exists \mathbf{d}[\mathbf{d}(T)(j) \wedge |\{x \in I : x \neq j \wedge \mathbf{d}(T)(x)\}| \neq 3]$

This suggests that for pragmatic reasons (30-a) and (30-b), if they have a reading at all, it is going to be the Larson-reading. However, notice that for the same reason, the Larson-reading of (30-a), i.e. (32), is equally trivial as (31-a), meaning that (30-a) is

<sup>30</sup>Lerner & Pinkal (1992) and Heim (2006) proposed solutions very similar to this.



inappropriate on both readings, and thus inappropriate. This seems in accordance with intuition.<sup>31</sup>

$$(32) \quad \exists \mathbf{d}[\mathbf{d}(T)(j) \wedge \neg \exists x[x \neq j \wedge \neg \mathbf{d}(T)(x)]] \\ \equiv \exists \mathbf{d}[\mathbf{d}(T)(j) \wedge \forall x[x \neq j \rightarrow \mathbf{d}(T)(x)]]$$

What about (30-b) and (30-c)? We have seen already in section 3.2 that with some extra machinery, Larson (1988) could account for the desired readings. Thus, they are predicted to have the Larson-readings only.<sup>32</sup>

The problematic examples include now at least the following ones:

- (13) Today it is warmer than it *might* be tomorrow.  
 (11) John is taller than (at least) *somebody* else.  
 (33) John is taller than *required*.

The problem with (13) and (11) is that according to the strongest meaning hypothesis, the Klein-reading of these examples is preferred, although the other reading is the only one that seems to exist. Although these examples were problematic for the original analysis of Seuren and Klein, and for our modification of it as well, now we have a little bit more freedom to account for them. Before, we had to explain the intuitive ‘wide scope’ reading by still adopting a ‘small scope’ analysis. Now we can explain the ‘wide scope’ reading simply by giving *independent* motivation for why the stronger ‘small scope’ reading does not exist. I believe that such an independent motivation can be given for (13) and for (11). As for (13), it is not unreasonable (though somewhat stipulative) to assume that epistemic ‘might’ takes obligatory wide-scope. But this means that the Klein-reading is ruled out. A similar story can be told for (11). It has been argued that ‘(at least) somebody’ is a Positive Polarity Item. As such, this item is not allowed to stand in the scope of negation. This has the desired result that the Klein-reading is ruled out, and that only the weaker Larson-reading is left.

The problem for (33) is perhaps more serious.<sup>33</sup> The problem now is that according to the strongest meaning hypothesis the Larson-reading is predicted, although (33) only seems to have the minimality reading predicted by Seuren and Klein. Recall that the maximality reading as predicted by Larson seems correct for other universal modals:

- (17) John is taller than he *ought to/should* be.

This suggests that there is something special going on with ‘require’. It is unclear to me exactly why ‘require’ is so special, but at least two proposals have been made in the literature. First, as discussed in section 3.2, Schwarzchild (ms) proposed that in contrast to *ought* and *should*, *require* and *have to* are ‘scope-splitting’ modals that take obliga-

<sup>31</sup>It seems, however, that on the phrasal reading of comparatives, (30-a) has a reading according to which John is the shortest person. On the other hand, one needs extra (focal) stress on ‘nobody’ for this reading to come about. Perhaps this non-predicted reading can be explained in terms of this extra required stress. Thanks for Chris Tancredi (p.c.) for bringing up this example.

<sup>32</sup>Unfortunately, if we use the extra machinery also for the Klein/Seuren-reading, it is not predicted anymore that (30-b) and (30-c) are trivial. I am not sure what to do with this problem.

<sup>33</sup>I should notice, though, that (33) is a problem for the analyses discussed in section 4 as well.

tory scope *over* the (in our terms) negation. The resulting prediction is in accordance with our intuitions, but the proposal by itself, of course, is not yet very explanatory. Perhaps the ‘scope-splitting’-behavior can be explained by a second suggestion due to Krasikova (2007), taken over by Beck (manuscript). Krasikova observed that ‘required’ and ‘have to’ are so-called *sufficiently*-modals: modals that go well with ‘only’ to receive a ‘sufficiently’-interpretation.

(34) You only have to/\*should walk 500 meters before you are at the central station.

On the basis of this observation she suggests that ‘required’ and ‘have to’ should thus be given a *scalar* meaning: If (34) without ‘only’ is true, it means that walking 500 meters is the *minimum* amount of meters you have to walk before you are at the central station, although by walking more meters, you might arrive there as well. This, in turn, suggests that ‘required to be tall’ should receive a minimum-interpretation as well, a suggestion which would indeed predict correctly.

## 6 Conclusion

The traditional analyses (Seuren, Klein, von Stechow) of comparatives are all much alike, and give rise to very similar predictions concerning quantifiers in *than*-clauses. It is well-known that they can account for a proper – but still significant – subset of examples involving such quantifiers. Larson (1988) and Schwarzschild & Wilkinson (2002) account for the complementary subset. In the main part of this paper I discussed two strategies how to solve this problem. According to a first strategy, one stays close to the original Seuren/Klein/von Stechow account and tries to ‘explain away’ the problems by making use either of coarse-grained models, or of intervals. According to a second strategy, one allows comparative sentences to be ambiguous, but explains away the (non-existing) ambiguity by the strongest meaning hypothesis together with some independent reasons why certain undesired readings do not exist. The second strategy makes perhaps the better predictions. The first strategy seems less ad hoc.

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