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Contents

iv

Preface

The ninth volume of the series *Empirical Issues in Syntax and Semantics* (EISS), like the preceding eight volumes of the series, is closely connected to the conference series *Colloque de Syntaxe et Sémantique à Paris* (CSSP). All of the 13 papers included in the present volume are based on abstracts that were accepted (in two cases, invited) for CSSP 2011, which took place on 21–23 September 2011 at Université Paris 8 (`http://www.cssp.cnrs.fr/cssp2011/index_en.html`). As a condition for inclusion in the volume, authors were asked to not publish their papers in other conference proceedings concurrently.

I take this opportunity to thank the reviewers, whose comments helped the authors to improve their papers, often substantially. With their permission, the reviewers were (in alphabetical order):

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I would also like to thank both the scientific committee and the organizing committee of CSSP 2011 (`http://www.cssp.cnrs.fr/cssp2011/contact/index_en.html`) for their efforts in planning and organizing a memorable conference.

Finally, I thank the previous editors of EISS, Olivier Bonami and Patricia Cabredo Hoffherr, who together edited the previous four volumes (5–8) of EISS, for their notable editorial work over an extended period of time.

Christopher Piñón
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Should I stay or should I go? Optional focus movement in Italian

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1. Introduction

One well known problem in the analysis of focus is the apparent optionality of fronting of the focus constituent in languages like Italian, as seen in (1B′):[1]

(1) A: So che Gianni ha invitato Lucia …
           I know that John invited Lucy …
     B: No, ha invitato [MaRIna]_F.   (focus *in situ*)
           no, (he) invited Marina
     B′: No, [MaRIna]_F ha invitato.   (focus *ex situ*)
           no, Marina (he) invited

Optional movement is problematic in two respects. First, recent syntactic analyses assume that the displacement of a constituent is triggered by the need to satisfy a formal requirement, which is implemented in terms of features. According to this view, in (1B′) the direct object bears a [focus] feature, which must be licensed in an appropriate scopal position in the left periphery of the clause (Rizzi 1997). But such featural requirements are assumed to be mandatory, and therefore, the optionality observed in (1B)/(1B′) is unexpected.[2]

A similar problem emerges with respect to the interpretation of focus. In the Alternative Semantics approach (Rooth 1992), the focus constituent is interpreted *in situ*, whereas in one version of the Structured Meaning approach (Krifka 2006), the focus constituent must be displaced in order to create a partitioned structure that can be transparently mapped into a structured meaning (§3.3): from either perspective, optional movement is once again unexpected.

The structures (1B) and (1B′) are commonly taken to be fully equivalent with respect to their interpretive properties; in this paper we argue that they are not. In §2 we show that it is possible to distinguish (at least) two types of interpretation, which are felicitous in different

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[*]For useful comments we wish to thank the audiences at CSSP 2011 (Université Paris 8) and at the Workshop *Left Periphery: Where Syntax and Discourse meet* (University of Verona, July 2011), the editor Christopher Piñón, as well as an anonymous EISS reviewer. Many thanks to Ad Neeleman for discussion of the issues raised in §4. All remaining errors are ours. Valentina Bianchi takes responsibility for §1, §3 and §4.1–§4.2; Giuliano Bocci takes responsibility for §2, §4.3 and §5.

[1]The main prosodic prominence is indicated by putting the corresponding syllable in capitals.

[2]As a response to this problem, the view has emerged that certain instance of movement may be triggered by interface requirements which optimize the mapping between syntax and the external components. We discuss this view in §4.1.

contexts; we provide experimental evidence showing that one of the two is incompatible with focus fronting. In §3 we propose a semantic characterization of these interpretations, and in §4 we reconsider the optionality issue and we discuss the consequences of our findings for the syntax-semantics interface and the syntax-prosody interface.

2. Contrastive and corrective import

Consider the statements in (2) and (3) by speaker A:

(2) A: Maria era   molto elegante   l'altra sera   a teatro.
         Maria was   really elegant   yesterday night at (the) theatre

(3) A: L'altra sera   a teatro,   Maria   si era messa   uno straccetto di H&M.
         yesterday night   at (the) theatre, Maria   wore   a cheap-dress from H&M

Suppose now that a speaker B replies to (2) or (3) by means of (4):

(4) B: Si era messa   un ArMAni,   non uno straccetto di H&M.   (focus *in situ*)
         (she) wore   an Armani (dress),   not a cheap-dress from H&M

In the context of (2), (4) constitutes an elaboration of speaker A's assertion: the focus structure simply contrasts the focussed direct object with another alternative provided by speaker B in the negative tag. In this case, the focus structure conveys a merely *contrastive* import.

In the context of (3), instead, the reply in (4) clearly entails the denial of speaker A's assertion: as a matter of fact, part of the denied assertion is repeated in the negative tag. (4) thus conveys a conversational move of correction; in this case, the focus structure is again contrastive, but it bears an additional *corrective* import. (Correction will be explicitly analysed in §3.)

In §2.1 we show that this distinction is relevant in determining the possibility of focus fronting in Italian.[3]

2.1 The experiment

Following our native speaker intuitions, we hypothesized that only the corrective import may license focus fronting in Italian, while the merely contrastive import cannot. In order to substantiate this insight, we carried out a two-alternatives forced-choice experiment, with stimuli presented in written form. We created 18 pairs of experimental sentences, minimally differing in the position of the focus element: *in situ* versus *ex situ*. The pairs of experimental sentences were presented in fictional dialogues, which were designed to induce either a merely contrastive or a corrective interpretation of the focus structure. Moreover, the experimental items occurring in corrective contexts were presented with or without the negative tag. The independent factor had thus three levels: (i) the context inducing a contrastive interpretation and negative tag in the target sentence; (ii) the context inducing a corrective interpretation and negative tag in the target; (iii) the context inducing a corrective interpretation and no negative tag. The three conditions are exemplified in Table 1.

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[3]We are not claiming that these are the only available interpretations for focus in Italian: see Brunetti 2009 for detailed discussion. We do claim, however, that precisely these two interpretations can be clearly distinguished in the contexts that introduce our experimental stimuli.

Condition 1: *Merely contrastive context, + negative tag*	
Context: A: Maria era molto elegante l'altra sera a teatro. Maria was really elegant yesterday at the theatre	
focus in situ B: Si era messa un ArMAni, non uno straccetto di H&M. (she) wore an Armani (dress), not a cheap dress from H&M	*focus ex situ* B′: Un ArMAni si era messa, non uno straccetto di H&M. an Armani (dress) (she) wore, not a cheap dress from H&M

Condition 2: *Corrective context, + negative tag*	
Context: A: L'altra sera a teatro, Maria si era messa uno straccetto di H&M. yesterday at the theatre, Maria wore a cheap dress from H&M	
focus in situ B: Si era messa un ArMAni, non uno straccetto di H&M. (she) wore an Armani (dress), not a cheap dress from H&M	*focus ex situ* B′: Un ArMAni si era messa, non uno straccetto di H&M. an Armani (dress) (she) wore, not a cheap dress from H&M

Condition 3: *Corrective context, - negative tag*	
Context: A: L'altra sera a teatro, Maria si era messa uno straccetto di H&M. Yesterday at the theatre, Maria wore a cheap dress from H&M	
focus in situ B: Si era messa un ArMAni. (she) wore an Armani (dress)	*focus ex situ* B′: Un ArMAni si era messa. un Armani (dress) (she) wore

Table 1. Examples of experimental stimuli

18 monolingual speakers of Italian volunteered for the experiment. They were asked to choose the more natural alternative between the two presented replies of speaker B, minimally differing in the position of the focus element (dependent factor: focus *in situ* versus *ex situ*). The items were rotated through the three conditions, so that each subject saw each item only in one condition. Each subject judged 18 experimental trials along with 18 filler trials.[4] The order of the trials was pseudo-randomized, and the presentation order of the minimal pairs was counter-balanced. The experiment was implemented in PraatMCF (Boersma & Weenink 2012).

The response percentages across conditions are reported in Figure 1. In contexts evoking mere contrast (Condition 1), focus *ex situ* was virtually never preferred over focus *in situ*: 1.9% versus 98.1%. In corrective contexts, focus *ex situ* was preferred over focus *in situ* 25% of the time when the negative tag did not occur (Condition 3), and 13% of the time when the negative tag occurred (Condition 2). We analyzed the data with a mixed logit model (Baayen 2008), in

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[4]The fillers were identical in format to the experimental trials but concerned the subject position in questions: pre-verbal versus post-verbal.

which we included random intercepts for both subjects and items. As summarized in Table 2, the results showed that the probability of preferring a focus *in situ* was indeed significantly higher in a corrective context than in a contrastive one, whether the negative tag was present (p=.002) or not (p<.0001).

	Contrastive context (+neg. tag)	Corrective context (-neg. tag)	Corrective context (+neg. tag)
in situ	98%	75%	87%
ex situ	2%	25%	13%
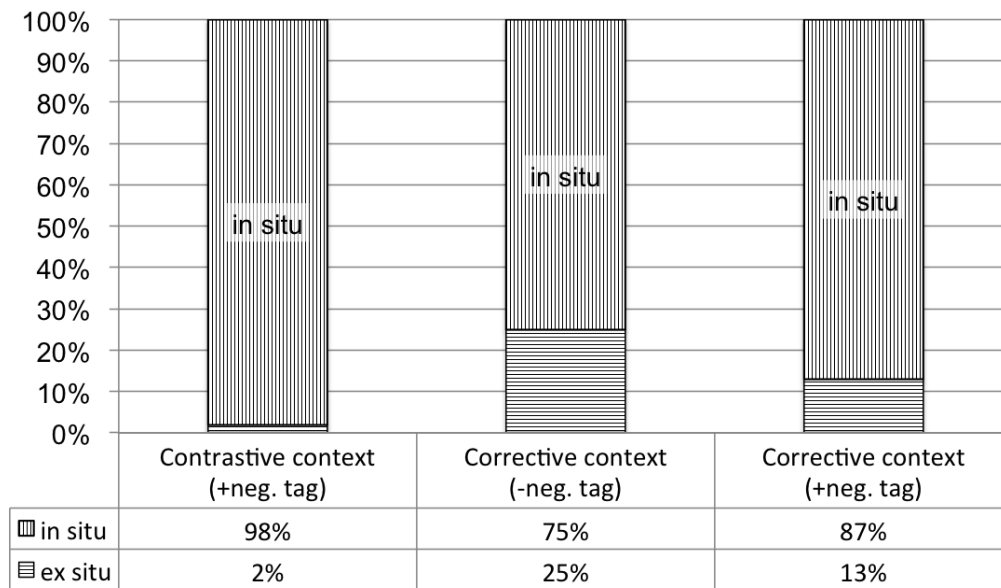
Figure 1. Summary of the experimental results

Predictor	**Coefficient**	*SE*	**Wald Z**	*p*
Intercept	5.946	*(1.030)*	5.771	<0.0001***
Corrective, – neg. tag	-4.133	*(0.941)*	-4.391	<0.0001***
Corrective, +neg. tag	-2.839	*(0.929)*	-3.057	.002**

Table 2. Summary of the fixed effects in the mixed logit model for focus *in situ* versus focus *ex situ*. (Reference Category = Contrastive context (treatment coding); number of observations = 324; subjects = 18; logLik = -89.35)

In light of these results, we conclude that focus *ex situ* is not legitimate in contexts of mere contrast. Conversely, in corrective contexts, focus *ex situ* is a possible option – regardless of the occurrence of the negative tag –, though not the preferred choice.

3. Focus and correction

In order to explain this correlation, the next step is to give an explicit semantic characterization of the corrective versus merely contrastive import.

3.1. Contrastive focus

As for contrastive focus, we assume a minimal characterization: it simply conveys that one focus alternative is salient in the context, but it does not associate any particular presupposition to this alternative.[5]

In a sentence like (4) (in the context of (2)), we take the whole structure to be contrastive: the symmetrically contrasting alternatives are specified in the antecedent clause and in the negative tag. (For concreteness, we analyze the latter as an elliptical clause).

(2)   A: Maria era   molto elegante   l'altra sera   a teatro.
          Maria was   really elegant   yesterday night at (the) theatre

(4)   [[Si era messa [un ArMAni]$_F$] ~ p$_1$],   non [[~~si era messa~~ [uno straccetto di H&M]$_F$ ~ p$_2$]
          (she) wore   an Armani (dress)   not   (she wore)   a cheap dress from H&M[6]

In both the first clause and the elliptical clause, a focus operator ~ adjoins at the clausal level and introduces a free variable (p$_1$/p$_2$). The value of the variable is constrained to be a member of the focus semantic value of the clause, which in both cases consists in a set of alternative propositions of the form **wear**(**mary**, x) (where x is a member of the domain of individuals D$_e$) or Y([λx.**wear**(**mary**, x)]) (where x is an individual variable and Y is a quantifier of type <et,t>). The context must then specify a salient proposition of the required form as the value of each variable. In the case of p$_1$, the value is the proposition expressed by the negative tag, and conversely, the value of p$_2$ will be the proposition expressed by the first clause.

As for the corrective import, we will first outline a general characterization of correction (§3.2), and we will then consider the role of focus (§3.3–§3.4).

3.2. The corrective move

Correction is a complex conversational move which, as we saw, involves the denial of a previously asserted proposition and the assertion of a distinct proposition. We rely on van Leusen (2004)'s analysis, which we restate in terms of Stalnakerian context update. We equate van Leusen's context with the common ground, consisting in a set of propositions to which all the conversational participants are publicly committed, and which represents a shared information state.[7] A conversational move is then a particular way of updating such a context.

Like any conversational move, correction is subject to a number of felicity conditions. The general consistency condition requires that both the input context and the output context be a consistent set of propositions; the informativity condition requires that the propositional content of an updating move is not already entailed by the input context (because this would correspond to a vacuous update).[8] The more specific felicity conditions are the following:

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[5]Cf. Rooth 1992:14.

[6]If one wants to analyze ellipsis along the lines of Merchant 2001, the ellipsis remnant must be extracted from the clausal constituent that undergoes ellipsis; we assume that such movement is triggered by an EPP-like feature borne by the functional head that licenses ellipsis.

[7]The common ground in turn characterizes a set of possible worlds, the context set, which includes all the worlds that are compatible with the shared information. We will refer to the common ground, rather than to the context set, as this is the simplest way to reformulate van Leusen's analysis. See also the last paragraph of this section for a more refined approach.

[8]Consistency and informativity correspond to Stalnaker's (1978:154) principle 1.

- **Locality condition**: The propositional content of a discourse move is interpreted as relative to a contextually given spatio-temporal-modal setting (or type of setting).[9]
- **Antecedent condition:** For a correction to be felicitous in a context C, C must entail an antecedent proposition which is the target of correction.
- **Incompatibility condition:** The context resulting from updating C with the corrective claim must entail the denial of the antecedent proposition (possibly via pragmatic strengthening).

To see how these conditions apply, consider for instance the corrective context (1). (1A) constitutes the antecedent proposition. Incompatibility and locality imply that the corrective claim (1B)/(1B′) is inconsistent with (1A) in the context of interpretation C: in other terms, the antecedent proposition and the corrective claim 'are interpreted as mutually exclusive claims about a common local setting' (i.e. a specific situation).

In this way, correction achieves a complex update effect: the corrective claim entails the denial of the antecedent proposition; thus, in order to update the context with the content of the corrective claim without incurring a violation of Consistency, it is first necessary to retract the antecedent proposition from the context.[10] This results in a (non-monotonic) retraction update, followed by a monotonic update.

Notice that we can avoid the retraction step if we assume that a correction takes place at a stage of the conversation in which the antecedent proposition is still at issue, namely, it has been asserted but it has not yet been entered in the common ground. This is possible if we adopt a more structured view of the discourse context, following Farkas & Bruce 2010: an asserted proposition immediately becomes part of the speaker's public commitments, but it is entered in the common ground only after it has been accepted (if tacitly) by all the conversational participants. From this perspective, correction is a type of 'reversal' move; anyway, it still holds true that the corrective claim is presupposed to be incompatible with the antecedent proposition.[11]

3.3. The role of focus

The next step is to define the role of focus in implementing a correction.[12] In this respect, van Leusen (2004:§5) provides a very interesting observation (cf. also Asher 2004:§2.3.2):

[9]Locality: For a discourse context C and a discourse contribution resulting in an update C[u], there is a local spatio-temporal-modal setting (or type of setting) s such that the semantic content of the contribution is situated in s and s is bound in C (C[u^s]). In the text we will leave implicit the reference to the local settings.

[10]As van Leusen notes, in virtue of incompatibility, the corrective claim need not contain any explicit marker of negation. This possibility was indeed tested in our experiment: as shown in Table 1, in condition 3 the target sentence in a corrective context did not include any marker of negation.

[11]The notion of correction that we adopt here is clearly narrower than the one proposed by Asher (2004): the latter also subsumes cases where the corrected proposition has not been entered in the common ground by speaker A, but it is assumed by speaker B to be believed by A. For example, in (i) (due to Vallduví), speaker B corrects A's assumption that the president has some positive attitude about the china set:

i.   A: I got the president a nice Delft china tray that matches the set he has in the living room.
             Was that a good idea?
     B: Nope. The president HATES the Delft china set. (Asher 2004:(26))

Our impression is that similar cases with a constituent in focus would not allow for focus fronting in Italian. We leave this problem for future investigation.

[12]Van Leusen (2004:§5) suggests that incompatibility follows if focus in the corrective claim triggers an exhaustivity presupposition: for example, in (1B)/(1B′), the only person that Gianni invited is Marina. This is sufficient to exclude the truth of the proposition asserted by speaker A. However, focus *ex situ* in Italian is not inherently exhaustive (Brunetti 2004); therefore, van Leusen's suggestion cannot be a general solution.

The information structure of the corrective claim induces a 'parallelism constraint' relative to the antecedent in the context of interpretation. The background of the corrective claim must in a certain sense be 'shared' by the antecedent, and the focus must be contrastive to the parallel element in the antecedent.

This suggests that focus in a corrective claim is a specific type of contrastive focus: it contrasts the focussed element with a focus alternative that has been previously asserted.

This insight can be straightforwardly formulated in terms of Alternative Semantics.[13] Consider again example (1) ((1B) and (1B′) will have the same analysis):

(1)   A: Gianni ha invitato Lucia.
          John invited Lucy
      B′: [[[MaRIna]$_F$ [*pro* ha invitato _]] ~ p$_2$]
          Marina   (he)   invited

Assume that in the corrective claim (1B′), the focus operator ~ adjoins at the clausal level and introduces a free variable p$_2$. Recall that the value of this variable must be a member of the focus semantic value of the clause, which consists in a set of alternative propositions of the form **invite(john**, x) (where x is a member of the domain of individuals).[14] Note that the antecedent proposition expressed by (1A) – **invite(john**, **lucy**) – is in fact a member of this set.

We can then recast incompatibility as a focus-related presupposition: namely, the presupposition that the context already supports a distinct member of the focus semantic value of the corrective claim, which is inconsistent with the corrective claim itself. (We return in §4 to the source of the incompatibility presupposition.)

(5)   Incompatibility presupposition (Alternative Semantics version):
          For a corrective claim Z and context C,
          $\exists p \in [\![Z]\!]^f [p \neq [\![Z]\!]^0 \wedge p = p_2 \wedge$ **incomp**$(p, [\![Z]\!]^0, C)]$
          where: **incomp**$(p, p', C) \leftrightarrow C \vDash p \wedge (C + p' \vDash \neg p)$.[15]

The free variable p$_2$ introduced by the focus operator (the incompatible alternative) must receive a value from the context: this will be a contextually salient proposition. This salient proposition will be the proposition expressed in the previous assertion. The latter thus qualifies as the target of the correction.

In (1), the incompatibility presupposition is satisfied in virtue of the fact that, as we noted above, the ordinary value of (1A) is a member of the focus semantic value of (1B′):

Presupposition: $\exists p \in [\![(1B')]\!]^f [p = p_2 = [\![(1A)]\!]^0 \wedge$ **incomp**$(p, [\![(1B')]\!]^0, C)]$
$[\![(1A)]\!]^0 =$ **invite(john, lucy)**
$[\![(1B')]\!]^0 =$ **invite(john, marina)**

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[13]Below we briefly discuss another implementation in terms of Structured Meanings.

[14]If one assumes that illocutive operators are introduced in the compositional interpretation of the syntactic structure (Haegeman 2004, Krifka 2011), it is possible to define alternatives even at the level of the speech act (Tomioka 2010). We do not explore this possibility here, but leave it for future research. (See also §4.2 for further discussion of illocutive operators.)

[15]Incompatibility is formulated along the lines of van Leusen (2004:§4.1). However, as noted at the end of §3.1, with a more structured view of the discourse context this can be weakened to the effect that the relevant focus alternative has been introduced in the context, but has not yet been accepted by all the participants as part of the common ground, and hence is not entailed by it.

$[\![(1B')]\!]^f = \{\textbf{invite}(\textbf{john}, x) \mid x \in D_e\}$
$\quad\quad \rightarrow [\![(1A)]\!]^0 \in [\![(1B')]\!]^f$

Note that the focus structure of the antecedent proposition (1A) is completely irrelevant, since we only use its ordinary value: thus, the presupposition is satisfied even if the corrective claim is under-focussed with respect to the antecedent (i.e. its focus constituent is smaller that that of the antecedent). This is a welcome consequence: as a matter of fact, (1A) need not have narrow focus on the direct object, parallel to (1B′), but it may have predicate focus or even broad focus on the whole sentence, and the correction conveyed by (1B′) remains equally felicitous.

On the other hand, the exchange in (6) exemplifies a case where the incompatibility presupposition is not satisfied, leading to an infelicitous correction in (6C):

(6)   A: Dove studia Gianni ora?
           where studies Gianni now?
           'Where does John study nowadays?'
      B: Studia all'SOAS di Londra.
           (he) studies at the SOAS in London
           'He studies at the SOAS in London.'
      C: No, [alla Royal Ballet SCHOOL]$_F$ studia (# danza classica).
           no, at the Royal Ballet School (he) studies (# classical dance)
           'No, he studies (classical dance) at the Royal Ballet School.'

The problem with (6C) is the presence of additional material (*danza classica*) with respect to the proposition asserted in (6B). (6B) is thus not a member of the focus semantic value of (6C):[16]

$[\![(6B)]\!]^0 = \exists e \, (\textbf{study} \, (e, \textbf{john}) \wedge \textbf{at}(e, \textbf{SOAS}))$
$[\![(6C)]\!]^0 = \exists e \, (\textbf{study} \, (e, \textbf{john}, \textbf{cl.dance}) \wedge \textbf{at}(e, \textbf{RBS}))$
$[\![(6C)]\!]^f = \{\exists e \, (\textbf{study} \, (e, \textbf{john}, \textbf{cl.dance}) \wedge \textbf{at}(e, x)) \mid x \in D_e\}$
$\quad\quad \rightarrow [\![(6B)]\!]^0 \notin [\![(6C')]\!]^f$

Therefore, the incompatibility presupposition is not satisfied, and (6C) is not a felicitous correction of (6B). (Obviously, (6C) becomes a felicitous correction if we remove the offending additional material.)

To conclude this section, we wish to highlight some crucial aspects of this analysis:

i.   The focus semantic value is exploited at the level of the proposition. (Technically, the focus operator adjoins at the clausal level.)
ii. Corrective focus conveys a *contrast across utterances*: the incompatible alternative comes from a previous speech act (it is the antecedent proposition).
iii. The incompatibility presupposition has a direct impact on the discourse context, triggering the retraction (or rejection) of the antecedent proposition.

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[16]Here we make explicit use of the Davidsonian event position (which was omitted for simplicity in the previous formulae) in order to analyse the locative modifier.

3.4 Partial incompatibility

Up to now, we have been reasoning in terms of incompatibility between two whole propositions. However, in a very intuitive sense not all of the corrective claim is incompatible with the antecedent proposition: only the focus is.

(1) A: John invited Lucy.   (antecedent proposition)
     B: [Marina]$_F$ [he invited t]   (corrective claim)
         INCOMPATIBLE   COMPATIBLE

In other terms, B's reply conveys a *partial denial*: the two speakers agree on the background information and disagree on the focus. This insight can be straightforwardly expressed with a Structured Meaning format along the lines of Krifka (2006). (1B) will have the following focus-background partition (disregarding for the moment the focus alternatives): the focus is the denotation of the direct object, and the background is the property of being invited by John.

(1)   B: <**marina**, [λy.**invited(john**, y)]>

Suppose that we now assume a parallel partition of the antecedent proposition (1A):

(1)   A: <**lucy**, [λy.**invited(john**, y)]>

We can then say that the two foci are incompatible in that, when combined with the *same* background, they yield two propositions that are inconsistent in the context of interpretation. In other terms, corrective focus 'breaks up' the proposition into an incompatible part (the focus) and a validating part (the background with respect to which incompatibility is calculated).

If, following Krifka (2006), we enrich the structured meaning with a set of contextually salient focus alternatives (ALT([[FP]])), we can give a different formulation of the Incompatibility presupposition which expresses the idea of a partial denial:

(7)   Incompatibility presupposition (Structured Meanings version):
      ∃y∈ALT([[FP]]) **incomp**([[FP]], y, [[B]], C), where
      – ALT([[FP]]) = a set of salient alternatives to the focus phrase denotation
      – **incomp**(x, y, λz.B(z), C) ↔ C ⊨ B(y) ∧ C + B(x) ⊨ ¬B(y)
      (In prose: the presupposition that there is one member in the set of focus alternatives of
      the corrective claim which, combined with the same background B, yields a proposition
      that is inconsistent with the corrective claim in the context of interpretation C.)[17]

This will trigger a partial revision of the information conveyed by the corrected assertion.

The reader will immediately spot one shortcoming of this solution: it requires that the antecedent proposition and the corrective claim have a fully parallel focus-background partition, essentially equivalent to the congruence observed in question-answer pairs. But as we noted above, this is too strict a requirement: in the felicitous exchange (1), (1A) may have focus on the direct object, on the predicate, or on the whole clause. One possibility could be to invoke

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[17]Note that this presupposition has purely existential force; no direct anaphoric link is established with the previous assertion, contrary to the Alternative Semantics version. However, the corrective import might be achieved if the set of salient alternatives is restricted to include only the alternative introduced in the previous assertion.

focus projection, and require that the focus-background partition of the corrective claim be parallel to one of the possible partitions of the antecedent proposition. However, the following example suggests that this will not do either:

(8) A: Cosa ne   ha fatto   Gianni della sua vecchia Fiat?
         what of-it has made John   of his old Fiat?
         'What did John do with his old FIAT car?'
     B: pro$_k$ la$_i$ ha [venDUta]$_F$.   (focus on the verb)
         (he)   it.F.SG. has sold.F.SG
         'He sold it.'
     C: No, [la ToYOta]$_F$ pro$_k$ ha venduto.   (focus on the direct object)
         no, the Toyota   (he)   has sold
         'No, he sold his Toyota car.'

The focus-background partition of the corrective claim (8C) does not constitute one of the possible partitions of the antecedent (8B) according to the usual focus projection rule, since in (8B) the direct object does not bear the main sentence prominence:

$[\![(8B)]\!]$ = <$[\lambda x.[\lambda y.\textbf{sell}(y, x)]]$, $[\lambda P.P(\textbf{fiat})(\textbf{john})]$>
         under some assignment g such that g(k)= **john**, g(i)= **fiat** (John's old Fiat car)
$[\![(8C)]\!]$ = <**toyota**, $[\lambda x.\textbf{sell}((\textbf{john}, x)]$>
         under some assignment g such that g(k)= **john**

This forces us to the conclusion that the original partition of the antecedent proposition can be revised 'on the fly'. This is perhaps not completely implausible, in view of the fact that correction does not constitute a canonical responding move in the same way as an answer to a question; therefore, unlike question-answer pairs, in this case a strict congruence cannot be imposed *a priori*. We leave this problem open for future investigation.

3.5 Intermediate conclusions

Under either of the analyses sketched above, we can identify two properties that are characteristic of corrective focus, as opposed to merely contrastive focus.

First, the domain of corrective focus is necessarily at the level of the *proposition*, whereas the domain of merely contrastive focus can also be defined at lower compositional levels (cf. e.g. Rooth's (1992) farmer example (11)).

Second, corrective focus is strictly tied to the *conversational dynamics*: the contrasting alternative comes from a previous speech act, and corrective focus conveys its rejection. In the case of merely contrastive focus, instead, both the contrasting alternatives are typically provided within a single speech act, as in (4) above.

We can now reconsider in the light of these observations the different availability of the two types of focus with respect to the *in situ* and *ex situ* positions, and the issue of optional movement.

4. General discussion
4.1 Optional movement and interface strategies

The experimental evidence provided in §2.1 allows us to make three preliminary, very general points:

i. An undifferentiated notion of focus is inadequate to capture the syntactic distribution of focus elements in Italian, since it would leave unexplained the fact that in the merely contrastive condition, as opposed to the corrective condition, focus *ex situ* was virtually never preferred.

ii. It has been suggested that focus fronting may be triggered by emphasis (Hartmann & Zimmermann 2007 on Hausa). However, unless this notion is explicitly defined and some diagnostic criteria are identified, it is impossible to compare such a view with our proposal.

iii. Focus fronting cannot be analyzed as a purely 'stylistic' phenomenon occurring in the PF branch of the derivation: once again, from this perspective we could not explain why the availability of the fronted position is restricted to the corrective condition, namely, it is sensitive to interpretive properties of the context.

On the contrary, the interpretive distinction that we identified affects the syntactic distribution of the focus element. The next question, then, is: Why can corrective focus occur *ex situ*, and why cannot merely contrastive focus do the same?

Recall our earlier observation (§3.3) that corrective focus involves a contrast across utterances, whereas merely contrastive focus typically involves contrast within an utterance. This suggests that the core difference may lie in the extension of the domain of focus,[18] and optional movement may be thought of as a way of marking the focus domain.

This insight fits with the 'flexible' approach to focus proposed by Neeleman and van de Koot 2008. In this approach, no syntactically active focus feature triggers movement, nor is movement necessary in order to make the focus structure readable at the interface (*contra* Rizzi 1997, Cinque & Rizzi 2008). Optional movement is triggered by an *interface strategy* aimed at disambiguating the extension of the domain of focus: an element freely adjoins to a dominating node, and at the interface, a templatic mapping rule may interpret the adjoined element as the focus, and the lower part of the adjunction structure as the domain of focus.[19] Then, given that the domain of corrective focus must be a whole proposition, we expect that the focus element can adjoin to the upper edge of the clause.

The problem with this solution is that as far as we can see, it cannot really exclude focus fronting in the case of merely contrastive focus. This can in principle take as its domain any compositional level dominating the focus (Rooth 1992): but then, nothing prevents it from having a clausal domain, and according to Truckenbrodt's (1995:§4.4) principle of domain maximization, this option should be chosen whenever possible. Therefore, it seems that this solution does not account for the observed asymmetry.

4.2 Corrective focus as a root phenomenon

We therefore turn to the second property that we highlighted in §3.5, namely, the fact that corrective focus implements a specific conversational move. An important observation is that a conversational move – a speech act – must be expressed by a root clause.

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[18]In Alternative Semantics terms, the domain of focus is the compositional level at which the focus operator adjoins. In Structured Meanings terms, the domain of focus corresponds to the compositional level at which the focus-background partition applies.

[19]If no overt movement takes place, the structure can be interpreted by means of a covert mechanism, on which we cannot dwell here. Neeleman and colleagues (2007) define a notion of 'domain of contrast' which applies to both contrastive topics and foci.

The term 'root clause' was introduced by Emonds (1970) to characterize (a) syntactically unembedded clauses, and (b) a very restricted subset of embedded clauses (e.g. complements to verbs of saying). Starting from the seminal proposal by Hooper & Thompson 1973, a consistent line of research has pursued the insight that the crucial property of root clauses and root-like embedded clauses is their *discourse-active* status, namely their potential to convey a speech act (cf. Gärtner 2002, Meinunger 2004, Haegeman 2004, Dayal & Grimshaw 2009, Miyagawa 2011; for general discussion, see Haegeman 2011, Bianchi & Frascarelli 2010). A synthetic formulation of this view can be found in the following quote (Krifka 2011:2–3):

> Root clauses have a functional feature that allows them to express assertions or other kind of speech acts, and due to this feature they cannot be embedded, if it were not for those exceptional cases that do allow for the syntactic embedding of speech acts.

The most straightforward implementation of this idea is, we believe, in cartographic terms. Suppose, following Krifka's suggestion, that the discourse-active status of a clause is encoded in a functional feature; it is natural to assume that this feature is realized at the clausal level, which semantically corresponds to a whole proposition. (We may actually take this functional feature to be the syntactic incarnation of an illocutive operator, as in Haegeman's (2004) construal of Rizzi's (1997) Force head.)

We then propose that the crucial property that licenses focus fronting is not the determination of the domain of focus per se, but rather, the necessarily 'root' quality of corrective focus, as opposed to merely contrastive focus.[20] In particular, we hypothesize that the corrective import – that is, the incompatibility presupposition – can only be licensed in a clause that carries the discourse-active feature.

This licensing relation can be implemented in at least two different ways. In cartographic terms, Incompatibility would be encoded in a functional projection situated in the left-periphery of discourse-active clauses; this projection attracts a [focus] element because Incompatibility must be calculated with respect to a focus alternative.[21]

However, the idea that a specific pragmatic import is encoded by a narrow-syntactic feature has been disputed as a violation of Inclusiveness (see Fanselow & Lenertova 2010 and Horvath 2010). Adopting this perspective, one could maintain a weaker licensing relation: movement of the focus constituent to the left periphery of the clause signals the fact that the focus alternatives are exploited at the discourse level in order to convey a particular type of context update; yet, in an exchange like (1), the discourse relation of correction linking (1B)/(1B′) to (1A) is not directly encoded in the left periphery, but it is identified by the hearer as the most plausible way to embed (1B/B′) in the overall discourse structure (along the lines of Asher 2004). This view minimizes the syntactic encoding of pragmatic functions, but still it must maintain that movement is licensed by the discourse-active status of the clause in which it occurs: therefore, this crucial piece of information must be visible to the syntax.

Note that under either version, our proposal implies that corrective focus always enters a dependency with the left periphery of the clause, even when the focus constituent appears to be *in situ.* In the next section, we reconsider the optionality problem in the light of this conclusion.

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[20]For empirical evidence that corrective focus is a root transformation, we refer to Bianchi 2011.

[21]If the discourse-active clause contains a topmost illocutive operator, the focus could be taken to associate with such an operator, along the lines of Beyssade et al. 2011.

4.3. Optionality and the syntax-prosody interface

According to our analysis, corrective focus is always licensed at the root of a discourse-active clause, even when it appears *in situ*. Still, the experimental results reported in §2 indicate that the fronting of corrective focus, though possible, is dispreferred with respect to the *in situ* alternative. To account for this apparent optionality, one might postulate that the movement of corrective focus to the left periphery can take place either overtly or covertly, and that the covert option is preferred by virtue of economy of derivation. However, as discussed in Alboiu 2003, a similar analysis is problematic, since focus *ex situ* would give rise to a violation of Procrastinate.

Building on Alboiu 2003, we propose a different account, in which optionality is reduced to the syntax-prosody interface. We assume a single derivational cycle with alternative linearization of one of the copies of a movement chain, and we hypothesize that corrective focus movement consistently takes place in the syntax; however, at the syntax-prosody interface, the mechanism of copy deletion can target either the higher or the lower copy. We argue that deletion of the higher copy – yielding focus *in situ* – results in an unmarked prosodic structure, while deletion of the lower copy – yielding focus *ex situ* – results in a marked prosodic structure. From this perspective, there is an intrinsic tension between the *ex situ* position, in which the corrective import is licensed, and *in situ* position, which is prosodically less marked.[22]

In the following section we discuss in detail the relevant notion of prosodic markedness.

4.3.1. Fronted focus and prosodic markedness in Italian

Our notion of prosodic markedness is based on the rightmostness of prosodic heads. It is a widespread assumption (see Nespor & Vogel 1986) that in Italian the head within any prosodic constituent above the word level is assigned to the rightmost element. This is absolutely clear in broad focus sentences. In sentences with corrective focus, the main prominence of the utterance is consistently associated with the focus element, irrespective of its being *in situ* or *ex situ*;[23] however, in case of focus *ex situ*, the prosodic status of post-focal elements is controversial. According to Vallduví's (1992) seminal work (see also Szendrői 2002), Italian is characterized by a rigid prosodic template, in which rightmostness is never violated: the main prominence is invariably the rightmost phrasal prominence of the utterance, and all the elements following it are assumed to be extra-sentential and extra-prosodic.

This line of analysis, however, appears problematic in light of experimental research on intonation. Unlike what is observed in Germanic languages, in many varieties of Italian post-focal constituents associate with compressed pitch accents (see Grice et al. 2005 for an overview): consequently, these constituents cannot be analyzed as extra-prosodic, *contra* Szendrői (2002).

Bocci and Avesani (2011) have recently investigated the phonological status of post-focal elements, providing new experimental evidence against the alleged inviolability of rightmostness in Italian. They carried out a production experiment on read speech in which they com-

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[22]This situation is reminiscent of the economy condition of 'Minimize Mismatch' discussed in Bobaljik 2002 for A-chains.

[23]An instance of corrective focus in (Tuscan) Italian, independently of its being *in situ* or *ex situ*, systematically associates with a rising bitonal pitch accent L(ow)+H(igh)*. According to the experimental findings described in Bocci 2009, this notably contrasts with the nuclear pitch accent H(igh)+L(ow)* observed in broad focus sentences and in case of new information focus. Notice, however, that Bocci (2009) actually refers to corrective focus as contrastive focus. In future work, we plan to compare the intonational properties of corrective and merely contrastive focus, as defined in this paper.

pared the degree of metrical prominence assigned to post-focal elements. The experimental conditions are exemplified in Table 3.

Condition A	[Germanico vorrebbe invitare Pierangela]_BF Germanico would like to invite Pierangela
Condition P	[Germanico]_CF vorrebbe invitare Pierangela Germanico would like to invite Pierangela
Condition H	[Germanico]_CF la vorrebbe invitare [Pierangela]_RDed Germanico her-would like to invite Pierangela

Table 3. Examples of experimental sentences from Bocci & Avesani 2011

The stimuli presented an infinitival verb form (the target word) followed by its object and occurring in three conditions: (i) condition A: in a broad focus sentence (BF); (ii) condition P: following a subject on which the context imposed a corrective focus (CF) interpretation; (iii) condition H: following a CF subject and preceding a right dislocated (RD-ed) topic.

The rationale was related to the predicted metrical representations: see Table 4. In condition A, the infinitive was expected not to qualify as a phrasal head, since the head should be assigned to the object. Similarly, the infinitive in condition P, being followed by its object, should not qualify as a phrasal head, regardless of the metrical status of post-focal material.

In condition H, instead, the RD-ed object was expected to be phrased as an independent intonational phrase (ι) and, consequently, the infinitive was expected to be wrapped between the phonological phrase (φ) boundary closing the initial focus and the ι-boundary setting apart the RD-ed Object. If phrasal prominences were assigned in post-focal context by virtue of default mapping rules, the infinitive in condition H should qualify as a φ-head, being the rightmost element within its φ-phrase. Conversely, if post-focal elements were extra-prosodic, the infinitive should bear only a word-level prominence as in A and P.

Condition A: broad focus	{ * }υ phonological utterance [*]ι intonational phrase (*)φ (*)φ phonological phrase Germanico vorrebbe invitare Pierangela Germanico would like to invite Pierangela
Condition P: initial corrective focus	{ * }υ phonological utterance [*]ι intonational phrase (*)φ (*)φ phonological phrase [Germanico]_CF vorrebbe invitare Pierangela Germanico would like to invite Pierangela
Condition H: initial corrective focus, right dislocated	{ * }υ phonological utterance [*]ι [*]ι intonational phrase (*)φ (*)φ (*)φ phonological phrase [Germanico]_CF la vorrebbe invitare [Pierangela]_RDed Germanico her-would like to invite Pierangela

Table 4. Metrical representations of the experimental sentences according to Bocci and Avesani's (2011) analysis

The results clearly showed that metrical phrasal heads are assigned to post-focal material in condition H. The infinitive (though 'given' in sense of Schwarzschild 1999 and part of the background) bore a higher metrical prominence than in A (where it is non-given but in a structurally weak position, i.e. non-head) and in P (where it is given and in a weak position): for instance, the infinitive's stressed vowel in condition H was characterized by significantly longer durations than in A and P, more extreme formant trajectories and higher spectral emphasis. On the basis of these results, Bocci and Avesani conclude that rightmostness is violated in condition H at the ι- and υ-level, and that the existence of a rigid prosodic template in Italian must be rejected.[24] According to their analysis, Italian prosody is rigid only in the sense that it fails to destress given information,[25] and that phrasing and headedness must apply exhaustively.[26]

Let us now go back to the optionality of focus fronting. Given Bocci and Avesani's analysis, it follows that focus fronting necessarily induces a violation of rightmostness: since post-focal elements are not extra-prosodic, but phrased and headed in Italian, the assignment of the main prominence to focus *ex situ* gives rise to a marked prosodic structure.

Recall from §2.1 that in our experimental results, focus fronting was a possible option in the corrective conditions, unlike the merely contrastive condition, but the *in situ* position was preferred. This can be explained as a syntax-prosody interface effect: spelling out the *ex situ* position gives rise to a more marked prosodic structure with respect to the *in situ* position.[27]

Notice that prosodic markedness can also account for another asymmetry. As shown in Figure 1 in §2.1, in the corrective contexts the probability of preferring focus *ex situ* is higher in case the negative tag does not occur (Condition 3, 25%) than in case it occurs (Condition 2, 13%).[28] According to Bocci (2009), negative tags are produced as an independent prosodic phrase (be it a phonological phrase or a phonological utterance) which undergoes a prosodic compounding process joining the negative tag and the main clause. Crucially, within the prosodic constituent in which the tag is phrased, the highest prominence is assigned to the negative element *non*, and the following material is prosodically subordinated: thus, the negative tag involves an independent violation of rightmostness. This is illustrated in the upper part of Table 5, exemplifying the metrical representation of the experimental sentence in Condition 2 with focus *in situ* and a negative tag (cf. Table 1, §2.1).

If we combine a negative tag with a focus *ex situ* in the main clause, the resulting prosodic structure involves a double violation (see the lower part of Table 5).

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[24]Samek-Lodovici (2006) argues that fronted focus in Italian results from the right dislocation of post-focal material. This analysis is similar to the one proposed by Szendrői. However, Samek-Lodovici's account does not state that post-focal elements are prosodically invisible and, therefore, it is consistent with Bocci and Avesani's results. For reasons of space, we cannot discuss this proposal in detail, but we refer the reader to Bocci (2009) for a discussion.

[25]This is not a new observation: see, for instance, the discussion in Ladd 1996 and the experimental results discussed in Swerts et al. 2002.

[26]Crucially, according to Bocci and Avesani's analysis (see also Bocci 2009), the occurrence of post-focal phrasal prominences in condition H is not due to specific discourse-related properties (such as a second occurrence of focus), but only to default mapping rules.

[27]Notice that in the experimental stimuli with focus *in situ*, the focussed element occurs in sentence-final position, and therefore, the prosodic structure complies with rightmostness.

[28]The experiment described in §2.1 was not designed to compare these two conditions. We plan to investigate the impact of the negative tag in a dedicated experiment. At the present stage of investigation, we simply take the observed asymmetry between Condition 2 and Condition 3 as a tendency.

Focus *in situ* + negative tag	{ }υ′ { * } { * }υ [*] [*]ι (*) (*) (*)φ Si era messa [un ArMAni]_{CF} non uno straccetto di H&M (she) wore an Armani (dress), not a cheap dress from H&M
Focus *ex situ* + negative tag	{ }υ′ { * } { * }υ [*] [*]ι (*) (*) (*) (*)φ [Un ArMAni]_{CF} si era messa non uno straccetto di H&M an Armani (dress) (she) wore, not a cheap dress from H&M

Table 5. Metrical representations of the experimental sentences in Condition 2

This accounts for the lower rate of preference for focus *ex situ* in Condition 2 with respect to Condition 3.

5. Summary

In this paper we provided experimental evidence that supports a distinction between two interpretive imports that may associate with a focus structure: (a) a merely contrastive import of a focus structure and (b) a corrective import. We showed that the specific import of a focus structure affects the distribution of the focus element in Italian: in particular, only the corrective import can license the *ex situ* position ('focus movement').

We proposed that the crucial difference relates to the fact that the corrective import has an impact on the conversational dynamics, and therefore, it can only be licensed in discourse-active clauses: only the latter can convey a conversational move, that is, a specific proposal to update the discourse context. We then sketched a cartographic implementation of this insight, whereby the corrective import is licensed in the left periphery of discourse-active clauses. This explains why only corrective focus, but not merely contrastive focus, can target a left-peripheral *ex situ* position.

The surface optionality of such movement was resolved at the syntax-prosody interface. We proposed that the focus element always enters a dependency with the left-peripheral position, but at the interface, it is possible to spell out either the higher or the lower copy of the dependency. The first option, however, gives rise to a marked prosodic structure violating the rightmostness requirement, since the fronted focus element, bearing the main prominence at the ι-level, is not in the rightmost position. This view is crucially based on the observation that in Italian, the post-focal material is not extra-metrical (Bocci and Avesani 2011), and hence rightmostness is a violable constraint.

We conclude with a general remark. Focus is a multi-layer phenomenon, affecting different aspects of interpretation (Krifka 2007). Previous accounts have related the phenomenon of 'focus movement' to the semantic core, that is, the determination of the domain of focus. Our results suggest that focus movement may be triggered by other aspects of interpretation lying outside the semantic core: in particular, those which relate to the conversational dynamics.

References

Alboiu, Gabriela. 2003. Operator Asymmetries in Romanian: Syntax and/or Phonology? In Ana Pérez-Leroux and Yves Roberge (eds.), *Romance linguistics: Theory and acquisition.*3–18, Philadelphia: John Benjamins.

Asher, Nicholas. 2004. Discourse semantics and the Focus/Background distinction. In Hans Kamp and Barbara Partee (eds.), *Context-dependence in the analysis of linguistic meaning.*29–60. Amsterdam: Elsevier.

Baayen, Harald. 2008. *Analyzing linguistic data: A practical introduction to statistics using R*. Cambridge: Cambridge University Press.

Beyssade, Claire; Elizabeth Delais-Roussarie; Jean-Marie Marandin; and Annie Rialland. 2011. Ground-Focus articulation in the Grammar.
Online: `http://www.llf.cnrs.fr/Gens/Marandin/Text-FGA.Definitif.pdf.`

Bianchi, Valentina, and Mara Frascarelli. 2010. Is topic a root phenomenon? *Iberia* 2.43–88.

Bianchi, Valentina. 2011. On 'focus movement' in Italian. To appear in Ángel Jiménez Fernández (ed.), *Information Structure, agreement and the CP.* Philadelphia: John Benjamins.

Bobaljik, Jonathan D. 2002. A-Chains at the PF-interface: Copies and "covert" movement. *Natural Language and Linguistic Theory* 20.197–267.

Bocci, Giuliano, and Cinzia Avesani. 2011. Phrasal prominences do not need pitch movements: postfocal phrasal heads in Italian. *Proceedings of Interspeech-2011.*1357–1360.

Bocci, Giuliano. 2009. *The syntax-prosody interface from a cartographic perspective: Evidence from Italian.* To be published (Philadelphia: John Benjamins).

Boersma, Paul, and David Weenink. 2012. Praat: doing phonetics by computer [Computer program]. Online: `http://www.praat.org/.`

Brunetti, Lisa. 2004. *A unification of focus.* Padova: Unipress.

Brunetti, Lisa. 2009. Discourse functions of fronted foci in Italian and Spanish. In Andreas Dufter and Daniel Jacob (eds.), *Focus and background in Romance languages.* 43–82. Philadelphia: John Benjamins.

Cinque, Guglielmo, and Luigi Rizzi. 2008. The cartography of syntactic structures. *Studies in Linguistics – CISCL Working Papers* 2.42–58.

Dayal Veneeta, and Jane Grimshaw. 2009. Subordination at the interface: the quasi-subordination hypothesis. Online: `http://www.rci.rutgers.edu/%7Edayal/QSpaper.pdf.`

Emonds, Joseph. 1970. *Root and structure-preserving transformations.* PhD Thesis, MIT.

Fanselow, Gisbert, and Denisa Lenertova. 2010. Left peripheral focus: mismatches between syntax and information structure. *Natural Language and Linguistic Theory* 29.169–209.

Farkas, Donka F. and Kim B. Bruce. 2010. On reacting to assertions and polar questions. *Journal of Semantics* 27.81–118.

Gärtner, Hans-Martin. 2002. On the force of V2 declaratives. *Theoretical Linguistics* 28.33–42.

Grice, Martine; Maria Paola D'Imperio; Michelina Savino; and Cinzia Avesani. 2005. Towards a strategy for ToBI labelling varieties of Italian. In Sun-Ah Jun (ed.) *Prosodic typology: The phonology of intonation and phrasing*. New York: Oxford University Press.

Haegeman, Liliane. 2004. Topicalization, CLLD and the left periphery. In Claudia Maienborn, Werner Frey, and Bernard Shaer (eds.), *ZAS Papers in Linguistics 35: Proceedings of the Dislocated Elements Workshop.*157–192.

Haegeman, Liliane. 2011. The syntax of MCP: Deriving the truncation account. Online: `LingBuzz/001246.`

Hartmann, Katharina, and Malte Zimmermann. 2007. In place – out of place? Focus in Hausa. In Kerstin Schwabe & Susanne Winkler (eds.), *On Information Structure, meaning and form: Generalizing across languages*. 365–403. Amsterdam: John Benjamins.

Hooper, Joan and Sandra Thompson. 1973. On the applicability of root transformations. *Linguistic Inquiry* 4.465–497.

Horvath, Julia. 2010. "Discourse-features", syntactic displacement, and the status of contrast. *Lingua* 120.1346–1369.

Krifka, Manfred. 2001. For a structured meaning account of questions and answers. In Caroline. Fery & Wolfgang Sternefeld, *Audiatur Vox Sapientiae: A festschrift for Arnim von Stechow*. Akademie Verlag. 287–319.

Krifka, Manfred. 2006. Association with focus phrases. In Valeria Molnar & Susanne Winkler, (eds.) *The architecture of focus*. 105–136. Berlin: Mouton de Gruyter.

Krifka, Manfred. 2007. Basic notions of information structure. In Caroline Féry, Gilbert Fanselow, and Manfred Krifka (eds.), *Interdisciplinary Studies on Information Structure* 6.

Krifka, Manfred 2011. Embedding speech acts. Online: `http://philpapers.org/`.

Ladd, Robert D. 1996. *Intonational phonology*. Cambridge: Cambridge University Press.

Meinunger, André. 2004. Verb position, verbal mood and the anchoring (potential) of sentences. In Horst Lohnstein and Susanne Trissler (eds.), *The syntax and semantics of the left periphery*. 313–41. Berlin: Mouton de Gruyter.

Merchant, Jason 2001. *The syntax of silence*. New York: Oxford University Press.

Miyagawa, S. 2011. Agreements that occur mainly in the main clause.
Online: `http://web.mit.edu/miyagawa/www/manuscripts.html`.

Neeleman, Ad; Elena Titov; Hans van de Koot; and Reiko Vermeulen. 2007. A syntactic typology of topic, focus and contrast. Online: `lingBuzz/000562`.

Neeleman, Ad, and Hans van de Koot 2008. Dutch scrambling and the nature of discourse templates. *Journal of Comparative Germanic Linguistics* 11.137–189.

Nespor, Marina, and Irene Vogel. 1986. *Prosodic phonology*. Dordrecht: Foris.

Rizzi, Luigi 1997. The fine structure of the left periphery. In Liliane Haegeman (ed.), *Elements of grammar*. 281–337. Dordrecht: Kluwer.

Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1.75–116.

Samek-Lodovici, Vieri. 2006. When Right Dislocation meets the Left-Periphery. A unified analysis of Italian non-final focus. *Lingua* 116.836–873.

Schwarzschild, Roger. 1999. Givenness, Avoid F, and other constraints on the placement of accent. *Natural Language Semantics* 7.141–177.

Stalnaker, Robert. 1978. Assertion. In Peter Cole (ed.), *Syntax and semantics 9: Pragmatics*. New York: Academic Press. 315–332.

Swerts, Mark; Emiel Krahmer; and Cinzia Avesani. 2002. Prosodic marking of information status in Dutch and Italian: a comparative analysis. *Journal of Phonetics* 30.629–654.

Szendrői, Kriszta. 2002. Stress-focus correspondence in Italian. In Claire Beyssade, Reineke Bok-Bennema, Frank Drijkoningen, and Paola Monachesi (eds.), *Romance languages and linguistic theory 2000: Selected papers from 'Going Romance' 2000*. Amsterdam: John Benjamins.

Truckenbrodt, Hubert. 1995. *Phonological phrases: Their relation to syntax, focus and prominence*. Cambridge MA: Ph.D. dissertation, MIT.

Tomioka, Satoshi. 2010. Contrastive topics operate on speech acts. In Malte Zimmermann and Caroline Féry (eds.) *Information Structure: Theoretical, typological and experimental perspectives*. Oxford: Oxford University Press.115–138.

Vallduví, Enric. 1992. *The informational component*. New York: Garland.

van Leusen, Noor. 2004. Incompatibility in context: A diagnosis of correction. *Journal of Semantics* 21.415–442.

Wh-coordination in Hungarian and Romanian multiple questions

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1. Introduction

According to one definition, *coordination* is a syntactic operation that usually includes the presence of a conjunction and is based on some repetitive mechanism (Sag et al. 1985). However, the exact nature of this repetitive mechanism has not always been clear. Nowadays, it is generally accepted that the conjuncts must be categorially/functionally similar and they must share a superordinate semantic concept they all can be seen as instances of. The assumption that categorial identity is not always realized is easy to show (based on Sag et al. 1985):

(1)   a.   Pat is [a Republican]$_{NP}$ and [proud of it]$_{AP}$.
       b.   Pat is [either asleep]$_{AP}$ or [at the office]$_{PP}$.
       c.   That was [a rude remark]$_{NP}$ and [in very bad taste]$_{PP}$.

As these examples illustrate, the syntactic parallelism is weak concerning category and morphosyntactic features like gender, number, mood, etc. However, syntactic parallelism is strong when it comes to the syntactic function of the conjuncts: in the above examples, although the conjuncts are not of the same category, they share the same function (they are all predicative complements of the copula). These observations can be captured by the so-called *Wasow's Generalization*: for a coordination to be well-formed, each conjunct must independently meet the constraints imposed by the shared material. Another constraint concerning coordination constructions applies at the semantic level: the conjuncts must also share the same semantic role. In the following example, although each conjunct would form a grammatical sentence on its own (since the verb is optionally transitive), the sentence is ungrammatical, as they have different semantic roles:

(2)   *John eats [an apple and at midnight].

However, there are some specific structures that apparently violate the strong syntactic and semantic parallelism required in coordination (see examples in Chaves and Paperno 2007). One of these structures is the case of *wh*-phrases,[1] illustrated in (3) for two typologically unrelated

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[1]For the sake of simplicity, we illustrate this phenomenon with the help of binary examples (in which two conjuncts are coordinated). The coordination of more than two conjuncts works the same way. Throughout the paper, we only talk about 'bare' *wh*-phrases, but the proposed generalizations seem to hold for complex *wh*-phrases as well.

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languages: Hungarian (H) and Romanian (R).[2] Since in these structures the conjuncts apparently do not share the same syntactic function and same semantic role, they are sometimes referred to as *hybrid coordination* (Chaves and Paperno 2007).

(3)   a.   **Ki** (és) **mikor** jött? (H)
           who (and) when came
       b.   **Cine** (și) **când** a   venit? (R)
           who (and) when has come

The paper is structured as follows. In §2 we present some general observations about *wh*-coordination in Hungarian and Romanian multiple questions. In §3 we examine the syntactic structure of these constructions in the two languages. In §4 we move on to our proposed analysis that we formalize within the framework of Head-driven Phrase Structure Grammar (HPSG), followed by a conclusion in §5.

2. The data: generalities

In this section, we introduce some basic properties of *wh*-coordination with respect to the two languages examined. These include the comparison of coordinate structures with other multiple question structures, and, crucially, the problem of *wh*-word order, which creates a lot of confusion in the speakers' acceptability judgments. Although in this paper we mostly used examples that can be found on the internet and in corpora, and we checked their acceptability with native speakers by using questionnaires (presenting each item in an appropriate context), we experienced considerable hesitation in these judgments. The acceptability of these examples thus clearly necessitates further experimental studies, which was beyond the scope of this paper.

2.1. Coordination and other multiple question structures

Multiple questions involving the presence of a conjunction should clearly be distinguished from those without a conjunction, since they do not have the same properties. Those containing a conjunction can further be divided into two groups, based on the possibility for one of the *wh*-phrases to be 'stranded' at the end of the sentence.

2.1.1. Coordinate and 'paratactic' multiple questions

Concerning the examples in (3), we should note that the presence of the conjunction is not obligatory. In the languages used as illustration above, where both 'paratactic' *wh*-phrases (henceforth **paratactic-*wh***)[3] such as (4), and coordinated *wh*-phrases (henceforth **coord-*wh***) such as (5), are possible in multiple questions, the two patterns usually have different interpretational properties.

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[2]In this paper, we concentrate on the coordination of *wh*-phrases in Hungarian (see also Bánréti 2007, and Lipták 2001, 2003) and Romanian (see also Comorovski 1996, and Rațiu 2011), keeping in mind that this structure is possible in other languages as well: Vlach (Merchant 2008), and in the Slavic languages (Chaves and Paperno 2007, and Gribanova 2009 on Russian, Skrabalova 2006 on Czech, and see Kliaschuk 2008, Citko and Gračanin-Yuksek 2012, and Tomaszewicz 2011 for cross-linguistic analyses).

[3]I.e. The *wh*-phrases are cumulated in the preverbal domain without a conjunction.

(4) a. **Ki mit** eszik karácsonykor? (H)
        who what eats   Christmas-at
        'Who eats what at Christmas?'
     b. **Cine ce**   mănâncă de Crăciun? (R)
        who what eats   at Christmas
     c. Answer: 'We usually eat fish, our neighbours cabbage, and our colleagues turkey.'

(5) a. **Ki** és **mit** tett a levesbe? (H)
        who and what put the soup-into
        'Who put something into the soup and what was it?'
     b. **Cine** și **ce** a pus în supă? (R)
        who and what has put into soup
     c. Answer: 'It was me and I added some curry to it.'

As can be seen from the examples, paratactic-*wh* as in (4) usually licenses so-called *pair-list answers*, whereas coord-*wh* as in (5) are often argued to license so-called *single pair answers*. Ginzburg and Sag (2000) argue that the pair-list reading is the default reading of multiple questions, and the single pair reading is always related to some additional mechanism, like a *uniqueness presupposition*. Single pair answers are usually given to questions that refer to unique events and inquire about more than one participant of that event. It is, however, also possible that the uniqueness presupposition is cancelled in the answer, since the question has to be divided into subquestions (see Büring 2003), and the answer provides a number of subevents of the main events (Jean-Marie Marandin, László Kálmán, p.c.):

(6) a. **When** and **where** were the children examined?
     b. Answer 1: On Monday in the school.
     c. Answer 2: *The girls* on Monday at school and *the boys* on Friday at home.

   The second distinguishing property between paratactic and coord-*wh* is related to the first. It is usually assumed that *wh*-phrases in paratactic-*wh* obey strict ordering constraints influencing the interpretation of the question, whereas there is no strict syntactic constraint on the order of *wh*-phrases in coord-*wh*, or at least the different orders do not trigger significant interpretational differences. All the orders do not seem to be possible though (see §2.2). Furthermore, in coord-*wh* the first *wh*-phrase can constitute an independent intonational unit, which is not the case with the initial *wh*-phrase in paratactic-*wh*. The above considerations thus motivate the claim that coordinate and paratactic multiple questions are not simple variants of the same structure, but reveal different structures necessitating different analyses.

2.1.2. Coord-*wh* and end-attach-*wh* multiple questions

   There is another multiple question structure which has not yet been illustrated. In this type, one *wh*-phrase is in an initial position, whereas the other is 'stranded' at the end of the sentence (henceforth **end-attach-*wh***).

(7) **Ki** jött, és **mikor**? (H)   (8) **Cine** a venit, și **când**? (R)
    who came, and when   who has come, and when

   End-attach-*wh* shares some properties with coord-*wh*. Apart from the fact that the 'stranded' *wh*-phrase is marked by a conjunction and it can constitute an independent intonation unit, end-

attach-*wh* usually licenses a single-pair reading. It is also our aim in this paper to examine to what extent end-attach-*wh* can be analyzed in the same way as coord-*wh* in the two languages.

2.2. Asymmetries and acceptability judgments

It is an important observation concerning multiple questions that there is considerable variation in their acceptability among speakers, not independently of the complex interpretational patterns sketched above. Speakers' intuitions are uncertain as regards both (i) the available semantic interpretations (pair-list versus single-pair) and (ii) the ordering variations.[4]

For instance, Comorovski (1996) and Rațiu (2011) consider that, contrary to what happens in paratactic-*wh*, no ordering restriction appears to hold between the *wh*-phrases in coord-*wh* in Romanian. That is, we can switch the order of the *wh*-phrases without any change in acceptability. However, we have found that there are indeed ordering constraints which affect the acceptability.

2.2.1. The main/subordinate clause asymmetry

The first asymmetry that has been observed (Gazdik 2011) is that coordinate multiple questions are sometimes much more natural in embedded clauses than as main clause questions:

(9) a. Még holnap   egyeztetünk, hogy **mikor** és **hol**   kéne   találkozni. (H)
        still tomorrow agree   that when and where should meet
        'We will discuss tomorrow when and where we will meet.'
    b. Te rog să ai   grijă **cui**   și **ce**   spui! (R)
        please have.SUBJ attention who.DAT and what.ACC tell.2
        'Please be careful what you tell and to whom!'

A possible explanation might be found in the fact that these questions usually refer to unique events, and this is why it is more felicitous to ask a question about this event if it has already been introduced into the discourse. One way of signaling this is exactly to introduce it with a main clause and embed the question in the subordinate clause. This problem still needs further investigation though.

It is interesting to note that the main/subordinate clause asymmetry can be observed in the so-called correlative coordination of *wh*-phrases as well. For instance, in Romanian, the use of correlative items *și...și* 'both...and' in main *wh*-coordination, as in (10b), yields an ungrammatical sentence, while it is quite acceptable in embedded clauses such as (10a).[5]

(10) a. Vreau să știu   *și*   **cine**, *și*   **ce**   a spus despre mine.
        want   know.SUBJ CORREL who,   CORREL what has told about   me
        'I want to know both who told and what he told about me.'
    b. *Și   **cine**, *și*   **ce**   a spus despre mine?
        CORREL who,   CORREL what has told about   me

---

[4]The different judgments referred to in the literature are contradictory. For example, Romanian (i) is considered acceptable by Rațiu 2011, while it appears ungrammatical in Kliaschuk 2008.

(i) **Ce** și **cine** a cumpărat? (R)
     what and who has bought

[5]Rațiu (2011) ignores grammatical uses of correlative items in subordinate clauses.

2.2.2. The argument/adjunct asymmetry

Apart from the main/subordinate clause differences, the argument/adjunct asymmetry can also play a role. This evokes the insights of Browne (1972) and Lewis et al. (2012), who show that the possibility of coord-*wh* in English is related to the argument/adjunct asymmetry and in particular to the syntactic behaviour of the verbal head (i.e. if it selects for an optional or an obligatory complement). According to experimental studies of Lewis et al. (2012), obligatorily transitive verbs, like *fix* in (11a), are often unacceptable if their subcategorized complement is in the left conjunct, whereas optionally transitive verbs, like *eat* in (11b), are more acceptable in this context. On the other hand, when the left conjunct is an adjunct as in (11c), the transitivity asymmetry seems to disappear.

(11) a. *__What__ and __when__ did John fix?
      b. __What__ and __when__ did John eat?
      c. ...the mechanic decided __when__ and __what__ {he could eat / he would fix}...

Returning to Hungarian and Romanian, there are four syntactic patterns of coord-*wh*: (a) adjunct–adjunct, (b) adjunct–argument, (c) argument–adjunct, and (d) argument–argument, illustrated in (12) for Hungarian, and in (13) for Romanian.

(12) a. __Mikor__ és __miért__ ment el?
          when   and why   left.3 PRT
      b. __Hol__ és __mit__ ettél?
          where and what ate.2
      c. __Ki__ és __miért__ ment el?
          who and why   left PRT
      d. __Ki__ és __mit__ választott?
          who and what chose

(13) a. __Unde__ și __când__ pleacă?
          where and when go.3?
      b. __Unde__ și __ce__ mâncăm?
          where and what eat.4
      c. __Cine__ și __când__ pleacă?
          who and when go?
      d. __Cine__ și __ce__ a cucerit?
          who and what has conquered

The first pattern does not seem to pose any acceptability problem; the other three patterns, however, are subject to more or less variation in acceptability judgments, especially in Romanian, even though all available in both languages. At this stage, we believe that part of this variation is related to the fact that both Hungarian and Romanian are *pro*-drop languages, allowing the dropping of some arguments (subject or complements). This may help us to explain the difference in acceptability between (14b) and (15b) in Romanian: although both verbs *a spune* 'to tell' and *a locui* 'to live' can have a dropped subject, they do not have the same behaviour with the complement they select for; while the former allows the non-realization of its direct complement, the latter requires an overt locative complement.

(14) a. __Cine__ și __ce__ ți-a   spus?
          who and what CL.2-has told
      b. __Ce__ și __cine__ ți-a   spus?
          what and who CL.2-has told

(15) a. __Cine__ și __unde__ locuiește?
          who and where lives
      b. *__Unde__ și __cine__ locuiește?
          where and who lives

The transitivity asymmetry observed in English obviously plays role in end-attach-*wh* in both languages under examination. In these contexts, the syntactic behaviour of the verbal predicate affects the ordering of *wh*-phrases. For example in Romanian (16), the verbal head *a mânca* 'to eat' can have an absolute use, without any overt complement, which could explain why inverted orders of *wh*-phrases are acceptable. On the other hand, in (17) the verb *a se baza* 'to rely

on' requires an overt prepositional complement in the clause, which cannot thus be stranded in an end-attach-*wh* structure.

(16) a. **Ce** ai mâncat, și **unde**?
          what have.2 eaten,   and where

(17) a. **Pe cine** te bazezi, și **de ce**?
          whom rely-on.2, and why

      b. **Unde** ai mâncat, și **ce**?
          where have.2 eaten,   and what

      b. ***De ce** te bazezi, și **pe cine**?
          why rely-on.2, and whom

2.2.3. [+Human] subject first

At the semantic level, in both languages the order of the *wh*-phrases usually follows some universal animacy hierarchy as regards the position of subject-*wh*-phrases. In Hungarian, if the *wh*-phrase *ki* 'who' is present in the question, it has to be the initial *wh*-phrase, otherwise the order is free:

(18) a. **Ki** és **mit** választott?
          who and what chose

(19) a. **Ki** és **miért** ment el?
          who and why left PRT

      b. ***Mit** és **ki** választott?
          what and who chose

      b. ***Miért** és **ki** ment el?
          why and who left PRT

The same preference for human subject in first position is observed in Romanian too, at least in argument-argument combinations; the reverse order is only acceptable in a given context and with a specific prosody, but not in out-of-the-blue utterances.

(20) a. **Cine** și **ce** a văzut la Victor Ponta pentru a-l alege în funcția unui partid
          who and what has seen   at Victor Ponta ...
          aflat într-o profundă criză?
          'Who saw what in Victor Ponta to elect him head of a party in a deep crisis?'
      b. ??**Ce** și **cine** a văzut la Victor Ponta ...?
          what and who has seen   at Victor Ponta ...

A more rigid constraint concerns cases in which both *wh*-phrases bear a [+human] feature: insofar as the order of [+human subject] with respect to [+human complement/adjunct] is concerned, two groups of Romanian speakers have been identified: there is one group who dislikes the presence of a conjunction between these *wh*-phrases, while the other group accepts it. However, neither group accepts the inverted order in these cases.

(21) a. **Cine** (??și) **pe cine** a văzut?
          who (and) whom   has seen
      b. ***Pe cine** și **cine** a văzut?
          whom   and who has seen

In both languages, end-attach-*wh* is infelicitous if the sentence-final *wh*-phrase is the subject, as in (22) and (23). Two possible explanations are at hand for the infelicity of such examples. On the one hand, it can be considered reminiscent of the animacy hierarchy referred to above. On the other, cataphoric dependency (the fact that an element is presupposed or referred to in the sentence, before it is actually introduced) is generally not admitted in coordinate structures (unlike in subordination), cf. the 'counter-indefiniteness' effect (Kayne and Pollock 2001).

(22) ??**Miért** hívott és **ki**? (H)   (23) ??**Ce** a mâncat, și **cine**? (R)
       why called and who   what has eaten and who

Moreover, in both languages, coordinate structures are infelicitous if the verbal predicate involves a *symmetric* or *reversible* semantic relation:

(24) a. ****Ki** és **kivel** játszott? (H)   (25) a. ****Ki** és **kit** ütött? (H)
        who and who.INSTR played   who and whom hit

       b. **Cine** (??**și**) **cu cine** s-a   b. **Cine** (??**și**) **pe cine** a lovit?
         who and with whom REFL-has   who and whom has hit
         întâlnit? (R)   (R)
         met

Interestingly, in these contexts, Romanian speakers prefer the 'paratactic' structure. This means that contrary to the general assumption, paratactic-*wh* can license single pair answers in special cases. The type of answer is again related to a unique event, and the question either refers to its participants, as in (26), or even the identity of the participants can be known, and then the question refers to their respective roles in the event, as in (27).

(26) **Cine cu cine** s-a întâlnit?   (27) **Cine pe cine** a lovit?
       who with whom REFL-has met   who whom has hit

In Hungarian, although paratactic-*wh* containing these question words is grammatical, it does not mean the same, as it exclusively licenses pair-list answers, which presupposes that there is more than one meeting or hitting event. This is why a fourth type of syntactic structure is preferred in the case of symmetric or reversible predicates: in this type, one *wh*-phrase appears sentence-initially, whereas the other remains in its canonical position, as in (28) and (29). This kind of structure is also possible in Romanian, as in (30) and (31).

(28) **Ki** játszott **kivel**?   (29) **Ki** ütött **kit**? (H)
       who played who.INSTR   who hit whom
(30) **Cine** s-a întâlnit **cu cine**?   (31) **Cine** a lovit **pe cine**? (R)
       who REFL-has met with whom   who has hit whom

To conclude this section, we have shown that, contrary to what is often assumed in the literature, we do find some ordering constraints in *wh*-coordination, even if the interplay of the constraints governing these orderings is not always clear to us. Furthermore, a gradience can be observed in the acceptability of the data, which means that we can find intermediate examples between fully acceptable and ungrammatical ones. However, cumulativity of violated constraints renders intermediate examples ungrammatical (e.g. the combined violation of semantic and syntactic constraints in Romanian, as shown in (32)).

(32) a. **Ce** și **cine** ți-a spus?
         what and who CL.2-has told

       b. ??**Ce** și **cine** susține?
          what and who defends

       c. ****Ce** și **cine** consumă dimineața?
          what and who eats morning.DEF

Finally, it is also possible that the variation observed with some orderings be explained as a kind

of syntactic priming: the stricter orderings in paratactic-*wh* have an impact on the speakers' preferences as regards the *wh*-combinations in coordination structures, and this influences the acceptability judgments. This may help us to explain why all 10 Romanian subjects participating in a 5-point rating scale task ranked the sentence in (33) above 4 (high degree of acceptability), and the reversed order in (34) below 3 (low degree of acceptability). The issue necessitates further experimental investigations (e.g. experiments with a speeded acceptability judgment task).

(33)   **Cine** și **ce** a văzut?   (34)   **Ce** și **cine** a văzut?
          who and what has seen   what and who has seen

3. Background of the analysis

In this section, we examine the syntactic structure of the already presented constructions. More precisely, our aim is to determine whether they are monoclausal or biclausal.

3.1. Previous analyses

Generally, previous analyses proposed for coordinate multiple questions treat them as either monoclausal or biclausal structures, but they usually assume (except for Citko and Gračanin-Yuksek 2012, and Haida and Repp 2011) that one type of analysis can be cross-linguistically valid. According to the monoclausal approaches (Kazenin 2002, Lipták 2001, 2003, Skrabalova 2006, and Gribanova 2009), parallel to the analysis of paratactic-*wh*, the *wh*-phrases are fronted by movement to the left periphery of the same clause and then a 'spurious coordinator' is inserted between the *wh*-phrases, as illustrated in (35a). Other analyses assume that coordinate multiple questions are in fact biclausal, as schematized in (35b).

(35)   a. $[_{CP}\ [_{\&P}\ \text{wh}_1\ \textbf{conj}\ \text{wh}_2]\ [_{TP}\ t_1\ ...\ t_1]\ ]$
        b. $[_{\&P}\ [_{CP}\ \text{wh}_1\ [_{TP}\ t_1\ ...\ ]]\ \textbf{conj}\ [_{CP}\ \text{wh}_2\ [_{TP}\ ...\ t_2\ ]]]$

There are two different biclausal analyses: one involving syntactic ellipsis (Bánréti 2007, Giannakidou and Merchant 1998, Merchant 2008, and Tomaszewicz 2011), which assumes that coordinate multiple questions contain standard clausal coordination accompanied by the ellipsis of all the material except for the *wh*-phrase itself in one of the conjuncts (i.e. *backwards sluicing*). According to the other approach, coordinate multiple questions involve multidominance, characterized by a single element being shared between two mother nodes (Citko and Gračanin-Yuksek 2012; Rațiu 2011). In what follows, we examine the syntax of these structures in Hungarian and Romanian separately.

3.2. The syntactic structure of Romanian coord-*wh* and end-attach-*wh*

We will argue that both coord-*wh* (36) and end-attach-*wh* (37) are biclausal in Romanian.

(36)   [**Cine** –]$_S$ [și **când** a venit]$_S$?[6]   (37)   [**Cine** a venit]$_S$ [și **când** –]$_S$?
          who – and when has come   who has come and when –

Conclusive evidence in favour of the biclausal analysis comes from the distribution of the

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[6]Note that the adjunct in the right conjunct can be analyzed either as an integrated or as an incidental adjunct. In the last case, the structure would be [**Cine** [și **când**–]$_S$ a venit]$_S$.

interrogative particle *oare* (Raţiu 2011). This particle optionally occurs in interrogative clauses in a relatively free distribution, as in (38a), and usually only appears once per clause, as in (38b). However, as Raţiu (2011) convincingly shows, the interrogative particle *oare* can appear only once per clause with paratactic-*wh*, as in (39), while with coord-*wh* and end-attach-*wh*, it can co-occur with each *wh*-phrase, as in (40a)–(40b) and in (40c), respectively. Thus, each of these two structures behaves like a coordination of two interrogative clauses.

(38) a. (*Oare*) Cine (*oare*) vine?
          (PRT) who (PRT) comes

      b. *Oare* cine (*oare*) vine?
          PRT who (PRT) comes

(39) a. *Oare* **cine** (**oare*) **ce** zice?
          PRT who (PRT) what says

      b. **Cine** (**oare*) **ce** *oare* zice?
          who (PRT) what PRT says

(40) a. *Oare* **cine** și *oare* **ce** va spune?
          PRT who and PRT what will say

      b. **Cine** *oare* și **ce** *oare* va spune?
          who PRT and what PRT will say

      c. *Oare* **cine** va veni, și *oare* **când** ?
          PRT who will come, and PRT when

Monoclausal analyses of coord-*wh* usually stipulate that the conjunction is a semantically spurious element (see Merchant 2008). However, in Romanian, coord-*wh* are compatible with other conjunctive items (41) apart from the conjunction *și* 'and'. If the conjunctive *and* is assumed to have some spurious uses (where it is semantically contentless), it is difficult to extend this analysis to the other coordinators, which seem to always be semantically contentful. More interestingly, the list of available conjunctions in Romanian multiple *wh*-questions contains the conjunction *iar* 'and' (41c), which is reserved for contrastive clausal coordination (Bîlbîie 2011).

(41) a. Nu vreau să mi se spună **când** *sau* **cât** trebuie să mănânc.
          NEG want.1 tell.SUBJ.3 me when or how much must eat.SUBJ.1
          'I don't like being told when or how much I have to eat.'

      b. Mă interesează nu **cine**, *ci* **ce** a făcut.
          me interests not who but what has done
          'I'm not interested in who did it, but in what he did.'

      c. Vreau să știu mai întâi **cine**, *iar* apoi **ce** a făcut.
          want.1 know.SUBJ.1 first who, and then what has done
          'I want to know first who did it, and then what he did.'

Furthermore, it is possible to coordinate the yes/no question marker *dacă* 'if' and a *wh*-phrase, which also shows that the structure is biclausal, since the answer to the second question has to presuppose that the first is already resolved:

(42) RATB și Metrorex vor anunța vineri **dacă** și **când** intră în grevă generală.
      RATB and Metrorex will announce Friday if and when enter in strike general
      'RATB and Metrorex will announce on Friday if and when they enter in general strike.'

Moreover, it is possible to insert sentence-level adverbials (e.g. speech act adverbs) between the *wh*-phrases:

(43) Nu văd **cum** și, *mai important*, **cine** ar putea să-l dea jos   pe Băsescu.
      not see.1 how and, most importantly, who could   overthrow.SUBJ Băsescu.ACC
      I don't see how, and most importantly, who could overthrow Băsescu.

Based on the above arguments, we assume that both coord-*wh* and end-attach-*wh* are bi-clausal in Romanian (*contra* Comorovski 1996).

3.3. The syntactic structure of Hungarian coord-*wh* and end-attach-*wh*

Concerning Hungarian, we claim that like in Romanian, end-attach-*wh* (45) is biclausal, but contrary to Romanian, coord-*wh* (44) is monoclausal.

(44)   [[**Ki** és   **mikor**]$_{wh-P}$ jött]$_S$?   (45)   [**Ki** jött]$_S$ [és   **mikor** –]$_S$?
       who and when   has   come   who has   come and   when –

Our first argument to support this claim comes from the distribution of the interrogative particle *vajon*: unlike the possibility of repeating *oare* with each *wh*-word in Romanian coord-*wh* and end-attach-*wh*, its Hungarian equivalent, *vajon*, cannot be repeated in coord-*wh*, as in (46a), but it can in end-attach-*wh*, as in (46b):

(46)   a.   *Vajon* **ki**   és   (*vajon) **mikor** érkezett?
            PRT   who and (PRT)   when arrived
       b.   *Vajon* **ki**   érkezett és   (*vajon*) **mikor**?
            PRT   who arrived and PRT   when

Secondly, sentence-level adverbials cannot appear between the *wh*-phrases in coord-*wh*, as in (47a), only in a prosodically marked sentence, as in (47b), where the adverbial and the second *wh*-word are incidental constituents. However, they can appear in end-attach-*wh* before the last *wh*-word, as in (47c):

(47)   a.   ***Ki**   és   *még*   *fontosabb* **mikor** jött   be ide?
            who and even more important when   came in here
       b.   **Ki**   – és   *még*   *fontosabb*: **MIKOR** – jött   be ide?
            who – and even more important: when   – came in here
       c.   **Ki**   jött   be ide, és   *még* *fontosabb*: **mikor**?
            who came in here and more important   when

Thirdly, some auxiliaries can appear between the *wh*-phrases in coordinate structures, which means that the structure is monoclausal (if we assume that the auxiliary and the main verb have to be clausemates):[7]

(48)   **Mit** *akarunk* és   **hol**   vacsorázni?
       what want.3   and where eat for dinner
       'What do we want to eat for dinner and where?'

The coordination of the clitic *-e* (the interrogative marker used in subordinate clauses) and a *wh*-phrase can only be tested in end-attach constructions. Since it is possible to coordinate them,

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[7]It can be argued that *akar* 'want' is an auxiliary in Hungarian. Syntactic evidence comes from the fact that it can interrupt the infinitive following it and appear between the verbal particle (if there is one) and the verbal stem.

this supports our claim that end-attach-*wh* is biclausal:

(49)   Léci, léci, jelezzen,   aki   még nem tette, hogy jön-**e**   és **hányan**!!!
      please please sign.IMP.3, who yet   not   did,   that   comes-CL.INTERR and how many
      'Please please, tell me if you come and if so, how many of you!'

Finally, conclusive evidence comes from the definite/indefinite conjugation paradigms. Transitive verbs in Hungarian appear in two conjugations: definite and indefinite. They must agree with the definiteness of their object and appear in the definite conjugation if the object is definite, as in (50), whereas they appear in their indefinite form in all other cases, as in (51).

(50)   Olvas**ok**   egy könyvet.   (51)   Olvas**om**   a   könyvet.
      read.1.INDEF a   book.ACC   read.1.DEF the book.ACC

The interrogative word *mit* 'what' triggers the indefinite conjugation, since the object is asked about and not yet identified:

(52)   Mit   olvas**ol**?
       what read.2.INDEF

Lipták (2001) observed that if coordinate *wh*-structures were in fact biclausal with ellipsis in the first conjunct, one could not explain the definite conjugation on the verb in (53b):

(53)   a.   **Mit** készítesz   és   **hogyan** (készíted)?
           what prepare.2.INDEF and how   (prepare.2.DEF)
       b.   **Mit** és **hogyan** {készítesz   / *készíted}?
           what and how   {prepare.2.INDEF / prepare2.DEF}
           'What are you preparing and how (are you preparing it)?'

Note that the questions in (53a)–(53b) do not mean the same. In (53a), the part containing the second *wh*-word (and possibly an elliptical verb) is a question separate from the first. The answer to this second question presupposes that we know the answer to the first, which is why the verb form is definite. In (53b), however, the *wh*-phrases are part of one and the same question, hence the indefinite verb form. In coord-*wh*, *mit* cannot be in a separate clause, since it would have to trigger the definite conjugation on the verb in the second clause containing *hogyan*.

Based on the above arguments, we assume (agreeing with Lipták (2001)) that coord-*wh* is monoclausal, whereas end-attach-*wh* is biclausal in Hungarian.

4. A sketch of analysis in HPSG

In the previous section, we have reached the conclusion that while end-attach-*wh* structures are biclausal in both languages, coord-*wh* exhibit different structures: they are monoclausal in Hungarian, whereas they are biclausal in Romanian. In this section, we sketch a formal analysis of coordinate multiple questions within a construction-based version of HPSG that relies on rich inheritance hierarchies of lexical and phrasal types (Ginzburg and Sag 2000).

4.1. General architecture

In HPSG, words and phrases are modeled as feature structures of the type *sign*, where phonology, syntax, and semantics are represented in one description. Structure sharing allows

for certain values to be identical in a feature structure. Words, unlike phrases, have an argument structure feature (ARG-ST) encoding the subcategorization properties of lexical items. The *synsem* objects which occur on the ARG-ST list may be canonical if they correspond to overt linguistic expressions (and in this case they occur in both VALENCE and ARG-ST lists) or non-canonical (and in this case they only occur in the ARG-ST of a word). Non-canonical synsems have as subtypes (i) extracted elements, typed as *gap* (available for extraction dependencies), (ii) 'empty' pronouns, typed as *pro*, and (iii) pronominal clitics, typed as *pron-affix*. Phrases are classified along two dimensions: HEADEDNESS and CLAUSALITY. This cross-classification recognizes a distinction between *headed-phrases* versus *non-headed-phrases*, on the one hand, and *clauses* versus *non-clauses*, on the other. In a headed structure, the HEAD features of the mother are identical to the HEAD features of the head daughter.

According to Ginzburg and Sag 2000, the content of a clause is always some subtype of the semantic type *message*: *proposition* for declarative clauses, *question* for interrogative clauses, etc. The content of a verb specifies a state-of-affairs (SOA), which contributes to the construction of a certain kind of message. Questions are ontologically distinct from propositions, since they lack properties that are characteristic of truth-bearing expressions. Questions are akin to open propositions, and analyzed as *propositional abstracts*, where the set of abstracted elements may be the empty set (0-ary abstracts for polar questions) or a non-empty set (1-ary abstract, 2-ary or *n*-ary abstracts) for *wh*-questions. The *question* type is specified for two features: a feature PARAMS, whose value is a (possibly empty) set of *parameters* corresponding to the set of entities that get abstracted away, and a PROP feature, whose value is a *proposition*. A *wh*-phrase is thus represented as a parameter that introduces a restriction, and multiple *wh*-phrases are accommodated in terms of a non-singleton PARAMS value. The parameter comprises an index and its restriction (the use of the index allows for linking the abstracted parameter to an argument position within the proposition). Following Bonami and Godard 2006, we consider that the *interrogative-clause* has a unary daughter, which is a clause denoting a proposition (type shifting from *proposition* to *question*). Parameters are retrieved from the daughter's STORE value, as shown by the constraint in (54).

(54)
$$
\begin{bmatrix} \textit{inter-cl} \\ \text{CONT} \begin{bmatrix} \textit{question} \\ \text{PARAMS} & \{\boxed{1}, ..., \boxed{n}\} \\ \text{PROP} & \boxed{0} \end{bmatrix} \\ \text{STORE} \;\; \{\} \end{bmatrix} \longrightarrow \begin{bmatrix} \text{CONT} & \boxed{0} \\ \text{STORE} & \{\boxed{1}, ..., \boxed{n}\} \end{bmatrix}
$$

We analyze coordinate phrases as a subtype of *non-headed-phrase*, consisting of (at least) two immediate constituents, which may each be introduced by a conjunction (Abeillé 2005). Inside the coordinate phrase, the conjunct introduced by a conjunction is represented here (for the sake of simplicity) as a *head-marker phrase*. We follow Sag 2005 in considering that lexical entries do not fix the type of their HEAD values, which can be underspecified. This allows us to handle cases in which coordinate elements do not share the same syntactic category. A very simple way to capture Wasow's Generalization given in the beginning of this paper is to assume that an element in construction with a coordinate structure has access not only to the coordinate structure as a whole, but also to the syntactic property of each conjunct. In order to implement this, we use the feature CONJUNCTS-LIST (CNJ-LST) introduced by Chaves and Paperno 2007 for 'hybrid' coordinations in Russian, which allows the coordinate construction to collect the conjoined signs, making them accessible to the head. A simplified version is given in (55).

(55)
$$\begin{bmatrix} coord\text{-}ph \\ \text{SYNSEM}|\text{HEAD}|\text{CNJ-LST} \left\langle \boxed{1}, ..., \boxed{n} \right\rangle \\ \text{CONJ } nil \end{bmatrix} \longrightarrow \begin{bmatrix} \text{SYNSEM} & \boxed{1} \\ \text{CONJ} & nil \end{bmatrix}, ..., \begin{bmatrix} head\text{-}marker\text{-}ph \\ \text{SYNSEM}|\text{HEAD}|\text{CNJ-LST} \left\langle \boxed{n} \right\rangle \\ \text{CONJ } conj \end{bmatrix}$$

HPSG organizes the sign into information which is locally relevant (LOCAL) and information that plays a role in long distance dependencies (NON-LOCAL). In the case of *wh*-questions, the syntactic relation between the fronted *wh*-phrase and the rest of the clause can be accounted for in terms of an extraction phenomenon, which is a non-local dependency, of the type *head-filler-phrase*, as defined by the constraint in (56).

(56)
$$\begin{bmatrix} head\text{-}filler\text{-}ph \\ \text{SLASH } \boxed{s} \\ \text{STORE } \boxed{0} \cup \left\{ \boxed{1} \right\} \end{bmatrix} \longrightarrow \begin{bmatrix} \text{LOC } \boxed{2} \\ \text{WH } \left\{ \boxed{1} \right\} \end{bmatrix}, \mathbf{H} \begin{bmatrix} \text{SLASH } \boxed{s} \cup \left\{ \boxed{2} \right\} \\ \text{STORE } \boxed{0} \end{bmatrix}$$

A *head-filler-phrase* requires exactly two immediate constituents: a filler daughter and a sentential head daughter containing a *gap* (i.e. one of the arguments of the verbal head is not locally realized). The presence of a gap is encoded in terms of a non-empty SLASH value, which is amalgamated by the verb, being also the verb's SLASH value. Further, the verb's SLASH value is propagated through the syntactic tree, until a compatible filler constituent occurs. Extraction is thus treated entirely in terms of the inheritance of SLASH specifications. The percolation of the non-local information has as a result the fact that this information is simultaneously present at every node in the extraction path. Interrogative *wh*-phrases which function as fillers bear non-empty specifications for the feature WH whose value is a set containing a parameter, which is retrieved in the STORE value of the mother, contributing thus to the global content.

4.2. Analysis of Hungarian coordinate *wh*-structures

We have concluded above that coordinate *wh*-structures are monoclausal in Hungarian. Lipták (2001) comes to a similar conclusion. She claims that the conjoined *wh*-phrases do share a function, which is *focus*. According to her analysis, focus as the common function would account for 'hybrid' coordinations, such as (3), since the conjoined items are pragmatically prominent, or salient in the discourse,[8] and they bear a pitch accent in prosody as well. Although it is a usual assumption to claim that question words are best analyzed as (a subtype of) foci, this analysis faces a serious problem here: unlike *wh*-phrases, two non-interrogative foci cannot be coordinated in Hungarian:

(57)   a.   **Ki**   és   **mikor** ment el?
            who and when   left   PRT

       b.   *JÁNOS és   TEGNAP ment el.
            John   and yesterday left   PRT

This means that *focus* cannot be the shared function of the conjoined *wh*-phrases. In our approach, the common function of conjoined *wh*-phrases is *filler* (cf. the HPSG ontology), referring to the fact that these constituents do not appear in their canonical position (i.e. they correspond to *gaps* on the ARG-ST list of the verbal head). The only stipulation we need for Hungarian coord-*wh* is to allow the *head-filler-ph* in (58) to have more than one filler, by us-

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[8]Chaves and Paperno (2007) observe the same about Russian, although they cannot determine the exact nature of this pragmatic salience.

ing the CNJ-LST proposed for coordination structures. Coordination of *wh*-fillers is reserved to constituents bearing a WH feature, which prevent non-interrogative fillers from being conjoined.

(58)
$$\begin{bmatrix} \textit{head-coord-filler-ph} \\ \text{SLASH } \boxed{9} \\ \text{STORE } \boxed{0} \cup \{\boxed{3}, \boxed{4}\} \end{bmatrix} \rightarrow \begin{bmatrix} \text{CNJ-LST} \left\langle \begin{bmatrix} \text{LOC } \boxed{1} \\ \text{WH} \{\boxed{3}\} \end{bmatrix}, ..., \begin{bmatrix} \text{LOC } \boxed{2} \\ \text{WH} \{\boxed{4}\} \end{bmatrix} \right\rangle \end{bmatrix}, \mathbf{H} \begin{bmatrix} \text{SLASH } \boxed{9} \cup \{\boxed{1}, \boxed{2}\} \\ \text{STORE } \boxed{0} \cup \{\boxed{3}, \boxed{4}\} \end{bmatrix}$$

In figure 1, we provide the syntactic tree for the Hungarian coordinate *wh*-structure ***Ki és mit látott?*** ('Who saw something and what was it?').
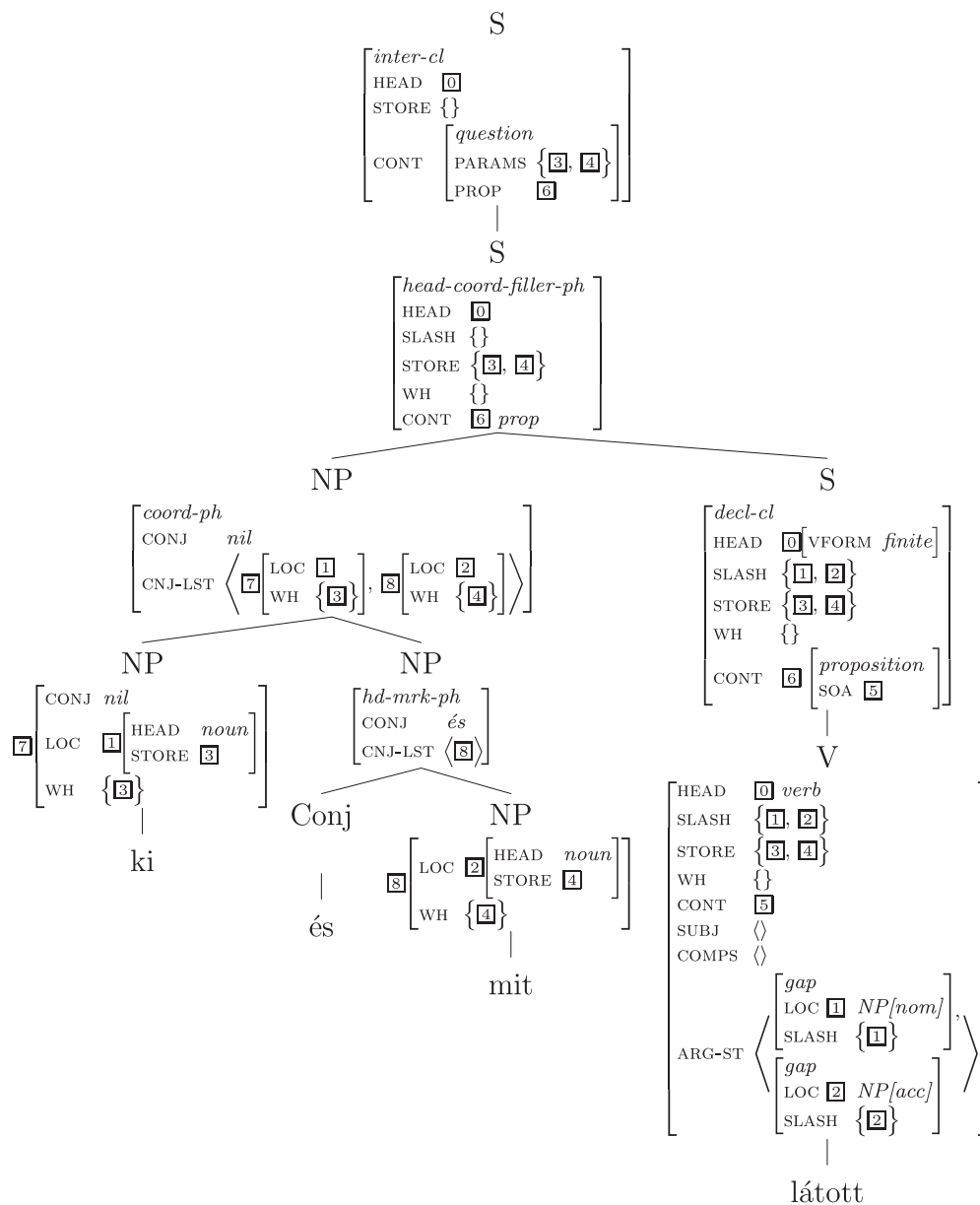
Figure 1: Syntactic tree for Hungarian coordinate *wh*-questions

The ARG-ST of the verbal head contains two *gaps* corresponding to the extracted *wh*-phrases (note the feature-sharing of LOC) and bearing a non-empty value for the feature SLASH. SLASH specifications are amalgamated by the verb and inherited from the verb to the S that it projects. All extracted *wh*-phrases bear a *parameter* value for the feature WH, which is stored by *coordinate-phrase*. In order to be licensed by the grammar, the Hungarian example has then to successively satisfy constraints (55), (58) and (54).

4.3. Analysis of Romanian coordinate *wh*-structures

In the §3.2, we gave some empirical evidence in favour of the biclausal analysis of coordinate multiple *wh*-questions in Romanian. That is, for a coordination such as ***Cine și ce** a făcut?* ('Who saw something and what was it?'), what we have is a coordination of two interrogative clauses: one which is reduced to the *wh*-phrase and the other one which is a complete clause.

One obvious analysis would be to assume that the first clause undergoes (backward) ellipsis, according to which the elided constituent is structurally represented and interpreted. Thus, ellipsis in the first conjunct is possible under identity with the second conjunct. Such an analysis has to postulate the presence of an empty pronominal in the first conjunct (in order to satisfy the subcategorization requirements of the verbal head). However, cataphoric use of pronominals is usually impossible in coordinate constructions. Moreover, even if we put this problem aside, we observe that not all verbal predicates allow for indefinite null arguments. Therefore, the verb supposedly undergoing ellipsis cannot always be reconstructed in the first conjunct, for instance, because one of its arguments would be missing:

(59) Polițistul   satului   îi   cunoaște pe   toți;   știe **cine**
       policeman.DEF village.GEN CL.ACC knows   PRT.ACC everyone; knows who
       (*locuiește) și **unde** *locuiește*.
       (lives)   and where (lives)

(60) **Cine** (*ocupă) și **ce** **loc** *ocupă* pentru tine?
       who (occupies) and which place occupies for   you

The second option is to assume a multidominance analysis (Rațiu 2011). According to this approach, one expects that the 'shared' material could not be realized with each *wh*-phrase and, in particular, could not occur in the first conjunct. However, the 'shared' material can be realized more than once and not necessarily in the second conjunct, as shown in (61b) (*contra* Rațiu 2011).

(61) a. **Cine** și **ce** a mâncat?
           who and what has eaten
      b. **Cine** a mâncat și **ce** (a   mâncat)?
           hho   has eaten   and what (has eaten)

We can avoid these problems if we assume a fragment-based analysis, adapted from Ginzburg and Sag 2000. As shown by the constraint in (62), we use a *wh-fragment-phrase*, which allows for an NP, an PP or an AdvP to be exhaustively dominated by a finite category, which has propositional content. The parameter expressed by the *wh*-expression is inherited via STORE by the mother. Unlike Rațiu 2011 who has to posit two different analyses in order to account for coord-*wh* with co-arguments and co-adjuncts respectively, the analysis we propose can handle

both of these cases, as well as the mixed cases (argument–adjunct or adjunct–argument).

(62)
$$\begin{bmatrix} \textit{wh-fragment-ph} \\ \text{HEAD} \begin{bmatrix} \text{VFORM} & \textit{finite} \end{bmatrix} \\ \text{STORE} \left\{ \boxed{1}\textit{param} \right\} \\ \text{CONT} \textit{ proposition} \end{bmatrix} \longrightarrow \begin{bmatrix} \text{HEAD} & \textit{noun} \vee \textit{prep} \vee \textit{adv} \\ \text{STORE} & \left\{ \boxed{1} \right\} \end{bmatrix}$$

The only stipulation we must make is to posit a special coordination rule which combines a (full) clause of type *head-filler-ph* and a 'fragmentary' phrase sharing the same properties (in particular, the same semantic content) to build the equivalent of a multiple question. The right semantic description is obtained via the content identity imposed by the coordination construction, as shown in (63).

(63)
$$\begin{bmatrix} \textit{special-coord-ph} \\ \text{STORE } \boxed{1} \cup \boxed{2} \\ \text{CONT } \boxed{3} \end{bmatrix} \longrightarrow \begin{bmatrix} \text{STORE} & \boxed{1} \\ \text{CONT} & \boxed{3} \end{bmatrix}, \begin{bmatrix} \text{STORE} & \boxed{2} \\ \text{CONT} & \boxed{3} \end{bmatrix}$$

With all these ingredients, we are now able to derive in the figure 2 the syntactic tree for the Romanian example ***Cine și ce*** *a făcut?* ('Who saw something and what was it?').[9]

The analysis we proposed for Romanian coord-*wh* can be easily extended to the end-attach-*wh* in both languages. For the lack of space, we cannot provide an illustration of this.

5. Conclusion

This paper addressed the problem of coordinate *wh*-phrase structures in Hungarian and Romanian, concentrating on cases where the conjoined *wh*-phrases are in the preverbal domain. We showed that the significant hesitation and variation in the acceptability judgments render the analysis of such structures very difficult. Instead of neglecting it, we attributed the acceptability problem to the interplay of various syntactic and semantic factors. However, experimental studies must be conducted in order to obtain more clear-cut data, which is left for further research.

We rejected those analyses that aim to assign a unique universal structure to coord-*wh* construction cross-linguistically, since we argued that coord-*wh* is monoclausal in Hungarian but biclausal in Romanian, and thus necessitates different analyses. The universalism, if it exists, concerns rather end-attach-*wh*, which receives the same treatment in both languages.

Finally, as far as the Law of Coordination of Likes is concerned, *wh*-coordination is not problematic at all in either language, since the identity constraints imposed by the coordination are always satisfied: in Hungarian, coord-*wh* structures share the *filler* function, while in Romanian, coord-*wh* (as well as end-attach-*wh* in both languages) share the same propositional content.

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[9]We represent the ARG-ST of the verbal head as containing two non-canonical arguments: the first one, typed as *pro*, corresponds to an unexpressed subject, while the second one, typed as *gap*, corresponds to the extracted direct object.

S

$$\begin{bmatrix} \textit{inter-cl} \\ \text{HEAD} \quad \begin{bmatrix} \text{VFORM} \; \textit{finite} \end{bmatrix} \\ \text{STORE} \; \{\} \\ \text{CONT} \quad \begin{bmatrix} \textit{question} \\ \text{PARAMS} \; \{\boxed{1}, \boxed{2}\} \\ \text{PROP} \quad \boxed{7} \end{bmatrix} \end{bmatrix}$$

S

$$\begin{bmatrix} \textit{special-coord-ph} \\ \text{CONJ} \quad \textit{nil} \\ \text{HEAD} \quad \begin{bmatrix} \text{VFORM} \quad \textit{finite} \\ \text{CNJ-LST} \; \langle \boxed{8}, \boxed{9} \rangle \end{bmatrix} \\ \text{STORE} \; \{\boxed{1}, \boxed{2}\} \\ \text{WH} \quad \{\} \\ \text{CONT} \quad \boxed{7} \; \textit{prop} \end{bmatrix}$$

S

$$\boxed{8} \begin{bmatrix} \textit{wh-fragment-ph} \\ \text{CONJ} \quad \textit{nil} \\ \text{HEAD} \quad \begin{bmatrix} \text{VFORM} \; \textit{finite} \end{bmatrix} \\ \text{STORE} \; \{\boxed{1} \; \textit{param}\} \\ \text{WH} \quad \{\} \\ \text{CONT} \quad \boxed{7} \; \textit{prop} \end{bmatrix}$$

NP

$$\begin{bmatrix} \text{HEAD} \quad \textit{noun} \\ \text{STORE} \; \{\boxed{1}\} \\ \text{WH} \quad \{\boxed{1}\} \end{bmatrix}$$

cine

S

$$\begin{bmatrix} \textit{hd-mrk-ph} \\ \text{CONJ} \quad \textit{și} \\ \text{CNJ-LST} \; \langle \boxed{9} \rangle \end{bmatrix}$$

Conj

și

S

$$\boxed{9} \begin{bmatrix} \textit{head-filler-ph} \\ \text{HEAD} \quad \boxed{0} \begin{bmatrix} \text{VFORM} \; \textit{finite} \end{bmatrix} \\ \text{SLASH} \; \{\} \\ \text{STORE} \; \{\boxed{2}\} \\ \text{WH} \quad \{\} \\ \text{CONT} \quad \boxed{7} \; \textit{prop} \end{bmatrix}$$

NP

$$\begin{bmatrix} \text{LOC} \; \boxed{4} \begin{bmatrix} \text{STORE} \; \boxed{2} \end{bmatrix} \\ \text{WH} \quad \{\boxed{2}\} \end{bmatrix}$$

ce

S

$$\begin{bmatrix} \textit{decl-cl} \\ \text{HEAD} \quad \boxed{0} \\ \text{SLASH} \; \{\boxed{4}\} \\ \text{STORE} \; \{\boxed{2}\} \\ \text{WH} \quad \{\} \\ \text{CONT} \quad \boxed{7} \begin{bmatrix} \textit{proposition} \\ \text{SOA} \; \boxed{6} \end{bmatrix} \end{bmatrix}$$

V

$$\begin{bmatrix} \text{HEAD} \quad \boxed{0} \; \textit{verb} \\ \text{SLASH} \; \{\boxed{4}\} \\ \text{STORE} \; \{\boxed{2}\} \\ \text{WH} \quad \{\} \\ \text{CONT} \quad \boxed{6} \\ \text{SUBJ} \quad \langle \rangle \\ \text{COMPS} \; \langle \rangle \\ \text{ARG-ST} \; \left\langle \; \textit{NPpro[nom]}, \begin{bmatrix} \textit{gap} \\ \text{LOC} \; \boxed{4} \; \textit{NP[acc]} \\ \text{SLASH} \; \{\boxed{4}\} \end{bmatrix} \right\rangle \end{bmatrix}$$
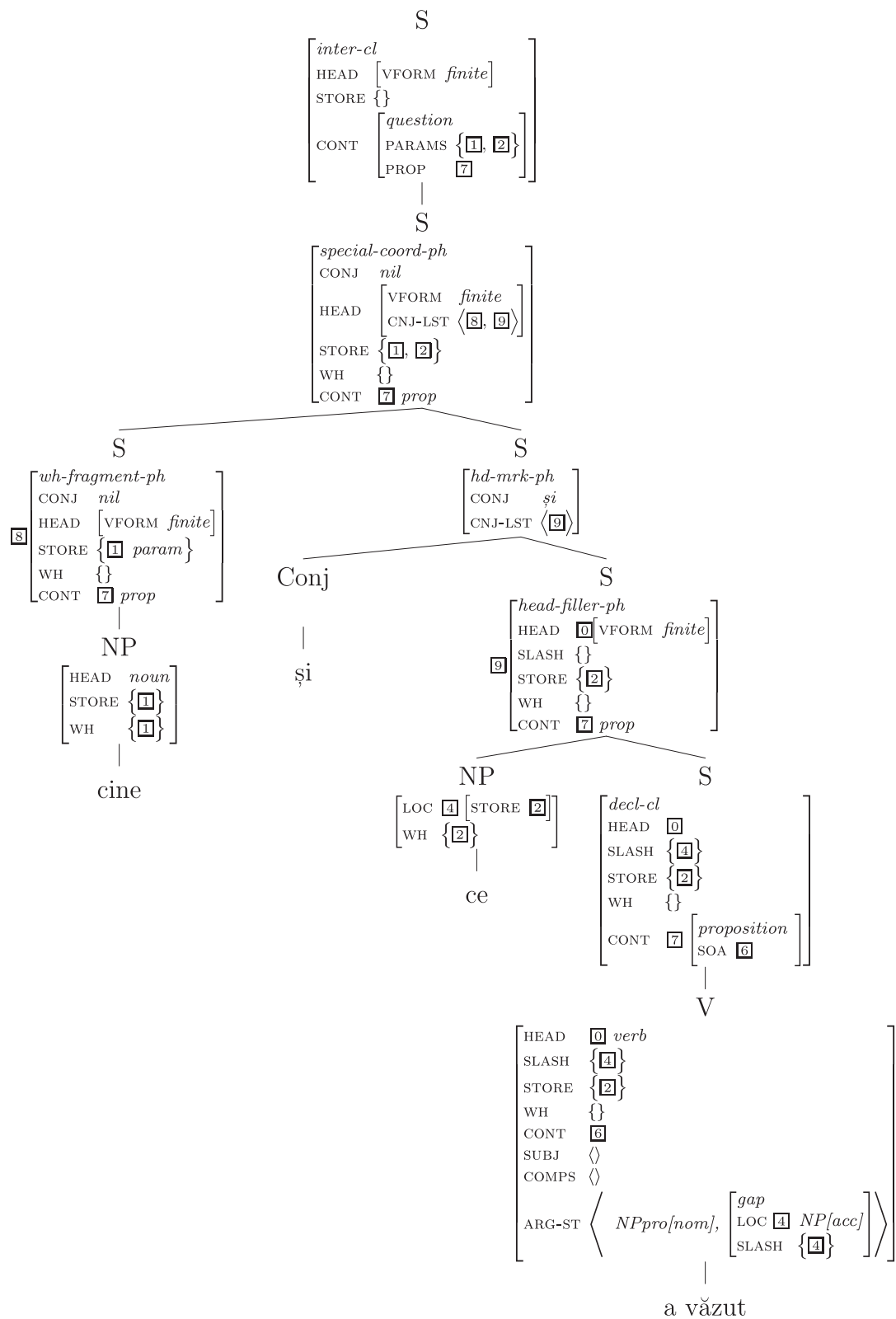
a văzut

Figure 2: Syntactic tree for Romanian coordinate *wh*-questions

References

Abeillé, Anne. 2005. Les syntagmes conjoints et leurs fonctions syntaxiques. *Langages* 160.42–66.

Bánréti, Zoltán. 2007. *A mellérendelés és az ellipszis nyelvtana a magyarban* [The Grammar of Coordination and Ellipsis in Hungarian]. Budapest: Tinta könyvkiadó.

Bîlbîie, Gabriela. 2011. *Grammaire des constructions elliptiques: Une étude comparative des phrases sans verbe en roumain et en français*. Université Paris Diderot-Paris 7 dissertation.

Bonami, Olivier, and Danièle Godard. 2006. Sentence initial adverbials and clause types in French. Presentation at Alliance Workshop, Colchester.

Browne, Wayles. 1972. Conjoined question words and a limitation on English surface structures. *Linguistic Inquiry* 3.223–226.

Büring, Daniel. 2003. On D-trees, beans, and B-accents. *Linguistics and Philosophy* 26.511–545.

Chaves, Rui Pedro, and Denis Paperno. 2007. On the Russian Hybrid Coordination Construction. *Proceedings of the 14th International Conference on HPSG*, 46–64. Stanford: CSLI Publications.

Citko, Barbara, and Martina Gračanin-Yuksek. 2012. Towards a new typology of coordinated *Wh*-questions. *Journal of Linguistics*. 1–32.

Comorovski, Ileana. 1996. *Interrogative phrases and the syntax-semantics interface*. Dordrecht: Kluwer Academic Publishers.

Gazdik, Anna. 2011. *Multiple questions in French and in Hungarian: A Lexical-Functional analysis with special emphasis on the syntax-discourse interface*. Université Paris Diderot-Paris 7; ELTE Budapest dissertation.

Giannakidou, Anastasia, and Jason Merchant. 1998. Reverse sluicing in English and Greek. *The Linguistic Review* 15.233–256.

Ginzburg, Jonathan, and Ivan Sag. 2000. *Interrogative investigations: The form, meaning and use of English interrogatives*. Stanford: CSLI Publications.

Gribanova, Vera. 2009. Structural adjacency and the typology of interrogative interpretations. *Linguistic Inquiry* 40.133–154.

Haida, Andreas, and Sophie Repp. 2011. Monoclausal question word coordination accross languages. *Proceedings of NELS 39*, ed. by S. Lima, K. Mullin, and B. Smith. To appear.

Kayne, Richard S., and Jean-Yves Pollock. 2001. New thoughts on stylistic inversion. *Subject Inversion in Romance and the Theory of Universal Grammar*, ed. by A. Hulk and J.-Y. Pollock, 595–621. Oxford: Oxford University Press.

Kazenin, Konstantin I. 2002. On Coordination of Wh-Phrases in Russian. Ms., Universität Tübingen.

Kliaschuk, Mikalai. 2008. L'interrogation coordonnée dans les langues slaves. *Proceedings of the 2007 Annual Conference of the Canadian Linguistic Association*.

Lewis, Shevaun, Bradley Larson, and Dave Kush. 2012. What and when can you fill a gap with something? 25th Annual CUNY Conference on Human Sentence Processing. New York.

Lipták, Anikó. 2001. *On the syntax of wh-items in Hungarian*. Utrecht University dissertation.

Lipták, Anikó. 2003. Conjoined questions in Hungarian. *Multiple wh-fronting*, ed. by C. Boeckx and K. Grohmann, 141–160. Amsterdam: John Benjamins Publishing Company.

Merchant, Jason. 2008. Spurious coordination in Vlach multiple wh-questions. Ms. University of Chicago.

Rațiu, Dafina. 2011. *De la syntaxe à la sémantique des propositions interrogatives: Étude comparative des questions multiples en roumain*. Université de Nantes dissertation.

Sag, Ivan. 2005. La coordination et l'identité syntaxique des termes. *Langages* 160.110–127.

Sag, Ivan, Gerald Gazdar, Thomas Wasow, and Steven Weisler. 1985. Coordination and how to distinguish categories. *Natural Language and Linguistic Theory* 3.117–171.

Skrabalova, Hana. 2006. Parataxe apparente et coordination des interrogatifs en tchèque. *Faits de Langues* 28.231–242.

Tomaszewicz, Barbara. 2011. Against Spurious Coordination in multiple wh-questions. *Proceedings of the 28th West Coast Conference on Formal Linguistics*, ed. by M. B. Washburn, K. McKinney-Bock, E. Varis, A. Sawyer, and B. Tomaszewicz, 186–195. Cascadilla Proceedings Project.

Imperatives: meaning and illocutionary force

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1. Beyond obligations: the variable force of imperatives

Certain types of utterances, by virtue of being made, bring about obligations on their speakers or addressees. An utterance of a performatively used necessity modal brings about an obligation for the addressee (Kamp 1973). Explicitly performative utterances constituting promises or orders do the same for the speaker and addressee, respectively (Searle 1964; Alston 2000; Truckenbrodt 2009). It would seem that in the same fashion an utterance of an imperative creates an obligation for the addressee, a view explicitly espoused by Lewis (1969).

(1)   [Lecturer to class]
        The assignment must be in my mailbox by noon.   (performative use)
        ↪ *The students are obligated to return the assignment in the lecturer's mailbox by noon.*

(2)   I promise you that the report will be in your mailbox by noon.
        ↪ *Sp is obligated to Addr to have the report in Addr's mailbox by noon.*

(3)   I order you to have the report in my mailbox by noon.
        ↪ *Addr is obligated to Sp to have the report in Sp's mailbox by noon.*

(4)   Have the report in my mailbox by noon!
        ↪ *Addr is obligated to Sp to have the report in Sp's mailbox by noon.*

Indeed, orders are the stereotypical uses of imperatives, and are often taken to be the core use semantically. On such a view, it is tempting to assume that imperatives create obligations for

the addressee by virtue of linguistic convention. However, this cannot be right, given that imperatives are also used with a weaker directive force in requests, pleas, warnings, etc. What directive uses have in common is that they are all attempts by the speaker to get the addressee to do something (Searle 1975). Suppose we had an account of how this happens. Then we could construe order uses simply as attempts to get the addressee to do something in contexts in which the speaker happens to have authority over the addressee, where 'authority' means that the addressee is obligated to comply with such attempts of the speaker. Looking at things this way, it is only by extra-linguistic circumstance that such directives sometimes create obligations.

A directive utterance of an imperative (I) expresses a certain content related to the addressee's future actions; (II) conveys that the speaker wants the content to become reality; and (III) acts as an inducement for the addressee to bring about the content. The imperative in (5a), intuitively, has the overall effects in (5b).

(5)   a.   Leave!
      b.   (I)   expresses: *The addressee leaves*;   (content)
           (II)   conveys that the speaker wants the addressee to leave;   (speaker desire)
           (III) acts as an inducement for the addressee to leave.   (addressee inducement)

The content is presumably determined by the system of semantic composition,[1] but what about (II) and (III)? Are they both determined by linguistic convention, or is only one of them so determined, with the other arising in context where appropriate? In order to answer this question, we have to consider the full range of uses that imperatives can have in context, since any effect that is present as a matter of linguistic convention must be universally present.

As observed by Schmerling (1982), imperatives have a wide range of uses going beyond even the extended sense of directive uses mentioned above: they can be used to merely express a wish, to permit, concede, offer or invite, and also to give advice. We divide the uses of imperatives into four groups, based on how they line up with respect to speaker desire and addressee inducement and the kinds of issues they raise about the proper analysis of imperatives.

A linguistic reflex of the fact that imperatives come with a variety of 'illocutionary forces' and that uttering them brings about the corresponding kind of speech act is that imperative utterances can be subsequently described, depending on the context they are uttered in, with various verbs for acts of communication. In the examples below, utterances of imperatives in (i) can be described after the fact with the corresponding sentences in (ii).

Group I: directives   This group encompasses uses of imperatives that are intended to get the addressee to do something or refrain from doing something. It comprises orders, warnings, requests, as well as certain kinds of advice and pleas. The implications of speaker desire (II) and of intended addressee inducement (III) are both present.

(6)   a.   (i)   Stand at attention!   (command)
           (ii)   He ordered me to stand at attention.
      b.   (i)   Don't touch the hot plate!   (warning)
           (ii)   He warned me not to touch the hot plate.
      c.   (i)   Hand me the salt, please.   (request)

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[1]Throughout, we use 'content' to refer to the proposition that needs to become true for the imperative to be fulfilled. We leave it open whether the content should be identified with the denotation of the imperative, or be part of this denotation (as in Kaufmann 2012), or be derived from it (as in Portner 2005). We also set aside the question of the status of the understood second person subject.

		(ii)	He requested to be passed the salt.	
	d.	(i)	Take these pills for a week.	(advice)
		(ii)	He advised me to take the pills for a week.	
	e.	(i)	Please, lend me the money!	(plea)
		(ii)	He pleaded with me to lend him the money.	

Group II: wish-type uses Imperatives can express mere speaker wishes, such as well-wishes, ill-wishes/curses, and even addressee-less or 'absent' wishes. Though often ignored or set aside, wish uses are real, in the sense that they derive from the meaning of imperatives,[2] and, as Schmerling (1982) and Kaufmann (2012) argue, analyses of imperatives ought to be responsible for them. Characteristic of these uses is that they do *not* induce the addressee to act. Indeed, they occur precisely in contexts in which it is taken for granted that the addressee (if there is one) cannot do anything about the realization of the content of the imperative, a restriction that a successful analysis of imperatives should explain. Wish-type uses thus suggest that speaker desire (II) is conventional, while addressee inducement (III) is not.

(7)	a.	(i)	Get well soon!	(well-wish)
		(ii)	He wished me to get well soon.	
	b.	(i)	Drop dead!	(curse)
		(ii)	He cursed me to drop dead.	
	c.	(i)	Please, don't rain!	(addresee-less wish)
		(ii)	He expressed the wish that it not rain.	
	d.	(i)	[on the way to a blind date] Be blond!	(absent wish)
		(ii)	He wished for his date to be blond.	

Group III: permissions and invitations This group encompasses uses that don't really express that the speaker wants something to happen, but rather communicate, in response to a manifest or potential addressee desire, that the speaker does not mind something happening. Examples are permissions, concessions, offers, and invitations. These uses create particular problems for a uniform account of imperatives, as they seem to be associated with neither implication (II) or (III). To the extent that permissions and offers are enticements to action, this is so because of a potential pre-existing addressee desire.

(8)	a.	(i)	Okay, go out and play.	(permission/concession)
		(ii)	He allowed me to go out and play.	
	b.	(i)	Have a cookie(, if you like).	(offer)
		(ii)	He offered me a cookie.	
	c.	(i)	Come to dinner tonight(, if you like).	(invitation)
		(ii)	He invited me to go to dinner that night.	

Group IV: disinterested advice A special class of advice uses is one where the speaker has no interest in the fulfillment of the imperative. These uses are different from advice uses where there is a salient goal shared between speaker and addressee, which fall in Group I. Disinterested advice uses suggest that the implication of speaker desire might not be a conventional effect of imperatives. Moreover, it does not seem quite right to say that, on these uses, the ad-

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[2]The cross-linguistic variation in the availability of wish uses supports this point. Greek, for instance, disallows wish uses for imperatives.

dressee is enticed *by the imperative* to realize the content. Rather, any motivation the addressee may have for doing so derives from a prior goal of his.

(9)   [Strangers in the streets of Palo Alto.]
        A: Excuse me, how do I get to San Francisco?
        B: Take the train that leaves from over there in 10 minutes. [points to train station]

There are also things imperatives can *never* do: they can never be used to assert or claim that their contents are true, nor can they be used to promise that their contents will become true. The imperatives in (10) can never be described with the declaratives with which they are paired.

(10)   a.   (i)   Be at the airport at noon!
              (ii)   He promised me that I will/would be at the airport at noon.
        b.   (i)   Stay out of trouble!
              (ii)   He claimed that I (would/will) stay out of trouble.
        c.   (i)   Take the Northbound train (to go to San Francisco)!
              (ii)   He claimed that I will take the Northbound train (to go to San Francisco).

How can the heterogeneity and systematic exclusion of speech act types associated with imperatives be captured without disjunctively listing illocutionary forces in the semantics of an imperative operator? This is actually an instance of the central question for theories of the form-force mapping, which imperatives present in a particularly pressing manner. A typical way to answer this question from the viewpoint of formal semantics is to determine the denotational meaning of a given clause type, and then seek a uniform context-change effect for objects of this type, after which a pragmatic theory would have to fill in how this context-change effect gives rise to the various uses a sentence can be put to. However, prior to investigating the uses of imperatives, we have no idea what their denotatum or context-change effect is. For this reason, one cannot even begin to study the semantics of imperatives without first understanding the uses they are put to. As we have seen in this section, different use types point in different directions about the conventional status of implications (II) and (III). In what follows, we first investigate some general constraints that all uses of imperatives are subject to. These allow us to approach the question of which implications are conventional from a new angle. We propose a semantic analysis which captures these constraints. We then compare our analysis to two recent influential proposals, by Kaufmann (2012) and by Portner (2007). Finally, we argue that the fundamental features of a successful account of imperatives are largely independent from the choice of denotation type.

2. Four challenges of imperatives

In this section, we outline four non-obvious challenges that any successful theory of imperatives has to meet. Although some of the observations in the discussion below have been made before, here we bolster them, generalize them, and bring out their significance in a new way.

2.1. Contextual inconsistency

Portner (2007:367) observes that 'it's odd to give conflicting imperatives even when they are of different subtypes (unless you have changed your mind, of course), as shown in example [(11)]. This pair of sentences cannot be coherently uttered by a single speaker.'

(11)   Stay inside all day!   (order)
         #Since you enjoy the nice weather, go out and play a little bit.   (suggestion)

More generally, we observe that if two imperatives have contextually inconsistent contents, then uttering one after another always constitutes a (partial) retraction or further specification of the first, even if the two imperatives have different forces, and even if there is considerable temporal distance between the two utterances. As seen in the examples below, the second imperative limits the scope of the first: the command in (12a) does not apply to the afternoon, the permission of the first imperative in (13) is not operative for the time just after the time of utterance, and a similar effect is seen in the two imperatives in (14).

(12)   a.   Stay inside all day!   (command)
         b.   Okay, go outside and play in the afternoon!   (permission/concession)

(13)   Okay, go but don't go quite yet!   (permission – request)

(14)   Okay, stay out late but be sure to be back by 1!   (permission – command)

At first glance, this may appear unsurprising given the 'action-inducing' nature of some of the uses of imperatives. After all, what would be the point of commanding or requesting two incompatible things? However, the contents expressed with imperatives are required to be consistent even when the imperative does not constitute an enticement to action. Surprisingly, contradicting imperatives expressing wishes are incoherent, as seen in (15).

(15)   a.   Please, rain tomorrow so the picnic gets cancelled!
         b.   Please, don't rain tomorrow so I can go hiking!

There is no obvious pragmatic, rationality-related explanation for this, as it is quite possible to desire two incompatible things. The following desiderative assertion is unexceptional and makes perfect sense.

(16)   I want it to rain tomorrow so the picnic gets cancelled but, on the other hand, I don't
         want it to rain tomorrow so I can go hiking.

So, why can the two imperatives in (15) not be interpreted as an admission of incompatible desires (as in (16)), but instead sound like the speaker is vacillating between his two desires? The only viable explanation seems to be that it is a general fact about imperatives that different utterances of imperatives (from the same speaker, towards the same addressee) must be *consistent* (and hence contradicting utterances must be interpreted as revisions).

Given the functional heterogeneity associated with imperatives, how do we ensure that they have to be consistent? A satisfactory analysis would explain this without simply stipulating the consistency requirement as a constraint on imperative use.

2.2. Speaker endorsement

Although the enticement to action implied by directive uses cannot be built into the meaning of the imperative, as it does not square with wish uses, the bouletic implication of wish uses is compatible with directive uses. This raises the question whether speaker desire is a basic common core across imperative uses. As observed by Schwager (2006) and Kaufmann (2012), imperatives, in *all* their uses, imply that the speaker endorses the realization of the content in

some way. She notes that it is not felicitous to follow an imperative with an assertion that the realization of the content goes against the speaker's desires:

(17)   #Call him at home! I don't want you to but he is fine with that.

This effect could be argued to follow from general pragmatic considerations for directive and wish uses, but this is not possible for 'disinterested advice' uses, as exemplified by (9). B can use the imperative *even when* it is mutually manifest that he does not share A's goal. So in such cases there is no pragmatic basis to assume that the speaker has a desire for the addressee to take the train. However, even in these cases, the speaker cannot follow his piece of advice with a declaration that following that advice goes against his wishes:

(18)   A: How do I get into the building?
    a.   B: Officially, you are not allowed to but just go through this door.
    b.   B: #I don't want you to but just go through this door.
    c.   B: The only way is through this door. But I don't want you to go / you are not allowed to go through this door.

In response to the question in (18), it is perfectly fine to both give the information sought after and assert that the speaker does not want the addressee to act on this information (as is done in (18c)). However, as the infelicity of (18b) illustrates, this is *not* possible when the imperative is used. At the same time, the imperative is fine even with a statement that acting on the information is not permitted (as in (18a)).

What are we to make of these observations? It seems that there *is* a bouletic component conventionally associated with imperatives. For if it were not conventional, we would expect this constraint to be absent in scenarios in which the speaker can be assumed to not share the goals of the addressee, as in disinterested advice uses.

Schwager (2006:166) reduces the apparent requirement for a bouletic component, evidenced by (17), to speaker endorsement, employing advice uses to tease the two apart. Her argument is that since in advice uses the speaker is disinterested in the addressee's future behavior, the speaker cannot be said to actively want the content of the imperative to be realized. She proposes to capture this conventional effect in terms of a felicity condition on uses of imperatives:

(19)   The speaker affirms the ordering source. (Therefore, he considers it to be better (some-times with respect to a contextually salient goal) that the proposition modalized by the imperative operator comes out true.)

One way to make this formulation more precise is to interpret 'considers it to be better' as 'prefers it to its negation', in a bouletic sense. This construal has the added advantage of pre-dicting the consistency constraint discussed in the previous section. But it is too strong for disinterested advice, as in (9), for which all that is necessary is that the speaker does not have a desire *against* the realization of the content. Kaufmann and Schwager (2009) in fact propose the weaker alternative in (20).

(20)   The negation of the prejacent does not follow from what is optimal with respect to the speaker's wishes.

(20) will trivially be fulfilled in normal contexts for directive uses, and it will ensure that imper-atives can only be used for advice if the speaker (minimally) does not care whether the prejacent

gets realized. However, (20) is too weak to predict the consistency requirement, and at the same time, it is too strong for concession uses, as seen in (21).

(21)   OK, go to Paris then since you want it so much!
      a. #But, don't forget, I don't want you to.
      b.   But, don't forget, I didn't want you to.

Concession uses complicate the picture considerably. On one hand, they indicate that the speaker has changed his mind, and is no longer trying to prevent the realization of the content. At the same time, it is contextually manifest (and, in languages like German, signaled through the use of discourse particles like *halt*) that the speaker, in some sense, is *still* against the addressee's realizing the content. This conflict, in addition, is different from the mere instance of conflicting desires illustrated in (16). The use of the imperative indicates that the speaker's (limited) endorsement of the content now overrides his desire to the contrary. Hence, *I don't want you to* follow-ups, as in (21a), are infelicitous. And yet, there is a sense in which the speaker's desire for the negation of the content persists. Consequently, we want a formulation of the constraint that is consistent with such a conflict.

    The persistence of conflicting preferences can be detected by the fact that concessions and concessive advice, while being incompatible with the follow-up statement *I don't want you to*, are actually fine if the desire to the contrary is expressed by means of the verb *wish*:

(22)   OK, go through this door. But it's officially prohibited so I wish you would not.

Wish, unlike *want*, can express a desire that the agent takes to be unrealizable or highly unlikely to be realized. In (22), the speaker (resignedly) endorses the realization of the content, and then explicitly expresses a desire for its negation. So, requiring that an imperative be used only if the speaker does not have a desire for the negation of the content is empirically wrong. Minimally, we have to distinguish between different kinds or relative importance of desires, and do so in the right way.

2.3. Automatic sincerity

    The speaker of an imperative cannot be taken to be *insincere* with respect to the desire he communicates with an imperative:[3]

(23)   a. A: I want you to give me an aspirin!
           B: No, you don't, you are lying.
      b. A: Give me an aspirin!
           B: # You are lying, you don't want me to give you one.

It is not just that the speaker has privileged access to (is an epistemic authority on) the desire he expresses, but it is impossible for him to lie about it using an imperative. The problem does not rely on the subleties of the semantics of the verb *lie*. The same point can be made with a response indicating disbelief.

(24)   a. A: I want you to give me an aspirin!
           B: I don't believe you, you don't really want me to give you one.

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[3]The example is from Schwager (2006:160), who attributes it to Manfred Bierwisch.

b.   A: Give me an aspirin!
      B: # I don't believe you, you don't really want me to give you one.

Utterances of imperatives are parallel in this respect to utterances of explicit performatives:

(25)   A: I order you to administer this drug.
        B: # I don't believe you, you didn't just order me to administer the drug.
        B: # You are lying, you didn't just order me to administer the drug.

2.4. Interlocutors' role in acting on the imperative

On typical directive uses, a speaker attempts to get the addressee to realize the content. The division of labor is clear: the addressee is to realize the content, the speaker is to do nothing after uttering the imperative. But things are not always this straightforward. It may well be that the speaker needs to perform some supporting action to enable the addressee in this goal:

(26)   Be at the airport at noon! If necessary, I can give you a ride.

It might hence be tempting to assume that there is no conventional implication that the speaker will not be involved in making the content true. Given that there seems to be *some* kind of conventional implication that the speaker prefers the content to be realized, as we argued in §2.2, it is then clear why a speaker might be expected to undertake enabling actions.

However, this cannot be the whole story. If it were, one would be able to use an imperative merely to tell the addressee that he should not interfere with one's plans for bringing about the content. An extreme example would be that of the speaker uttering (27) in order to get the addressee to sit still so that the speaker can carry him to the conference room:

(27)   Be in the conference room in three minutes!

So, we see that, on the one hand, there clearly is some kind of conventional preferential implication of imperatives, saying that the speaker wants, in some sense, the content to be realized. At the same time, it seems to be a conventional implication of imperatives that the speaker will not be the one fulfilling the imperative. But this implication should not be so strong as to rule out *any* speaker involvement.

Things get even more complicated once we look beyond directive uses. In the case of wishes, there frequently is no addressee, or if there is one, it is taken for granted that he can do nothing to realize the wish. So we should not stipulate a conventional implication that directly puts the onus for making the content true on the addressee either.

In sum, the fourth challenge is this: imperatives have *some* conventional implication that limits, but does not completely exclude, the involvement of the speaker in the realization of the content. And if, but only if, there is a volitional addressee and he has influence on the realization of the content, the primary responsibility for realizing the content lies with him. We can thus say that, in this case, imperatives are agentive for the addressee, echoing Belnap and Perloff (1990).[4]

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[4]Belnap and Perloff (1990:173) put forth the following *imperative content thesis*: 'regardless of its force, the content of every imperative is agentive.' In a similar vain, Farkas (1988) argues that imperatives make reference to the RESP(onsibility) relation between the addressee and the situation described by their content. This thesis cannot be maintained, given the existence of wish uses. Instead of being a feature of the *content* of the imperative, we take it to be an implication in appropriate contexts.

3. Imperatives as preferential attitudes

In Condoravdi & Lauer 2011 we propose an account of explicit performatives that directly links the illocutionary act performed by such utterances to their meaning, and provide a straight-forward answer to the question of how saying so makes it so. Our analysis rests on the assumption that the conventional effect of assertions is to bring about a doxastic commitment on the part of the speaker and takes explicit performative verbs to denote communicative events that bring about speaker commitments to a belief or an intention. We propose that the same constructs are involved in the analysis of imperatives. We take imperatives to commit the speaker to a partic-ular kind of preference,[5] and to be bounded by a condition that limits his active involvement in making the content true.

Functional heterogeneity is captured through the interaction of the constant meaning of imperatives with varying contextual conditions. Imperatives do not create obligations as a matter of course by linguistic convention, but give rise to obligations only indirectly when the context is right.

3.1. Effective preferences

An agent is generally subject to a large number constraints and attitudes that influence his actions: desires, inclinations, personal moral codes, and obligations, to name but a few. All of these come in different degrees of importance (Condoravdi & Lauer 2011). We use *preference structures*, as defined in (28), to model ranked preferences and assume that, at any given time, an agent has a family of such structures representing the various sources of his preferences.

(28)   A *preference structure* relative to an information state W is a pair $\langle P, \leq \rangle$, where $P \subseteq \wp(W)$ and $\leq$ is a partial order on P.   (Condoravdi & Lauer 2011)

An agent may well have inconsistent preferences, such as the simultaneous desires reported in (16). However, if an agent is to *act*, he needs to resolve these conflicts as he cannot act on a preference for two incompatible things. If the agent is to decide on a course of action, he needs to integrate all his preference structures into a global set of preferences subject to a consistency constraint, which the underlying preferences do not necessarily obey. This is captured in the following definition of *consistency* for preference structures.

(29)   A preference structure $\langle P, \leq \rangle$ is *consistent* iff for any $X \subseteq P$, if $\bigcap X = \emptyset$, there are $p, q \in X$ such that $p < q$.[6]

A rational agent A at a moment (= world-time pair) w will have a distinguished, consistent preference structure $\langle P_w(A), \leq_{P_w(A)} \rangle$. We call this *A's effective preference structure* at w. We write $EP_w(A, p)$ for 'p is a maximal element of A's effective preference structure at w.' Due to the consistency requirement on effective preference structures, if p and q are believed to be incompatible, $EP_w(A, p)$ and $EP_w(A, q)$ cannot be jointly the case.

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[5]In this respect, our analysis similar in spirit to the proposals by Bierwisch (1980), Wilson and Sperber (1988), and Davis (2009, 2011).

[6]This definition of consistency is a generalization of the definition in Condoravdi & Lauer 2011.

Effective preference structures can be linked to action choice by adopting the conceptualization of Belnap (1991:791):

> As for choice, we idealize by postulating that at each moment w_0, there is defined for each agent a a (possibly one-member) *choice set*, that is, a partition of all of the histories passing through w_0. A member of a choice set is called a *possible choice*, so that a possible choice is a set of histories.

A's effective preference structure at w_0, then, is used to determine (together with A's beliefs) which element of the choice set is chosen. In the general case, a (persistent) effective preference will influence action choices at a (possibly large) set of moments. Suppose my effective preference now is to be at the airport at noon tomorrow. What is required for this to be achieved is a complex ensemble of actions that result in my being at the airport at noon, such as setting the alarm, getting up when it rings, taking the train rather than the bus, or alternatively asking for a ride, etc. All these action choices are required by my maximal effective preference to be at the airport at noon. We say that an agent A 'is an agent for p' if p is either about a volitional action of A or if the agent has an effective preference for p that determines his action choices so as to bring about p.

3.2. Commitments

We take the basic effects of many kinds of utterances as being constituted by the commitments they engender for their speakers, constraining their future actions, linguistic and non-linguistic. Commitments are always *commitments to act* in a certain way: keeping a commitment means making the right action choices. Action choices are determined by an agent's effective preferences together with his beliefs, and hence, a speaker can only be committed to beliefs and preferences: being committed to having a certain preference means being committed to choose one's action as if one really has this preference, and similarly for belief.

We write $PEP_w(A, p)$ for 'A is publicly committed at w to act as though p is a maximal element of A's effective preference structure', and $PB_w(A, p)$ for 'A is publicly committed at w to act as though he believes p'. These public beliefs and preferences will jointly determine action choices an agent is committed to making. We refer the reader to Condoravdi & Lauer 2011 for a formalization of the requisite notion of commitment, relying here on the intuitive idea that utterances are public events that create commitments by virtue of normative *conventions of use* (cf. von Savigny 1988), an example of which we will see shortly.

3.3. Directive imperatives

We assume for now that imperatives contain an abstract operator IMP which takes a propositional argument. This assumption facilitates the comparison with Schwager (2006)/Kaufmann (2012) in §4, but it is not essential to our account. Indeed, as we argue in §6, our account is compatible with several options for the denotational meaning of imperatives, illustrating that the question 'What do imperatives denote?' is not a crucial one.

(30)   CONVENTION ABOUT EXPRESSIONS WITH PROPOSITIONAL DENOTATIONS
        When a speaker Sp utters an expression ϕ which denotes a proposition $[\![\phi]\!]^c$ in a context c, he thereby commits himself to act as though he believes that $[\![\phi]\!]^c$. That is, the utterance results in the following commitment: $PB(Sp, [\![\phi]\!]^c)$

We also adopt Schwager's (2006) EPISTEMIC UNCERTAINTY CONSTRAINT:

(31)   An utterance of an imperative ϕ! in context c is felicitous only if the speaker takes both $[\![\phi]\!]^c$ and $[\![\neg\phi]\!]^c$ to be possible.

A first stab at the semantics for IMP, to be revised later on, is in (32): IMP(p) is true iff the speaker is committed to an effective preference for the addressee to form an effective preference for p.

(32) $[\![\text{IMP}]\!]^c := \lambda p[\overbrace{\lambda w[PEP_w(Sp, \underbrace{\lambda v[EP_v(Ad, p)]}_{A})]}^{S}]$ (preliminary)

where Sp is the speaker in c and Ad is the addressee in c

In (32), p is what we have called the content, A states that the addressee has an effective preference for p, and S states that the speaker is committed to an effective preference for A. With this, an imperative like (33a) has the logical form in (33b), which is equivalent to (33c).

(33)   a.   Be at the airport at noon!
        b.   IMP($\lambda u[Ad$ is at the airport at noon in $u]$)
        c. $\lambda w[PEP_w(Sp, \lambda v[EP_v(Ad, \lambda u[Ad$ is at the airport at noon in $u])])]]$

(33c) is true iff the speaker Sp is committed to a preference for the addressee Ad to effectively prefer that Ad be at the airport at noon; that is, that Ad is an agent for being at the airport at noon. Note that, according to (30), if Sp utters (33a) in a world w^*, (33c) cannot fail to be true at w^*, given that Sp incurs a doxastic commitment about the existence of a preferential commitment and given the principle of DOXASTIC REDUCTION FOR PREFERENCE COMMITMENT in Condoravdi & Lauer 2011:156. That is, an utterance of an imperative is *self-verifying*, and hence cannot be insincere. This explains why imperatives cannot be used to lie, and hence cannot be challenged as lies.

(33c) is exactly what we want for *directive uses*. Indeed, in Condoravdi and Lauer (2011), we proposed a variant of (32) as the asserted content for verbs denoting directive communicative acts, distinguishing between them only in terms of their presuppositions: *order* presupposes that the speaker (of the order) presumes to have authority over the addressee. *Request* and *plead* both presuppose that the realization of the complement of the verb is beneficial to the speaker. In addition, *request* presupposes that it is presumed that p does not interfere with the addressee's current preferences, while *plead* presupposes that it is presumed that p is (likely to be) inconsistent with the addressee's current preferences. Finally, *warn* presupposes that the speaker takes $\neg p$ to be detrimental to the addressee, and that whether p becomes realized is under the control of the addressee. On this analysis of performative verbs, it is clear why imperative utterances can be described using these directive verbs. Imperatives result in the same commitment as the corresponding explicit performative would, and depending on properties of the context, the utterance will give rise to contextual implications about the speech act performed.

3.4. A uniform semantics for imperatives

The semantics in (32) is too specific to cover all uses of imperatives, as it makes explicit reference to the addressee, and to his volitional state and action choices. In wish uses, there often is no (volitional) addressee, or if there is one, it is presumed that he cannot influence whether

the content gets realized (i.e. he is not an agent for the content).

If the content of the imperative is about an addressee action, (34) is sufficient to capture what is conveyed by directive uses: the speaker has a preference for the addressee performing the action, e.g., in (35), the speaker has a preference for the addressee to close the window.

(34) $[\![\text{IMP}]\!]^c := \lambda p[\lambda w[PEP_w(Sp, p)]]$ (final)

(35)   a.   Close the window!

        b. $\lambda w[PEP_w(Sp, \lambda u[Ad \text{ closes the window in } u])]$

This works because if p is about an addressee action, we don't need the detour through an effective preference that will ensure that the addressee is an agent for p. For the general case, can we find contextual conditions under which the semantics in (34) entails the version in (32)? Suppose that it is taken for granted that (i) the speaker himself will not bring about p, (ii) the speaker believes that a necessary precondition for p to become realized without his own involvement is that the addressee effectively prefers it,[7] and (iii) the speaker will only commit to an effective preference for p if he actually effectively prefers p. In this case, because of (iii), $PEP_w(Sp, p)$ will entail $EP_w(Sp, p)$, which, by (i) and (ii), implies $EP_w(Sp, \lambda v[EP_v(Ad, p)])$.[8] This is not quite identical to (32), but it can have the same effect, provided the addressee concludes, plausibly, that conveying this implication was the speaker's intent in publicly committing to a preference for p.[9]

Now, (ii) is actually something we want to simply be a contextual condition that may or may not be in place. If it is absent, we *do not* want to get the stronger version in (32), because, empirically, this is when we get wish uses. Things are different with (i). As discussed in §2.4, imperatives *always* imply a minimization of speaker involvement. We hence propose that there is a second conventional meaning component:

(36)   The speaker takes it to be possible and desirable that, after his utterance, there is no action on his part that is necessary for the realization of the content.

We leave this statement at the informal level, as the requisite notion of a necessary speaker action does not have a ready formalization, and developing one would take us too far afield here. We also leave it open whether this implication is a second speaker commitment induced by imperative utterances, or whether this is simply something that is signaled by the use of the imperative, or a felicity condition on uses of imperatives.

The need for consistency of the content of imperatives derives from the consistency requirement on effective preferences. When an agent utters an imperative with content p, he is committed to p being a *maximal* element of his effective preference structure. Maximal elements, by definition, are unranked with respect to each other, which entails that they must be compatible. Two successive imperatives with contradictory contents thus indicate that the speaker has changed his mind about his effective preferences from one utterance to the next. This compatibility requirement is *not* a stipulation particular to imperatives; it is independently motivated by the fact that these preferences are part of a model of the agent's decision procedure.

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[7](ii) is meant to capture the assumption that the addressee will not bring about p inadvertently, and that, minimally, his assent is necessary for the realization of p.

[8]We can see this step as an instance of practical reasoning by the speaker.

[9]Alternatively, if we take (ii) to be about the doxastic commitments of the speaker, we can dispense with (iii) and do the practical reasoning step using public beliefs and preferences. In this case, we directly derive (32) as a contextual implication of (34).

3.4.1. Functional heterogeneity

To make good on our claim that the various uses of imperatives arise from the interaction of imperative meaning with contextual conditions, let us now outline the contextual conditions that give rise to each use. We already identified the conditions under which directive uses arise. Below, we sketch the contextual conditions for the other uses.

Group II: wish-type uses   Given our proposal that imperatives express preferences, it might seem at first glance that wish uses are somehow the unmarked case—that they arise straightforwardly from the meaning of the imperative. In some sense, this is true, but it is important to keep in mind that imperatives, on our account, express *effective* preferences. And, in general, such an expression is *not* a good way to express a mere desire or wish. This is so because an effective preference is one that the agent will act on, and given (36), the expression of such a preference will generally give rise to an enticement for the hearer to bring about the preferred state of affairs, if the addressee has control over it.

However, recall that effective preferences are derived by integrating the agent's underlying preferential attitudes—including his desires and wishes. This means that the expression of an effective preference can, indirectly, convey such an underlying (mere) wish, given that two conditions are fulfilled: (i) it is not up to the addressee whether the content gets realized, and (ii) no other maximal effective preference is in conflict with the wish. That is, our account predicts that wish uses are possible only in contexts in which these conditions are met, thus capturing the empirical generalization about wish uses we observed in §1. The second imperative in (37), for instance, cannot be interpreted as the expression of a mere wish/hope, but rather will always have the ring of an exhortation, even in the context of the first imperative—unless we can imagine a circumstance in which there is a factor outside the control of the addressee that decides whether he is able to work on the train.

(37)   Have a good trip and get a lot of work done on the train!

The secondary meaning component in (36) excludes uses of imperatives as promises, whereby by uttering an imperative the speaker is committed to bringing about the content by further actions of his, on the assumption that, given the causal structure of the world, a lot more is required of an agent to ensure the realization of an effective preference than simply expressing it.

Magical imperatives   In the limiting case, when an utterance suffices to realize a preference it expresses, imperatives can be used to this effect. For instance, imperatives can be used by magicians, gods, and other agents of supernatural powers to bring about the thing they 'command':

(38)   a.   Stand up and walk!
         b.   Rise from the dead, Lazarus!

Group IV: disinterested advice   Assuming a suitable semantics for *want*, our account straightforwardly predicts the impossibility of *but I don't want you to do it* follow-ups, as the imperative is taken to express a speaker preference. This leaves open the question how we can account for the intuition that, in advice uses, the speaker does not seem to have any personal interest in the addressee fulfilling his goal and hence realizing the content.

We want to suggest that, in these case, there is indeed a (very weak) speaker preference, due

to the principle in (39), which aims to capture a rule of behavior like 'If you truly do not care whether g, and you know that someone else prefers g, then act as though you prefer g, as well.'

(39)   COOPERATION BY DEFAULT

An agent A is cooperative-by-default iff he adds any topical goal g of another agent to his effective preference structure, such that for any preference structure P_A: for no $p \in P_A : p < g$.

It is important to realize how weak (39) is. The preference for g will be bounded by other preferences the agent happens to have, and so in the event of conflicting preferences a 'bottom-layer' preference that gets added on another's behalf will be inactive. For instance, by uttering the imperative in (9) B does not commit to doing everything in his power to get A to San Francisco, because the preference for A getting to San Francisco will be bounded by other preferences of B for not going to San Francisco without a personal reason.

On the other hand, suppose that an agent truly does not care whether some other agent's goal g gets realized (like B in (9), presumably). In this case, even though g is added 'at the bottom' of the preference structure (g is not ranked above any other member of the preference structure), there is nothing preventing g from being a maximal element: this is why, if a speaker is truly disinterested, he can give advice by means of an imperative. If the addressee goal g has become an effective preference of the speaker by (39), then in view of the speaker's utterance of the imperative ϕ! as a contribution to the issue of how to realize g, the addressee may infer that a possible reason for the speaker's preference for $[\![\phi]\!]$ is that realizing $[\![\phi]\!]$ is a way for realizing g.[10] We predict, then, that disinterested advice uses are possible just in case the speaker does not have a preference of any kind for either $[\![\phi]\!]$ or $[\![\neg\phi]\!]$. This is why, as seen in (40), not only *but I don't want you to do it* follow-ups are infelicitous, but also *but I wish you would not*, in contrast to what we observed for concessions, as in (22).

(40)   A: How will I get to San Francisco?

B: Take the train. #But you know how dangerous I think this is, so I don't want you to take it/I wish you would not.

B's utterance of the imperative indicates that A's goal of getting to San Francisco and the particular way of doing so have become maximal effective preferences of B's. But the stated preference of B against A taking the train implies that B would prefer another way for A to achieve his goal, in which case A taking the train is not maximal. Or if there is no other way, A's goal of getting to San Francisco would not have become B's maximal effective preference to begin with.

Finally, let us consider cases where the speaker secretly has an effective preference for the opposite of the addressee's goal. Suppose A asks the question in (40), B secretly wants A to not go in that direction, say in order to throw him off the tracks of someone A wants to protect, and hence replies *Take the Southbound train!* B's utterance is (intentionally) misleading because he implies that the Southbound train is a way of getting to San Francisco. However, the imperative utterance is not a lie about A's effective preferences. Hence, contrary to Kaufmann's (2012:69–70) construal of such cases, the imperative utterance itself, though misleading, is not insincere.

Group III: Permissions, invitations   In cases of a power asymmetry between speaker and addressee, the speaker's *PEP*s can be thought of as determining the 'sphere of permissibil-

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[10]That is, the addressee assumes the speaker's preference for $[\![\phi]\!]$ is the result of practical reasoning by the speaker and recovers the premise of a means-of relation between $[\![\phi]\!]$ and g in this practical reasoning.

ity' in the sense of Lewis (1979). In such contexts *permissions* arise when the following preconditions are in place: (i) the addressee has a preference for the content p and (ii) there is some q which is incompatible with p such that $\lambda w[PEP_w(Sp, q)]$. The imperative utterance indicates a change in the speaker's preferences, such that p is now ranked above q. In cases like (12)–(14), the two imperatives both introduce maximal elements which constrain each other. For *offers* and *invitations*, neither of the two preconditions is necessary. Our account straightforwardly extends to offers with an overt *if you like*, which we can treat these as standard (reduced) conditionals.

(41)   Take a cookie, if you like (to take a cookie).

Informally speaking, (41) comes out to mean something like *If you want to take a cookie, I want you to take one*, which seems exactly the effect that (41) has in context. We assume that offer and invitation uses that do not contain an overt *if you like* are implicitly conditionalized. The same is true for some instances of permission uses, where the speaker may be uncertain whether the addressee actually has a preference for the content of the imperative. In such cases, imperatives are understood as expressing not a global preference, i.e. a maximal effective preference across all the worlds in the speaker's doxastic state, but one that depends on certain facts being the case and about which the speaker is uncertain.

Our account does not fall prey to the arguments raised by Hamblin (1987) and Schwager (2006:170) against treating such *if you like*-conditionals as true conditionals. Their arguments are based on the assumption that the conditionals involve deontic or teleologic conditional necessities. Our account, by contrast, treats them as conditional preferences.

Concessions   Concession uses arise in the same circumstances as permission uses, but differ in that the speaker retains a previous (non-effective) preference against the realization of the content of the imperative, even though, as the imperative utterance conveys, his effective preferences have changed (perhaps under pressure from the addressee) to make the content maximal. In this way, we capture the sense in which a speaker, in a concession use, both disprefers and (newly) prefers the realization of the content of the imperative. To our knowledge, no other account of imperatives is able to capture this fact.

4. Schwager 2006 and Kaufmann 2012: imperatives express necessities

Kaufmann (2012) (building on her dissertation, Schwager 2006) offers a developed account of imperatives, which is the most successful existing analysis we know of in terms of its treatment of functional heterogeneity. The basic thesis is that imperatives are *utterances of modal necessity statements* with the same context-change effect as indicatives (much as in the version of our analysis presented above). In particular, she construes imperatives as equivalent to PERFORMATIVE USES OF MODALS, which do not only *report*, but *bring about* the necessity they express, as seen in (1).

There are two basic strategies for accounting for performative uses of modals, considered in some detail in Kamp (1978). One is to assume that modals are *ambiguous* between a reportative and a performative meaning. The challenge for such an account is to spell out what such a 'performative meaning' consists in. The other strategy is to assume that the semantics of the modals is constant across the two uses, and that the performative effect arises through pragmatic reasoning triggered by certain contextual conditions. The challenge for such an account is to specify these contextual conditions in such a way that the performative effect can be plausibly derived.

Kaufmann follows the second strategy, which has the advantage of being more parsimonious and semantically uniform.

She assumes that utterances of modal sentences are always assertions of modal propositions, and that the performative effect arises from a combination of contextual conditions. In particular, she proposes the following conditions (adapted from Schwager 2006): (i) the modal base is *realistic*, (ii) the ordering source is preference-related, (iii) the speaker is taken to have *perfect knowledge* of both modal base and ordering source, (iv) the speaker is taken to consider possible both the prejacent and its negation, and (v) the speaker considers the ordering source as a good guideline for action. Schwager (2006) and Kaufmann (2012) argue that in a context satisfying these conditions an utterance of an appropriate modal proposition cannot fail to have the performative effect of creating an obligation or issuing a permission.

4.1. Imperatives as necessarily performatively used modals

In order to accommodate the fact that imperatives, unlike modal declaratives, do not have reportative uses, Schwager proposes that they come with a set of felicity conditions that ensure that imperatives can only be used in contexts in which the corresponding modal declarative would be performatively used. In addition to the EPISTEMIC UNCERTAINTY CONSTRAINT, which we have adopted, these include (42) and (43).

(42)   EPISTEMIC AUTHORITY CONSTRAINT
         The speaker is an epistemic authority on both the modal base and the ordering source of the imperative modal.

(43)   ORDERING SOURCE RESTRICTION
         The ordering source of the imperative modal has to be preference-related, or 'prioritizing' in the sense of Portner (2007): it has to be bouletic, deontic, or teleological.

(42) is intended to ensure that the speaker cannot be mistaken with his utterance, while (43) ensures that the imperative modal cannot be construed epistemically, for instance. A final condition is the ORDERING-SOURCE AFFIRMATION PRINCIPLE, which we discussed already in §2.2, and which we will return to below.

A distinctive feature—and, seemingly, a distinctive advantage—of such an account of imperatives is that a large part of the functional heterogeneity of imperatives can be located in the *underspecification of modals*. Wish readings can be construed as modal statements with a modal background 'what the speaker desires', advice can be construed as a modal statement with a teleological modal ordering source, and so forth. However, our assessment below of how the analysis deals with the challenges presented in §2 also shows that this underspecification is too unconstrained.

The consistency requirement   Since Kaufmann accounts for functional heterogeneity in terms of the underspecification of modals, she cannot directly account for the consistency requirement. It is perfectly possible for a speaker to command one thing and desire its negation. Possibly, a suitably strong version of the ORDERING SOURCE AFFIRMATION PRINCIPLE could predict the consistency requirement, but as discussed in §2.2, such a version is likely to be too strong for advice and concession uses.

Speaker endorsement   We have discussed the versions of the ORDERING SOURCE AF-FIRMATION PRINCIPLE offered in Schwager 2006 and in Kaufmann & Schwager 2009 in §2.2. In Kaufmann (2012:162), the author proposes a quite different formulation, combining it with the ORDERING SOURCE RESTRICTION. The new constraint makes reference to a *salient decision problem*, represented as a partition of the set of possible worlds.

(44)   [E]ither (i) in c there is a salient decision problem $\Delta(c) \subseteq \wp(W)$ such that in c the imperative provides an answer to it, g is any prioritizing ordering source, and speaker and addressee consider g the relevant criteria for resolving $\Delta(c)$; or else, (ii) in c there is no salient decision problem $\Delta(c)$ such that the imperative provides an answer to it in c, and g is speaker bouletic.

This formulation is disjunctive and relies on the rather unclear notion of the speaker considering 'g as the relevant criteria for resolving $\Delta(c)$'. We don't think that it solves the basic problem, in any case. Either considering g the relevant criteria entails that the speaker *wants* these criteria to be used, in which case (44) is subject to Kaufmann's own criticism of preference-based accounts of imperatives; or it is read in a weaker way, in which case it does not solve the *#but I don't want you to do it* problem. Finally, as Kaufmann herself points out, this version does not account for concessive uses, where different kinds/strengths of preferences appear to be at play.

We conclude that even though Kaufmann's various versions illuminate the extent and complexity of the problem, none of her versions of the principle ends up resolving the tension of speaker endorsement in a fully satisfactory manner.

Sincerity   If (42) is commonly presupposed, an imperative utterance cannot be challenged as mistaken. However, as noted in §2.3, imperatives can also not be challenged as *lies*, something that is always possible with utterances of declaratives (modal or not), even when the speaker is taken to have privileged epistemic access to their truth. Hence, Kaufmann's account does not predict automatic sincerity. In cooperative scenarios, she can rely on a pragmatic principle ruling out insincerity, but the possibility of lying crucially involves contexts with limited cooperation. She argues that there are cases of insincere imperatives, involving examples of misleading advice. As we argued in §3.4.1, these involve a false implication, not a false imperative utterance.

Interlocutors' involvement   Kaufmann's account does not predict that the speaker of an imperative, with his utterance, indicates that his involvement in the realization of the content is to be minimized. Given that the allowable ordering sources for the imperative modal include 'what the speaker desires', 'what the addressee desires', and 'what the goals of the addressee are', it is unclear how the account would exclude an ordering source that is constituted by the speaker's plans or intentions. But then it should be possible to utter *Be at the airport at noon!* as a promise that the speaker will do everything in his power to ensure the addressee will be at the airport at noon, something that, as we have pointed out in §1, is impossible.

The account also predicts that wish uses are more generally available than they actually are. Given that the ordering source of the imperative modal can be 'what the speaker desires', a speaker should feel free to use imperatives to express any kind of wish. However, as we have seen, wish readings are only possible if it is taken for granted that the addressee has no control over the realization of the content.

5. Portner 2005, 2007: a dedicated discourse parameter for imperatives

Portner (2005, 2007) analyzes imperatives as denoting properties that are presuppositionally restricted to apply to the addressee(s). He further introduces a global discourse parameter, the *TDL* function, which assigns to each interlocutor a To-Do List. Portner takes these lists to be sets of properties, but for purposes of our discussion, we take them to be sets of propositions, namely those propositions that Portner's properties stand in a one-to-one correspondence with, due to the presuppositional constraint on their argument. The dynamic effect of uttering an imperative is to add its content to the To-Do list of the addressee, which, intuitively, is a set of propositions the agent is to make true.

Portner's account thus makes essential reference to the addressee, and hence has difficulty accounting for wish uses that have no addressee (*Please, don't rain!*), or are uttered in the absence of their addressee (*Be blond!*). The extent to which the account can capture functional heterogeneity is hence limited from the start. In Portner (2007), he proposes that To-Do lists have various 'sections' corresponding to the various uses, such as a section recording obligations (for order uses), another recording hearer desires (for invitation uses), another recording hearer goals (for advice uses), and so on. Crucially, even though Portner introduces these 'sections', thereby acknowledging the functional heterogeneity of imperatives, he does not model it. All propositions on the To-Do list are treated equally in terms of the function that Portner proposes for these lists. This function is specified by his principle of AGENT'S COMMITMENT, given in (45) in modified form.[11]

(45) For any agent *i*, the participants in the conversation mutually agree to deem *i*'s actions rational and cooperative to the extent that those actions tend to make it more likely that the largest subset of propositions on *TDL*(*i*) becomes true.

Unpacking Portner's definition requires pinning down what 'tend to make it more likely' amounts to. Independently of how this is done, (45) is a reconstruction of the notion of commitment in terms of what is rational to do. On this understanding, either it is never rational to violate a commitment (say, disobey an order), or one would have to say that if an agent rationally disobeys an order, he has not violated a commitment (perhaps even: he has not really *disobeyed* the order). Both options seem untenable.

Let us assume, then, that Portner's AGENT'S COMMITMENT is replaced with a more appropriate notion of commitment (perhaps the one we sketched above and explicate in Condoravdi

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[11]Portner defines AGENT'S COMMITMENT as in (i), where $<_i$ is a ranking on worlds, derived from the To-Do list of agent *i*, which is effectively treated as a Kratzerian ordering source.

(i) For any agent *i*, the participants in the conversation mutually agree to deem *i*'s actions rational and cooperative to the extent that those actions in any world $w_1 \in \bigcap CG$ tend to make it more likely that there is no $w_2 \in \bigcap CG$ such that $w_1 <_i w_2$.

As Kaufmann (2012) notes, by quantifying over the worlds in the common ground, (i) requires not only that the agent acts in accord with his To-Do list, but also that he *makes it common ground* that he is doing so. Moreover, having a global condition on the common ground makes (i) provably equivalent to AGENT'S COMMITMENT TO A FLAT ORDERING:

(ii) For any agent *i*, the participants in the conversation mutually agree to deem *i*'s actions rational and cooperative to the extent that those actions in any world in the common ground tend tomake it more likely that there are no $w_1, w_2 \in \bigcap CG$ such that $w_1 <_i w_2$.

& Lauer 2011). Employing such an independently given notion of commitment, the function of To-Do lists then can be stated along the lines of (46).

(46)   An agent i is committed to act in such a way so as to make true as many propositions on $TDL(i)$ as possible.

In essence, this means that the addressee of an imperative automatically becomes committed to making the content of the imperative true. While this may be right for order uses, which intuitively create hearer obligations, most other uses of imperatives, even other directive uses, do *not* (directly) induce hearer commitments. A crucial feature of requests, pleas, warnings, etc. is that they do not create addressee commitments (though they may be uttered in the hope that the addressee takes on a commitment). Things are even worse for wish uses, which typically do not even have an addressee, and for permission, invitation, and advice uses. On Portner's account, if someone offers you a drink by saying *Have a drink!*, you are thereby committed to drink, regardless of your wishes.

The consistency requirement   In order to account for the consistency requirement of imperatives, Portner (2007) imposes consistency on To-Do Lists. This constraint is simply stipulated about To-Do lists, whose sole *raison d'être* is to serve as a container for imperative denotations, thereby stipulating, as a discourse constraint, that imperatives need to be consistent. There is nothing about the function Portner assigns to To-Do lists that necessitates, or even makes particularly plausible, this constraint. Indeed, the 'ranking' induced by a To-Do list is the familiar Kratzer-ordering, whose main purpose is to allow for incompatible constraints.[12]

Speaker endorsement   Portner's account has nothing to say about speaker endorsement. As argued in §2.2, while it may be possible to derive speaker endorsement pragmatically in the case of directive uses of imperatives, this is implausible for other uses, most notably cases of disinterested advice. There is nothing in Portner's account that predicts the general infelicity of *but I don't want you to do it* continuations, as the conventional meaning and update effects in his account do not make any reference to the speaker.

Interlocutors' involvement   Portner's account largely sidesteps the problem of limited speaker involvement because the proposed context change effect is specified to target the *addressee*'s To-Do list—and as such, there is no possibility that an imperative could be used as, say, a promise that the speaker will bring about the realization of the content. However, this advantage comes at the price of the limited coverage of uses. As we discussed above, Portner's account is viable only for directive uses and is inapplicable for most wish uses and difficult to square with advice uses. This is so even in its 'proposalist' construal, which we discuss next.

5.1. Proposals to the rescue?

There is an obvious reaction to some of our criticisms. Suppose that the context change effect proposed by Portner is not the actual effect of the utterance of an imperative, but rather, imperatives only *propose* the update of the addressee's To-Do List. Davis (2011:151,154), for instance, suggests this line of defense. Under such a view, an addressee only becomes committed

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[12]Portner (2012), assumes that To-Do lists can be inconsistent, and uses this crucially in his account of permission uses of imperatives. This reveals the conflict in his analysis between accommodating permission uses and capturing the consistency requirement.

to realize the imperative once he accepts this proposal.

How well such a proposalist construal can account for functional heterogeneity remains to be seen since it appears that all the interesting action will have to happen in the negotiation of the speaker's proposal. It seems likely, then, that a comprehensive account of imperatives can only be developed on this basis if the fact that utterances constitute proposals is explicitly modeled. Farkas (2011) gives a variant of a Portner-style account that explicitly models the proposal character, but does not defend it as a general analysis of imperatives.

We doubt that a proposalist construal will be able to account for the very uses for which a 'direct' construal of Portner's account is most problematic. While invitation imperatives such as *Have a cookie!* no longer directly (and implausibly) commit the addressee, they will give rise to such a commitment once accepted. The same will be true for advice uses. But accepting a piece of advice does not commit you to act on it. The basic problem remains.

Similarly, the proposalist construal still must make essential reference to the addressee, and thus is unable to account for wish uses that lack volitional addressees or addressees altogether.

5.2. To-Do lists and the common ground

Given that Portner assumes that imperatives target a global discourse parameter, he has to address a problem that all accounts assuming such global parameters face, namely that the To-Do lists and the common ground need to be kept 'in sync'. If an imperative adds something to a To-Do list, then, after the utterance of an imperative, the common ground needs to reflect what just happened. And in particular, if an order was given (and the orderer had the requisite authority), the common ground should afterwards reflect the fact that a new obligation exists. However, if the dynamic effect *only* specifies a change in the To-Do list, this will not be ensured since the common ground will be unaffected by the utterance of an imperative.

Portner (2007), in order to ensure that the common ground after the utterance of an imperative *p*! entails the corresponding necessity statement *must(p)* or *should(p)*, proposes a two-part dynamic effect: the imperative updates the To-Do list and it also updates the common ground, effectively adding *p* to the modal ordering source corresponding to the 'flavor' of the imperative for all worlds in the common ground.[13] This, however, does not quite achieve the effect Portner intends, given how ordering sources are employed in a Kratzerian semantics for modals. To see this, suppose there are worlds in the common ground at which the relevant ordering source, before the imperative utterance is made, contains a proposition q that is incompatible with p. Adding p to this ordering source will *not* make such worlds verify $must(p)$ since there will be 'best' worlds with respect to the ordering source in which q is true but p is not. Hence, the common ground will fail to entail *must(p)*. In order to ensure that an utterance of *p*! results in the common ground entailing *must(p)*, Portner would have to strengthen his secondary update clause to a proper update with *must(p)*.

Doing so would have the added benefit of modeling functional heterogeneity and thus addressing our criticism of Portner's account on this score. But then, all the work would be done by the secondary update clause, and the To-Do list construct would be rendered superfluous. Imperatives would distributively update the common ground, targeting contextually given modal ordering sources. Indeed, once Portner's second update clause is strengthened in this way, it becomes a variant of the account by Schwager (2006) and Kaufmann (2012).

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[13]Given his formal setup, Portner needs to stipulate an additional principle, CONVERSATIONAL BACKGROUND CONTAINS TO-DO LIST, to achieve this effect.

6. Imperatives: content and dynamic effect

We have so far discussed imperatives in terms of the conventional constraints on their use, evaluating our proposal and competing ones in terms of how well they capture these constraints, and have deemphasized the question of the denotation of imperatives. This is not just a methodological choice, but it reflects what we take to be the crucial issue for an analysis of imperatives.

In §3 we spelled out our analysis on the assumption that IMP is part of the denotation of the imperative. The commitment to a preference for $[\![p]\!]$, crucial to deriving the performative effect, arose indirectly from a doxastic commitment to $[\![\text{IMP}(p)]\!]$, given the convention (30). Equivalently, we can assume that the denotation of imperatives is not $[\![\text{IMP}(p)]\!]$, but rather simply $[\![p]\!]$. That is, the denotation of *Leave!* is $\lambda w.leave(Ad, w)$. Then we need the IMPERATIVE CONVENTION in (47):

(47)   When a speaker utters an imperative $\phi!$ in a context c, he thereby commits himself to an effective preference for $[\![\phi]\!]^c$.

On such an implementation, the denotation of imperatives need not be propositional. We may just as well assume that imperatives denote the (special) properties suggested by Portner (2005, 2007), or the event descriptions we suggested in Condoravdi & Lauer 2010. All this requires is a minor adjustment of the IMPERATIVE CONVENTION. Finally, if we take imperatives to have a non-propositional denotation, the respective conventions can make reference to the semantic types instead of the syntactic form.

All these alternatives are consistent with the crucial features of our account, and none of them is obviously superior on conceptual grounds. We take this as an indication that the crucial/interesting semantic question about imperatives is not 'What do they denote?', but rather 'What is their dynamic effect?' The choice of denotation will constrain the dynamic effect a certain clause type can have, but not determine it. Indeed, as far as we can see, it might well be that there is no fact of the matter about what the denotation of imperatives is. It is quite conceivable that some speakers take imperatives to denote properties, while other speakers in the same community take them to denote propositions. If each of these groups of speakers has an appropriate understanding of the corresponding convention of use, the speakers in the community could successfully communicate without ever discovering their differences with respect to what they take imperatives to denote.[14]

The fact that these variant implementations are equivalent is noteworthy, as such differences in implementation are often taken to be distinctive and decisive feature of accounts of imperatives. Part of our point here is that these modeling choices are not always as crucial as they are taken to be.

References

Alston, William P. 2000. *Illocutionary acts and sentence meaning*. Ithaca: Cornell University Press.

Belnap, Nuel. 1991. Backwards and forwards in the modal logic of agency. *Philosophy and Phenomenological Research* 51.777–807.

Belnap, Nuel, and Michael Perloff. 1990. Seeing to it that: A canonical form for agentives. *Knowledge*

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[14]The situation is different for declaratives and interrogatives because they can be embedded in various environments, which places additional constraints on their semantic types. Since imperatives can only embed in a rather limited manner, there are fewer such constraints.

representation and defeasible reasoning, ed. by Henry Kyburg, Ronald Loui, and Greg Carlson, Studies in Cognitive Systems, vol. 5, 167–190. Dordrecht: Kluwer Academic Publishers.

Bierwisch, Manfred. 1980. Semantic structure and illocutionary force. *Speech act theory and pragmatics*, ed. by John R. Searle, Ferenc Kiefer, and Manfred Bierwisch, 1–35. Dordrecht: Reidel.

Condoravdi, Cleo, and Sven Lauer. 2010. Speaking of preferences: Imperative and desiderative assertions in context. Talk presented at the *7th workshop on Inferential Mechanisms and their Linguistic Manifestation*, University of Göttingen, Germany.

Condoravdi, Cleo, and Sven Lauer. 2011. Performative verbs and performative acts. *Sinn and Bedeutung 15: Proceedings of the 2010 annual conference of the Gesellschaft für Semantik*, ed. by Ingo Reich, Eva Horch, and Dennis Pauly, 149–164. Saarbrücken: Universaar – Saarland University Press.

Davis, Christopher. 2009. Decisions, dynamics, and the Japanese particle *yo*. *Journal of Semantics* 26.329–366.

Davis, Christopher. 2011. *Constraining interpretation: Sentence final particles in Japanese*. University of Massachusetts at Amherst dissertation.

Farkas, Donka F. 1988. On obligatory control. *Linguistics and Philosophy* 11.27–58.

Farkas, Donka F. 2011. Polarity particles in English and Romanian. *Romance linguistics 2010: Selected papers from the 40th linguistic symposium on Romance linguistics*, 303–328. Amsterdam: John Benjamins.

Hamblin, C. L. 1987. *Imperatives*. Oxford, UK: Basil Blackwell.

Kamp, Hans. 1973. Free choice permission. *Proceedings of the Aristotelian Society* 74.57–74.

Kamp, Hans. 1978. Semantics versus pragmatics. *Formal semantics and pragmatics for natural languages*, ed. by Franz Guenthner and Siegfried J. Schmidt, 255–287. Dordrecht: Reidel.

Kaufmann, Magdalena. 2012. *Interpreting imperatives*. (*Studies in Linguistics and Philosophy*, vol. 88.) New York: Springer.

Kaufmann, Stefan, and Magdalena Schwager. 2009. A unified analysis of conditional imperatives. *Proceedings of Semantics and Linguistic Theory 19*, ed. by Ed Cormany, Satoshi Ito, and David Lutz, 239–256.

Lewis, David. 1969. *Convention: A philosophical study*. Cambridge: Harvard University Press.

Lewis, David. 1979. A problem about permission. *Essays in honor of Jaakko Hintikka*, ed. by Esa Saarinen, Risto Hilpinen, Illka Niiniluoto, and Merrill Provence, 163–175. Dordrecht: Reidel.

Portner, Paul. 2005. The semantics of imperatives within a theory of clause types. *Proceedings of Semantics and Linguistic Theory 14*, ed. by Robert B. Young, 235–252. Ithaca: CLC Publications.

Portner, Paul. 2007. Imperatives and modals. *Natural Language Semantics* 15.351–383.

Portner, Paul. 2012. Permission and choice. *Discourse and grammar: From sentence types to lexical categories*, ed. by Günther Grewendorf and Thomas Ede Zimmermann, Studies in Generative Grammar, 43–68. Berlin: De Gruyter.

von Savigny, Eike. 1988. *The social foundations of meaning*. Berlin: Springer-Verlag.

Schmerling, Susan. 1982. How imperatives are special and how they aren't. *Papers from the Parasession on Nondeclaratives: Chicago Linguistic Society*, ed. by Robinson Schneider, Kevin Tuite, and Robert Chametzky, 202–218.

Schwager, Magdalena. 2006. *Interpreting imperatives*. Frankfurt am Main: Johann Wolfgang Goethe-Universtät dissertation.

Searle, John R. 1964. How to derive "ought" from "is". *Philosophical Review* 73.43–58.

Searle, John R. 1975. A taxonomy of illocutionary acts. *Language, mind, and knowledge*, ed. by Keith Gunderson. Minneapolis: University of Minnesota Press.

Truckenbrodt, Hubert. 2009. Performatives and agreement. Manuscript, ZAS, Berlin.

Wilson, Deidre, and Dan Sperber. 1988. Mood and the analysis of non-declarative sentences. *Human agency: Language, duty and value*, ed. by Jonathan Dancy, Julius Moravcsik, and Christopher Taylor, 77–101. Stanford: Stanford University Press.

Exclusivity, uniqueness, and definiteness

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1. Introduction

This paper deals with two puzzles concerning the interaction between definiteness and exclusives. The exclusives in question are *sole* and *only*, and the puzzles are as follows.

1.1. Puzzle 1: anti-uniqueness effects

Use of a definite description of the form *the F* requires that there be no more than one *F*. For example, all of the examples in (1) imply that there is no more than one author of *Waverley*.

(1) a. Scott is the author of *Waverley*.   [1 author]

   b. Scott is not the author of *Waverley*.   [≤1 author]

   c. Is Scott the author of *Waverley*?   [≤1 author]

   d. If Scott is the author of *Waverley*, then ...   [≤1 author]

However, by inserting an exclusive, one can increase the number of *F*s.

(2) a. Scott is the **sole/only** author of *Waverley*.   [1 author]

   b. Scott is not the **sole/only** author of *Waverley*.   [>1 author]

   c. Is Scott the **sole/only** author of *Waverley*?   [≥1 authors]

   d. If Scott is the **sole/only** author of *Waverley*, then ...   [≥1 authors]

An utterance of (2a) means of course that there is only one author of *Waverley* – indeed, that is most likely one's point when one uses (2a). But (2b) can mean that there is strictly more than one author of *Waverley,* on the reading that can be paraphrased, 'It's not the case that only Scott is an author of *Waverley*'. In (2c) the question may concern the number of authors; if the answer is *no,* then there are several. Likewise, in (2d), it is supposed in the antecedent that there is only one author, and the sentence is consistent with the falsehood of that supposition, so there might be more.

In general, sentences of the form *X is F* have two readings, a *predicative* one and an *equative* one. For example, the predicative reading of (2a) is 'Only he is an author of *Waverley*'. The

equative reading can be paraphrased, 'He is the same person as the sole author of *Waverley*,' or brought out by a continuation, 'No, really, they are the same guy!,' as discussed by Wang and McCready (2005). It is on the predicative reading of (2b) that the implication that there is more than one author arises, and this is the phenomenon that we seek to explain. We will refer to this phenomenon as an *anti-uniqueness effect*.

1.2. Puzzle 2: *a(n) sole/*only*

Even though *sole* and *only* both give rise to anti-uniqueness effects, they differ with respect to whether or not they can occur with the indefinite article. This is illustrated in (3)–(5).[1,2]

(3)   If the business is owned by a(n) **sole/*only** owner (the business is not a corporation or LLC), only the owner is eligible to be the managing officer.

(4)   This company has a(n) **sole/*only** director.

(5)   There was a(n) **sole/*only** piece of cake left.

The challenge is to give lexical entries for *sole* and *only* that capture their common behavior with respect to the first puzzle as well as this difference between them.

1.3. Preview

Our solution to the first puzzle lies mainly in the analysis of the definite article. Our proposal for *only* is fairly straightforward; the more radical aspect of our solution lies with *the*. The main idea is that definites are fundamentally predicative and presuppose a weak form of uniqueness (*weak uniqueness*), which is an implication from existence to uniqueness: if there is an *F*, then there is only one. By weakening the presuppositions of *the,* we render the definite article compatible with exclusive descriptions. In fact, according to our proposal, the definite article contributes almost nothing in examples such as those in (2), and this allows anti-uniqueness inferences to arise from the interaction between negation and the exclusive.

We propose that both the definite article and the indefinite article are fundamentally identity functions on predicates, without any existence implication. The existence component of a definite or indefinite description comes into play when it is used in an argument position. The two articles differ only in that the definite article presupposes weak uniqueness.

Because definite and indefinite articles are presuppositional variants, they compete under Maximize Presupposition, which favors the presuppositionally stronger variant (the definite article in this case), ceteris paribus. This explains why *only* is incompatible with the indefinite article, but leaves unexplained why *sole* is compatible with it.

In §3, we argue that the indefinite uses of *sole* can be divided into several categories. One is the 'anti-comitative' use, on which it signifies being without any other entities in a salient group (§3.1). We argue in §3.2 that *sole* can also be used as an expression of singular cardinality

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[1]An idiosyncratic exception to this rule is the idiom *only child,* which allows an indefinite determiner. But *only child* in this sense does not tolerate modification between *only* and the noun, as in **an only smart child,* and *child* must be interpreted relationally in this context. Furthermore, *child* cannot be replaced by other kinship terms such as *cousin, sister,* or *grandchild*. According to some speakers *an only son* is possible, but not *an only daughter*.

[2]The opposite order of *only* and the indefinite article, as in *only an owner,* is of course acceptable, and here we have the NP-modifying use of *only,* rather than adjectival *only*.

like *single* and *one*. Since *sole* performs double-duty as an exclusive adjective and a cardinality adjective, it has the positive properties of both: Like *only,* and unlike *single* and *one,* it can combine with plural noun phrases (*the only/sole/*single/*one people I trust*), and like *single* and *one,* it can be used emphatically in superlative constructions (*That was the #only/sole/single/one deadliest assault since the war began*). Finally, we argue in §3.3 that there is a quantificational use of *sole* meaning '(only) one', which can be derived as a special case of 'anti-comitative' *sole*.

2. Anti-uniqueness effects
2.1. A closer look at the problem

Recall the contrast between (1) and (2), showing that by inserting an exclusive into a definite description, one increases the number of entities implied to satisfy the nominal predicate. At first glance, this would seem to suggest that the insertion of an exclusive eliminates the uniqueness implication normally associated with definite descriptions. But on closer inspection, it turns out to be the *existence* implication of the definite article that is missing.

To see this, it might help to have some lexical entries. For *only* and *sole,* we can use the following.

(6) **Proposed lexical entry for *sole/only* (first version)**
ONLY $= \lambda P \,.\, \lambda x : P(x) \,.\, \forall y[x \neq y \rightarrow \neg P(y)]$

Applied to 'author of *Waverley*', which we represent simply as AUTHOR, this gives:

(7) ONLY(AUTHOR) $= \lambda x : \text{AUTHOR}(x) \,.\, \forall y[x \neq y \rightarrow \neg \text{AUTHOR}(y)]$

Thus we analyze adjectival *only,* like its adverbial cousin, in terms of two meaning components, a negative universal which is its at-issue content (nothing other than *x* is *P*), and a presupposition (*x* is *P*). For adverbial *only*, the presupposition is typically what is referred to as the 'prejacent', viz. the proposition that would be expressed by the clause containing adverbial *only* if the *only* were not there. For adjectival *only,* we analyze the presupposition analogously, as a proposition derived from the nominal that *only* modifies.[3] Evidence for the presuppositional status of this meaning component comes from sentences we have already seen: a negated *sole/only* predication as in (2b) implies that the subject bears the nominal property. The presupposition plays an essential role in deriving anti-uniqueness effects, as we will see in §2.3.

In order to analyze (1) and (2), we need a lexical entry for *the* that is compatible with predicative definite descriptions. These are not quite like definite descriptions in argument position, as Strawson (1950:320) points out at the beginning of *On referring,* by way of setting these aside:

> [I]f I said, 'Napoleon was the greatest French soldier', I should be using the word 'Napoleon' to mention a certain individual, but I should not be using the phrase,

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[3] In general, Coppock and Beaver (2011) argue that exclusives all presuppose that there is some true answer to the current question under discussion (CQ) that is at least as strong as *p*, and assert that there is no true answer that is stronger than *p*, where *p* is the prejacent. Exclusives differ with respect to semantic type (adjectival exclusives like *only* and *mere* being of type $\langle et, et \rangle$) and constraints imposed on the CQ. Adjectival *only* requires the question to be 'What things are *P*?', where *P* is the property denoted by the modified nominal, so the way that it instantiates the general schema for exclusives is equivalent to the lexical entry in (6) (which is much simpler than the statement of it that brings out how it instantiates the schema).

'the greatest French soldier' to mention an individual, but to say something about an individual I had already mentioned. It would be natural to say that in using this sentence I was talking *about* Napoleon and that what I was *saying* about him was that he was the greatest French soldier. But of course I *could* use the expression, 'the greatest French soldier', to mention an individual; for example, by saying: 'The greatest French soldier died in exile'.

Graff (2001) articulates what Strawson was getting at in a more precise way, arguing that definites can serve as predicates, that is, functions from individuals to truth values. Strong evidence that definites can have this type was given by Doron (1983), who shows that definites pattern with other predicate-denoting expressions in being able to function as the second argument of *consider*:

(8)   John considers this woman competent / a good teacher / the best teacher / his girlfriend / *Mary / *some good teacher I know / *you.

Furthermore, as Doron (1983) shows, definites and indefinites can be used without an overt copula in Hebrew, but the copula is obligatory with proper names, pronouns, and *eize* 'some' indefinites; this can be understood under the assumption that definites can denote properties.

Winter (2001) gives an analysis on which predicative definites are type $\langle e,t \rangle$, as suggested by this data. According to his analysis, definites are initially predicative, and become quantificational in argument position by combining with a choice function. He gives two versions of the definite article, one Russellian and one Strawsonian. The Strawsonian one is as follows.

(9)   **Winter's lexical entry for *the*** (Winter 2001:153–4)
        THE $= \lambda P : |P| = 1 . P$

On the Russellian version, the cardinality constraint $|P| = 1$ is part of the asserted content. Under both versions, existence and uniqueness are simultaneously encoded in a single statement.

If it is defined, the meaning of (2b) 'Scott is not the only author of *Waverley*' is as follows.

(10) $\neg$THE(ONLY(AUTHOR))(S)

Intuitively, (2b) is true if Scott is an author of *Waverley,* and *Waverley* has at least one additional author. If that is the case then $|\text{AUTHOR}| > 1$. But neither Scott nor the additional author is an 'only author', because for both, there is a distinct individual who is an author. So there is no 'only author', i.e. $|\text{ONLY(AUTHOR)}| = 0$. Whenever there is more than one author, ONLY(AUTHOR) fails to meet the presuppositional requirements of THE. So, under this analysis, the sentence is predicted to introduce a presupposition failure in exactly those scenarios where, intuitively, it is true.

Which presupposition is failing, existence or uniqueness? The cardinality-one requirement $|P| = 1$ expresses uniqueness and existence at once; let us break this apart into a uniqueness component $|P| < 2$ and an existence component $|P| > 0$. Our problem is not that there are *too many* satisfiers of the predicate 'only author'; the problem is that there are *too few*; again, $|\text{ONLY(AUTHOR)}| = 0$. Thus it is the *existence* presupposition that is causing our problem, not the uniqueness presupposition, as it may have appeared at first.

2.2. Proposed theory of *the*

The solution now presents itself: get rid of the existence presupposition for the definite article. This is a bold suggestion, in light of the long and venerable tradition of assuming that definites presuppose existence. But existence will only be eliminated as a presupposition for predicative definites. For argumental definites as in *The author is sick,* we assume that existence is introduced through general type-shifting operations that apply to both definites and indefinites (Coppock and Beaver 2012). And the assumption that predicative definites do not presuppose existence is welcome on independent grounds. There are other uses of predicative definites that do not imply uniqueness, such as the following:

(11)   You're not the queen of the world.

(12)   7 is not the largest prime number.

An utterance of (11) does not commit the speaker to the existence of a queen of the world, nor does (12) commit the speaker to the existence of a largest prime number.

We therefore propose that the definite article lexically imposes a *weak uniqueness* condition, which precludes multiplicity, but does not require existence.[4] Effectively, we are *splitting up the existence and uniqueness components of the meaning of the definite article,* so that uniqueness is contributed by all uses of definites, predicative and non-predicative alike, but existence only comes in when definites are used referentially, typically in argument position.

Our proposed lexical entry is given in (13). It takes as input a predicate, and returns the same predicate, as long as the input predicate has a cardinality no greater than one.

(13)   **Proposed lexical entry for *the***
THE $= \lambda P : |P| \leq 1 \, . \, P$

Thus *the* presupposes uniqueness (in a sense), but not existence.

2.3. Definites and exclusives

Now, the meaning of (2b) 'Scott is not the only author of *Waverley*' is as follows.

(14) $\neg \text{THE}(\text{ONLY}(\text{AUTHOR}))(\text{S})$
$= \neg[[\lambda P : |P| \leq 1 \, . \, P](\lambda x : \text{AUTHOR}(x) \, . \, \forall y[y \neq x \rightarrow \neg \text{AUTHOR}(y)])(\text{S})]$

The presupposition of the definite article will be defined if $|\text{ONLY}(\text{AUTHOR})| \leq 1$. If x satisfies the predicate $\text{ONLY}(\text{AUTHOR})$, then there is no y distinct from x that also satisfies that predicate, so indeed $|\text{ONLY}(\text{AUTHOR})| \leq 1$. So (2b) turns out to be equivalent to $\neg \text{ONLY}(\text{AUTHOR})(\text{S})$, giving rise to the presupposition that Scott is an author, and being true if there is some y distinct from Scott that is also an author. It implies that there are multiple *authors* of *Waverley*, even though there is no *sole author* of *Waverley*. So there is no inherent conflict in the meaning of the sentence, and we get the anti-uniqueness inference, namely, that Scott is an author of *Waverley* and somebody else is too.

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[4]Büring (2011) makes a similar proposal, and attributes similar ideas to Schwarzschild (1994) and Löbner (2000).

2.4. Plurals
2.4.1. Plural definites

The uniqueness condition that is often attributed to the definite article does not work straight-forwardly with plurals and mass terms, as Sharvy (1980) points out.

> Phrases like 'the coffee in this room' and 'the gold in Zurich' are common and ordinary definite descriptions, and are often 'proper,' in the sense that they denote single objects – a single quantity of coffee or a single quantity of gold. Yet their contained predicates, 'is coffee in this room' and 'is gold in Zurich', apply to more than one object.

So, given our lexical entry for *the*, *the gold in Zurich* should fail to denote. Likewise, the property of being teachers holds of all subsets of the teachers, so *the teachers* should also fail to denote.[5]

To remedy this, we make use of Link's (1983) analysis of plurals. First, we assume that the domain of individuals contains non-atomic sums of individuals, so, for example, the sum of a and b is written $a \oplus b$. Individuals are parts of their sums, and the part-of relation is written $\sqsubseteq_i$. For example, $a \sqsubseteq_i a \oplus b$. Individuals that have no individuals as parts are called *atoms*. For the meanings of plural nouns, we use a cumulativity operator '$*$', 'working on 1-place predicates P, which generates all the individual sums of members of the extensions of P' (Link 1983:130). Link defines the extension of $*P(x)$ as the complete join-subsemilattice in the domain of individuals generated by the extension of P. This boils down to the following:

(15) **Cumulativity operator (definition)**
   For all x, $*P(x)$ iff for all atoms y such that $y \sqsubseteq_i x$, $P(y)$.

For example, if $\text{TEACHER}(a)$ and $\text{TEACHER}(b)$ then $*\text{TEACHER}(a \oplus b)$ (even though the un-starred predicate TEACHER might not hold of that sum). Following Winter (2001), we assume that a *maximum sort* filter applies before THE:

(16) **Maximum sort (definition)**
   $\text{MAX\_SORT} = \lambda P . \lambda x . P(x) \wedge \forall y[x \sqsubset_i y \rightarrow \neg P(y)]$

The symbol $\sqsubset_i$ signifies the proper individual-part relation; $a \sqsubset_i b$ iff $a \sqsubseteq_i b$ and $a \neq b$. Applied to a cumulative predicate such as $*\text{TEACHER}$, MAX_SORT yields a predicate characterizing the singleton set containing the largest individual sum composed of teachers. Applied to a non-cumulative predicate such as TEACHER, this yields a predicate charcterizing the set of maximal individuals which are themselves teachers. In the singular case, the uniqueness presupposition of *the* is satisfied if there is no more than one teacher; in the plural case, the uniqueness pre-supposition is satisfied if the individual-part lattice over teachers has no more than one maximal element (which is always the case).

2.4.2. Exclusives and plurals

We have to complicate our analysis of adjectival *only* as well in order to account for sentences with plurals like (17) and (18).

(17)   Scott and Ballantyne are the **only/sole** authors of *Waverley*.

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[5]The Sharvy quotation notwithstanding, we do not attempt an analysis of mass terms here.

(18)   Scott and Ballantyne are **not** the **only/sole** authors of *Waverley*.

Our lexical entry in (6) applied to the starred predicate $*\text{AUTHOR}$ yields the following.

(19) $\text{ONLY}(*\text{AUTHOR})$
          $= \lambda x : *\text{AUTHOR}(x) \,.\, \forall y[x \neq y \rightarrow \neg \, *\text{AUTHOR}(y)]$

Let us represent *Scott and Ballantyne* as the sum individual $\text{S} \oplus \text{B}$, and consider what happens when this function is applied to $\text{S} \oplus \text{B}$. If Scott and Ballantyne are both authors, then the presupposition of $\text{ONLY}(*\text{AUTHOR})$ will be satisfied, and the function will yield true iff $\forall y[\text{S} \oplus \text{B} \neq y \rightarrow \neg \, *\text{AUTHOR}(y)]$. But this is too strong. $\text{S} \neq \text{S} \oplus \text{B}$ and $*\text{AUTHOR}$ holds of S if it holds of $\text{S} \oplus \text{B}$. The following lexical entry solves that problem.[6]

(20)   **Proposed lexical entry for *sole/only* (generalized)**
          $\text{ONLY} = \lambda P \,.\, \lambda x : P(x) \,.\, \forall y[x \sqsubset_i y \rightarrow \neg \, *P(y)]$

Applied to $*\text{AUTHOR}$, (20) gives the following:[7]

(21) $\text{ONLY}(*\text{AUTHOR}) = \lambda x : *\text{AUTHOR}(x) \,.\, \forall y[x \sqsubset_i y \rightarrow \neg \, *\text{AUTHOR}(y)]$

So if $\text{S} \oplus \text{B}$ satisfies $\text{ONLY}(*\text{AUTHOR})$, then it is not ruled out that S satisfies $*\text{AUTHOR}$; it is only ruled out that some larger sum, like $\text{S} \oplus \text{B} \oplus \text{M}$ does. Notice the similarity with MAX_SORT; the only difference is that ONLY has a presupposition where MAX_SORT has an ordinary at-issue condition.

Before moving onto the plural case, let us make sure that we have not lost our solution to the problem for the singular case. (10) will now be expanded as follows.

(22) $\neg\text{THE}(\text{ONLY}(\text{AUTHOR}))(\text{S})$
          $= \neg[[\lambda P : |P| \leq 1 \,.\, P](\lambda x : \text{AUTHOR}(x) \,.\, \forall y[x \sqsubset_i y \rightarrow \neg \, *\text{AUTHOR}(y)])(\text{S})]$
          $= \neg[\forall y[\text{S} \sqsubset_i y \rightarrow \neg \, *\text{AUTHOR}(y)]]$ if $|\text{ONLY}(\text{AUTHOR})| \leq 1$ and $\text{AUTHOR}(\text{S})$;
          undefined otherwise

Thus indeed, (2b) is still correctly predicted to presuppose that Scott is an author of *Waverley* and make an at-issue contribution that someone else is, too.

2.4.3. Plurals, definites, and exclusives

Now let us consider (17) and (18) with these lexical entries in hand. Plural definite descriptions with exclusives, as in these examples, are slightly different from singular ones, because when the nominal is plural it is not the case that the property that the definite article combines with has an empty extension. For example, the property denoted by *only authors* denotes some

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[6]This more complex variant is still a simplification of the lexical entry for *only* proposed by Coppock and Beaver (2011), according to which, like its other exclusive brethren, it presupposes that $P(x)$ is a lower bound on the true answers to the current question under discussion (CQ) and it asserts that $P(x)$ is an upper bound on the true answers to the CQ. Under Coppock and Beaver's (2011) analysis, adjectival *only* requires the CQ to be 'What things are $*P$?' with answers ranked in a way that corresponds to a boolean lattice of individuals. For example, '$*P(a \oplus b)$' is a stronger answer than '$*P(a)$'. Here we have omitted any reference to the CQ, as it only serves to bring out the parallels between adjectival *only* and other exclusives.

[7]We have reduced $**\text{AUTHOR}$ to $*\text{AUTHOR}$ because $**P = *P$ for all P. The cumulativity operator is closed under sum formation, so the extension of $**P$ cannot contain any elements that are not already in the extension of $*P$.

group of people constituting the only authors even if Scott and Ballantyne are not the only individuals in that group. But our solution does not rely on the emptiness of the extension of the description containing the exclusive; it works here too. The presupposition of the definite article is satisfied in this case, because the description still characterizes a single entity.

The predicate that THE combines with is $\text{MAX\_SORT}(\text{ONLY}(*\text{AUTHOR}))$, which turns out to be equal to $\text{ONLY}(*\text{AUTHOR}))$. To see this, let us expand the expression:

(23) $\text{MAX\_SORT}(\text{ONLY}(*\text{AUTHOR}))$
   $= \lambda x . [\text{ONLY}(*\text{AUTHOR})(x) \wedge \forall y[x \sqsubset_i y \rightarrow \neg \text{ONLY}(*\text{AUTHOR})(y)]]$
   $= \lambda x : *\text{AUTHOR}(x) . \forall y[x \sqsubset_i y \rightarrow \neg *\text{AUTHOR}(y)] \wedge \forall y[x \sqsubset_i y \rightarrow \neg \text{ONLY}(*\text{AUTHOR})(y)]$

The first at-issue condition on the final line ($\forall y[x \sqsubset_i y \rightarrow \neg *\text{AUTHOR}(y)]$) requires that nothing that x is a part of satisfies $*\text{AUTHOR}$. The second condition ($\forall y[x \sqsubset_i y \rightarrow \neg \text{ONLY}(*\text{AUTHOR})(y)]$) requires that nothing that x is a part of satisfies $\text{ONLY}(*\text{AUTHOR})$. Nothing that fails to satisfy $*\text{AUTHOR}$ can satisfy $\text{ONLY}(*\text{AUTHOR})$, so the second condition is implied by the first condition. Hence:

(24) $\text{MAX\_SORT}(\text{ONLY}(*\text{AUTHOR}))$
   $= \lambda x : *\text{AUTHOR}(x) . \forall y[x \sqsubset_i y \rightarrow \neg *\text{AUTHOR}(y)]$
   $= \text{ONLY}(*\text{AUTHOR})$

In other words, $\text{MAX\_SORT}(\text{ONLY}(*\text{AUTHOR}))$ and $\text{ONLY}(*\text{AUTHOR})$ are equivalent.

Furthermore, they are both guaranteed to satisfy the weak uniqueness presupposition of the definite article. For any x such that $\text{ONLY}(*\text{AUTHOR})(x)$, there is no y distinct from x such that $\text{ONLY}(*\text{AUTHOR})(y)$. Thus $|\text{ONLY}(*\text{AUTHOR})| \leq 1$, so $|\text{MAX\_SORT}(\text{ONLY}(*\text{AUTHOR})) \leq 1$ as well. This means that $\text{THE}(\text{MAX\_SORT}(\text{ONLY}(*\text{AUTHOR})))$ is $\text{ONLY}(*\text{AUTHOR})$. Hence 'the only authors of *Waverley*' has the following denotation.

(25) $\text{THE}(\text{MAX\_SORT}(\text{ONLY}(*\text{AUTHOR})))$
   $= \text{THE}(\text{ONLY}(*\text{AUTHOR}))$
   $= [\lambda P : |P| \leq 1 . P](\text{ONLY}(*\text{AUTHOR}))$
   $= \text{ONLY}(*\text{AUTHOR})$

If we apply this predicate to $\text{S} \oplus \text{B}$, we get the following denotation for 'Scott and Ballantyne are the only authors of *Waverley*':

(26) $\text{ONLY}(*\text{AUTHOR})(\text{S} \oplus \text{B})$

This is defined if $*\text{AUTHOR}(\text{S} \oplus \text{B})$, and true if there is no y such that $\text{S} \oplus \text{B} \sqsubset_i y$ and $*\text{AUTHOR}(y)$. In other words, it is correctly predicted that (17) presupposes that Scott and Ballantyne are authors of *Waverley*, and has as its at-issue content that there are no more authors of *Waverley*. The negated version (18) retains the presupposition that Scott and Ballantyne are authors of *Waverley*, and has as its at-issue content that it is *not* the case that there are no more authors of *Waverley*; hence, there are authors of *Waverley* other than Scott and Ballantyne. Our assumptions therefore correctly capture anti-uniqueness effects with both singular and plural definite descriptions containing exclusives.

2.5. Definites in argument position

We have argued that definites have a predicative meaning under which they presuppose uniqueness but not existence. But definites in argument positions (e.g. subject position) do presuppose existence. How do they acquire the existence component?

Coppock and Beaver (2012) argue that the meaning of argumental definites and indefinites can be derived from the corresponding predicative meanings using general mechanisms that introduce existence. Existence is generally at-issue with argumental indefinites and presupposed with argumental definites; both the non-negated and the negated variants of (27) imply the existence of a (salient) baby zebra, whereas only non-negated variant of (28) implies this.

(27) a.   I saw the baby zebra yesterday.

     b.   I didn't see the baby zebra yesterday.

(28) a.   I saw a baby zebra yesterday.

     b.   I didn't see a baby zebra yesterday.

However, there are cases where existence is at-issue even with definites. For example, (29) can be used to communicate that there was more than one invited talk.

(29)   Chris didn't give the only invited talk.

On the reading of (29) on which it is implied that there were multiple invited talks, we have an anti-uniqueness effect in argument position, and existence of something that satisfies the predicate 'only invited talk' is not implied. To account for this, Coppock and Beaver (2012) propose that two type shifts are generally applicable to both definites and indefinites: Partee's (1986) IOTA type-shift ($P \mapsto \iota x P(x)$), which introduces an existence presupposition, and the A type-shift ($P \mapsto \lambda Q . \exists x [P(x) \wedge Q(x)]$), which does not. Usually, IOTA is used with definites and A is used with indefinites; because of Maximize Presupposition (see below), the IOTA option will not be used with indefinites, and there is a general preference for IOTA, so IOTA is used for definites whenever existence is common ground. But in cases where existence is at-issue, IOTA is not available for definites, and in that case A applies; hence the primary reading of (29).

2.6. Summary

We have assumed the meaning in (20) for *sole* and adjectival *only* and the meaning in (13) for *the*, repeated here:

(30)   ONLY $= \lambda P . \lambda x : P(x) . \forall y [x \sqsubseteq_i y \rightarrow \neg \, {}^*P(y)]$

(31)   THE $= \lambda P : |P| \leq 1 . P$

Further, we have assumed that plurals denote cumulative predicates, and that MAX_SORT applies to a predicate prior to combining with THE. (We assume that this is a filtering operation that is generally available.) With these assumptions, we can account for the fact that inserting an exclusive into a negative predication of a singular or plural definite description increases the number of entities that are implied to bear the nominal predicate.

3. *A(n) sole/*only*

The solution to the previous problem gives rise to a new problem. We have given the same lexical entry for *sole* and *only,* but they differ with respect to their ability to occur in indefinite noun phrases, as shown above in (3)–(5), repeated here.

(32)   If the business is owned by a(n) **sole/*only** owner (the business is not a corporation or LLC), only the owner is eligible to be the managing officer.

(33)   This company has a(n) **sole/*only** director.

(34)   There was a(n) **sole/*only** piece of cake left.

We would expect *sole* and *only* to behave in the same way if they have the same meaning.

In particular, what we have said so far predicts both *sole* and adjectival *only* to be incompatible with the indefinite article, if we adopt the Maximize Presupposition principle (Heim 1991). One possible formulation of this principle is as follows.

(35)   **Maximize Presupposition** (adapted from Schlenker 2011)
Among a predetermined set of competitors with the same assertive content relative to the context, choose the one that marks the strongest presupposition compatible with the common ground.

Let us assume futhermore that definite and indefinite determiners are predetermined to compete in the relevant sense, and have the same assertive content relative to the context (e.g. the indefinite article in a predicative indefinite is an $\langle et, et \rangle$ identity function). This predicts that *only* and *sole* cannot occur with indefinite determiners, given the common lexical entry that we have given for these two words, because the definite determiner would always win out. This is partly good, because *only* cannot occur with indefinite determiners, as shown above. But it is also partly problematic, because it is incorrect for *sole*.

We will suggest in §3.1 that *sole* has an 'anti-comitative' meaning; that is, it signifies being without any other entities in a salient group. This analysis yields an analogy between exclusives and superlatives: *only* is to superlatives à la Heim (1999) as *sole* is to superlatives à la Herdan and Sharvit (2006). We furthermore argue for the existence of two additional uses of *sole,* of which one can be derived as a special case. One of these additional uses, discussed in §3.2, is an expression of singular cardinality like *single* and *one*. The other, discussed in §3.2, is a quantifier meaning '(only) one'.

3.1. Anti-comitative *sole*

In this section, we propose that one sense of *sole* is, roughly, 'unaccompanied', and we refer to this as its *anti-comitative* sense. A sole owner, for example, is unaccompanied by any other owners, or is in a group of owners consisting of only one individual. We assume that anti-comitative *sole* depends on a salient method of grouping individuals provided by the context, e.g. 'individuals that have the same hair color' or 'individuals that live together'. We refer to this salient equivalence relation as **W** (for 'with'), and the set of sets of individuals that stand in this relation to each other as **S**, as in Herdan and Sharvit's (2006) analysis of superlative adjectives.

Herdan and Sharvit observe that the problem of compatibility with indefinite determiners also arises with superlatives. Standard theories of superlatives predict that they cannot occur with

the indefinite article. For example, Heim's (1999) analysis of the superlative *richest,* liberally construed, is given in (36).

(36) **Meaning of *richest^i*** (Heim 1999, liberally construed)
$\lambda P . \lambda x : P(x) \wedge x \in \mathbf{C} . \forall y \in \mathbf{C}[\forall d[\text{RICH}(d)(y) \rightarrow \text{RICH}(d)(x)]]$

This takes a property P and returns a property that holds of x if for all y in some contextually sailent group $\mathbf{C}$, y enjoys no degree of wealth exceeding x's, and it is defined only if the P holds of x and x is in $\mathbf{C}$. This always characterizes a unique entity (ignoring the possibility of a tie at the top), so it predicts that superlatives cannot occur with an indefinite article.

But there are examples in which superlatives occur with indefinite articles, such as (37), and Herdan and Sharvit provide (38) and (39).

(37) This class has a **best** student.

(38) The dean praised some **best** student. He happened to be the best student in the class of 2005. The best students in the other classes were not praised at all. [Herdan and Sharvit's (6)]

(39) Sonia decided that she would marry some **richest** eligible bachelor, preferably the richest bachelor among the tennis players, but he could also be the richest bachelor among the art collectors or the richest bachelor among the yacht-owners. [Herdan and Sharvit's (8)]

In (38), for example, there are multiple sets of students in the context, one for each class. Herdan and Sharvit call this set of sets $\mathbf{S}$ and propose that superlatives like *richest* should be analyzed as in (40).

(40) **Meaning of *richest^{ii}*** (Herdan and Sharvit 2006)
$\lambda P . \lambda x : \exists X \in \mathbf{S}[x \in X] \wedge P(x) .$
$\exists X \in \mathbf{S}[x \in X \wedge \forall y \in X[\forall d[\text{RICH}(d)(y) \rightarrow \text{RICH}(d)(x)]]]$

This takes a property P and returns a property that is true of x if there is an X in $\mathbf{S}$ such that x is richest in X. This analysis accounts for the ability of superlatives to take both the definite and the indefinite determiner as follows: if $\mathbf{S}$ contains multiple sets, then *richest bachelor* doesn't pick out a unique referent, so it is appropriate to use the indefinite article. Otherwise, if $\mathbf{S}$ contains only one set, then there is only one richest bachelor, so the definite article is appropriate.

Herdan and Sharvit's analysis can be recast in terms of an equivalence relation $\mathbf{W}$, which is interdefinable with Herdan and Sharvit's $\mathbf{S}$ as follows:

$$\mathbf{W}(x,y) \iff \mathbf{W}(y,x) \iff \exists X \in \mathbf{S}[x \in X \wedge y \in X]$$

Assume furthermore that $\mathbf{W}$ induces a partition on the entire domain of entities, so the presupposition that x is part of some equivalence class is unneccessary. Then we can write Herdan and Sharvit's analysis of *richest* in terms of $\mathbf{W}$ as follows.

(41) **Meaning of *richest^{ii}*** (recast using $\mathbf{W}$)
$\lambda P . \lambda x : P(x) . \forall y[\mathbf{W}(x,y) \rightarrow \forall d[\text{RICH}(d)(y) \rightarrow \text{RICH}(d)(x)]]$

Because it requires fewer symbols, we use this formulation as a basis for comparison to our analysis of *sole*.

Heim's analysis of *richest* is to Herdan and Sharvit's analysis of *richest* as *only* is to what we propose here for *sole*:

$$richest^i : richest^{ii} :: only : sole$$

Completing the analogy gives us the lexical entry in (42) for *sole*.

(42) **Lexical entry for anti-comitative *sole***
    $\text{AC-SOLE} = \lambda P . \lambda x : P(x) . \forall y[\mathbf{W}(x,y) \to y \sqsubseteq_i x]$

If the input property *P* applies only to atoms, then *x* must be an atom, in which case (42) implies that *x* is the only member of its equivalence class. If the input property can apply to non-atomic individuals, then (42) requires that the only other elements of the equivalence class are mereological parts of *x*.

Now, *sole P* is not guaranteed to be unique; there may be several individuals *x* which satisfy the predicate, because there may be several equivalence classes containing a single element. For example, suppose that each set in S is a set of people who own the same business. If Harry is the sole owner of 'Harry's bikes' and Bill is the sole owner of 'Bill's pizza', then Harry will be the sole element of one of these sets, and Bill will be the sole element of another. Thus the extension of *sole N*, unlike that of *only N*, may have cardinality greater than one, and we correctly predict that *sole* is possible with an indefinite determiner in such a case. Like Herdan and Sharvit, we can say that when **S** contains multiple sets, the indefinite article is possible, and that when **S** contains only one set, the definite article must be used.

The salient equivalence relation may correspond to the modified predicate *P*, so that individuals who have the same value for *P* are grouped together. Suppose $\mathbf{W}(x,y)$ holds if and only if $[P(x) \leftrightarrow P(y)]$. Applied to *P*, (42) then boils down to the following:

$$\lambda x : P(x) . \forall y[P(y) \to y \sqsubseteq_i x]$$

This is equivalent to $\text{ONLY}(P)$:

$$\lambda x : P(x) . \forall y[x \sqsubset_i y \to \neg \ {}^*P(y)]$$

Hence the intuitive equivalence between *He is the sole person I trust* and *He is the only person I trust,* and the fact that *sole* gives rise to anti-uniqueness effects.

3.2. Cardinality terms versus exclusives

There are several properties that set *sole* apart from *only,* and group it with *single*. These three words are near-synonyms; the following example is attested with *single* but *sole* or *only* can be used instead without a change in truth conditions:

(43)   That document is the **only/sole/single** source of truth.

However, in this section we will suggest that a distinction should be drawn between *exclusive* (uses of) adjectives on the one hand, and *cardinality* (uses) on the other, that *single* is a cardinality term, and that *sole* is ambiguous between an exclusive and a cardinality term.

Sole patterns with *single* and against *only* in several respects. First, both *sole* and *single* are compatible with an indefinite article while *only* is not.

(44)   There was a(n) *__only/sole/single__ piece of cake left.

Second, *sole* and *single* can both be used emphatically in superlative constructions such as the following, whereas *only* cannot be.

	indef. art	plural	emph. sup.
only	no	yes	no
sole	yes	yes	yes
single	yes	no	yes

Table 1: Properties of exclusive and cardinality adjectives

(45)   This is the **#only/single/?sole** greatest threat.

Notice that the cardinal *one* can also be used in this construction, along with other cardinals, as we will discuss below.

Single, like the cardinal number *one*, differs from *only* and *sole* in that they are incompatible with plural nominals.

(46)   They are the **only/sole/#single/*one** people I trust.

Notice that, as illustrated in (43), analogous examples in which the modified nominal is singular are acceptable with *single*. Likewise, *one* is far more acceptable in a version of (46) in which the modified nominal is singular:

(47)   She is the **one** person I trust.

Hence the problem in (46) seems to be due to the plurality of the nominal.

The properties distinguishing *only, sole,* and *single* are summarized in Table 1. To explain this pattern, we argue that *only* is a pure exclusive, while *sole* is ambiguous between an exclusive and a cardinality adjective, and *single* is a pure cardinality term (like *one*).

What does it mean to be a 'cardinality term'? The analysis of cardinal numbers is a subject over which much ink has been spilled. Without meaning to take a stand on all of the issues that are dealt with in that literature, we follow Krifka's (1999) analysis of cardinals. His analysis of *seven* involves the following ordinary semantic content.

(48)   **Lexical entry for *seven*** (Krifka 1999, simplified)
$\lambda P_{\langle e,t \rangle} . \lambda x_e . \#(x) = 7 \wedge {}^*P(x)$

Here, '#(x) gives the number of atoms that the sum individual *x* consists of' (Krifka 1999:264). We assume that *one* is analogous, and suggest that *single* and *sole* can be given the same analysis.

(49)   **Proposed lexical entry for *one/single/sole***
$\text{ONE} = \lambda P_{\langle e,t \rangle} . \lambda x_e . \#(x) = 1 \wedge {}^*P(x)$

In the following sections we show how this analysis can be used to account for the differences just observed.

3.2.1. Plurality

As illustrated above in (46), *only* and *sole* are compatible with plural nominals, but *single* and *one* are not. This can be explained under the assumption that *only* is an exclusive, that *single* and *one* express singular cardinality, and that *sole* is ambiguous between an exclusive is ambiguous between an exclusive and a singular cardinality term.

In the case of a singular definite description, both the cardinal adjective and the exclusive adjective *only* give rise to a singular-cardinality implication. Our proposed representation of *single source (of truth)* is as follows.

(50) ONE(SOURCE)
      $= \lambda x . \#(x) = 1 \wedge {}^{*}\text{SOURCE}(x)$

This predicate can be fed as an argument to THE as long as the following condition holds:

(51) $\forall x, y[[\#(x) = 1 \wedge {}^{*}\text{SOURCE}(x) \wedge x \neq y] \rightarrow \neg[\#(y) = 1 \wedge {}^{*}\text{SOURCE}(y)]]$

Prima facie this does not rule out that there is a sum of individuals y such that ${}^{*}\text{SOURCE}(y)$ and $\#(y) = 2$, but it follows as an inference; if that were the case, then there would be multiple parts of that plural individual with one atom, violating (51). Hence, the following is presupposed.

(52) $\forall x, y[\text{SOURCE}(x) \wedge x \neq y \rightarrow \neg[\text{SOURCE}(y)]]$

Hence a singular-cardinality presupposition is contributed by the definite article in a phrase like *the single source of truth*. As we have seen, the same implication is at-issue for *only,* so both cardinality terms and exclusives imply singularity in one way or another.

When it comes to plurals, exclusives and cardinals diverge further. Exclusives do not give rise to a singular-cardinality implication in this case, and therefore allow plural morphology on the noun, as we saw above. Singular cardinals have a built-in singular-cardinality requirement. Assuming that plural morphology introduces the condition that the number of atoms that the entity in question consists of is greater than one, plural morphology conflicts with the singular-cardinality requirement imposed by *single* and *one*.

3.2.2. Emphatic reinforcement of superlatives

As mentioned above, another empirical property distinguishing *only* from the others involves superlatives. Consider the following example from the New York Times.

(53) It was the **single** deadliest assault on Americans since the war began.

If *single* were removed from this sentence, the truth conditions would seem to remain the same. What is it contributing? The purpose seems to be to emphasize that the event in question is unique, hence, newsworthy. But unique among assaults, not among deadliest assaults.

Other modifiers expressing singular cardinality can be used in this construction (*sole*, *one*), but *only* cannot be.

(54) It was the **sole/one/#only** deadliest assault on Americans since the war began.

We can explain this under the assumption that emphatic reinforcement of superlatives may involve cardinality adjectives but not exclusive adjectives.

That assumption would predict that other cardinality expressions can be used in the same way, and this prediction is borne out.

(55) These were the **two** deadliest assaults of the war.

Notice that (55) does not mean that the two assaults in question were both the deadliest; one may have been less deadly than the other, as long as it was deadlier than all the rest. Thus, this construction does not involve quantification over deadliest assaults. It is beyond the scope of this paper to give an analysis of examples like (55) (see Yee 2010 for a detailed analysis of related constructions involving ordinals, e.g. *the third highest mountain*), but any adequate analysis of those should carry over to examples like *single deadliest assault*, if it is assigned the same meaning as *one deadliest assault*, by analogy to *two deadliest assaults*. The point here is that this construction allows cardinals of all varieties but not pure exclusives, so the use of *single* and *sole* in it provides further evidence that these are cardinal terms.

3.2.3. *Sole*: cardinality term *and* exclusive

Let us return to our original question: why is it that *sole* is compatible with the indefinite article and *only* is not? We have given two reasons. First, *sole* has an 'anti-comitative' meaning, which boils down to the meaning of *only* in one special case, but is more general. When the salient equivalence relation yields multiple equivalence classes with a unique element, the presupposition of the definite article is not satisfied, and the indefinite article is possible. Furthermore, *sole* has a use as a cardinality term like *single* and *one*, while *only* does not. The fact that *sole* is acceptable with plural nominals (as in *They are the only/sole people I trust*) indicates that *sole* does double-duty as both an exclusive (via its anti-comitative use) and a cardinality term. Thus, it has the *positive* properties of both: ability to modify plurals, like exclusives, and ability to emphatically reinforce superlatives and co-occur with an indefinite determiner, like cardinality terms.

3.3. Quantificational *sole*

There are still some remaining puzzles regarding the behavior of *sole*. First, (56) seems to imply that there was only one woman at the party, not that there was a woman and she was alone, or that there was (at least) one woman at the party.

(56)   There was a **sole** woman at the party.

A related puzzle is the contrast between (56) and (57).

(57)??There was **some sole** woman at the party.

This is not due to an across-the-board restriction against using *some* with *sole*; when used in its anti-comitative sense, brought out by a relational noun, *some* is acceptable:

(58)   There was **some sole** author at the party.

Furthermore, there are some uses of *sole* that, at least to some degree, license NPIs in the VP:

(59) ?A **sole** employee **ever** complained about the mess.

But again, this property does not hold across the board with *sole*:

(60) *A **sole** author **ever** complained about the mess.

The lexical entries we have given for *sole* do not create a downward-monotone environment, so the possibility of (59) – at least, the contrast between (59) and (60) – is puzzling.

A further contrast that can be brought out by contrasting relational nouns like *author* with non-relational nouns is the ability to occur with DP-modifying *not*.

(61) **Not** a **sole** person came.

(62) **Not** a **sole** author came.

There is a reading of (62) on which it is acceptable, paraphrasable as 'No authors came'. But this cannot be paraphrased using the most common reading of *sole author,* which can be analyzed using anti-comitative *sole*.

These properties can be explained if *sole* can function as a quantifier of type $\langle et, \langle et, t \rangle \rangle$, and it means *only one*.

(63) $\lambda P_{\langle e,t \rangle}.\lambda Q_{\langle e,t \rangle}.|\{x : P(x) \land Q(x)\}| = 1$

Because it is a quantifier, DP-modifying *not* is compatible with it. The determiner *some* is incompatible with it because *some* requires a property for its first argument, whereas *a* is semantically 'light' enough to be ignored in the semantic composition. This *some* licenses NPIs in the VP to the same extent that *exactly one* does (cf. *?Exactly one student ever came to my office hours*). As Larry Horn (p.c.) has pointed out to us, NPIs can be licensed pragmatically by for example percentages, when the percentage is surprisingly low (cf. *{?30%,*75%} of voters ever read the newspaper*); we assume that the same mechanism is at work with quantificational *sole*.

This version of *sole* does not need to be stipulated through an additional lexical entry; it can be derived either from cardinality *sole* as in (49) (as pointed out to us by Chris Piñon) or from anti-comitative *sole* as defined in (42). We will illustrate the latter strategy. (63) comes about when the salient equivalence relation is determined by the modified N′ and the VP predicate, that is, when $\mathbf{W}(x,y)$ holds if and only if $[P(x) \land Q(x)] \leftrightarrow [P(y) \land Q(y)]$ holds (where *P* and *Q* are the N′ and VP predicates respectively). For example, the inference that there was only one woman at the party arising from (56) can be derived using anti-comitative *sole* as follows. The meaning of 'A sole woman was at the party' is:

(64) $\exists x[\text{AC-SOLE}(\text{WOMAN})(x) \land \text{AT-PARTY}(x)]$

Sole introduces a presupposition on the existentially quantified variable *x* that it is a woman. We assume that this results in a presupposition that a woman exists, and restricts the existential quantifier so that it ranges only over women. The at-issue-content of (56) can be written:

(65) $\exists x[\text{WOMAN}(x) \land \text{AT-PARTY}(x) \land \forall y[\mathbf{W}(x,y) \to y \sqsubseteq_i x]]$

Suppose that $\mathbf{W}$ is instantiated as a relation that holds between *x* and *y* if and only if $\text{WOMAN}(x) \land \text{AT-PARTY}(x)$ is equivalent to $\text{WOMAN}(y) \land \text{AT-PARTY}(y)$. This sort of choice of $\mathbf{W}$ is rational in any context where the goal is to determine the number of *P*s that *Q*. The sentence specifies that *x* is a woman at the party, so the set of *y*s that stand in the $\mathbf{W}$ relation to *x* is the set of women at the party. Hence (65) can be rewritten as:

(66) $\exists x[\text{WOMAN}(x) \land \text{AT-PARTY}(x)] \land \forall y[[\text{WOMAN}(y) \land \text{AT-PARTY}(y)] \to y \sqsubseteq x]$

This is equivalent to a statement that the cardinality of the set of women at the party is exactly one: $|\text{WOMAN}(x) \land \text{AT-PARTY}(x)| = 1$. Thus, with the appropriate choice of $\mathbf{W}$, the quantificational version of *sole* in (63) can be derived as a variant.

4. Conclusions

To summarize, we have argued for two main conclusions:

- Definite noun phrases are fundamentally predicative and contribute a weak uniqueness presupposition (existence → uniqueness), which is logically independent of existence. Only in argument position does a definite (or indefinite) article signal existence.

- A distinction is to be drawn between pure exclusive adjectives (adjectival *only*) and cardinality adjectives (*single, unique*). *Sole* can function as both, and can also be used as a quantifier. (The quantificational use, however, is derived.)

With these assumptions, we can explain the anti-uniqueness effects that *only* and *sole* give rise to in predicative definite descriptions, and the fact that *sole* is compatible with the indefinite article while *only* is not. The distinction between exclusive and singular-cardinality adjectives has broader empirical consequences as well; exclusive adjectives are compatible with plurals but singular-cardinality adjectives are not, and cardinality adjectives can modify superlatives but exclusive adjectives cannot.

References

Büring, Daniel. 2011. Conditional exhaustivity presuppositions in clefts (and definites). Semantics Archive. Online: http://semanticsarchive.net/Archive/DQxOTVjY/.

Coppock, Elizabeth, and David Beaver. 2011. Sole sisters. *Proceedings of SALT 21*, ed. by Neil Ashton, Anca Chereches, and David Lutz, 197–217. Rutgers University, eLanguage.

Coppock, E. and Beaver, D. 2012. Weak uniqueness: The only difference between definites and indefinites. To appear in *Proceedings of SALT 22*. Rutgers University, eLanguage.

Doron, Edit. 1983. *Verbless predicates in Hebrew*. University of Texas at Austin dissertation.

Graff, Delia. 2001. Descriptions as predicates. *Philosophical Studies* 102.1–42.

Heim, Irene. 1991. Artikel und definitheit. *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*, ed. by Arnim von Stechow and Dieter Wunderlich, 487–535. Berlin: Mouton de Gruyter.

Heim, Irene. 1999. Notes on superlatives. Ms., MIT.

Herdan, Simona, and Yael Sharvit. 2006. Definite and nondefinite superlatives and NPI licensing. *Syntax* 9.1–31.

Krifka, Manfred. 1999. At least some determiners aren't determiners. *The semantics/pragmatics interface from different points of view*, ed. by Ken Turner, 257–291. Oxford: Elsevier.

Link, Godehard. 1983. The logical analysis of plurals and mass terms: A lattice-theoretical approach. *Meaning, use, and the interpretation of language*, ed. by Rainer Bäuerle, Christoph Schwartze, and Arnim von Stechow, 302–323. Berlin: Walter de Gruyter.

Löbner, Sebastian. 2000. Polarity in natural language: Predication, quantification and negation in particular and characterizing sentences. *Linguistics and Philosophy* 23.213–308.

Partee, B. H. (1986). Noun phrase interpretation and type-shifting principles. In Groenendijk, J., de Jongh, D., and Stokhof, M., editors, *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*, pages 115–143. Foris, Dordrecht.

Schlenker, Philippe. 2011. Maximize Presupposition and Gricean reasoning. Ms., UCLA and Institut Jean-Nicod.

Schwarzschild, Roger. 1994. Plurals, presuppositions and the sources of distributivity. *Natural Language Semantics* 2.201–248.

Sharvy, Richard. 1980. A more general theory of definite descriptions. *The Philosophical Review* 89.607–624.

Simons, Mandy; David Beaver; Judith Tonhauser; and Craige Roberts. 2010. What projects and why. *Proceedings of SALT 20*, 309–327.

Strawson, P. F. 1950. On referring. *Mind* 59.320–344.

Wang, Linton, and Eric McCready. 2005. Testing predicative definite descriptions. Ms., National Chung Cheng University and Osaka University.

Winter, Yoad. 2001. *Flexibility principles in boolean semantics*. Cambridge, MA: MIT Press.

Yee, Charles. 2010. Building DRT lexical entries for superlatives and ordinal numbers. Online: `http://semanticsarchive.net/Archive/jg0YzQ4M/`.

How do you double your C? Evidence from an Oïl dialect

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1. Introduction

This paper aims at extending the empirical coverage and typology of *double complementizer constructions*[1] (henceforth DCC), by looking at a dialect, undescribed so far, where they are extensively used. DCC are structures where two instances of a complementizer[2] frame a left-peripheral XP. In (1a), for instance, the argument clause takes the form *that1 XP that2 TP,* where XP stands for the temporal adjunct, while in standard English only the first instance of the complementizer *that* would be present (*that XP _ TP*), as in (1b), where I bold the relevant difference:

(1)   a.   It is useful to know **that** once you have mastered the chosen dialect **that** you will be able to pick up a newspaper and read it. (McCloskey 2006:(69d))
       b.   It is useful to know **that** once you have mastered the chosen dialect _ you will be able to pick up a newspaper and read it.

DCC have been identified in various languages, mostly for non-standard varieties (among others: Irish English, medieval and spoken Castillan, Galician, Portuguese, Flemish, Gothic, some medieval or modern Southern Italian dialects, medieval French, Old English) and provide precious material for investigating the cross-linguistic structure of the left-periphery of embedded clauses. Two paths have been more widely explored to account for them. First, Fontana (1993) and McCloskey (2006), for instance, analyze them in terms of CP recursion and XP adjunction; I will not investigate this possibility here. The second kind of analysis has been developed in line with cartographic approaches based on Rizzi 1997. In this framework, the first complementizer, which I call *que1* here, is generally argued to head Rizzi's ForceP or its equivalent in the author's specific terminology, while the second one (*que2*) heads a lower projection in the split-CP domain. Authors differ, however, as to the precise location and role they ascribe to *que2*.[3]

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    [1]The term is borrowed from Wanner (1995).
    [2]In Germanic languages in particular, the projection hosting the lower instance of C has also been argued to be the landing site of (V-to-)T-to-C in embedded V2 contexts. I leave a thorough comparison with these cases for further research, and will focus on cases where a second lexical instance of C is documented.
    [3]For a detailed picture of the different proposals regarding the location of *que2*, see Villa-García 2010.

In this paper, I show that a dialect of Picard, which I will loosely call 'Ternois',[4] exhibits a species of DCC whose properties differ from those documented in most DCC-licensing languages: the data from Ternois are particularly interesting in that they seem to represent one of the most extensive and productive cases of DCC among (European) languages and can thus serve as a testing ground to investigate what DCC can tell us about the left periphery of clauses. In §2, I will concentrate on the kinds of clauses where DCC are found in Ternois and show that they are much less restricted than in most other languages. In §3, I will focus on the kind of XPs that can be placed between the two *que* and reach the same conclusion. In §4, I will show that the data found in Ternois argue against the idea that *que2* is a licensing Topic Head and give additional support to the proposal made by Ledgeway (2005) for some Southern Italian dialects that the second instance of C appears in Fin°.

2. Some properties of DCC in Ternois: contexts

Picard is a (dying?) Oïl language spoken in northern France which displays dialectal variation. Ternois is one of its dialects, spoken between Arras and Saint-Pol-sur-Ternoise (roughly, the light gray circled area in figure 2 below).
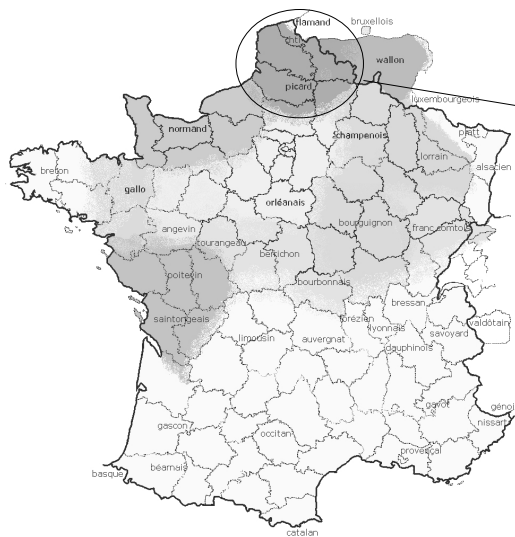
Figure 1: Oïl dialects (apart from French)   Figure 2: Picard dialects
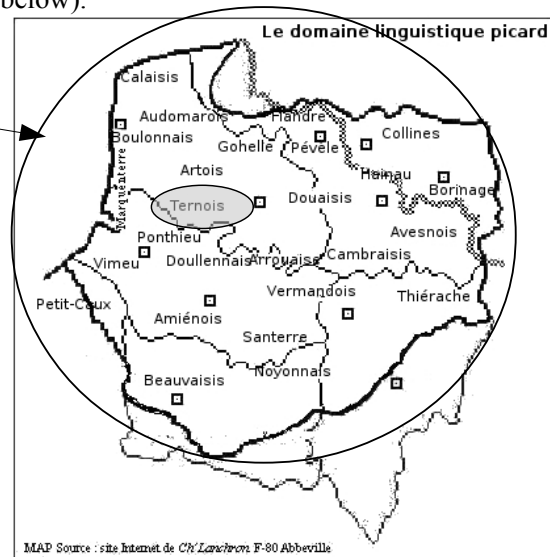
The syntax of Ternois lacks any detailed description thus far (as is the case for the syntax of most Picard dialects). It shares with the Vimeu dialect (cf. Auger 2003) – and most other Picard dialects – at least one property that interferes with DCC: it displays both subject clitic left dislocation and subject doubling of the Friulan type (type 4) in the typology of Poletto (2000). In languages belonging to this type, all instances of subjects (strong pronouns, DPs, quantifiers and variables in relatives) can be doubled. In Ternois, though very frequent, subject doubling is nevertheless not compulsory, except for subject strong pronouns, which are always doubled by clitic. We will consider here that subjects that appear in DCC are clitic-left-dislocated (cf. Dagnac 2011b).

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[4]The data I am considering must be taken with caution, since access to documents in and speakers of these dialects is limited: cross-cutting is still needed to try to define the chronological, geographical, and maybe sociological frontiers of this dialect, for which the name Ternois is just a handy short-cut. Henceforth, it refers to the dialect of this region as written and plausibly spoken between 1900 and 1950.

Converging sources, such as the relevant maps of the *Atlas Linguistique de la France* (Edmont & Gilléron 1902-1910) and localized written corpora,[5] show that Ternois displays extensive DCC, or at least did so in the first half of the 20th century. Both writers and informants of the survey spontaneously and consistently produce, in various contexts, structures featuring two instances of *que*. In most languages where DCC have been studied, except maybe some Southern Italian dialects, ancient or modern (Ledgeway 2005 and Ledgeway & d'Alessandro 2010)[6], some restrictions bear on the embedded clauses that may host a doubled C, or on the properties of the XPs that can be placed in-between. In Ternois, none of these restrictions applies: though DCC is to some extent optional, it occurs in all embedded contexts allowing for *que*.

2.1. None of the usual restrictions applies

DCC has been shown to be restricted to a subset of embedded finite clauses in most other languages. None of these restrictions holds for Ternois: any embedded clauses that can be introduced by *que* allows for a second *que* when any XP is placed in its left periphery.[7]

2.1.1. Argument clauses: subjunctive and indicative

In Turinese and Ligurian (Paoli 2007), the availability of DCC depends on the mood of the embedded verb: it must be in the subjunctive mood, and *che2* cannot appear if it is in the present indicative, future, or conditional. (2), corresponding to Paoli's Turinese examples (2a) and (3a), illustrates the contrast between the present indicative (2a) and subjunctive (2b):

(2) a. *A   dis **che** Marìa e Gioann **ch'** a   **mangio**   nen ëd rane
         SCL say that Mary and John that SCL eat.IND   not of frogs[8]
         'S/He says that Mary and John do not eat frogs'
     b. I   veno volonté, basta mach **che** Gioann **ch'** a   **staga**   nen solo
         SCL come willingly as long as   that John   that SCL stay. SUBJ not alone
         'I will come willingly as long as John is not on his own'

In Ternois, this is not the case: DCC appears both in indicative and subjunctive embedded clauses, as illustrated in (3) and (4) respectively:

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[5]Published texts from this area are few. I thoroughly checked the complete (known) works of Léon Lemaire (suburbs of Arras, 1875–1955), who resorts to DCC systematically (87% of the clauses that can display DCC do so), and Edmond Edmont (Saint-Pol, 1849–1926), who does so more optionally (24% of the relevant contexts, with much variation depending on the text) – see appendix. These texts include prose and poetry; in the latter case, the presence of a doubled *que* seldom affects the metrics, which, as in French, is based on a fixed number of syllables: a large number of *que* appear before vowels, where they elide and form a single syllable with the following vowel, or are elided even before a consonant, as (3) shows. Authors from the Ternois region writing in the 1980s–2000s do not resort to DCC, but my informant accepts sentences with DCC as 'natural' or 'current': field work is planned, as well as corpus work on (recent) non-literary texts, to assess to what extent DCC is still productive.

[6]These studies do not explicitly list the contexts in which DCC may occur. Judging from the examples, however, contexts for DCC seem to be rather unconstrained in these dialects, too.

[7]McCloskey (2006) focuses on embedded T-to-C, which, he shows, is only possible in arguments of Question Predicates (versus Resolutive Predicates). In Ternois, where T-to-C is ruled out in WH-questions, the same contexts would yield doubled *que*. Embedded WH-questions are too rare in my corpus for me to make a serious comparison. I leave this point open.

[8]SCL stands for 'Subject Clitic', IND For 'Indicative', SUBJ. for 'Subjunctive', ∅ for an exceptionally missing item.

(3)   […] argretter, **qu**'dins ch' pat'lin d' nou z'aïeux, / **Qu**' on euch   laiché sombrer
       […] regret, that in the city of our ancestors, that we have.SUBJ let   sink
       si bell's   accoutumances (R25)
       so beautiful habits
       '… regret that in the city of our ancestors (that) one may have lost such beautiful habits'

(4)   [i']   s'rappellent […] / **Qué** ch' bos   d' Wailly **qu**i   les appelle' (R84)[9]
       [they] remember   […]   that the forest of Wailly that-it   them calls
       'They remember that the Wailly forest (that it) calls them'

2.1.2. Factive and volitional predicates

In Spanish, only a subset of clauses introduced by *que* 'that' allows for DCC: in particular, it is excluded from complements of factive and volitional predicates (Demonte & Fernandez-Soriano 2005, Villa-García 2010). In Ternois, complements of factive predicates, as in (3) above, and volitional predicates, as in (5), can equally host DCC:

(5)   [i] faut s'ouaiter pour cha / **Equ** l'Etat   **qu**i   reuv'   sin pied d' bas (R104)
       it mustwish   for this   that the state that=it reopen.SUBJ its purse
       'To that effect, one must wish that the state (that it) reopens its purse'

2.1.3. Beyond arguments of verbs

In Spanish, *que*-clauses complements to nouns, as well as adjunct clauses, relative clauses and subject clauses, ban DCC (Demonte & Fernández-Soriano 2005, Villa-García 2010). In Ternois, complements of nominals (6a), adjunct clauses (6b), (extraposed) subject clauses (6c),[10] and relatives (6d) all allow for DCC:

(6)   a.   l' preuf'   **qué** l' fèmn' Lagueumelle / **Qu**'a'   n'lav' pon souvint ch' tiot salon ! (R53)
             the proof that the lady Lagueumelle that she washes not often   the little room
             'the proof that Lady L. (that she) doesn't wash her toilets often'
       b.   pour **qu'** à l'   prochain'ducasse, **qu'** in lich' moins d' tristess' sur … (R115)
             so   that at the next   fair,   that we read less   of sadness on …
             'So that at the next fair (that) one may see less sadness on …'
       c.   il ad'v'naut **qu'** ein' mam'zelle, […], **Qu**' all' quéïau, (R91)
             it happened that a   miss,   […], that she fell
             'It sometimes happened that a Miss, […], (that she) fell'
       d.   Deux œuf's (…) / **Que** s'tant' **qu**' alle a   dénichés (R70)
             Two eggs (…)   that her aunt that she has found t$_i$
             'Two eggs that her aunt (that she) found'

In this respect, Ternois patterns only with Portuguese (Mascarenhas 2005) and possibly with Southern Italian dialects (Ledgeway 2005, Ledgeway & d'Alessandro 2010).[11]

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[9]Picard has complex phonological rules, and no spelling norm, so *que* can be written *que, qu', qué, équ, equ, eq* … corresponding to the phonetic forms [kə], [k], [ke], [ɛk],[ək]. *Que* followed by the third person masculine clitic [i]/[il] yields [ki]: it can be spelt *qu'i* or *qui* – in the latter case, it is homonymous with the relative subject pronoun *qui,* though, unlike the latter, it cannot be separated from the verb.

[10]Preposed subject *that*-clauses are not productive in Ternois, independently of DCC.

[11]See footnote 6: the authors give no explicit list of contexts or restrictions of occurrence for these dialects.

2.2. More eligible contexts in Ternois

But Ternois provides more potential contexts for DCC than the other languages mentioned. Independently of DCC, Doubly Filled Comps are indeed frequent:[12] any WH-P is commonly followed by *que*. This is the case for relatives and embedded interrogatives, whatever the WH-P may be, as shown in (7a-b). Furthermore, *si* 'if/whether', introducing hypotheticals and embedded polar questions and *quand* 'when' introducing temporal adverbial clauses behave as WH-expressions in that they are followed by *que*, as in (8a-c).[13]

(7) a. Ein homm' **dont** **qu'** in sait l' grandeur d'âm' (Relative clause)
    A man of-whom that we know the greatness of soul'
    'A man whose greatness of soul we know'

  b. Nous savons **qu'mint qu'** il est joïeux (R46) (Embedded question)
    We know how that he is joyful
    'We know how happy he is'

(8) a. **quand qu'** j'arpinse à l'familièr' cité / J'ai moins cair chés boul'vards d'acht'heure (R25)
    when that I rethink to the old city I have less dear the boulevards of now
    'When I remember the familiar city, I like the present boulevards less'

  b. **si** **qu'** t' as du guignon, … (R49)
    if that you have of luck, …
    'if you are lucky, …'

  c. Jé n' sus pon, […], in m'sure / D' dir' **si** **qu'** i' met d' l'argint d' côté (R52)
    I am not, […], able / to say whether that he puts of the money aside
    'I am not able to tell whether he saves money'

When this instance of *que* is followed by a left-peripheral XP, it can also be doubled. (9) illustrates the structure with a doubled complementizer that corresponds to (7) and (8) for relatives, embedded questions, embedded exclamations, and adjunct clauses respectively:

(9) a. l' pemièr' ducasse, **dont** **qu'** nou populace, **Qu'** all' va profiter (R150)
    the first fair of-which that our people$_{fem}$ that she will enjoy
    'the first fair that our people (that it) will enjoy'

  b. Sur chés rimparts, **édù** **que** ch'l'herp' **qu'** all' poussaut drue (R30)
    On these ramparts where that the grass that she grew thick

  c. V'là **commint qu'** à Verdun, «l'Chinquième» **qu'** il a pris s' part (R125)
    Here's how that in Verdun the Fifth that it has taken its part …
    'That's how in Verdun the Fifth regiment (that it) took its part'

  d. Et, **quand qu'** la guerre' **qu'** all' s'ra passée,
    And, when that the war that she be.FUT past
    'And, when (that) the war (that it) is over'

  e. **si qu'** edman **qu'** j'épreuv' seul'mint l' sintimint que … (Ec3)
    if that tomorrow that I feel only the feeling that …
    'if (that) tomorrow (that) I just have the feeling that …'

---

[12] A doubly filled complementizer seems to be optional in Ternois – compare. (ia) and (ib) –, but the presence of *que* is clearly the most frequent case.
  i. a. quand qu' j'arpinse à l'familièr' cité (R25) (lit.: 'when that I think at the familiar city')
     b. Quand ej s'rai, pour toudis, … indormi (R1) (lit.:'When I will be, for ever, …, asleep')
[13] See Dagnac (2011a and 2012, respectively) for direct questions and WH-clauses in general.

2.3. Are there any restrictions on DCC in Ternois?

The variety of contexts that license DCC is such, in particular for speakers that make an extensive use of it, that one may wonder whether any context excludes it. Judging from the data available so far, root declarative clauses host no *que*: unsurprisingly, they display no DCC. Root WH-questions and exclamations, which also exhibit a doubly filled complementizer in Ternois, are potential candidates for DCC: I have found no case in corpora so far with a left-peripheral XP following *que*: XPs that are not clause-internal are either to the left of the WH-P or to the right of the VP.[14] The root-status of the few cases that may qualify for DCC is notoriously unclear: this includes quotation clauses, and clauses headed by a modal adverb followed by *que* ('maybe that', 'hopefully that'), where in standard French subject clitic inversion occurs. Moreover, non-finite clauses do not allow for *que* nor for a doubled *de*, the infinitive complementizer. So far, the right generalization is the following: DCC can occur in all embedded clause licensing the complementizer *que* – which, in Ternois, amounts to: DCC can occur in all embedded tensed clauses (but see §4 for two striking exceptions).

3. The range of 'sandwiched XPs'

In a parallel way, most languages in which some sort of DCC has been described so far impose restrictions on the XP that may occur between the two instances of the complementizer. These constraints are not found in Ternois.

3.1. Heaviness

For Irish English, McCloskey (2006) only discusses high adjuncts, which seem to be the only kind of XP occurring between the two C positions, and which are preferentially required to be 'heavy' in order to trigger DCC. In Ternois, doubled Cs can frame a rich set of items, among which are adjuncts. Heaviness is irrelevant: 'sandwiched' XPs can be monosyllabic, as is the case for the (doubled) subject *l'heur* in (10a) or for the adjunct *d'man* in (10b):

(10) a. dù   qu' nous irons / Tertous, **quand q**u' l' heur' **qu**' all' s'ra   sonnée (R122)
         where that we   go.FUT / all,   when that the hour that she be.FUT rung
         'where we will all go when the time (that it) has come'
     b. Qui sait **si**,   d'man,   **qu**' a' n' mettront pon / Ein couverque (R94)
         Who knows whether, tomorrow, that they put.FUT NOT / a   lid
         'Who knows whether, tomorrow, they won't wear a lid'

3.2. 'Fronting' versus clitic left dislocation

The Dutch data analyzed by Hoekstra (1993) show that only objects that are not echoed by a clitic can stand before *dat*, as in (11a), while clitic left dislocated XPs, as in (11b), cannot:

(11) a. Ik denk [**dat** Jan **dat** ik niet ga feliciteren]   (Hoeksema's 27a)
         I think that Jan that I   not go congratulate
     b. *Ik denk [**dat** Jan **dat** ik **die** niet ga feliciteren]   (Hoeksema's 26a)
         I   think that Jan that I   him not go congratulate

---

[14]Fieldwork and additional corpus work are planned to check whether the data are fully representative.

Ternois allows objects to be sandwiched in DCC. They can be 'fronted' (preposed but not doubled by a clitic), but they can also be clitic left dislocated, as shown by (12a-b) respectively:

(12) a. Il a pu souvint apprécier / **Commint qu'** à li **qu'** in pouvaut s'fier (R72)
          He could often   assess / how   that on him that we could   rely
          'He often witnessed how totally on him one could rely'
      b. […] **qu'** chés affreux nazis / **Qu'** in **l's** a   eus jusqu'à leur zi-zi (R151)
          […] that these awful nazis / that we them have got up to   their balls
              'that these awful nazis, we got them up to their balls'

3.3. Topics only?

Most of the Romance varieties that allow for DCC require that the XP preceding *que2* be in a topic position and be interpreted accordingly: what is assumed to be foci are either to its right or clause-internal. Again, this does not hold for Ternois.

3.3.1. Contrastively focused preposed arguments

In Spanish, Villa-Garcia (2010) shows that contrastively focused preposed arguments remain to the right of *que2*: in (13), his (20), *dos coches*, which bears contrastive stress, yields a good sentence only if it is not framed by the two instances of *que*:

(13) a. Me   dijeron **que** a tu   primo **que** DOS COCHES le   robaron(, no uno)
          to.me. said   that to your cousin that TWO CARS   to.him stole   (, not one)
      b. *Me   dijeron **que** DOS COCHES **que** le   robaron a tu   primo(, no uno)
          to.me. said   that TWO CARS   that to.him stole   to your cousin(, not one)
          'They told me that it was two cars that your cousin got stolen, not one.'

It is not the case in Ternois: preposed items with a contrastive focused intonation such as in (14) and (15) can precede *que2*:

(14) [Context: Talking to a fisherman out to catch carp]: Fisherman, if at the end of the day
      you have caught only little fish …
      Rappell'-ti **qu'** in mettant l'prix / Ch' l'éclusier, des carpe' et d's inguilles$_i$, PLEIN T'N'
      ÉPUIGETT' **qu'**i t'in$_i$ mettra
      Remember that, paying the price / the lock keeper, carps and eels, your net full, that he
      to-you=of-them= put.FUT
      'Remember that, if you pay the price, the lock keeper will give you carps and eels your
      net full' (= 'not just a few')
(15) Il a pu souvint apprécier / **Commint qu'** à li **qu'** in pouvaut s'fier (R72)
      He could often   assess / how   that on him that we could   rely
      'He (the colonel) often witnessed how on him (= 'not the other soldiers') one could rely
      [in order to carry out a reputedly dangerous mission through]'

3.3.2. Fronted quantificational adverbs

Benincà and Poletto (2004) argue that fronted (temporal) quantificational adverbs belong to the focus field (more specifically, that they stand in their lower Contrastive Focus position). Demonte and Fernandez Soriano (2009) note that the (focused) temporal adverb in (16) can

stand to the right of *que2*, which, according to them, reveals that *que2* does not stand in the lowest position of the CP-field.

(16)　Me　aseguró que esa tontería$_i$　que NUNCA la$_i$　diría　　（Benincà & Poletto's 46b)
　　　　to.me assured that that nonsense$_i$ that never　her$_i$ say.COND
　　　　'He promised that, such nonsense, never would he say it.'

These adverbials appear to the left of *que2* in Ternois:

(17)　a.　J'ai voulu, in mêm' temps, aussi, fournir el preuve/ **Equ toudis**, dins ch'parlache ed
　　　　　nou taïons, **qu'**in treuve/ Des mots tout juste à point (R154)
　　　　　'I wanted, at the same time, too, to give the proof that always, in the language of our
　　　　　grand-parents, (that) one finds well-done words'
　　　b.　leu espérance/ Ch 'est **qu' pu jamais,** sur nou qu'min d' fer,/ **Qu'**in r'voëch des
　　　　　ojeux d' Luchifer / Ardéclaver, (…) /Leus démolicheusés … pralines (R137)
　　　　　'their hope is that never more, on our railway, (that) one sees again birds of Lucifer
　　　　　send their devastating bombs'

3.3.3. A generalization

In Ternois, the proper generalization is that any item that, in a root declarative sentence, may show up to the left of the subject clitic can be 'sandwiched' between *que1* and *que2*. This item may, but does not have to, be 'substantial' or 'heavy'. The most frequent types of XP that show up between the two instances of *que* are doubled or clitic left dislocated subjects, and adjuncts of all kinds (scene-setting, causal, conditional, modal, etc.). These cases are illustrated in (18a) and (18b), respectively.

(18)　a.　Et,　quand **qu' la guerre qu'** all' s'ra　　passée, …
　　　　　and, when　that the war　　that she be.FUT past, …
　　　　　'And, when the war (that it) is over, …'
　　　b.　pindant qu' in　est dins les tranches, **Qu' à cause ed li**　qu' in　a l' firchon (R27)
　　　　　while　that we are in　the agonies, that because of him that we have the creeps
　　　　　'And while we suffer agonies, while because of him (that) we have the creeps'

Preposed objects are less frequent, yet possible too – either fronted or clitic left dislocated (see above),[15] and so are various kinds of verbal modifiers in the scope of negation (among which are preposed quantificational adverbs as seen above).

(19)　a.　Car v'là　**qu' tout près d' nous qu'**all' s'avanche (R89)
　　　　　For here's that all　close to us　that she steps forward
　　　　　'Because suddenly she comes next to us'
　　　b.　l'jalouss'té,　telle qu'ein méchant moustique, Ch'est　dins tous　chés　milieux
　　　　　the jealousy, such as a　wicked mosquito, it is　in　all　the　milieus
　　　　　qu'　profondémint　qu'alle pique. (R63)
　　　　　that　deeply　　　　that she stings
　　　　　'Jealousy, as a wicked mosquito, among all social backgrounds deeply stings.'

---

[15]Clitic left dislocated objects are generally interpreted as a given, contrastive or shifted topic; fronted objects are generally interpreted as focused within the sentence, even when their referent has been mentioned in the previous discourse. The latter are marked in Ternois, independantly of DCC.

Furthermore, no specific, discourse-linked interpretation of the left-peripheral XP seems to be required or excluded.

3.3.4. The number of fronted XP is not limited to one

Left-peripheral XPs combine freely: when multiple XPs are framed by *que*, most frequently, a DP subject is combined to one or more complements or adjuncts, as in (20):

(20) a. d'armarquer **qu'** cha voësin' vit'   **qu'**all' s'apprête à quitter ch'wagon (R71)
        to notice   that his neighbor quickly that she gets ready to leave the car
    b. V'là commit, **qu'** à Verdun, 'l'Chinquième' **qu'** il a pris s' part … (R125)
        Here's how   that at Verdun, 'the Fifth'   that it has taken its part

But other combinations are also possible. Thus, (14) in §3.3.1 combines, between the two instances of *que*, an adverbial, a clitic left dislocated subject, a clitic left dislocated direct object, and a focused verbal modifier. Note that contrary to what happens in Portuguese (Mascarenhas 2007), in this case, having more than two occurrences of *que* is marginal: there is only one example in the whole corpus, cited in (21):

(21) Il arrivaut, à m'sure, **equ** dehors, dins l' courette,/ **Qu'**ein mèr' **qu'**alle artreuvaut, couqué dins ein' carette …
    'It happened, often, that outside in the ward (that) a mother (that she) discovered, lying in a cart …'

Ternois differs from Ligurian and Turinese in that DCC is not correlated to the subjunctive mood of the embedded sentence. In differs from Spanish and Galician in that any subordinated clause normally headed by *que* can host a second *que* following any XP that can precede TP in a root clause. And it also differs from Portuguese both in that it does not rule out preposed non-topics, and that the presence of multiple XPs in the left periphery does not induce the presence of multiple instances of *que*. The languages Ternois comes closest to in this respect are the Southern Italian dialects studied by Ledgeway (2005) and Ledgeway and D'Alessandro (2010), with the provision that, as Ternois is a (quasi-)systematic doubly-filled COMP language, DCC is also extensively found in WH-clauses. In the next section, I propose an analysis of DCC that accounts for the empirical properties presented in §2 and §3, and for a few additional properties as well.

4. *Que2* heads FinP

In the Romance languages that allow for it, DCC has generally been dealt with within a cartographic approach, based on Rizzi's (1997) hierarchy of projections inside the CP-field (stars indicate the possibility of recursivity):

$$\text{ForceP/CP} > \text{Top*} > \text{FocP} > \text{TopP*} > \text{FinP}$$

In this framework, the second instance of *que* has received two main analyses. The most frequent claim is that *que2* heads a left-peripheral (high) Topic Phrase, (see for instance Mascarenhas 2007, Paoli 2006, and – with qualifications – Uriegareka 1995, Demonte & Fernandez Soriano 2009, and Villa-García 2010), while some authors propose instead that it

heads FinP (Bovetto 2002, López 2009, Ledgeway 2005). I show here that the second approach best captures the properties of Ternois's DCC, while in §5, I will argue that *que1* is the head of ForceP.

The fact that in several languages only topics can precede *que2* (as seen in §3.3) has been a major argument to view *que2* as heading a high Topic phrase, which in some analyses it serves to license: XPs that stand in FocP are then correctly predicted to remain to its right. In addition, viewing *que2* as a head that licenses the projection of TopicP in (some) embedded clauses aims at capturing the fact that DCC does not occur when no TopicP is present. I show here that the ordering argument does not hold in Ternois, and that this approach meets problems that can be solved if *que2* stands in Fin.

4.1. *Que2* is not the head of a TopicP
4.1.1. Position

As shown in §3, in Ternois no preposable XP has to remain to the right of *que2*. XPs that qualify for a left-peripheral Focus position, such as preposed quantificational adverbs or contrasted fronted objects, can (immediately) precede *que2*. If *que2* were the head of a TopP, one should assume that in these cases it heads a low TopicP. But, unless one can associate it to a particular discourse contribution I fail to see, this would not explain its presence in (15), repeated here as (22), where *li* 'him', a contrastively focused preposed argument, though refering to a given referent (a soldier called 'Pon-Froussard'), is no more the sentence topic (the colonel is), than the fronted items in (19), which are not even given:

(22) Il a pu souvint apprécier / **Commint qu**' à li **qu**' in pouvaut s'fier (R72)
      He could often assess / how   that on him that one could   rely
      'He (the colonel) often witnessed how on him (= 'not the other soldiers') one could rely
      [in order to carry out a reputedly dangerous mission through]'

If one wants to maintain that *que2* serves to license the projection of an extended CP in some clauses, in order to capture the fact that DCC only happens when some preposed XP stands in the left periphery, the only possibility is either to adopt Uriegareka's (1995) proposal that *que2* is the head of an unspecified functional projection linked to information structure, or to consider that in Ternois, unlike other languages, the discourse-linked projections are always licensed as a whole by the head of a lower TopicP.

4.1.2. Licensing

The intuition that some clauses need a special mechanism to license their informational structural left-peripheral projections is interesting, yet it needs to be examined more closely both the general idea and for Ternois in particular. First, if *que2* is the head licensing the TopP projection, when is TopP required to be licensed this way? Topics indeed occur in various kinds of clauses. In root clauses, they need no *que* to license them. So, *que2*'s presence may be linked to the special status of embedded clauses with respect to information structure. In most dialects that display DCC, *que2* is optional: XPs in high topic position can stand to the right of *que1* whether *que2* is present or not; if *que2* is a TopicP licensor, it should be covert in that case. Since *que1*, which is supposedly the complementizer introducing all embedded clauses (Kayne 76), may also be covert, we must assume a topic-licensing *que2* homophonous to the complementizer *que1*, a silent version of both *que1* and *que2* – plus an explanation for their distribution. Furthermore, the (optional) presence of this licensing topic-head just in the

contexts where DCC is possible in each language still needs a principled explanation. I will not try to find an answer to these questions, and I will rather concentrate on an analysis that seems more promising for Ternois.

In Ternois, what are the exact contexts where *que2* is licensed? DCC is found in all embedded clauses introduced by a *que*. Kayne (1976) argues that, in French, *que* is the (explicit or covert) complementizer that introduces all embedded tensed clauses. This holds even more straightforwardly for Ternois, where it is usually overt. And in all embedded tensed clauses, DCC can obtain. This suggests that *que2* is closely linked to nature of the tensed complementizer. This is confirmed by the following observation: DCC appears only in tensed clauses. Embedded infinitive clauses do license left-peripheral topics, to the left of the non-finite complementizer, *de/dé/ed*; but they rule out any *que* linked to the presence of this topic, as (23) shows:

(23) a. T' as   raison Colas,   faut   tacher / Ech temps perdu$_i$ **dé** l'$_i$ rattraper (R104)
      You have reason Colas, ∅ must try /   the time lost   C° it catch up
    b. *T'as raison Colas, faut tacher / Ech temps perdu$_i$ **que dé** l'$_i$ rattraper
    c. *T'as raison Colas, faut tacher / **dé** ch' temps perdu$_i$ **qué** l'$_i$ rattraper
      'You're right, Colas, one must try, the time gone by, to catch it up'

The presence of *que2* is then linked to the presence of a tensed embedded clause, but not to that of a topic.

4.2. *Que2* is merged as head of FinP

If the second *que* is the usual [+finite] complementizer, then the whole set of data in Ternois is accounted for straightforwardly.

4.2.1. Licensing and order solved

A natural consequence is indeed that *que2* is merged in the Fin head of all tensed embedded clauses. This corresponds to the distribution of DCC in Ternois: the lower *que* is found in any tensed embedded clause. Furthermore, it predicts that *que2* is not merged in the Fin head of infinitives, where the [-finite] complementizer *de* is overtly merged. This explains why in (23), *que* is ruled out. Assuming that clauses that do not project a subordinating CP domain do not have a Fin projection, the absence of *que* after preposed XPs in root clauses also follows. *Que2* in Fin also explains why any left-peripheral XP can precede *que2*: Fin being the lowest projection of the CP domain, any XP moved or first-merged within the CP domain is predicted to precede it. This clear-cut picture has two exceptions, though: DCC, surprisingly, fails to occur when the subject of the embedded clause is a non-doubled DP, or when it is relativized. I will argue that these exceptions can also be accounted for if *que2* is the finite complementizer standing in Fin.

4.2.2. Non-doubled subject DPs

The very systematic use of DCC by writers like Léon Lemaire has one striking exception: no DCC occurs in clauses where the subject is a non-doubled DP: the usual structure is then the French-like one in (24a), whereas (24b) would be expected:[16]

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[16]There are only a few exceptions, such as (i). See footnote 20 for a possible explanation.
  i.   Pourtant, paraît **qué** d'pu la guerre, Dins certain's régions d'nou païs, **Qu'** des parints ont chopé

(24) a. j'prétinds **qu**'à l'heur' d'aujourd'hui / Nou gins n'profit'nt-té pu d'agrémints in série (R25)
      b. %j'prétinds **qu'à** l'heur' d'aujourd'hui, **qu'** nou gins n'profit'nt-té pu d'agrémints in série
          'I claim that nowadays our people enjoy no longer pleasures by the dozen'

Under a topic head analysis, this fact seems hard to capture: why should the nature of the subject interfere with the licensing of the preceding adjunct? But if *que2* is in Fin, it can find an explanation. Pesetsky & Torrego (2001) propose indeed that finite C bears an uninterpretable tense feature that needs to be checked. This can be done in three ways:

- by attracting T to C in a classical way (Ternois has only marginal T-to-C, even in classical contexts such as root questions: see Dagnac 2011);
- by attracting a nominative DP: in their view, nominative case is actually a tense feature on D;
- by inserting/attracting a finite complementizer, since it also bears a tense feature.

If we assume this view, not only does the presence of *que* in Fin find a principled explanation (it checks the tense feature of C), but the absence of DCC in clauses like (24a) is no longer puzzling: non-doubled DP subjects bearing nominative case are attracted to SpecFinP to check its tense feature; as a consequence, no *que* is inserted in Fin.

4.2.3 Subject relatives

Under Kayne's (1976) influential analysis of French *qui/que,* which affirms that *qui* is a special version of the complementizer *que* – which could be extended to Ternois – the fact that *qui*-relatives do not give way to DCC is unexpected. If the 'normal' form *que* can be doubled, however this doubling occurs, we expect, contrary to facts, *qui* to be doubled as well, either as in (25b) or as in (25c), while the only possible form is actually (25a):

(25) a. Et ch'foot-ball' **qui**, l'diminche, atténu' leu innui, N'contint' pon, dins l'sémain',
          Batiche et ni Marie (R25)
      b. *Et ch'foot-ball' **qui**, l'diminche, **qui** atténu' leu innui, N'contint' pon, dins
          l'sémain', Batiche et ni Marie
      c. *Et ch'foot-ball' **que**, l'diminche, **qui** atténu' leu innui, N'contint' pon, dins
          l'sémain', Batiche et ni Marie
          Lit. 'And football, which, on Sundays, tempers their boredom, satisfies not, during
          the week, Batiche nor Mary'

Though influential, Kayne's analysis runs into some long-standing problems, and alternative analyses have been put forward. Sportiche (2011), in particular, argues that relative *qui* is a 'regular' WH-P, and that the French WH-paradigm can been analyzed as involving both strong and weak WH-forms. Considering relative (versus interrogative) *qui* as a nominative weak version of the WH-P can accommodate the facts discussed in Kayne 1976. His arguments and conclusions can very convincingly be extended to Ternois (cf. Dagnac 2012b).[17] On this

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l'manière / Pour êt', sans réplique, obéis. (R98)
'Yet, it seems that since the war, in some regions of our country, that some parents have found a way to be obeyed at once.'

[17]This mirrors the traditional analysis of French (and Picard) grammars: relative *qui* is a nominative WH-P, differing from interrogative *qui,* which does not encode case but animacy. In Ternois, the weak (relative) versus

view, since *qui* is morphologically nominative, the absence of *que* in Fin is no longer a surprise: just as a non-doubled subject DP, *qui* moves to SpecFinP and checks its tense feature, hence the absence of *que*.

5. The relationship between *que1* and *que2*

I have just shown that positing *que2* in Fin can explain its distribution, its ordering with respect to the whole range of preposed XPs, and the link between the presence of some forms of subjects and the absence of *que2*. Claiming that *que2* is a complementizer in Fin nevertheless leaves two questions open:

    i.   What is the relationship between the lower complentizer, *que2*, and the higher one, *que1*, and to what extent does it explain that *que2* only shows up in clauses that allow for *que1*?

    ii.   How can the optionality of DCC for some speakers be accounted for, and what are the exact patterns found?

Two answers have been given to question (i). To my knowledge, most analyses of Romance DCC, viewing *que2* as a topic head, assume that the co-occurrence of two similar forms is a coincidence: *que1* and *que2* are homophonous, and the optionality of *que2* is not paid much attention to. On the contrary, Ledgeway (2005) claims that it is not a coincidence. According to him, *que1* and *que2* are two instances of the same item, merged twice: DCC is an instance of head movement within the CP field, and *que2* is the spelled out lower copy of *que1*. I will capitalize on the latter analysis and show how it may be implemented, and how it can account for the optionality of DCC in Ternois.

5.1. Two copies in a head-movement chain

Que is a finite complementizer: it plays a role in the process of embedding a clause (it marks a clause as embedded or allows it to be embedded), and it selects a finite clause. In the cartographic approach, the relationship between the embedded clause and the embedding structure relies on the upper projection of the CP domain, ForceP in Rizzi's terms; the relationship between embedding and the tense status of the embedded clauses is mediated by FinP. A finite complementizer de facto assumes both functions. A natural reflex of this double function would be to merge it twice, once in order to take care of the finite specification, a second time to take care of embedding. Assuming further, following Pesetsky and Torrego (2001), that head movement is a way to check features, and that a head can check several features on its way up during the same phase, DCC would naturally be grounded in the need for *que* to check first the tense/finite feature of Fin, and then the subordinate specification of Force.

An indirect argument in favor of this view comes from the behavior of infinitives. We saw in §4.1 that no *que* follows preposed XPs in infinitives, a natural consequence of the [+finite] feature of *que* if *que2* stands in Fin. But the present analysis also accounts for the fact that the non-finite complementizer *de* cannot be doubled either: next to the correct (26a), (26b) is indeed ruled out, too:

(26) a. T'   as   raison Colas,   faut tacher / Ech temps perdu$_i$ **dé** l'$_i$ rattraper (Ra104)
             You have reason Colas, ∅ must try /   the time lost   C° it catch up

---

strong (interrogative) forms are overtly distinct: only the strong [-human] form *quoi* is found in interrogatives versus *que* in relatives, while the strong [+human] form is *tchèche/tchièce*, vs nominative *qui* in relatives.

b. *T'as   raison Colas,   faut tacher **d'** ech temps perdu **dé** l'rattraper
   You have reason Colas, ∅ must try / C° the time   lost   C° it catch up
   'One must try to catch up the times gone by'

This is predicted under Rizzi's (1997) analysis of the extended CP: infinitives lack the higher C position, so *de* would have no higher position to go to.

Another contrast can also be captured. Relative *qui* is nominative hence [+finite], but it is also plausibly [+sub] since it can only head embedded clauses.[18] It is then able to check the Force specification through WH-movement. This may be the reason why *qui* can be followed by *que* neither in Fin (it checks the tense feature itself), nor in Force (it does not require it to check [+sub]).[19]

(27) a.   *ch'foot-ball' **qui**, l'diminche, **qui/qu'** atténu' leu innui, …
      b.   *ch'foot-ball' **que**, l'diminche, **qui** atténu' leu innui, …
      c.   *ch'foot-ball' **qui que**, l'diminche, **qui/qu'** atténu' leu innui, …

On the contrary, there is no reason why the non-doubled DP subjects that check the tense feature in Fin would be [+sub]. In this case, the higher *que* is then expected to be inserted, which is borne out, as seen in (28):[20]

(28) j'prétinds **qu**'à l'heur' d'aujourd'hui / Nou gins n'profit'nt-té pu d'agrémints in série (=24a)
      'I claim that nowadays our people enjoy no longer pleasures by the dozen'

5.2. Optionality

An analysis of DCC in terms of multiple copies in Ternois as well as in Southern Italian dialects (as advocated in Ledgeway 2005) has a welcome consequence: it offers us a way to account for its inter- and intra-speaker variation. Other doubling phenomena have indeed been intensively investigated in European dialects, in particular within the Edisyn project (http://www.dialectsyntax.org). A general feature is that the syntax of dialects commonly allows the spell out of multiple copies, while standard varieties tend to favor the spell out of a single copy (in general, the higher one), and that dialects display variation with respect to which copy is pronounced (Barbiers et al. 2008a, 2008b). This pattern fits with the Ternois data. The standard language of the Oïl group is French, which, on a par with other Picard dialects, does not allow for DCC: in corresponding examples, only *que1* is present in French. Data from the *Atlas Linguistique de la France* (Edmont & Gilliéron 1902–1910) further

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[18]The strong, interrogative version of French *qui, tchièche/tchèche,* is neither nominative nor, plausibly, [+sub] since it can appear in root questions; it also may bear an interrogative feature. DCC is then predicted to occur in embedded *qui*-interrogatives. No embedded *qui*-interrogative is present in our corpora at all (with or without DCC), so this prediction remains to be checked.

[19]This does not extend to other weak (relative) WH-Ps, such as *dont*, which should also bear a [+sub] feature hindering *que* in Force. In fact, *dont que ... que ...* is allowed. This may follow from the fact that when Force is merged, *que*, which has been merged in Fin, is the closest candidate available to check [+sub].

[20]This difference in the featural content of *qui* and DP subjects, and the consequences it has on the way to check the Force, may play a role in the asymmetry pointed in footnote 16: the absence of DCC meets exceptions with non-doubled DP subjects but never with *qui*. As *qui* checks features on both Fin and Force, it is actually more economical than inserting *que*. DP subjects can only check Fin, so *que*-insertion will be required in Force; in this case, inserting *que* in Fin, though locally less economical, is 'a good investment' as it will also check Force: the fact that both strategies are equally costly though at different points may entail the variation in the actual choice of speakers.

suggest that some dialects neighboring Ternois (survey points 273, 275, 276) may allow, in some contexts, a construction akin to the DCC: in some embedded WH-clauses, no higher *que* is present but a *que* follows preposed XPs:

(29) Quand _ mon fiu **qu'**i   sro grand
        When _ my son that he is older

A more thorough look at Ternois shows that this latter construction can appear there too, as a variant, after WH-Phrases. Besides, DCC is optional, more or less so depending on the speaker: even Léon Lemaire, the writer who, in our corpus, most steadily produces DCC, does, from time to time, resort to 'French-like structures'. The general picture is then actually as follows:

(30) **DCC: WH-P *que1* XP *que2* TP**
        a. quand **qu**' la guerre'**qu**'all'   s'ra passée, …
             when that the war   that she   will be over
        b. ech couvert ed commoditè qu' Titisse qu'il   o arporté … (B449)
             the lid   of toilets   that Titisse that he has brought back

(31) **Variant 1: WH-P ~~que1~~ XP *que2* TP**
        a. Quand m' pinsée   **qu**'alle y vacabonde (R54)
             When my thought   that it   there wanders
        b. « el balayeusse » ∅ actuell'mint **qu**'in   voët […] broucher ch' boul'vard (R81)
             « the sweeper »   presently   that we see […] weeping the boulevard
        c. el malheureusse âme in peine   dont   l' complaint' **qu**' alle est acouftè' (R113)
             the poor   soul in mourn of-whom the lament   that she is muffled
        d. Et si, d'man,   qu' in   mettaut d'sur pied ein jouli' fête … (R96)
             And if, tomorrow, that we settled up   a   nice   party
        e. Qui sait   si,   d'man,   qu' a'   n' mettront pon / Ein couverque (R94)
             Who knows whether, tomorrow, that they won't wear   a   lid

(30) **Variant 2 – absence of DCC: *que1* XP ~~que2~~ TP**
        l' couvert ed commoditè, **qu**'min scélérat d' fius li avoèt mis in place ed sin doré (B436)
        'the toilet bowl that my scoundrel of a son had given him instead of his cake'

This variation across speakers and dialects could then rely on the same mechanism as argued for in other doubling phenomena, with the provision that, in Ternois, it applies to head movement and not to WH-movement: the three patterns above rely on which copy is allowed to be spelled out – only the higher one, as in standard dialects, a mixed system (higher *que* when SpecForceP is empty, or lower *que* when SpecForceP hosts a WH-element) for Ternois's neighbors and Ternois' s variant 1, both ends for Ternois usual cases.[21] This option being restricted to heads in Ternois, it prevents *qui*-doubling, on a par with other WH-doubling: only the higher *qui* is spelled out.[22]

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[21]The fact that DCC occurs only when some XP is preposed may have two explanations: either it is due to a Haplology Filter ruling out *que que* at PF, as advocated for in McCloskey (2006), or, as suggested in Rizzi (1997), an extended CP is projected only when it is required to host an IS projection; in other cases, a simple CP conflates Force and Fin, where both [+tense] and [+sub] are checked by *que*.

[22]The question arises whether other head movement cases entail doubling in Ternois. The answer depends on what counts as a head, and needs further investigation. Candidates could be clitic objects, which happen to

6. Conclusion

This paper shows that Ternois exhibits probably the most radical set of DCC described so far, reminiscent of what happens in some southern Italian dialects: the DCC occurs with all kinds of left-peripheral XPs, and generalizes to (almost) all clauses headed by *que*, that is all embedded tensed clauses, including embedded WH-clauses, which in Ternois admit doubly filled complementizers. Conversely, it occurs only in clauses headed by *que*: it does not take place when an XP is preposed in main clauses or in infinitive clauses. Unlike Iberic recomplementation, it clearly cannot be captured by a topic head analysis. On the contrary, the assumption that *que2* is in Fin and that *que1* and *que2* are two spelled out copies of the same item moved from Fin to Force to check, respectively, Tense and Subordination features, accounts for all of its properties. Moreover, this proposal is in line with what has been proposed for other dialectal cases of syntactic doubling, which it extends to head movement, introducing a parameter as to which kind of movement may give way to multiple spelled-out copies in a given set of dialects, and which copies can be spelled out. It thus offers a way to replace the variation affecting DCC in a broader typology of doubling phenomena and to account for its optionality across speakers and dialects.

Extending Sportiche's (2011) analysis of *qui* to Ternois, and assuming Pesetsky and Torrego's (2001) view of nominative and head movement, it also captures the puzzling absence of DCC displayed by *qui*-relatives and by embedded clauses with a non-doubled DP subject: in both cases, the nominative item moves to SpecFinP in order to check Tense, hindering *que*-insertion in the lower position; the two cases differ, though, in that, since DP subjects cannot check [+sub] in Force, the higher *que* is inserted, while in relatives *qui* moves on to check it: as a consequence, no *que* occurs at all in *qui*-relatives. If this approach is correct, it adds ground to the necessity of head movement in the grammar, and may contribute to the debate on the proper way to account for it. The question whether this analysis may be extended to more constrained cases of DCC in other languages and if, for instance, Spanish recomplementation is a different phenomenon remains open.

References

Auger, Julie. 2003. Le redoublement des sujets en picard. *Journal of French Language Studies* 13. 381–404.

Brovetto, Claudia. 2002. Spanish clauses without complementizer. *Current issues in Romance languages: Selected proceedings from the 29th linguistic symposium on Romance languages (LSRL-29),* ed. by Teresa Satterfield, Christina Tortora, and Diana Cresti, 33–46. Amsterdam: John Benjamins.

Barbiers, Sjef; Olaf Koeneman; and Marika Lekakou. 2008a. Syntactic doubling and the structure of chains. *Proceedings of the 26th West Coast Conference on Formal Linguistics,* ed. by Charles B. Chang and Hannah J. Haynie, 78–86. Somerville, MA: Cascadilla Proceedings Project.

Barbiers, Sjef; Olaf Koeneman; Marika Lekakou; and Margreet van der Ham (eds.) 2008b. *Microvariations in syntactic doubling.* (*Syntax and Semantics 36*). Bingley: Emerald.

Benincà, Paola, and Cecilia Poletto. 2004. Topic, focus and V2: Defining the CP sublayers. *The structure of CP and IP.* (*The cartography of syntactic structures*, vol. 2), ed. by Luigi Rizzi, 52–75. New York: Oxford University Press.

Cinque, Guillermo. 1990. *Types of A'-dependancies*. Cambridge, MA: MIT Press.

Citko, Barbara. 2008. Missing labels: Head movement as Project Both. *Proceedings of the 26th West Coast Conference on Formal Linguistics,* ed. by Charles B. Chang and Hannah J. Haynie, 121–128. Somerville, MA: Cascadilla Proceedings Project.

be sometimes doubled in Ternois, and some subject clitics in direct yes/no-questions.

Dagnac, Anne. 2011a. Les interrogatives picardes et le typage des questions en dialecte ternois. *Actes du 36ème congrès international de philologie et linguistique romanes*, Valencia, septembre 2010. Berlin*:* Walter de Gruyter, to appear.

Dagnac, Anne. 2011b. Generalized C-doubling in an Oïl dialect, subjects, and the nature of 'que2'. Paper presented at the Edisyn workshop, June 25, 2011, Amsterdam.

Dagnac, Anne. 2012. Interrogatives et relatives en picard. Toulouse: Université de Toulouse 2, Ms.

Demonte, Violeta, and Olga Fernandez-Soriano. 2007. La periferia izquierda oracional y los complementantes del español. *Vernetzungen: Kognition, Bedeutung, (kontrastive) Pragmatik,* ed. by Juan Cuartero and Martine Emsel, 133–147. Frankfurt: Peter Lang.

Edmont, Edmond. 1902. *Quatre légendes du pays de Saint-Pol*. Kessinger Publishing's Reprint.

Edmont, Edmond; and Jules Gilliéron. 1902–1910. *Atlas linguistique de la France*. Paris: Champion.

Edmont, Edmond. 1911. *A l'buée: Scène populaire Saint-Poloise*. Paris : Champion.

Fontana, Josep M. 1993. *Phrase structure and the syntax of clitics in the history of Spanish*. PhD Thesis. Online: `http://repository.upenn.edu/ircs_reports/183/`.

Hoeskstra, Eric. 1993. Dialectal variation inside CP as parametric variation. *Dialektsyntax (Linguistische Berichte, Sonderheft 5),* ed. by Werner Abraham and Josef. Bayer 161–179. Opladen: WestdeutscherVerlag.

Kayne, Richard. 1976. French relative 'que' *Current studies in Romance linguistics*, ed. by Marta Luján and Frederick Hensey, 255–299. Washington, DC: Georgetown University Press.

Laflutte, André. 1981. *Les 'coeurs' d'Arras*. Arras: Le Préau des livres.

Ledgeway, Adam. 2005. Moving through the left-periphery: the dual complementiser system in the dialects of Southern Italy. *Transactions of the Philological Society*, 103.339–396.

Ledgeway, Adam; and Roberta D'Alessandro. 2010. At the C-T boundary: Investigating Abruzzese complementation. *Lingua* 120.2040–2060.

Lemaire, Léon. 1947. *Racontaches d'un boïeu rouche*. Arras: Imprimerie Centrale de l'Artois.

Lemaire, Léon. 1945. *Eclats … d'patois*.
  Online: `http://www.u-picardie.fr/LESCLaP/PICARTEXT/Public/index.php`.

López, Luis. 2009. Ranking the linear correspondence axiom. *Linguistic Inquiry* 40.239–276.

McCloskey, James. 2006. Questions and questioning in a local English. *Crosslinguistic research in syntax and semantics*, *Vol. 2004,* ed. by Rafaela Zanuttini, 87–123. Georgetown University Press.

Mascarenhas, Salvador. 2007. Complementizer doubling in European Portuguese. Ms.
  Online: `http://homepages.nyu.edu/~sdm330/`.

Mille, Robert. 1988. *Min villach' la Buissiere. Poèmes en patois de Robert Mille*.
  Online: `http://www.u-picardie.fr/LESCLaP/PICARTEXT/Public/index.php`.

Paoli, Sandra. 2007. The fine structure of the left periphery: COMPs and subjects; evidence from Romance. *Lingua* 117.1057–1079.

Pesetsky, David; and Esther Torrego. 2001. T-to-C: Causes and consequences. *Ken Hale: a life in Language,* ed. by Michael Kenstowicz. Cambridge, MA: MIT Press.
  Online: `http://web.mit.edu/linguistics/www/pesetsky/Torrego-Pesetsky.pdf`.

Podevin, Alain. 1986. *Dins l'carnichotte éd min cœur*. Bibliothèque Municipale d'Amiens.

Poletto, Cecilia. 2000. *The higher functional field. Evidence from Northern Italian dialects*. New York/Oxford: Oxford University Press.

Rizzi, Luigi. 1997. The fine structure of the left periphery. *Elements of grammar,* ed. by Liliane Haegeman, 281–337. Dordrecht: Kluwers.

Sportiche, Dominique. 2011. French relative 'Qui'. *Linguistic Inquiry* 42.83–124.

Uriagereka, Juan. 1995. An F position in Western Romance. *Discourse configurational languages*, ed. by Katalin E. Kiss, 153–175. Oxford: Oxford University Press.

Villa-García, Julio. 2010. *Recomplementation and locality of movement in Spanish*. University of Connecticut. Ms.

Wanner Dieter. 1995. Les subordonnées à double complémentateur en roman médiéval. *Atti del XXI Congresso Internazionale di Linguistica e Filologia Romanza (18–24 settembre 1995), sezione 1,* ed. by Giovanni Ruffino, 421–433. Tübingen: Niemeyer.

Appendix

Frequency of DCC for embedded clauses of the form: XP + (YP) + (subject clitic) + V

The following tables detail, for each work of the corpus, the number and percentage of DCC according to the type of embedded clause involved:

Léon Lemaire (*Racontaches d'un boïeu rouche + Eclats … d'patois*: poetry):

	Relative clause	Argument clause	PP	Extraposed subjects	complement of N & Adj	when/if CPs	embedded questions	(Pseudo-) clefts	∑
Total	74	54	29	3	11	29	9	14	223
DCC	49	34	15	2	9	27	7	10	153
no DCC	25	20	14	1	2	2	2	4	70
of which: DP subject	15	10	14	1	2	2	0	4	48
genuine non DCC	10	10	0	0	0	0	2	0	22
% DCC	83%	77.3%	100%	100%	100%	100%	77.7%	100%	87.4%

Edmond Edmont (*A l'buée*: theater-like conversation in prose between laundresses)

	Relative clause	Argument clause	PP	Extraposed subjects	complement of N & Adj	When/ if CPs	embedded questions	clefts	∑
Total	5	5	2	0	0	1	0	3	16
DCC	4	2	1	0	0	1	0	0	8
%									50%

Edmond Edmont (*Quatre Légendes*: narrative tales in verse with explicit narrator)

	Relevant contexts	DCC	%
Saint -Michè	0	0	0
Peumier	25	6	24 %
Chelle féé	18	3	16,6%
Chl' ermite	16	1	6,25%
Total:	59	10	17%

Relevant maps in *Atlas Linguistique de la France (ALF)*:

ALF includes four sentences where a DP subject (which is doubled/clitic left dislocated in Picard) occurs in an embedded clause. They are listed below: the map numbers correspond to the relevant parts of the sentence, which is not bracketed; they mean, respectively: 'When my son is older (I'll send him to Paris)', '(He used to drink less) when his wife was still alive', '(the cart) that the servant loaded (…)', '(you should have seen) how the trees were covered with them'

Quand mon fils sera grand (je l'enverrai à Paris): maps 573 + 517;

(Il buvait moins) quand sa femme vivait encore: maps 143 + 458 + 548 + 1109;

(La charrette) que le domestique a chargée (…): map 1537;

(Vous auriez dû voir) comme les arbres en étaient chargés: maps 310 + 52 + 513 + 240.

Only in the Ternois area do they show instances of DCC. The survey points showing the DCC are, consistently, 283, 284, 285 (the very heart of the Ternois area) and, with variation, 273, 275, 276, 278, 286, 287, 296 (mostly in the Ternois area, or on its border).

The French *c'est*-cleft: an empirical study on its meaning and use

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1. Introduction

In French, the special syntactic construction called the *c'est*-cleft is associated with two important intuitions. First, the *c'est*-cleft *C'est X qui/que P* in (1a) is associated with an exhaustive inference given in (1c), which is somehow similar to the assertion found in exclusive sentences *Seul X P* shown in (1b), leading some researchers to claim that exhaustivity is part of the semantic meaning of the cleft (Clech-Darbon et al. 1999).[1]

(1) a. C'est [Batman]$_F$ qui a pour mission d'attraper les cambrioleurs.[2]
         it-is Batman who has for mission to-catch the thieves
         'It is Batman who has the mission of catching thieves.'
     b. Seul [Batman]$_F$ a pour mission d'attraper les cambrioleurs.
         'Only Batman has for mission to catch thieves.'
     c. 'No one else than Batman has the mission of catching thieves.'

Second, mainly popularized by the work of Lambrecht (1994), the usage of the *c'est*-cleft is claimed to be pragmatically motivated to mark focus on elements that occur in positions where French disallows prosodic marking. Thus, Lambrecht defends the claim that *c'est*-clefts are used to mark focus on arguments (2a), and are required with focused lexical subjects (2b) versus (2c) in narrow-focus cases (when there is a focus/ground articulation).[3]

(2) a. C'est [dans la cuisine]$_F$ que l'arme a été découverte.
         'It is in the kitchen that the weapon was discovered.'
     b. C'est [Marie]$_F$ qui a découvert les empreintes sur l'arme.
         'It is Marie who discovered the fingerprints on the weapon.'
     c. ?[Marie]$_F$ a découvert les empreintes sur l'arme.
         '[Marie]$_F$ discovered the fingerprints on the weapon.'

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*I would like to thank the reviewers of a previous version of this paper for their useful and insightful comments.

[1]Similar claims are made cross-linguistically for structures comparable to the *c'est*-cleft, such as the *it*-cleft in English or the pre-verbal position in Hungarian (Szabolcsi 1981; Kiss 1998).

[2]In this paper, I signal that an element X is the focus by marking it as follows: [X]$_F$.

[3]For a complete discussion of the difference between narrow versus broad focus, I refer the reader to Clech-Darbon et al. 1999.

In this paper, I provide empirical evidence challenging both intuitions. To begin with, despite surface similarities between the *c'est*-cleft and exclusive sentences (both seem to be used when *X P* and nobody else *P*), significant differences are illustrated in (3) and (4), which represent a challenge for a semantic account of exhaustivity. In these examples, changes in acceptability occur whether an exclusive sentence or a cleft sentence is used. In (3), the cleft differs from the exclusive sentence in prejacent inferences under negation. In (4), the *oui, mais*-continuation that does not offer a direct contradiction is infelicitous with an exclusive but accepted with a cleft.

(3) a. Pierre n'a pas seulement mangé [de la pizza]$_F$, bien qu'il ait mangé de la pizza.
         'Peter didn't only eat [pizza], though he did eat pizza.'
     b. *Ce n'est pas [de la pizza]$_F$ que Pierre a mangé, bien qu'il ait mangé de la pizza.
         'It wasn't pizza that Peter ate, though he did eat pizza.'

(4) a. Thomas: Seule [Marie]$_F$ a ri.
                  'Only [Marie]$_F$ laughed.'
         Julie: Non. / *Oui, mais [Jean]$_F$ a ri aussi.
                  'No. / *Yes, but [Jean]$_F$ laughed too.'
     b. Thomas: C'est [Marie]$_F$ qui a ri.
                  'It is [Marie]$_F$ who laughed.'
         Julie: Non. / Oui mais [Jean]$_F$ a ri aussi.
                  'No. / Yes, but [Jean]$_F$ laughed too.'

Next, the intuition concerning the cleft's usage is challenged in recent studies (among others, cf. Hamlaoui 2008 and Beyssade et al. 2011). The former argues that the cleft's occurrence is prosodically motivated, claiming that non-subjects do not need to be realized via clefting when occurring in informational contexts. The latter concentrates on the prosodic realization of focus in canonical sentences, claiming that prosodic cues alone can be used to signal focus in French. Yet, there are no studies to my knowledge that have tested how different grammatical types of focus (subject, non-subject, predicate, and sentence focus) are produced in a semi-spontaneous experimental setting.

Before turning to the organization of the paper, I shall define how *focus* is understood in this work. Following Zimmerman and Onea (2011:1658), I take focus to be 'a universal category at the level of information structure which plays a decisive role in common ground management and information update.' Crucially, I take focus to be triggered by a question-under-discussion (QUD), whether this question is explicit or not, and focus to be the element in the answer which instantiates the open variable in the QUD.

The paper is organized as follow: §2 gives a background on the literature on French *c'est*-clefts. §3 discusses the first intuition introduced above. I argue that a cleft of the form *c'est X qui/que P* does not behave like exclusive sentences, in the sense that the exhaustivity they trigger can be rejected without denial of the asserted content *X P*. I present results from a forced-choice experiment showing that speakers do not overtly contradict the statement found in a previous cleft sentence, whereas they do for statements found in an exclusive sentence. From these results, I conclude that, semantically, the exhaustivity is not part of the at-issue meaning of the cleft like it is for exclusive sentences. §4 turns to the second intuition by discussing the usage of the *c'est*-cleft and by introducing the pilot study of a production experiment designed to explore how different types of focus are realized. The preliminary results demonstrate that speakers do not reliably use clefts to mark focus on arguments (against

Lambrecht 1994). While grammatical subjects are mainly clefted, grammatical objects (either direct or indirect) are often realized *in situ*. These results correlate with intuitions found in past studies on French like Hamlaoui 2008. However, *contra* Vion & Colas 1995, the results indicate that clefts are not consistently used in contrastive contexts. Adding to the experimental results, the section also discusses constructed examples where focused subjects in sentence-initial position are strongly preferred. While these examples seem to challenge the data observed in the pilot experiment, they are accounted for in the optimality-theoretic model I develop in §5. This model, constituted of a ranking of the relevant syntactic, prosodic, and pragmatic constraints, explains the non-random alternation between *c'est*-clefts and canonical sentences.

2. Background on the French *c'est*-cleft

It is widely assumed that French marks focus via syntactic reordering, and that to a much greater extent than related Romance languages (Dufter 2009). Researchers, and first and foremost Lambrecht (1994), make two proposals that have been challenged by following scholars. First, Lambrecht argues that French categorically bans prosodic marking from sentence-initial position. Thus, 'bad' subjects are moved into a dedicated focus position (the cleft) in which they are interpreted as a focus, and marked as such. Second, he proposes that there is a one-to-one relationship between the grammatical function of the focused element and its realization by proposing three main focus categories: argument-focus, predicate-focus, and sentence-focus, which are all realized differently. Yet subsequent studies differ in the account they give concerning the cleft's occurrence. One interesting account is found in Clech-Darbon et al. 1999, which redefines the syntactic structure of the cleft. While the cleft had been previously analyzed as a single CP (Belletti 2005) or as a construction (Lambrecht 1994), Clech-Darbon and colleagues argue that there are in fact no real cleft sentences per se. Instead, a cleft is simply analyzed as the combination of an identificational TP (in which the focused constituent is merged as a complement) and to which a CP is right-adjoined. The CP is a classical relative clause in which a relative operator moves from SpecTP to SpecCP. The structure they propose is represented in (5) and is contrasted with traditional generative analyses where the focused phrase and the relative clause form one constituent (6):

(5) $[_{\text{IP}} [_{\text{IP}} \text{C'est}_i [_{\text{VP}} t_i [_{\text{DP}} \text{Marie}]]] \quad [_{\text{CP}} Op_j [_{\text{C'}} \text{qui} [_{\text{IP}} t_j \text{ a mangé} [_{\text{DP}} \text{un biscuit}]]]]$

(6) $[_{\text{TP}} \text{C'est} [_{\text{TOP}} [_{\text{FOC}} \text{Marie} [_{\text{TOP}} [_{\text{VP}} <\text{être}> [_{\text{SC}} <\text{Marie}> [_{\text{CP}} \text{qui a mangé un biscuit}]]]]]]]]$

The syntactic analysis in Clech-Darbon et al. 1999 led scholars like Hamlaoui (2008) to look at the syntax-phonology interface in a new way. Hamlaoui argues the advantage of analyzing the cleft as in (5) is that it makes correct predictions regarding prosody: main stress falls on the rightmost edge of an intonational phrase. Indeed, by creating two separate IPs, the cleft allows the focus element to receive main stress and to fulfill the rightmost preference of the language for accent placement (figure 1), which is simply not the case when one analyzes the cleft as in (6).

Hamlaoui argues that a cleft construction is preferred over a canonical sentence in two contexts: answers to subject-constituent questions and contrastive/corrective contexts. Her proposal challenges Lambrecht's in the sense that she postulates no need for the focused constituent or the main stress to move to a dedicated focus position. Instead, she argues that the mapping of phonology and syntax displayed in figure 1 allows the focused constituent to be directly merged in the position where grammar assigns main stress (rightmost). Grammatical

subjects are realized in a cleft to receive rightmost stress when focused, and grammatical objects remain in situ. In this paper, I follow her view of cleft sentences.
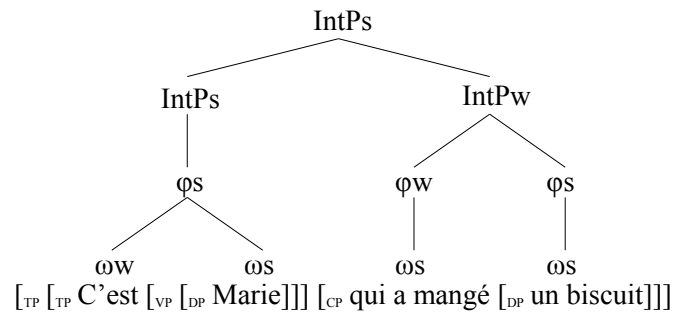
Figure 1. Syntactic structure for the *c'est*-cleft (from Hamlaoui 2008)

Finally, let's discuss the semantic contribution of the *c'est*-cleft, and more specifically the exhaustive inference associated with it. There is, to the best of my knowledge, only a couple of studies that propose a formal analysis of exhaustivity in French, namely Clech-Darbon et al. 1999 and Doetjes et al. 2004. The first study proposes a semantic account of the inference, in the sense that they argue the cleft contributes exhaustivity to the truth conditions of the sentence, as if the focus were under scope of an exclusive operator. The second study remains unclear about the nature of the inference but argues exhaustivity arises when the focused element is referential. This scarcity of formal analyses is interesting because the majority of studies on the cleft discuss its identificational/exclusive property. Lambrecht (1994), Katz (1997) and deCat (2007) all mention that one of the discourse functions of the *c'est*-cleft is to identify the *X* as having the property *P*, carrying the inference that nothing else in the context displays the property *P*.

3. The *c'est*-cleft's meaning: the exhaustive inference
3.1. Introduction

Despite the wide number of studies on the nature of the exhaustive inference, it is only within the last couple of years that researchers turned to experimentally testing the claims advanced in past theoretical works. Unfortunately, none of the proposals so far can be said to be both descriptively adequate and theoretically motivated. Perhaps the biggest problem for most of these accounts is that empirical evidence reveals a rather surprising fact: the main function of the cleft is not, as often assumed in the previous literature, *exhaustivity*. Cross-linguistically, different constructions have been rightfully considered exhaustive and recognized as being somewhat similar to each other. The most discussed forms include the English *it*-cleft, its German counterpart, and the preverbal focus position in Hungarian. Challenges in accounting for their meaning are similar to the ones I discussed for the French *c'est*-cleft in the previous section. Interestingly, the cross-linguistic literature differs from the French literature in that there is an extensive body of work on the exhaustive inference and the semantics of clefts, whereas the French literature focuses more on documenting the pragmatic functions of *c'est*-clefts (its exhaustivity being too often taken for granted).

In the English literature, it has become almost formulaic to begin a paper on the semantics of clefts with the observations that a cleft *It was NP that P-ed* bears the existential presupposition (i) there exists an *x* such that P(*x*) and that it implies (ii) that the referent of NP in some way exhausts the set $\{x \mid P(x)\}$. But we can immediately see that these two inferences

do not share the same footing. The existential presupposition is the only one that passes standard projection tests for presupposition. That is, (8a) follows from each of (7a-d), but (8b) obviously does not.

(7)   a. It was a cake that Mary baked.
        b. It wasn't a cake that Mary baked.
        c. Was it a cake that Mary baked?
        d. If it was a cake that Mary baked, we're all going to be sick.

(8)   a. Mary baked something.
        b. Mary didn't bake anything other than a cake.

Three main types of analysis exist for explaining where the exhaustive inference in (ii) comes from: scholars either argue that it is entailed (i.e. the cleft semantically contributes exhaustivity to the meaning of the sentence), that it is derived from a presupposition, or that it is implicated. Yet, some problems arise with each of these analyses. First, if exhaustivity were indeed entailed, originating in Bolinger 1972 and argued for in Atlas & Levinson 1981, the continuations (a-d) to (9) below would be informative and felicitous. However, it is simply not the case. The continuations are infelicitous precisely because the cleft does not assert anything about exhaustivity, and is therefore inconsistent. In order to be felicitous, what is needed is the explicit indication of exhaustivity, for example by inserting an exclusive particle like 'only' as illustrated in the continuations (a'-d'). The experiment presented in §3 also provides evidence that exhaustivity is not asserted.

(9)   I know that Mary baked a cake, …
        a. #but it wasn't a cake that she baked!
        b. #but was it a cake that she baked?
        c. #but I've just discovered that it was a cake that she baked!
        d. #if it was a cake that she baked, then we're all in trouble.

        a'. but it wasn't only a cake that she baked!
        b'. but was it only a cake that she baked?
        c'. but I've just discovered that it was only a cake that she baked.
        d'. if it was only a cake that she baked, then we're all in trouble.

The second type of approach, defended for example in Percus 1997 and Hedberg 2000 assumes that exhaustivity is in a sense presupposed. The biggest problem facing presuppositional analyses, as mentioned above, is that exhaustivity does not seem to project out of standard embeddings as shown below, where (10b) does not follow from (10a).

(10)   a. If it is Paul and Mary who arrived, the party is about to start.
        b. Nobody else arrived.

Finally, Horn (1981) suggests that clefts only conversationally implicate exhaustivity. In general, Horn claims that any device which asserts $P(x)$ and presupposes that there exists an x such that $P(x)$ gives rise to the following conversational reasoning: if there were others contextually relevant individuals that satisfy P, the speaker would have mentioned them. Since he did not, there are not. The only difficulty that appears with this pragmatic account concerns another characteristic of conversational implicatures: *cancelability*. Horn illustrates such a

problem with the examples in (11), where it seems strange for the same speaker to say both parts of the utterance without sounding like contradicting himself (11a). However, cancelability does not seem too problematic when uttered by another speaker (11b).

(11) a. ?It was a pizza Mary ate; indeed, it was a pizza and a calzone.
  b. A: It was a pizza Mary ate.
  B: Indeed, it was a pizza and a calzone.

3.2. Experiment 1

The experiment presented in this section is derived from Onea & Beaver 2011, and contributes to the experimental trend started on the issue by researchers like Onea (2009) by testing the degree of exhaustivity of the French *c'est*-cleft construction. The goal of the experiment is to confirm or falsify that, in French, the cleft contributes to the truth-conditional meaning of the utterance. The hypothesis is that the cleft only enriches the interpretation of the utterance on an intended level, the exhaustivity being part of its non at-issue meaning.[4] The design must therefore test whether or not speakers systematically attribute an exhaustive reading to the cleft sentences. To do so, I rely on the idea that if some aspect of the sentence meaning is non at-issue, the speaker must be able to cancel the implicature without also denying the truth of the sentence. The core assumption behind experiment 1 relies on a property commonly attributed to implicatures, that is their optionality or cancelability. Therefore, if a speaker does not attribute a strong exhaustive reading to a sentence, he will have no problem choosing a continuation that adds to the previous sentence (e.g. a continuation sentence introduced by *yes, and*). However, if the speaker attributes a strong exhaustive reading to a sentence, he will tend to overtly contradict a sentence that continues the discourse (e.g. by choosing a continuation introduced by *no*).

3.2.1. Participants

24 undergraduates from the University of Toulouse Le Mirail were recruited for this experiment. All participants had normal, uncorrected vision and were native speakers of French. All were naive as to the purpose of the experiment.

3.2.2. Material and design

The experiment was designed with the experimental software WebExp. Each experimental item consisted of a question-answer pair (Q-A) and three possible continuations (C1, C2, C3). The answers to the Q-A pair all contained a two-place predicate R, a focus argument F and a background argument B, and differed only in form: either a canonical sentence (can), an exclusive sentence including *seulement* (exc) or a *c'est*-cleft sentence (cl). These three sentence forms constitute our three conditions. Within each condition, a sub-condition was introduced depending on whether the grammatical subject (subj) or the grammatical object (obj) was focused. Thus, the experiment is a 3x2 design with a total of six conditions: can-subj, can-obj, exc-subj, exc-obj, cl-subj, and cl-obj. A total of 60 different items was created in order to avoid recognition by the participants (ten different lexicalizations of each six conditions). The experimental setup is within subject, such that every participant saw exactly eight items from each of the three conditions (can, exc, cl); that is four items per sub-condition. The

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[4]Simons et al. (2010:323) propose a definition of at-issueness where a proposition *p* is at-issue iff the speaker intends to address the QUD via ?*p*.

continuations were given through forced choice, the participants being offered three possibilities which were derived by either changing the focus element F' or the background element B' and adding either *oui, et* ('yes, and'), *oui, mais* ('yes, but') or *non* ('no') as a root. A typical example of an experimental item is given in (12) for the cleft-obj condition. Participants saw the experimental items in written form without any clear marking of what element was focused, since the preceding question-under-discussion was presented to trigger the correct focus.

(12) Q: Qu'est-ce que le fermier a brossé?
          What is it that the farmer has brushed?
          'What is it that the farmer brushed?'
      A: C'est le cheval que le fermier a brossé.
          'It's the horse that the farmer brushed.'
      C1: Oui, et le fermier a aussi brossé la chèvre.
          'Yes, and the farmer also brushed the goat.'
      C2: Oui, mais le fermier a aussi brossé la chèvre.
          'Yes, but the farmer also brushed the goat.'
      C3: Non. Le fermier a aussi brossé la chèvre.
          'No. The farmer also brushed the goat.'

Participants were asked to choose which continuation seemed the most natural given the previous context: the Q-A pair. The instructions made clear to the participants that this Q-A pair and the continuation were uttered by three different persons. No participant saw the same lexical item in more than one condition. In addition to the eight experimental items, each participant saw two introductory items, two warm-up items and ten fillers. The latter items were created to prevent the development of specific expectations or strategies on the part of the subjects.

3.2.3. Results and discussion

The experimental results are given in figure 2 below in absolute numbers. The results of the experiment clearly show that the exhaustivity effect associated with a *c'est*-cleft is not as strong as the one associated with an exclusive, but much stronger than an underspecified sentence like a canonical. The results support the prediction that speakers are more likely to overtly contradict a semantically exhaustive sentence (i.e. sentences with an exclusive) than other types of sentences. Indeed, if the exclusive *seul* is present, participants choose to update the conversation with the continuation introduced by *non* (out of 192 exclusive sentences, 181 were continued with *non*). As predicted too, a canonical sentence is not contradicted because not semantically exhaustive. Conversations with canonical sentences are continued by a simple addition rather than a correction, introduced by *oui, et* (out of 192 canonicals, 115 were continued with *oui, et*). Finally, in the cleft condition, a conversation is continued with *oui, mais* 113 times out of 192. Speakers therefore choose the intermediate option to update a cleft conveying a medium degree of disagreement; not directly accepting the change of focus as an addition to the preceding answer, but not overtly denying it either. These results correlate with the prediction that cleft sentences are associated with an exhaustive inference that is cancelable, therefore not part of their at-issue meaning. A statistical analysis shows that the difference in distribution of responses across the three answer types was highly significant ($\chi^2(3) = 40.698$, p < .001). Therefore, as predicted, we get a significant effect for the continuation chosen depending on the sentence form presented in the previous answer. The distribution of

continuations chosen after exclusive sentences was significantly different from the distribution of continuation chosen after *c'est*-clefts ($\chi^2(2) = 311.9$, p < .001). Differences between clefts and canonical sentences are also relevant, although obviously much smaller: ($\chi^2(2) = 20.81$, p < .001).
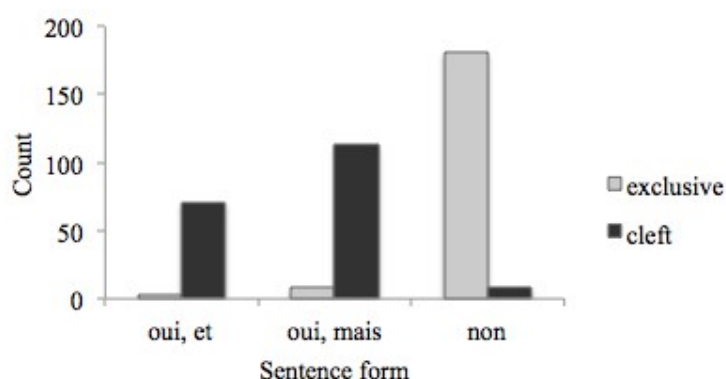
Figure 2. Distribution of continuations by sentence form

I conclude that the predictions made are confirmed by this experiment, and hence, the assumption that *c'est*-clefts do not contribute at issue exhaustivity is confirmed. Instead, the inference is triggered by the not at-issue content of the cleft.

4. Cleft's usage: producing the *c'est*-cleft
4.1. Introduction

If one looks at the literature on French focus marking, it is almost conventional to find that French marks focus via syntactic means. Compared to other Romance languages (Dufter 2009) or to English, French is often assumed to require special syntactic constructions to mark focus, and seems to be known as the 'black sheep' for not having a flexible prosody. Yet, in the past ten years, much work has been done on the prosodic markings of information structure in French, especially the characteristics of the prosodic realization of focus (Beyssade et al, 2011; Féry 2001; Sun-Ah & Fougeron 2000). But no clear consensus on the interaction of prosody and syntax is reached. Scholars depart from considerably differing assumptions regarding the acceptability of a sentence form given a certain context; syntacticians predicting movement of the presupposed material in a relative clause while most phonologists assume a narrowly focused XP can be realized via prosody in situ.

4.2. Experiment 2

The semi-spontaneous data analyzed in this section stem from an elicited production task, which constitutes a replication from Gabriel 2010.[5] The experiment presented here constitutes a pilot and is currently being conducted on a larger scale. It contributes to the experimental trend happening in the linguistic field by testing the realization of particular grammatical types of focus in two different contexts. While the majority of previous French experimental studies use written material to elicit data, the present experiment is a semi-spontaneous production task

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[5]Gabriel (2010) conducted a production experiment in two varieties of Argentinian Spanish, which examined the interaction of syntax and prosody in the marking of narrow focus subjects, objects, and double objects.

where participants do not produce scripted answers. It also expands on previous studies by including a wider range of grammatical types like indirect object, predicate, and sentence focus. The main research question underlying this study is whether there exists a strict one-to-one relationship between the grammatical function of the focused element and its realization, as predicted by Lambrecht (1994).

4.2.1. Participants

Six native speakers of French participated in the pilot experiment. All participants were living in the United States for less than two years at the time of the experiment. All had normal, uncorrected vision, and were naive as to the purpose of the experiment.

4.2.2. Material and design

The semi-spontaneous data analyzed in this section stem from an elicited production task. Participants were presented with two short picture stories as PowerPoint files and read a one-sentence description for each picture.[6] Participants subsequently read a series of questions targeting different grammatical focus. The questions were numbered, delivered in written form, one at a time, and displayed below the picture it corresponded to in the story line. An example of a visual stimulus is presented in Figure 3.

Description:
Marie achète le journal au kiosque.
'Marie is buying the newspaper at the kiosk.'

Question:
Où est-ce-que Marie achète le journal?
'Where is Marie buying the newspaper?'
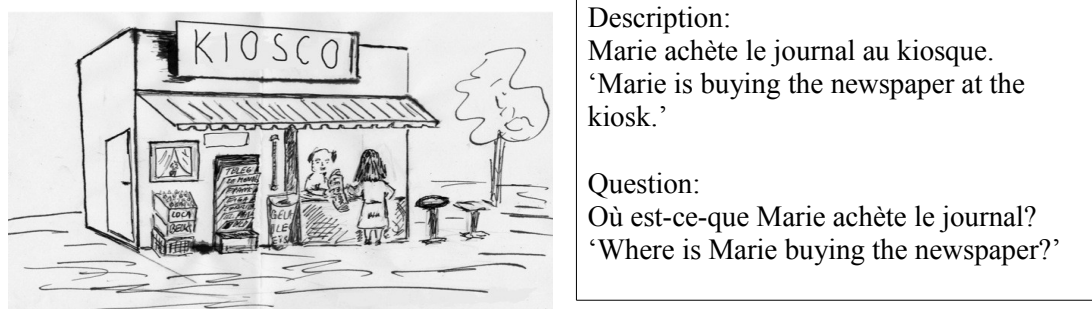
Figure 3: Visual stimuli presented to participants in pilot production experiment

The design included three independent variables: focus type, context and question form. Each of these variables had a few levels. For the variable focus type, I tested grammatical subjects, direct objects, indirect objects, predicate, and whole sentence. Two contexts were tested: neutral and corrective. The latter context is labeled *corrective* rather than *contrastive* as often seen in the literature because the stimuli found in that context involved sentences where the focus element was incorrectly identified and participants had to offer a correction according to what was really depicted. An example of a question triggering a neutral context is illustrated in (13a) and a question triggering a corrective context is in (13b). All corrective questions were of the form 'Regarde/Look, *X Predicate Y*, non/no?' with either *X P* or *Y* being incorrect according to the picture.

(13) a.   Où est-ce-que Marie achète le journal?
      b.   Regarde, Marie achète le journal au supermarché, non?

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[6]Some of the stimuli used in my production experiment were taken from Gabriel's (2010) study. One of them is reproduced with Gabriel's permission in Figure 3.

The questions were of two forms: either clefted or non-clefted. A clefted sentence was of the form 'Où c'est que Marie achète le journal', and non-clefted were of the form 'Où est-ce-que Marie achète le journal?'.

In this pilot experiment, each participant saw a total of 36 experimental stimuli and 20 distractors. Each participant saw four different lexicalizations of each focus type in both contexts, except for the whole sentence condition, where they only saw four lexicalizations in a neutral context (a contrastive context making no sense to be tested for such an information structure). Thus, the six participants produced a total of 216 experimental stimuli (120 in a neutral context and 96 in a contrastive context). A total of 48 sentences were produced in each condition, except only a total of 24 for the sentence-focus condition.

All speakers were instructed to avoid answering with a single constituent but rather to reply with a full sentence. They were also told to otherwise feel completely free regarding the phrasing of their answers. The three variables were chosen in relation with the three research questions examined. First and most importantly, the focus type was manipulated to test the realization of different focus types and verify whether each focus type is associated with a distinct realization.

Second, the context was altered to study the role of *contrast* in the structure used to mark focus. This variable is motivated by previous studies' assumptions that clefts are used more often when the answer is expressing a contrast (Vion & Colas 1995). The last variable studied is the form of the question answered. This variable is motivated by the idea that there exists a priming effect; the form of the question in some ways biases the form subjects will use when answering. The data was transcribed and systematized according to the sentence form used by the speakers for the expression of the relevant information structure given the preceding question.

4.2.3. Results and discussion

The data from this pilot experiment supports the hypothesis that there is no clear one-to-one relationship between the grammatical function of the focused element and its realization. Sentence focus, predicate focus, and indirect object focus were all realized with canonical structures. The difference in distribution of syntactic strategies used in an answer across the five focus types was highly significant ($p < .001$). The results are also consistent, to a certain extent, with the idea that there exists a subject/non-subject divide, whereby subjects are required to be clefted whereas objects do not. Yet, we will see that the divide is not as obvious, and in fact depends on the interaction of pragmatic and phonological factors rather than simply grammatical ones. An optimality theoretic account of the distributions observed in figures 4 and 5 is developed in §5.
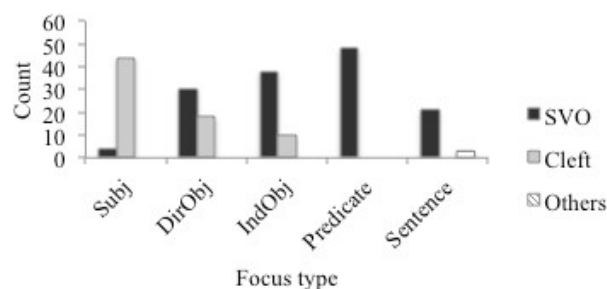
Figure 4. Counts of sentence form produced by focus type
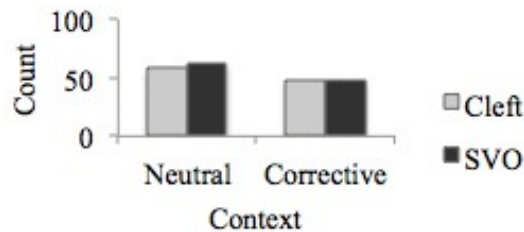
Figure 5. Counts of sentence form produced by context

Focused subjects Within the subject focus condition, the raw number count amounts to 43 clefts used out of 48 sentences produced across all six participants; the difference in the distribution of answer forms being highly statistically significant ($\chi^2(1) = 30.1$, p < .0001). The other variables were overridden by the grammatical function of the focused element. Indeed, the context in which the answer is uttered (contrastive versus neutral) and the form of the previous question (clefted versus non-clefted) had no effect on the form produced by participants. In contrastive contexts, participants only produced clefts (24 clefts out of 24 sentences produced), whereas four canonicals out of 24 sentences produced were found in the neutral context condition. This difference is, however, insignificant. No canonical sentence was produced whether the previous question form was clefted or non-clefted. These results correlate with the past literature, which argues that French bans prosodic marking on heavy NPs in sentence-initial position. Yet, despite appearing quite straightforward, some examples seem to require a subject focus to be realized *in situ*. Consider the following examples (produced by native speakers during a Christmas meal):

(14)   A: Ben alors, personne va me finir ce foie-gras?
            'So what, no one is going to finish this foie-gras?'
       B: Si si, [Pierre]$_F$ va bien le finir.
            'Yes, of course, [Peter]$_F$ is going to finish it.'

(15)   A: Mais alors d'après toi, qui doit se sentir concerné?
            'So according to you, who must feel concerned?'
       B: [Tous les pays qui font partie de l'Union Européenne]$_F$ doivent se sentir concernés.
            '[Every country that's part of the EU]$_F$ must feel concerned.'

(16)   A: Qui a participé à la conférence?
            'Who participated in the conference?'
       B: [Une trentaine d'étudiants]$_F$ ont participé.
            '[30 students]$_F$ participated.'

In (14), the focus element constitutes a contrast: the state of belief of the speaker S and the addressee A differ since S believes that no one will finish the foie-gras, whereas A offers another belief: Peter will. In (15) and (16), the focus subject is modified by a quantifier or a numeral. But these examples seem to occur only under specific pragmatic conditions. This is one of the limitations of the pilot experiment presented in this section: it does not include the pragmatic context that appears to force *in situ* focus marking on subjects.

The following generalizations account for the position of focused subjects in the data and the constructed examples discussed above. These generalizations will be translated as constraints involved in the OT model and explained in more detail in §5. In (16), I call a non-

quantified lexical subject any element that's a grammatical subject and is not modified by a quantifier or a numeral.

(17) By default, use a cleft to focus non-quantified lexical subjects. Use a canonical for quantified subjects and topical subjects.

(18) Use a canonical if you say something about the extension of the predicate. Use a cleft if there is a mismatch between the speaker and the addressee's belief state.

Focused objects (direct and indirect) In comparison with the focused subjects that frequently appear clefted, the focusing of an object, either direct or indirect, seems to be freer. The indirect object condition is unproblematic: the raw number count amounts to 38 canonicals and 10 clefts for a total of 48 sentences produced by six participants. This result is statistically significant ($\chi^2(1) = 16.3$, $p < 0.001$). This result is easily explained by the prosodic characteristics of French: given that indirect objects appear canonically in the rightmost position of the clause where main stress is assigned in unmarked cases, indirect objects do not need to be moved in a different syntactic position.[7] Moreover, we observe that out of the 10 clefts produced, 9 were produced in the corrective context.

Within the direct object condition, the raw number count amounts to 18 clefts and 30 canonicals out of 48 sentences produced across all six participants; the difference in the distribution of answer forms is not statistically significant ($\chi^2(1) = 3.00$, $p = 0.08$). The context condition does not explain this result either, since the 18 clefts are produced in corrective contexts as well as neutral contexts. This result is surprising and interesting for two reasons. First, it correlates with results found cross-linguistically for Spanish in Gabriel 2010. Second, it challenges the account given in Hamlaoui 2008, which argues for the non-emergence of clefts in object focusing and the emergence of clefts in contrastive [+/- corrective] contexts. Additionally, while Zubizarreta (1998:146) and Hamlaoui (2008) argue that heavy NP-shift to the rightmost position is acceptable for focused direct objects in ditransitive sentences, no participant resorted to that strategy in the production experiment: Sentences with the word-order S V IO [DO]$_F$ were not produced.

The OT account developed in §5 will account for the fact that objects are generally left in situ, yet acceptably clefted in both neutral and corrective contexts.

5. Accounting for the cleft/canonical alternation: an OT model

Stochastic Optimality Theory (Boersma & Hayes 2001) relies on the idea that the grammar of individual languages derive from a continuous ranking of universal, yet violable constraints on representational well-formedness of output form(s) given an input form. Each constraint is associated with a range of values instead of a fixed point, with the ranges of neighboring constraints overlapping to a lesser or a greater extent. Therefore, the rankings of constraint weights can be perturbed and rearranged, accounting for the variability of the data observed. If two constraints B and C overlap slightly, but are dominated by constraint A, the first ranking A >> B >> C will select one candidate as the optimal form, while the (less common) ranking A >> C >> B will allow another candidate to surface in certain contexts.

The goal of this section is to demonstrate how such a model can account for the data and the variation observed in the production experiment presented in §4. The set of constraints

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[7]The literature on the prosody of French is very large (Féry 2001, Delais-Roussarie & Rialland 2007). In this study, I follow the model developed in Delais-Roussarie 2005, where French is analyzed as a rightmost language with intonational and phonological phrases.

proposed in (24) aims to explain the way focus is realized in French by capturing the descriptive generalizations in (22), and by encompassing the special cases summarized in (23):

(22) Descriptive generalizations about French information structure:
   a. Phonology: Constituents carrying main stress are focused; non-accented constituents belong to the background.
   b. Syntax: Focused subjects are clefted; other focus constituents remain in situ.

(23) Special cases to be accounted for:
   a. Bare focused subjects can appear in situ.
   b. Quantified focused subjects can appear in a cleft.
   c. Focused direct objects can appear in a cleft.
   d. Focused indirect objects can appear in a cleft (in contrastive/corrective contexts).

(24) Set of constraints:
   a. Pragmatic constraints
   (i) NoQSubj: No quantified lexical subjects in sentence initial position.
   (ii) Stress-Focus (SF): The element resolving the QUD (a.k.a. the focused element) must receive highest prosodic prominence.
       (ii-a) Stress-Focus-Special ($SF_{special}$): When there is a special pragmatic context, the focus element must occur with the highest syntactic prominence, closest to the left edge of the sentence, in SpecIP position. This special pragmatic context is triggered when there is a mismatch between the speaker and the addressee's belief state.
       (ii-b) Stress-Focus-Informational (SF_{info}): When a focus element does not fully resolve the QUD, the focus must receive prosodic prominence and be realized in situ.
   b. Prosodic constraints
   (iii) Align-Focus-Right (AFR): The right edge of the focused element must be aligned with the right edge of an Intonational Phrase. One violation is inferred for every phonetic element occurring in between the end of the IP.
   c. Syntactic constraints
   (iv) Overt-Subj: Sentences must have an overt subject.
   d. Faithfulness constraints
   (v) Faith-Syn: Do not insert syntactic elements.

The data from the production experiment and the constructed examples discussed in §4 for focused subjects show (i) that, both in neutral and corrective contexts, participants produce the form Cleft$[S]_F$VO (Tableau 1), and (ii) that, in special contexts where something is said about the extension of the predicate and where the speakers' states of beliefs are not aligned, the canonical form $[S]_F$VO occurs (Tableau 2). However, it would be inaccurate to propose a constraint ranking which prevents canonical sentences from ever surfacing in non-special contexts. For example, the ranking needs to allow for focused quantified subjects to be produced sentence-initially in non-special contexts. So, in order to correctly account for the variability observed in the data (clefted focused subjects are strongly preferred but canonical focused subjects are not categorically banned), we must assume that the constraints NoQSubj, SF_{info}, and AFR overlap slightly, indicated by the dashed lines in both tableaux. This overlap in constraints does not interact with the constraint $SF_{special}$, which is ranked higher in order to account for the non-emergence of clefts in special contexts. Tableau 2 shows that candidate (b2) is ruled out because of its fatal violation of the dominating constraint $SF_{special}$, which requires the assignment of the highest syntactic position to focus in special contexts.

QUD:Qui a corrigé les copies?	SF	SF$_{special}$	Overt-Subj	NoQ Subj	SF$_{info}$	AFR	Faith-Syn
a1. ☞ C'est JEAN qui a corrigé les copies.					*		*
b1. JEAN a corrigé les copies.				*		**	
c1. A corrigé les copies JEAN.			*!				
d1. C'est Jean qui a corrigé les copies.	*!						
e1. Jean a corrigé les copies.	*!						

Tableau 1. Focused subjects realized in a cleft (in non-special contexts)

In Tableau 1, the clefted candidate (a1) violates the low ranked constraint Faith-Syn because a cleft adds syntactic material that is not present in the input (i.e. the corresponding canonical form). Candidate (a1) also violates SF$_{info}$ by not having the focused element realized *in situ*. However, (a1) fulfills AFR: the cleft creates two independent intonational phrases, thus the focused subject occurs at the right edge of the IP. Candidate (1b) counts two violations for the constraint AFR since the focused element is positioned two elements away from the right edge of the IP. It also violates NoQSubj since the focused subject is a heavy, bare noun phrase. However, the symbol (!) signals that this violation is not fatal, indicating that this candidate is (less commonly) selected as the optimal form when the (less common) ranking SF$_{info}$ >> NoQSubj is derived. Candidate (c1) where the focused subject would move to the right edge of the utterance in order to fulfill AFR is prevented by the dominating constraint Overt-Subj, which requires that SpecTP be filled. Finally, forms where there is no prosodic marking on the focused element (c1) and (d1) are ruled out because of their violation of the undominated constraint SF, which requires that a focus element receive highest prosodic prominence.

A similar ranking accounts for the case of focused objects in Tableau 3 and 4 (for non-special and special contexts, respectively). In order to capture the fact that both word orders SV[O]$_F$ and Cleft[O]$_F$ SV optionally occur in the data, both in neutral and corrective contexts, a continuous ranking scale is assumed with the property that SF$_{info}$ and AFR overlap slightly (see Tableau 3). Candidate (a1) violates AFR because the focused element is one element away from the right edge of the IP. Candidate (b1) violates the low ranked constraint Faith-Syn by virtue of adding material that was not present in the input, and violates SF$_{info}$ by virtue of realizing a focused element in a cleft within a non-special context. Candidate (b1) is selected as the output when the ranking AFR >> SF$_{info}$ applies. A candidate such as (c1) is ruled out because it inflicts three violations on the AFR constraint. In special contexts (see Tableau 4), the cleft (a2) is predicted to appear as the sole output because of (b2) fatal violation of the highly ranked constraint SF$_{special}$. A candidate with the form (c2) is ruled out for exactly the same reason.

QUD: Personne ne va corriger les copies?	SF	SF$_{special}$	Overt-Subj	NoQ Subj	SF$_{info}$	AFR	Faith-Syn
a2. ☞ JEAN va corriger les copies.				*		**	
b2. C'est JEAN qui va corriger les copies.		*!					
c2. Va corriger les copies JEAN.			*!				
d2. C'est Jean qui va corriger les copies.	*!						
e2. Jean va corriger les copies.	*!						

Tableau 2. Focused subjects realized in situ (in special contexts)

QUD: Qu'est-ce que Paul a trouvé sur le coffre?	SF	SF$_{special}$	Overt-Subj	NoQ Subj	SF$_{info}$	AFR	Faith-Syn
a1. ☞ Paul a trouvé DES CHEVEUX sur le coffre.						*	
b1. C'est DES CHEVEUX que Paul a trouvé sur le coffre.					*		*
c1. DES CHEVEUX Paul a trouvé sur le coffre.						***!	
d1. C'est des cheveux que Paul a trouvé sur le coffre.	*!						*
e1. Paul a trouvé des cheveux sur le coffre.	*!						

Tableau 3. Focused direct objects realized in situ (in non-special contexts)

QUD: C'est mon arme, mais pourquoi vous me soupçonnez?	SF	SF$_{special}$	Overt-Subj	NoQ Subj	SF$_{info}$	AFR	Faith-Syn
a2. ☞ C'est VOS EMPREINTES qu'on a trouvé sur l'arme.							*
b2. On a trouvé VOS EMPREINTES sur l'arme.		*!				*	
c2. VOS EMPREINTES, on a trouvé sur l'arme.		*!				***	
d2. C'est vos empreintes qu'on a trouvé sur l'arme.	*!						
e2. On a trouvé vos empreintes sur l'arme.	*!						

Tableau 4. Focused direct objects realized in a cleft (in special contexts)

Finally, the ranking proposed, with two pairs of overlapping constraints (NoQSubj/SF$_{info}$ and SF$_{info}$/AFR), also accounts for the distribution found in the data for focused indirect objects (see Tableau 5). Candidate (a1) is the most common output form since it does not violate any constraint. In Tableau 6, on the other hand, the indirect object is predicted to occur in a cleft sentence since leaving it *in situ* violates the higher ranked constraint SF$_{special}$.

QUD: Qu'est-ce que Paul a trouvé sur le coffre?	SF	SF$_{special}$	Overt-Subj	NoQ Subj	SF$_{info}$	AFR	Faith-Syn
a1. ☞ Paul a trouvé des empreintes SUR LE COFFRE.							
b1. C'est SUR LE COFFRE que Paul a trouvé des empreintes.					*!		*
c1. SUR LE COFFRE, Paul a trouvé des empreintes.						***!	
d1. C'est des empreintes que Paul a trouvé sur le coffre.	*!						*
e1. Paul a trouvé des empreintes sur le coffre.	*!						

Tableau 5. Tableau for focused indirect objects realized *in situ* (in non-special contexts)

QUD: Ce sont mes empreintes, mais pourquoi vous me soupçonnez?	SF	SF$_{special}$	Overt-Subj	NoQ Subj	SF$_{info}$	AFR	Faith-Syn
a2. ☞ C'est SUR L'ARME qu'on a trouvé vos empreintes.							*
b2. On a trouvé vos empreintes SUR L'ARME.		*!					*
c2. SUR L'ARME, on a trouvé vos empreintes.						***!	
d2. C'est sur l'arme qu'on a trouvé vos empreintes.	*!						*
e2. On a trouvé vos empreintes sur l'arme.	*!						

Tableau 6. Tableau for focused indirect objects realized in a cleft (in special contexts)

6. Conclusion

In this paper, I have investigated two aspects of the *c'est*-cleft: its meaning and its use. The data from the two experiments presented indicate that (i) the French *c'est*-cleft does not semantically contribute exhaustivity to the sentence's meaning and (ii) the alternation cleft/canonical is more complex than previously considered. The exhaustivity of the cleft is attributed to its non-at-issue meaning. I have followed a prosodic and pragmatic approach (*à la* Hamlaoui 2008) of the canonical/cleft non-random alternation, arguing that the constraint ranking SF >> SF$_{special}$ >> Overt-Subj >> NoQSubj, SF$_{info}$, AFR >> Faith-Syn, accounts for the realization of focus in French in various cases and interpretations.

References

Atlas, Jay David, and Stephen C. Levinson. 1981. *It*-clefts, informativeness and logical form: Radical pragmatics (revised standard version). *Radical pragmatics*, ed. by Peter Cole, 1–62. New York: Academic Press.

Belletti, Adriana. 2005. Answering with a cleft. The role of null subject parameter and the VP periphery. *Proceedings of XXX Incontro di Grammatica Generativa*, 63–82. Venezia: Cafoscarina.

Beyssade, Claire; Barbara Hemforth; Jean-Marie Marandin; and Cristel Portes. 2011. Prosodic markings of information focus in French. *Actes d'IDP 2009*, ed. by Hi-Yon Yoo and Elisabeth Delais-Roussarie, 109–122. Paris, Septembre 2009.

Boersma, Paul, and Bruce Hayes. 2001. Empirical tests of the Gradual Learning Algorithm. *Linguistic Inquiry* 32.45–86.

Bolinger, Dwight. 1972. A look at equations and cleft sentences. *Studies for Einar Haugen, Presented by friends and colleagues,* ed. by Evelyn Scherabon Firchow et al., 96–114. Mouton de Gruyter, The Hague.

deCat, Cécile. 2007. *French dislocation: Interpretation, syntax and acquisition*. Oxford University Press.

Clech-Darbon, Anne; Georges Rebuschi; and Annie Rialland. 1999. Are there cleft sentences in French? *The grammar of focus*, ed. by Georges Rebuschi and Laurice Tuller, 83–118. John Benjamins.

Delais-Roussarie, Elisabeth. 2005. *Études et modélisation des interfaces prosodiques*. Habilitation à diriger la recherche. Université Toulouse Le Mirail.

Delais-Roussarie, Elisabeth, and Annie Rialland. 2007. Metrical structure, tonal association and focus in French. *Romance languages and linguistic theory 2005*, ed. by Sergio Baauw, Frank Drijkoningen, and Manuela Pinto, 73–98. John Benjamins.

Doetjes, Jenny, Georges Rebuschi, and Annie Rialland. 2004. Cleft sentences. *Handbook of French semantics*, ed. by Francis Corblin and Henriëtte de Swart, 529–552. CSLI Publications.

Dufter, Andreas. 2009. Clefting and discourse organization: Comparing Germanic and Romance. *Focus and background in Romance languages*, ed. by Andreas Dufter and Daniel Jacob, 83–123. John Benjamins, Amsterdam.

Féry, Caroline. 2001. The phonology of focus in French. *Audiatur Vox Sapientiae: A Festschrift for Arnim von Stechow*, ed. by Caroline Féry and Wolfgang Sternefeld, 153–181. Berlin. Akademie-Verlag.

Gabriel, Christoph. 2010. On focus, prosody and word-order in Argentinian Spanish: A minimalist OT account. *ReVEL* 4.183–222.

Hamlaoui, Fatima. 2008. Focus, contrast, and the syntax-phonology interface: The case of French cleft-sentences. *Current issues in unity and diversity of languages: Collection of the papers selected from the 18th International Congress of Linguists*. Seoul: Linguistic Society of Korea.

Hedberg, Nancy. 2000. The referential status of clefts. *Language* 76.891–920.

Horn, Laurence R. 1981. Exhaustiveness and the semantics of clefts. *Proceedings of NELS 11*, 125–142.

Jun, Sun-Ah, and Cécile Fougeron. 2000. A phonological model of French intonation. *Intonation: Analysis, modeling and technology*, ed. by Antonis Botinis, 209–242. Kluwer Academic Publishers.

Katz, Stacey. 1997. *The syntactic and pragmatic properties of the* c'est-*cleft construction*. PhD dissertation, University of Texas at Austin.

Kiss, Katalin. 1998. Identificational focus versus informational focus. *Language* 74.245–273.

Lambrecht, Knud. 1994. *Information structure and sentence form: Topic, focus and mental representations of discourse referents*. Cambridge University Press.

Onea, Edgar. 2009. Exhaustiveness of Hungarian focus: Experimental evidence from Hungarian and German. *Proceedings of focus at the syntax-semantics interface*, ed. by Arndt Riester and Edgar Onea. Publikationen des SFB 732, Stuttgart.

Onea, Edgar, and David Beaver. 2011. Hungarian focus is not exhausted. *Proceedings of SALT 19*, 342–359.

Percus, Orin. 1997. Prying open the cleft. *Proceedings of NELS 27*, ed. by K. Kusumoto, 337–351.

Simons, Mandy; Judith Tonhauser; David Beaver; and Craige Roberts. 2010. What projects and why. *Proceedings of SALT 20*, 309–327.

Szabolcsi, Anna. 1981. The semantics of topic-focus articulation. *Formal methods in the study of language,* ed. by Jan Groenendijk, Theo Janssen, and Martin Stokhof, 513–541. Amsterdam: Matematisch Centrum.

Vion, Monique, and Annie Colas. 1995. Contrastive marking in French dialogue: Why and how. *Journal of Psycholinguistic Research* 24.313–331.

Zimmerman, Malte, and Edgar Onea. 2011. Focus marking and focus interpretation. *Lingua* 121.1651–1670.

Zubizarreta, Maria Luisa. 1998. *Prosody, focus, and word order*. The MIT Press.

More on the semantics of clitic doubling: principal filters, minimal witnesses, and other bits of truth

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1. Introduction

This paper deals with a phenomenon that in the generative paradigm has since Jaeggli (1982) come to be known as clitic doubling, and which is illustrated through the Albanian examples in (1). As its name suggests, clitic doubling involves the 'doubling' by a clitic pronoun of a DP that is a verbal argument inside one and the same propositional structure, which we take to be a clausal unit (Adger 2003).[1] The clitic and its associate (i.e. the DP it doubles) share the same case and phi-features (i.e. person, number and gender).[2] As the examples in (1) demonstrate, the associate can be instantiated by a full pronoun or a non-pronominal referring expression that can be a definite, indefinite, or proper noun.

(1) a. Ana   **më**   pa   **mua** në rrugë.
         Anna.the$_{NOM}$ me$_{CL}$ saw me$_{FP}$ in road
         'Anna saw me in the street.'
     b. Ana   **e**   lexoi **letrën**   deri në fund.
         Anna.the$_{NOM}$ CL.ACC.3S read letter.the$_{ACC}$ till in end
         'Anna read the letter to the end.'
     c. Ana   **e**   pa   **Benin**   në rrugë.
         Ana.the$_{NOM}$ CL.ACC.3S saw   Ben.the$_{ACC}$ in road
         'Ana saw Ben on the road.'
     d. Do   **ta**   pija   me kënaqësi   **një uiski**.
         FUT SUBJ.**CL.ACC.3S** drink with pleasure   a   whisky
         'I would gladly drink a whisky.'

Though clitic doubling constructions in many languages have since Kayne (1975) received a great deal of attention in the syntactic literature (for a recent review of the syntactic literature on clitic doubling, see Kallulli & Tasmowski 2008), modulo the detailed investigation in Gutiérrez-Rexach (1999) on clitic doubling in (varieties of) Spanish, research on the formal

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[1]We assume that the associate of the doubling clitic is a DP (Abney 1987), not an NP, which is why bare nouns cannot be clitic doubled (see Kallulli 2000, and Kallulli & Tasmowski 2008).

[2]However, just like full pronouns, clitics are frequently underspecified for case and/or gender, as is the case with *më* in (1a), which could be either accusative or dative and with *e* in (1b), which is underspecified for gender. For details on the clitic paradigms in Albanian, see Kallulli (1995).

semantics of these constructions has been much less prolific. This is in part due to the perplexing fact that while dative clitic doubling (i.e. clitic doubling of dative objects) behaves analogous to object agreement marking (e.g. see Sportiche 1996 and references therein), clitic doubling of direct object DPs seems to be subject to various idiosyncratic language-specific semantic constraints, such as animacy and specificity in Romanian and Spanish (Farkas 1978, Suñer 1988, Dobrovie-Sorin 1990), definiteness in Modern Greek (Anagnostopoulou 1994a,b, Anagnostopoulou & Giannakidou 1995), topichood and/or givenness in Albanian (Kallulli 2000, 2008), which make it very hard if not altogether impossible to come up with a unitary semantic analysis.[3]

In this paper, we present novel data from Albanian showing that (i) the DP associated with the clitic (i.e. the 'doubled' DP) must be interpreted as generating admissible minimal witnesses, which in turn makes the DP topical; and that (ii) as a consequence of (i), clitic doubling systematically produces information structure effects in that the doubled DP is unequivocally interpreted as topical.

This paper is organized as follows. In §2, we present the core data, which among other things necessitate the search for an alternative analysis to the one proposed in Gutiérrez-Rexach 1999. In particular, we draw attention to the fact that, contrary to what Gutiérrez-Rexach claims, clitic doubling cannot be explained by appealing to the notion of principal filterhood. §3 then details our own analysis, the crux of which is that the clitic doubled DP must be interpreted as generating an admissible minimal witness, from which all other effects such as those involving information structure are derived.

2. Determiner types and clitic doubling: the view from Albanian
2.1. Strong and weak determiners

On the basis of their formal properties, Barwise and Cooper (1981:182) distinguish between two classes of quantifiers, namely, 'strong' and 'weak' ones. Strong quantifiers are those headed by the 'strong' determiners in (2a), and weak quantifiers are those headed by the 'weak' determiners in (2b).

(2) a. strong determiners: the, both, all, every, each, most, neither
     b. weak determiners: a, some, one, two, three, …, many, a few, few, no, $\emptyset$

In Albanian, DPs headed by strong determiners can be clitic doubled; we already saw an instance of this in (1b). Two further examples of doubling with strong quantifiers are given in (3).[4]

(3) a. (I)   lexova   të dy   librat.
         them$_{CL.ACC}$ read.1s agr both   books.the $_{ACC}$
         'I read both books.'
     b. (I)   lexova   të gjithë librat.
         them$_{CL.ACC}$ read.1s agr all   books.the $_{ACC}$
         'I read all (the) books.'

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[3]However, some of these claims are controversial. For instance, the Greek example in (18b) in §2.3 shows that indefinites can clearly be clitic doubled in this language, a fact that has been acknowledged as a counterexample by Anagnostopoulou (1994b:4) herself.

[4]DPs headed by the strong determiners *every*, *each*, *most*, and *neither* may also be clitic doubled in Albanian. However, we postpone their discussion to §3.2.

DPs headed by weak determiners, except those headed by 'no' and bare nouns, may also be clitic doubled in Albanian, in which case the doubled DP invariably has wide scope.[5] An instance of clitic doubling with a weak quantifier was already provided in (1d); other examples are given in (4).

(4)   Javën e shkuar (i)   lexova dy / tre   / disa / ca   libra.
      week.the past   them$_{CL.ACC}$ read.I two / three / some / a few books
      'Last week I read two books/some books.'

(5)   Nuk (*/??e)   lexova asnjë   libër.
      not   CL.ACC.3S   read-I not.one book
      'I didn't read any book'

As we explicate below, the fact that DPs headed by weak determiners can be clitic doubled is unexpected under the only available semantic analysis of clitic doubling in the literature, namely, the one in Gutiérrez-Rexach 1999 on clitic doubling of direct objects in Spanish, which is outlined in the following subsection.[6]

2.2. Gutiérrez-Rexach 1999

Gutiérrez-Rexach (1999) claims that accusative DPs in Spanish are clitic doubled if and only if they denote principal filters. That is, direct object clitic doubling is according to him subject to the constraint in (6), with 'principal filter' defined as in (7):

(6)   *The Principal Filter Constraint*:
      The generalized quantifier associated with an accusative clitic has to be a principal filter.
      (Gutiérrez-Rexach 1999:326)

(7)   A generalized quantifier Q over E is a *principal filter* iff there is not necessarily empty set A ⊆ E, such that for all B ⊆ E, Q(B) = 1 iff A ⊆ B. The set A is called the *generator* of Q (A=GEN(Q)). (Gutiérrez-Rexach 1999:326)

The problem with this analysis is that since weak quantifiers can never denote principal filters, as is obvious from the original definition of principal filter in Barwise & Cooper 1981:183 given below in (8), clitic doubling them should not be possible, contrary to fact.

(8)   *Definition*. A determiner *D* is *definite* if for every model M = <E, [[]]> and every A which [[D]](A) is defined, there is a non-empty set *B*, so that [[D]](A) is the sieve {X ⊆ E | B ⊆ X}. (Hence [[D]](A) is what is usually called the principal filter generated by *B*.)

Specifically, the definition in (8) states that for a quantifier to be a principal filter, for *every* model there must be a non-empty set B (the set cannot be empty because it is the sieve) which belongs to the set of sets denoted by the quantifier X. To illustrate, consider the figures in (9), which show why *every* is a positive strong determiner (which generates the principal filter for the set in its restriction) but *two* is a weak determiner and can as such never denote a principal

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[5]Following Kallulli 2000 and related literature, we assume that bare nouns cannot be doubled because while clitics are D-elements (alternatively: carry a D-feature), bare nouns lack a D-projection, which results in a feature mismatch causing the derivation to crash.

[6]As Gutiérrez-Rexach acknowledges, clitic doubling is possible with weak determiners in Spanish, too.

filter. A quantifier like *two sailors* denotes the family of sets which intersect with the set of sailors containing at least two sailors, but there is no non-empty set B which would be the subset of all such sets in every model. But exactly this situation is true for a quantifier like *every sailor*: there is a set B (the set of sailors) which is a subset of all sets in the family of sets denoted by the quantifier. This is why the principal filter hypothesis cannot help us in explaining the semantic conditions behind clitic doubling in Albanian: weak quantifiers in Albanian can be clitic doubled even though weak quantifiers can never generate principal filters.

(9)

GQ *every sailor*

witness set for *every sailor*

GQ *two sailors*

$⟦$*two sailors smoke*$⟧ = 1$
$⟦$*two sailors drink*$⟧ = 1$
$⟦$*two sailors swim*$⟧ = 1$
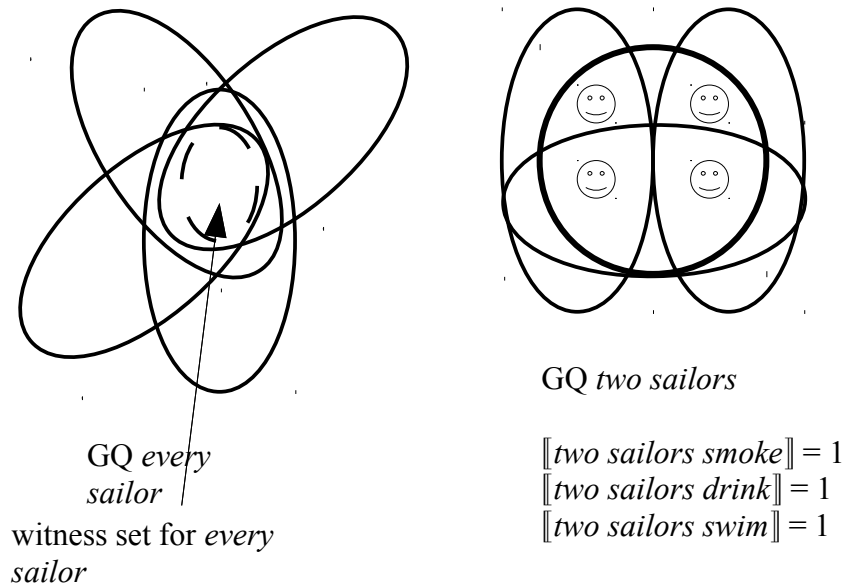
Concluding this section, since weak quantifiers (which can never denote principal filters) can be clitic doubled in Albanian (as witnessed by our example (4)), an approach along the lines of Gutiérrez-Rexach 1999 is untenable.

2.3. Further specifications: determiner subtypes, clitic doubling, and information structure

In §2.1 we saw that both strong and weak quantifiers may be clitic doubled in Albanian. The data in (10) through (12), however, further complicate the picture; while none of the quantifiers in (10) through (12) are principal filters, some allow clitic doubling and some do not. More specifically, while weak monotone increasing quantifiers may be clitic doubled, as shown in (10), weak monotone decreasing quantifiers and non-monotone quantifiers cannot be clitic doubled, as illustrated in (11) and (12) respectively.

(10) Javën e shkuar (?i)   lexova të paktën dy libra / më   shumë se   dy libra.
     week.the past   them$_{CL.ACC}$ read.I at least two books/ more many than two books
     'Last week I read at least two books/more than two books.'

116

(11) Javën e shkuar (??/*i)   lexova tëshumtën dy libra / më   pak se   dy libra.
     week.the past   them_CL.ACC read.I atmost   two books/ more lessthan two books
     'Last week I read at most two books/less than two books.'

(12) Javën e shkuar (??/*i)   lexova tamam tre   libra.
     week.the past   them_CL.ACC read.I exactly three books
     'Last week I read exactly three books.'

Furthermore, though quantifiers headed by strong determiners may be clitic doubled, there are contexts where they cannot be and contexts where they must be clitic doubled.[7] Consider the data in (13) through (16) (adapted from Kallulli 2000), noting in particular the complementarity of felicity conditions between the 'minimal pairs' in (13A)/(14B) versus (15B)/(16B), all of which mean 'Anna read the book':

(13) A: What did Ana do?   B: Ana (*e)   lexoi librin.
                                               Anna CL.ACC.3S read book.the
                                               'Anna read the book'
(14) A: What did Ana read?   B: Ana (*e) lexoi librin.
(15) A: Who read the book?   B: Ana *(e) lexoi librin.
(16) A: What did Ana do with/to the book?   B: Ana *(e) lexoi librin.

What these data highlight is that when the VP or direct object DP is focus or part of the focus domain, clitic doubling is impossible but when the direct object DP is exempted from the focus domain (i.e. when the direct object DP is topical, or given) a doubling clitic is not only possible, but indeed obligatory. In other words, direct objects in Albanian need to be clitic doubled in order to be interpreted as topical (or given), a property which also accounts for two additional facts pointed out in Kallulli 2008, namely, that the object of the verb 'to have' may not be clitic doubled in Albanian existential constructions, as shown in (17), and that first and second person personal pronouns are invariably clitic doubled in this language.

(17) (*I)   kishte minj në gjithë apartamentin.
     them_CL.ACC had   mice in all   apartment.the
     'There were mice all over the apartment.'

Indeed we will argue that precisely this is what also accounts for doubling of indefinites (and other weak quantifiers), as in (18a) and (18b) for Albanian and Greek, respectively, as these are 'non-novel' indefinites in the sense of Krifka (2001).[8]

(18) a. Do t**a**   pija   me kënaqësi një uiski.
        FUT SUBJ.**CL.ACC.3S** drink   with pleasure a   whisky
     b. To   pino exfaristos   ena ouiskáki. (Kazasis and Pentheroudakis 1976:399)
        it_CL.ACC drink with pleasure a   whisky
        'I would gladly drink a whisky.'

Summarizing the discussion so far, we have shown that direct object clitic doubling in Albanian cannot be explained in terms of principal filterhood because weak quantifiers, which

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[7]In fact as Kallulli (2000) shows, this also applies to doubling of indefinites (and/or other weak quantifiers).

[8]We discuss non-novel indefinites in some detail in §3.4.

are not principal filters, can be clitic doubled. Furthermore, weak quantifiers and monotone increasing quantifiers can be clitic doubled but monotone decreasing and non-monotone quantifiers cannot.[9] Finally, while both strong and weak quantifiers may be clitic doubled, there are contexts in which this is not possible, namely when they are part of the focus domain. What we are searching for, then, is some common property that would allow us to explain why strong determiners, weak determiners under wide scope interpretation and monotone increasing determiners can be clitic doubled and why monotone decreasing determiners and non-monotone determiners cannot be clitic doubled in Albanian, bearing in mind that clitic doubled expressions are invariably interpreted as topics in this language. Our hypothesis, then, naturally must mix purely semantic ingredients (monotone decreasing quantifiers can never be clitic doubled) with information structure approaches (even strong quantifiers cannot be clitic doubled when they are part of the focus domain/non-given).

3. Analysis
3.1. The proposal

Since clitic doubled DPs in Albanian are invariably interpreted as topical, we believe the explanation for the data discussed in the previous sections should start with a discussion of topichood and the topical status of these DPs.

The distinction topic/non-topic, which we take to be more or less identical to the distinction topic/focus (cf. Hedberg 2006), closely corresponds to the subject/predicate distinction (see in particular Strawson 1974). In a crude approximation, then, a sentence such as (19a) says about John, its topic, that he has the property of loving Mary, whereas a sentence such as (19b) says about Mary, its topic, that she has the property of being loved by John. As is clear from the equivalence of (19a´) and (19b´), both (19a) and (19b) have the same truth conditions, but they differ in how these truth conditions are communicated.

(19) a. John loves Mary.
      a´. $\lambda x[love'(John, x)](Mary)$
      b. Mary, John loves.
      b´. $\lambda x[love'(x, Mary)](John)$

Crucially, topics refer to entities or to sets of entities (for plural topics) and focus refers to the properties of entities or of sets of entities denoted by topics. More formally stated, only entities or sets of entities, i.e. type $<e>$ or $<e,t>$ expressions, can be interpreted as topics. Focus, on the other hand, is always interpreted as a property, i.e. type $<e,t>$, characterizing the topical entity, or also of type $<<e,t>,t>$ – property of sets – for plural topics. Already from this assumption it follows that generalized quantifiers are not good candidates for topichood because their type $<<e,t>,t>$ is not compatible with the entity (i.e. type $<e>$) status of topics (and in the case of the plural topics, which are of the type $<e,t>$, functional application would reverse the subject/predicate asymmetry). It is then hardly surprising that some quantifiers cannot serve as sentence topics. We use the left dislocation construction (which is usually taken as a signal of topichood of the dislocated phrase) to show that unlike proper nouns, quantifiers like *every sailor* cannot be left-dislocated – cf. the contrast between (20a) and (20b). Weak

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[9]By weak and strong quantifiers we also mean conjunctions and disjunctions of weak and strong quantifiers, because e.g. conjunction of strong quantifiers like *all the books and all the magazines* can be clitic doubled in Albanian. Also in this respect Albanian clitic doubling resembles partitivity contexts in English, where also conjunctions and disjunctions of strong quantifiers are allowed (see Keenan 1996). Thanks to the anonymous reviewer for pointing this out to us.

quantifiers like *three sailors* in (20c) on the other hand may be left-dislocated, which shows that at least some quantifiers allow for a topical interpretation.

(20) a. John, we met him yesterday.
      b. *Every/*no sailor, we met him yesterday.
      c. Three sailors, we met them yesterday.

But how can a quantifier allow for a topic interpretation given the fact that the logical type of quantifiers is incompatible with the entity type of the topic? Following ideas in Endriss 2009 and Szabolcsi 2010, we assume that it is the witness sets of topical quantifiers that serve as their meaning.

The concept of witness sets goes back to Barwise & Cooper 1981. Intuitively, we think about sentences like *John is a sailor* in terms of set membership: the sentence is true if John is the member of the set of sailors (formally: $j \in \{x \mid x \text{ is a sailor}\}$). But Barwise and Cooper (1981), following Montague (1973), argue exactly for the opposite perspective with respect to what is the function and what is its argument: a sentence like *John is a sailor* is true in their framework if and only if the property of being a sailor is one of the properties (family of sets) which John has (formally: $\{x \mid x \text{ is a sailor}\} \in \{X \subseteq E \mid j \in X\}$).

The idea of witnesses (or witness sets) can be understood as restoring the former intuition: the witness set for *John* is the singleton set $\{j\}$, and the sentence *John is a sailor* is true if and only if the witness set for *John* is a subset of the set of sailors. Similarly for quantifiers: the witness set of the quantifier *every sailor* is the set of sailors, the witness set of the quantifier *two sailors* is the set of sets containing as members sets of two sailors and so on. Schematically, the meaning of the sentence 'John is a sailor', which the figure in (21) is supposed to depict, can be explained in the three stages given in (21).

(21)
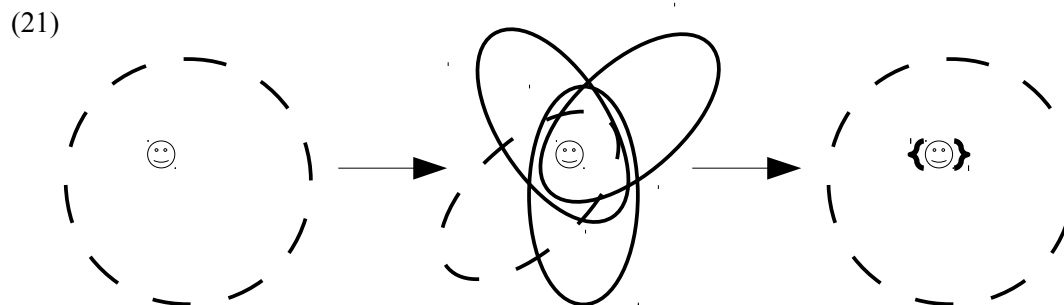
The intuition behind topics is that they are referential, and witness sets can also be conceived of as the generalized quantifier's referential contribution to the proposition (even if we accept the widely assumed view that quantifiers are non-referential expressions, as discussed in Heim & Kratzer 1998).

Let us compare the denotation of the generalized quantifiers with their witness sets. To visualize a generalized quantifier, we draw the denotations of the generalized quantifiers as in the table in (22). The order of rows starting from the bottom up represents the subset relation, hence $\{a\}$ is below $\{a, b\}$ and $\{a, b\}$ below $\{a, b, c\}$, because $\{a\} \subseteq \{a, b\} \subseteq \{a, b, c\}$. The boldface represents the denotation of the quantifier: the denotation of the quantifier *at least one student* (if we assume that only atomic individuals $\{a, b\}$ are students) is the family of sets containing at least one student:

$$\{\{a\},\{b\},\{a, b\},\{a, c\},\{a, d\},\{b, c\},\{b, d\},\{a, b, c\},\{a, b, d\},\{a, c, d\},\{b, c, d\},\{a, b, c, d\}\}$$

(22)   monotone increasing NPs like *at least one student* (assume that ⟦*student*⟧ is {a, b})

		{a,b,c,d}			
	{a,b,c}	{a,b,d}	{a,c,d}	{b,c,d}	
{a,b}	{a,c}	{a,d}	{b,c}	{b,d}	{c,d}
	{a}	{b}	{c}	{d}	
		Ø			

As is clear from the table, an element of the GQ denoted by *at least one student* will contain other elements beside the denotation of the restrictor, i.e. for this quantifier the denotation can contain tigers, cars, cats and any other elements that include at least one student. Barwise and Cooper (1981) define *witness sets* as elements from which such alien bodies are removed. A principal filter is a superset of a witness set; it is the denotation of the quantifier if the quantifier lives on some set: the witness sets of the quantifier *at least one student* are the sets {a}, {b}, and {a, b}.

Endriss and Hinterwimmer (2008) hypothesize that topical quantifiers are interpreted as *minimal witness sets* in such cases. While the witness sets for a monotone increasing quantifier such as *at least one student* in a model like (22) are {a}, {b}, and {a, b}, the minimal witness sets are simply the two sets {a} and {b}.[10] For monotone decreasing quantifiers the minimal witness set is the empty set ∅. To illustrate, consider a variant of example (4), repeated below in (23). The minimal witness sets for the weak quantifier *disa libra* 'some books' are the singleton sets of all atomic entities which are books in the particular model. Assume these sets are {a}, {b}, and {c}, which are interpreted as topical, with the rest of the sentence being interpreted as a property, as given in (24). Immediately, a type problem reveals itself: both the function and its argument are of the same type, namely, <e,t>, so we cannot proceed with the beta reduction.

(23)   Javën e shkuar   (i)   lexova   disa   libra.
         week.the past   them$_{CL.ACC}$ read.I   some   books
         'Last week I read some books.'

(24)   λx[read_last_week(I, x)]({a, b, c})

Endriss and Hinterwimmer (2008:90) solve this problem by hypothesizing that: 'the elements of the minimal witness set corresponding to the topical quantifier are distributed over the elements of the set denoted by the comment'. Applied to our example in (23), for each of the individuals in the witness sets of books, the individual is fetched as an argument into the predicate consisting of the focus part of the sentence. Of course this yields an implausible reading for (23), namely, that I read all the books in the universe of discourse. Endriss and Hinterwimmer resolve this via an operation very similar to that of choice functions (see the

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[10]We follow Barwise and Cooper (1981:103) in their definition of a witness set:

(i) A *witness set* for a quantifier D(A) living on A is any subset *w* of A such that *w* ∈ D(A).

And we follow Szabolcsi (1997) in her definition of a minimal witness set M:

(ii) A *minimal witness set* is a set that is smallest among the witness sets of a generalized quantifier D(A), i.e., M is a minimal witness set of D(A) iff ¬∃M'[M' ∈ D(A) ∧ M' ⊂ M].

discussion in the next section). But what this properly describes is the expectation that monotone decreasing quantifiers cannot be topics because their minimal witness set is the empty set $\emptyset$, which as such cannot be fetched into the predicate at all.

The classification of topical quantifiers is further developed in Endriss (2009). Following Kadmon (1985), Endriss claims that all generalized quantifiers introduce (plural) discourse referents (i.e. minimal witness sets which are accessible in subsequent sentences). Even if all quantifiers create plural discourse referents, the latter are not of the same type for all quantifiers.[11] Quantifiers are distinguished according to their ability to create exhaustive and non-exhaustive plural discourse referents. Consider the meaning differences in the interpretation of the anaphor *they* in the following sentences:

(25) a.   Three fishermen sat by the river. *They* caught a lot of fish.
      b.   At least three fishermen sat by the river. *They* caught a lot of fish.

The first sentence in (25a) containing the quantifier *three fishermen* is compatible with a situation in which more then three fishermen sat by the river, but *they* in the second sentence in (25a) can only be understood as referring to the three fishermen in the preceding sentence. The sentence in (25b) is also compatible with a situation in which more than three fishermen sat by the river, but in this case, the pronoun *they* in the second sentence refers to the totality of fishermen that sat by the river. In other words, in a situation where six fishermen sat by the river and three of them caught a lot of fish, (25a) would be true but (25b) would be false. The anaphor *they* serves as a means of distinguishing between the discourse referent created by the quantifier *three fishermen* and the quantifier *at least three fishermen*. In (25a), the anaphor refers back to one of the witnesses created by the quantifier, whereas in (25b) the anaphor cannot refer to any witness of the quantifier *at least three fishermen*, but must instead refer to the maximal (exhaustive) intersection of the set of fishermen with the set of entities sitting by the river. This distinction between exhaustivity and non-exhaustivity is according to Endriss (2009) anchored in the lexical meaning of the determiners. The distinction between the non-exhaustive weak determiner *three* and the exhaustive monotone increasing determiner *at least three* lies not only in the relation $=$ versus $\geq$, respectively, but crucially in the way the plural discourse referent X is created: for *three* it is any subset of the intersection of the noun P with the verb Q but for *at least three* it is the maximal intersection between P and Q, as shown in (26).

(26) a. $n = \lambda P \lambda Q. \exists X[|X| = n \wedge X \subseteq P \cap Q]$
      b.   at least $n = \lambda P \lambda Q. \exists X[|X| \geq n \wedge X = P \cap Q]$

Endriss (2009) uses this variable ability of quantifiers to create discourse referents for a classification of quantifiers in terms of their ability to be interpreted as topics. Her main idea is that the aboutness function of a topic quantifier shouldn't change the semantics (i.e. the truth conditions) of the sentence. So she tests whether quantifiers interpreted as topics have the same meaning as their basic meaning. We refer the reader to the definition (6.1) on page 248 from Endriss (2009), where the exact mechanism is explained. For our purposes, it is sufficient to demonstrate the topicality condition on two types of quantifiers: monotone decreasing quantifiers (such as *at most three horses* in (27a)) and weak quantifiers (such as *three horses* in (27b)). What the topicality condition tests is whether the topic interpretation (via witness sets) equals the normal interpretation of the quantifier. The topic interpretation is on the left side of

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[11]For a different hypothesis according to which only some quantifiers create discourse referents, see Kamp & Reyle 1993.

the equation of the formulas in (27), whereas the normal interpretation is on the right side. The minimal witness set for monotone decreasing quantifiers is the empty set and because the empty set is the subset of any set, the left part of (27a) is a tautology, hence it is not equal to the right side, which is simply the meaning of the quantifier *at most three horses* (the set of sets which include at most three horses). In (27b), on the other hand, the part on the left side is equal to the one on the right side because the witness set of the weak quantifier *three horses* (the set of sets containing three horses) is identical to the meaning of the quantifier.

(27) a. $\exists P[P = \varnothing \wedge P \subseteq Y] \neq \exists X[|X| \leq 3 \wedge X = [\![horse]\!] \cap Y]$
      b. $\exists P[P \subseteq [\![horse]\!] \wedge |P|=3 \wedge P \subseteq Y] = \exists X[|X| = 3 \wedge X \subseteq [\![horse]\!] \cap Y]$

The topicality condition draws a line between topicable and non-topicable quantifiers. With some simplification, weak quantifiers, indefinites, and the universal *all*-quantifier are topicable, whereas monotone decreasing quantifiers, non-monotone quantifiers, the universal quantifier *every*, and monotone increasing quantifiers are non-topicable. This is close (though not identical) to what we saw for the Albanian clitic doubling patterns. An exception are monotone increasing quantifiers which may be clitic doubled in Albanian, even though according to the topicality condition they are non-topicable. But as Endriss (2009) herself acknowledges, matters are not so simple and straightforward, since even a monotone increasing determiner such as the English *several* allows for a topical wide scope reading and non-exhaustive interpretation, as shown in (28) (from Endriss 2009, her example 6.44).

(28) a. Several mathematicians were at the party yesterday. They danced all night.
      b. The other mathematicians at the party only drank a lot.

The non-exhaustive interpretation of the quantifier *several mathematicians* shows that it can be interpreted as a vague bare numeral weak quantifier similar to *n*. Under such an interpretation, it can then meet the topicality condition.

To conclude this section, let us summarize our reasoning so far: if we put aside the information structure effects, the set of quantifiers which can be clitic doubled in Albanian consists of weak quantifiers (bare numeral and monotone increasing quantifiers) and strong quantifiers. Bare numerals and the *all* strong quantifier are uncontroversially argued to be good candidates to be topics by Endriss (2009). As for monotone increasing quantifiers, they allow for a topical interpretation under a non-exhaustive interpretation. Further scrutiny notwithstanding, we assume that the same process of reinterpretation is responsible for the acceptability of monotone increasing clitic doubled quantifiers in Albanian.

The next section is dedicated to those strong quantifiers which allow clitic doubling in Albanian but their status as topics (in a theory like Endriss') is at least controversial.

3.2. Presuppositional determiners

As was pointed out in §2.1, all DPs headed by strong determiners may be clitic doubled in Albanian. The fact that the DPs headed by the strong determiners *çdo* 'every', *secilin* 'each', *të shumtët* 'most', and *asnjërin* 'neither (one of)'/'none (of)' may be clitic doubled in Albanian – see the examples in (29) – is problematic for our attempt to explain the Albanian clitic doubling purely algebraically, because singular universal quantifiers are assumed to be non-topicable in Endriss' (2009) analysis, as was demonstrated by the ungrammaticality of (20b).

(29) a. (E)　　　　　lexova　　çdo　libër.
　　　　CL.ACC.3S　read.1s　every book
　　　　'I read each book.'
　　　b. (E)　　　　　lexova　　secilin　　libër.
　　　　CL.ACC.3S　read.1s　each.the_ACC　book
　　　　'I read each book.'
　　　c. (I)　　　　　lexova　　më të shumtët　　(e librave).
　　　　them_CL.ACC read.1s　sup most.pl.the　agr books.the_ACC
　　　　'I read most (books).'
　　　d. Nuk　(e)　　　　　lexova　　asnjërin　　　(libër)　/ (prej librave).
　　　　not　CL.ACC.3S　read.1s　neither.the_ACC　book　/ from books.the_DAT
　　　　'I read neither (book / of the books).'

However, the fact that the DPs headed by these strong determiners may be clitic doubled is not necessarily an argument against Endriss' 2009 framework because the minimal witness set for the universal quantifiers is the same for singular and plural; the minimal witness set for the quantifiers *every book*, *all books* and *each book* in any model would be the same, namely the set of all the books in the universe of discourse. Other things being equal, we would then expect universal quantifiers to be good topics independently of their grammatical number, with the consequence that the English facts in (20b) are surprising. Indeed Endriss 2009 attributes the non-topicability of singular universal quantifiers to a clash between the denotation of the minimal witness set and the morphological number of the quantifier (and the morphological number of the resumptive pronoun in the case of left-dislocated noun phrases like in (20b)). According to her, because the minimal witness set denotes plurality and the grammatical number on the quantifier (and the resumptive pronoun) is singular, there arises a mismatch, which is the reason for the ungrammaticality of singular universal quantifiers in syntactic positions associated with topics. It could be hypothesized that, for some reason, this clash in number doesn't arise in Albanian, hence the singular universal quantifiers are topicable in this language, perhaps due to the fact that clitics are very light elements (although they are not underspecified for number in Albanian). We would need to examine this hypothesis more thoroughly, but for now suffice it to mention that, as is well-known, a simple mapping between singular grammatical number and non-plurality of its denotation isn't always viable. For instance, collective nouns like *team* or *government* in English denote pluralities but are grammatically singular (even though they may determine plural agreement). Similarly, from a cross-linguistic perspective, Slavic languages exhibit singular verbal agreement with subject DPs headed by numerals higher then four.

Another problematic case is the determiner *asnjërin* 'neither (one of the)'/'none (of the)'. As the determiner is negative strong, its minimal witness set is simply the empty set. Being so, we would expect that clitic doubling of a DP headed by this determiner shouldn't be possible, contrary to fact – see (29d). We assume that the reason for this is the presuppositional behavior of determiners like *neither*. In this respect, there is a common core for all four quantifiers discussed in the present section: all these determiners are presuppositional, i.e., they presuppose the non-emptiness of the set denoted by their noun argument. We cannot go into the details of the presuppositional treatment of quantifiers here but would nonetheless like to mention that there is an ongoing discussion between the presuppositional and non-presuppositional treatment of quantifiers, which as far as we know has not been resolved yet. But starting at least with Barwise & Cooper (1981), it is usual to treat the determiners *the*, *both*, and *neither* as presuppositional. Nevertheless other determiners such as *every, all*, and *most* are also sometimes considered presuppositional, so basically all strong determiners are argued to

presuppose the non-emptiness of their restrictor (see Diesing 1992 and Heim & Kratzer 1998). For instance, Heim and Kratzer (1998:172) cite the following paradigm, originally due to Lumsden (1988), to test the presuppositionality of determiners. Filling the gap in (30) with the strong determiners *every*¸ *each*, *most*, or *neither* (as opposed to weak determiners like *two*, *no*, ...) leads to a presupposition that the speaker assumes that there are mistakes. We can then safely conclude that *neither* is different from *no* (and recall from §2.1 that *no* cannot be clitic doubled in Albanian, e.g. (5)), in that the former is presuppositional, whereas the latter is not.

(30)   If you find ___ mistake(s), I'll give you a fine reward.

We assume that our approach, which relies on topicality being explained via minimal witnesses, should be enriched with some presuppositional theory of topichood like the one in Cresti (1995). According to Cresti (1995), topical constituents bear some kind of existence presupposition. Although we would have been happier to treat Albanian clitic doubling in a purely algebraic fashion, data like (29) convincingly show that a mixed, semantico-pragmatic theory is needed. Moreover, there is a common denominator between topicality defined in terms of minimal witnesses and topicality defined in terms of presupposition theories, namely the constraint on the non-emptiness of the restrictor (be it non-emptiness of minimal witnesses or non-emptiness as a presupposition). We leave the proper investigation of this common link for future work.

3.3. The wide scope of clitic doubled indefinites

As is well-known, indefinites may receive either wide or narrow scope with respect to other scope taking elements in the same sentence. For instance, an indefinite expression such as *një libër* 'a book' in (31a) can have either a wide scope or a narrow scope reading with respect to the implication. Under a wide scope reading there must be (at least) one book in the particular bookshop such that if Ben buys it, the book will ruin him financially. Under the narrow scope reading, if Ben buys (at least) one book in the bookshop, he will be broke (i.e. any book in the bookshop is so expensive that buying it will spell financial disaster for him). The predicate logic formulas corresponding to the wide scope and the narrow scope readings of the indefinite are given in (31b) and (31c), respectively.

(31)   a.   Në qoftë se Beni do   të   blejë një libër në këtë library,
            in be   that Ben FUT SUBJ buy a   book in this bookshop
            atëhere s'do të   ketë   më   asnjë grosh.
            then   not-FUT SUBJ have.he more not.one cent
            'If Ben buys one/any book in this bookshop, then he will be broke.'
       b. $\exists x[\text{book'}(x) \wedge [\text{buy'}(\text{Ben}, x) \rightarrow \text{broke'}(\text{Ben})]]$
       c. $[\exists x[\text{book'}(x) \wedge \text{buy'}(\text{Ben}, x)] \rightarrow \text{broke'}(\text{Ben})]$

In contrast, the sentence in (32a), which differs from the one in (31a) only in that the indefinite is clitic doubled, lacks the narrow scope reading for the indefinite. That is, unlike in (31a), in (32a) the indefinite must scope over the implication, as shown in (32b) (versus the unavailable narrow scope reading in (32c)), which says that the witness set of books (in that particular bookshop) contains such a member that if Ben buys that member, he will be broke. This is equivalent to the predicate logic formula in (31b) but we use the minimal witness set way to express the meaning because it explains the obligatory wide scope interpretation straightforwardly.

(32) a. Në qoftë se Beni do **ta** blejë një libër në këtë library,
in be that Ben FUT SUBJ.**CL.ACC.3S** buy a book in this bookshop,
atëhere s'do të ketë më asnjë grosh.
then not-FUT SUBJ have.he more not.one cent
'If Ben buys a certain book in this bookshop, he will be broke.'

b. ∃P[book'(P) ∧ min(P, book') ∧ ∀x[[P(x) → buy(Ben, x)] → broke' (Ben)]]

c. *[∃x[book'(x) ∧ buy'(Ben, x)] → broke'(Ben)]

Following Endriss and Hinterwimmer (2008), we take this semantic property of clitic doubled indefinites to follow from their topical interpretation. Endriss and Hinterwimmer postulate the rule in (33), where α_T is the topical quantifier, Q is the comment and min(P,α_T) is to be read as 'P is a minimal witness set of α_T'. Accordingly, our example in (23), repeated here again for ease of reference, would have the interpretation in (34): there is a minimal witness set of the quantifier *some books* and for some of the atoms in this set it holds that I read every atom last week.

(23) Javën e shkuar (i) lexova disa libra.
week.the past them$_{CL.ACC}$ read.I some books
'Last week I read some books.'

(33) ∃P[α_T(P) ∧ min(P, α_T) ∧ ∀x[P(x) → Q(x)]]

(34) ∃P[some_books'(P) ∧ min(P, some_books') ∧ ∀x[P(x) → read_last_week' (I, x)]]

This mechanism is in fact almost identical to the choice function treatment of indefinites (see e.g. Reinhart 1997, Winter 2000): it selects one of the elements from the minimal witness set of the quantifier and this element is interpreted as having wide scope over other operators in the sentence. What is new about it is that it explains the link between topicality and wide scope phenomena: if the quantifier is clitic doubled, then it is topical and receives wide scope. The reason is that the topical quantifier is interpreted as its witness set, from which one of its members is picked up via existential closure. This member is then distributed over the predicate (i.e. the focus part of the sentence).

3.4. Non-novel indefinites

In §2.3, we noted that clitic doubled indefinites, as in (18), repeated below for ease of reference, are so-called 'non-novel' indefinites (Krifka 2001).

(18) a. Do t**a** pija me kënaqësi një uiski.
FUT SUBJ.**CL.ACC.3S** drink with pleasure a whisky

b. To pino exfaristos ena ouiskáki. (Kazasis & Pentheroudakis 1976:399)
it$_{CL.ACC}$ drink with pleasure a whisky
'I would gladly drink a whisky.'

Contra Heim's (1982) view, Krifka (2001) argues that indefinites may pick up discourse referents that exist in the input context. For a discourse referent to exist in the input context, it must either have been mentioned before in the immediate context, or its existence must in some way be presupposed (e.g. through sensory salience, via world knowledge, or typically through accommodation). Crucially, such non-novel indefinites must be deaccented, an idea that is in

tune with the well-known observation that across languages, 'given' (and therefore topical) information systematically correlates with lack of phonetic prominence (Ladd 1980, Schwarzschild 1999 and references therein). For Krifka, primary evidence for non-novel indefinites stems from adverbial quantification in connection with the so-called 'requantification problem' (Rooth 1985, 1995, von Fintel 1994), whereby the domain of quantification is given by the deaccented indefinite, which forces the assumption that indefinites may pick up existing discourse referents and 'requantify' over them, as illustrated in (35) (examples from Krifka 2001).

(35) a. A freshman usually wears a báseball cap.
        'Most freshmen usually wear a baseball cap.'
     b. A fréshman usually wears a baseball cap.
        'Most wearers of baseball caps are freshmen.'

That the clitic doubled indefinites in the sentences in (18) are non-novel is supported by several diagnostics. First, they are deaccented (i.e. the nuclear pitch accent cannot be borne by the clitic doubled expressions). Secondly, the clitic doubled indefinite in either sentence picks up a discourse referent whose existence in the input context is obviously presupposed, as can be seen by the fact that the sentences in (18) can be uttered felicitously in either of the contexts in (36). Finally, while the clitic doubled indefinite in (18a,b) functions as a kind of quotation in the context of (36a), it stands in a part-whole relationship with the indefinite 'a drink' in (36b), and is presupposed through accomodation in the context of (36c).

(36) a. What about a whisky? / Would you like a whisky?
     b. What about a drink? / Would you like a drink?
     c. I have just stepped out of work.

Looking back at the 'requantification' sentences in (35) from the perspective of topics interpreted as minimal witnesses, we immediately see a problem. Deaccented indefinites in the examples are not interpreted as we would expect: (35a) according to our assumptions would claim that there is a witness of the set of freshmen who usually wears the baseball hat, which of course contradicts the meaning the sentence has. This problem can be resolved by the assumption that quantificational adverbs like *usually* quantify over pairs of situations and specify to which degree the situations denoted by the topical phrase are contained in the situation denoted by the rest of the sentence. In other words, (35a) means that most situations containing a freshman are situations with the freshmen wearing a baseball cap. The set of situations containing the denotation of the topical noun phrase is called *indirect aboutness topic* by Endriss and Hinterwimmer (2008) because the topical expressions identify the set of the situations and is the real topic of the sentence over which the quantificational adverb ranges.

4. Summary and conclusion

In this paper, we have provided a formal semantic analysis of direct object clitic doubling in Albanian, which confirms and renders precise previous intuitions about this phenomenon (Kallulli 2000, 2008). Specifically, we have shown that clitic doubled direct object DPs must be interpreted as generating admissible minimal witnesses, which in turn makes these DPs topical. We consider clitic doubling to be a syncategorametic strategy for marking the clitic doubled DPs as topical, which renders weak quantifiers (at least in their narrow scope interpretation) and monotone decreasing quantifiers ungrammatical with clitic doubling, as these quantifiers

cannot be interpreted as topics (in the sense of topics being interpreted as minimal witness sets). In some cases, though, namely those involving the DPs headed by the strong determiners *çdo* 'every', *secilin* 'each', *të shumtët* 'most', and *asnjërin* 'neither (one of)'/'none (of)', this purely algebraic approach must be supported by a presuppositional analysis of quantifiers. Finally, future work will have to deal with whether and to what extent this analysis can also account for clitic doubling of dative DPs, which is obligatory in all possible contexts in this language.

References

Adger, David. 2003. *Core syntax: A minimalist approach*. Oxford: Oxford University Press.

Anagnostopoulou, Elena. 1994a. *Clitic dependencies in Modern Greek*. Doctoral dissertation, Salzburg University.

Anagnostopoulou, Elena. 1994b. On the representation of clitic doubling in Modern Greek. *EUROTYP Working Papers*, Theme Group 8, 5:1–66.

Anagnostopoulou, Elena, and Anastasia Giannakidou. 1995. Clitics and prominence, or why specificity is not enough. *Chicago Linguistics Society* 31:1–14.

Barwise, Jon, and Robin Cooper. 1981. Generalized quantifiers and natural language. *Linguistics and Philosophy* 4:159–219.

Cresti, Diana. 1995. *Indefinite topics*. Cambridge, MA: MIT dissertation.

Diesing, Molly. 1992. *Indefinites*. Cambridge, MA: MIT Press.

Dobrovie-Sorin, Carmen. 1990. *The syntax of Romanian*. Berlin: Mouton de Gruyter.

Endriss, Cornelia. 2009. *Quantificational topics*. Dordrecht: Springer.

Endriss, Cornelia, and Stefan Hinterwimmer. 2008. Direct and indirect aboutness topics. *Acta Linguistica Hungarica* 55(3–4):297–307.

Farkas, Donka. 1978. Direct and indirect object reduplication in Rumanian. *Papers from the Seventeenth Regional Meeting of the Chicago Linguistics Society* 14:88–97.

Gutiérrez-Rexach, Javier. 1999. The formal semantics of clitic doubling. *Journal of Semantics* 16(4):315–380.

Hedberg, Nancy. 2006. Topic-focus controversies. *The architecture of focus*, ed. by Valeria Molnar and Susanne Winkler. Berlin: Mouton de Gruyter.

Heim, Irene. 1982. *The semantics of definite and indefinite noun phrases*. Amherst, MA: UMass dissertation.

Heim, Irene, and Angelika Kratzer. 1998. *Semantics in generative grammar.* Oxford: Blackwell.

Jaeggli, Oswaldo. 1982. *Topics in Romance syntax*. Dordrecht: Foris.

Kadmon, Nirit. 1985. The discourse representation of noun phrases with numeral determiners. *Proceedings of NELS 15*, ed. by Stephen Berman, Jae-Woong Choe and Joyce McDonough. Amherst, MA: GLSA.

Kallulli, Dalina. 1995. *Clitics in Albanian*. [University of Trondheim Working Papers in Linguistics 24.] Dragvoll: University of Trondheim.

Kallulli, Dalina. 2000. Direct object clitic doubling in Albanian and Greek. *Clitic phenomena in European languages*, ed. by Frits Beukema and Marcel den Dikken, 209–248. Amsterdam: John Benjamins.

Kallulli, Dalina. 2008. Clitic doubling, agreement, and information structure. *Clitic doubling in the Balkan languages*, ed. by Dalina Kallulli and Liliane Tasmowski, 227–255. Amsterdam: John Benjamins.

Kallulli, Dalina, and Liliane Tasmowski (eds.) 2008. *Clitic doubling in the Balkan languages*, 1–32. Amsterdam: John Benjamins.

Kamp, Hans, and Uwe Reyle. 1993. *From discourse to logic*. Dordrecht: Kluwer Academic Publishers.

Kayne, Richard. 1975. *French syntax*. Cambridge, MA: MIT Press.

Kazazis, Kostas, and Joseph Pentheroudakis. 1976. Reduplication of indefinite direct objects in Albanian and Modern Greek. *Language* 52:398–403.

Keenan, Edward. 1996. The semantics of determiners. *The handbook of contemporary semantic theory*, ed. by Shalom Lappin, 41–63. Oxford: Blackwell.

Krifka, Manfred. 2001. Non-novel indefinites in adverbial quantification. *Logical perspectives on language and information*, ed. by Cleo A. Condoravdi and Gerard Renardel de Lavalette, 1–40. Stanford, CA: CSLI Publications.

Ladd, Robert. 1980. *The structure of intonational meaning: Evidence from English*. Bloomington: Indiana University Press.

Ladusaw, William. 1982. Semantic constraints on the English partitive construction. *Proceedings of the First West Coast Conference on Formal Linguistics*.

Lumsden, Michael. 1988. *Existential sentences*. London: Croom Helm.

Montague, Richard. 1973. The proper treatment of quantification in ordinary English. *Approaches to natural language*, ed. by Jaakko Hintikka, Julius Moravcsik and Patrick Suppes, 221–242. Dordrecht: Foris.

Reinhart, Tanya. 1981. Pragmatics and linguistics. An analysis of sentence topics. *Philosophica* 27:53–94.

Reinhart, Tanya. 1997. Quantifier scope: how labour is divided between QR and Choice Functions. *Linguistics and Philosophy* 20:335–397.

Rooth, M. 1985. *Association with focus*. Amherst, MA: UMass dissertation.

Rooth, Mats. 1995. Indefinites, adverbs of quantification and focus semantics. *The generic book*, ed. by Gregory N. Carlson and Francis Jeffry Pelletier, 265–291. Chicago: Chicago University Press.

Schwarzschild, Roger. 1999. GIVENness, AvoidF and other constraints on the placement of accent. *Natural Language Semantics* 7:141–177.

Sportiche, Dominique. 1996. Clitic constructions. *Phrase structure and the lexicon*, ed by Johan Rooryck and Laurie Zaring, 213–87. Dordrecht: Kluwer.

Strawson, Peter. 1974. *Subject and predicate in logic and grammar*. London: Methuen.

Suñer, Margarita. 1988. The role of agreement in clitic doubled constructions. *Natural Language and Linguistic Theory* 6:391–434.

Szabolcsi, Anna. 1997. Strategies for scope taking. *Ways of scope taking*, ed. by Anna Szabolcsi, 109–154. Dordrecht: Kluwer.

Szabolcsi, Anna. 2010. *Quantification*. Cambridge: Cambridge University Press.

Von Fintel, Kai. 1994. *Restrictions on quantifier domains*. Amherst, MA: UMass dissertation.

Winter, Yoad. 2000. What makes choice natural? *Reference and anaphoric relations*, ed. by Urs Egli and Klaus von Heusinger. Dordrecht: Kluwer.

Indicative and subjunctive mood in complement clauses: from formal semantics to grammar writing

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1. Introduction
1.1. The approach

The approach adopted in this paper is that of a 'big grammar', in the manner of Bosque & Demonte 1999, Renzi-Salvi-Cardinaletti 2001, Solà et al. 2002, and Huddleston & Pullum 2002, for Spanish, Italian, Catalan, and English, respectively. Such grammars, while relying on the findings of formal studies, contain no or very little formalization, in order to enhance readability. Instead, they search for maximum generalization, aiming at a level of description where linguists can understand each other, independently of their choice of a particular theory or grammatical framework. Moreover, given that they claim responsibility towards the data, which are not homogeneous (see for instance, regional variation, presence of the remains of an older stage of the language), they allow for multi-factorial analyses, that is, the analysis of a part of the grammar can appeal to different factors, not only an interaction of syntax, semantics and pragmatics, but also (incomplete) historical changes, grammaticalization, and preferences among competing forms. The use of the subjunctive mood in French is a case in point. Although it is the locus of much variation across speakers, we will concentrate here on its use in standard French (leaving aside regional and social variation, which requires a specific investigation), more precisely on its use in complement clauses, where the alternation with the indicative is made clear. Even within these limits, we find that the distribution of the indicative and the subjunctive moods cannot be explained by one general principle.

1.2. The problem

Finite complement clauses in French allow for two personal moods: indicative and subjunctive.[1]

(1)   Paul **sait** que nous {**sommes**IND / *s**oyons**SUBJ } là.
        Paul knows that we are here

---

[1]The mood (IND for indicative, SUBJ for subjunctive) is indicated as indices; CPAST is for compound past, PRES for present, IMP for imperfect past, and FUT for future.

(2) Paul **veut** que nous {**soyons**SUBJ /***sommes**IND } là.
     Paul wants that we be here

The distribution appears to be semantically motivated: each mood is associated with a stable set of verbs across languages (such as Romance and Germanic languages) which have both moods (Farkas 1992), while other classes of predicates show variation. Moreover, it is largely accepted that the use of the indicative can roughly be described as follows:

(3) The indicative mood is appropriate when the clause expresses a proposition
     corresponding to an agent's belief.

The use of the subjunctive is less clear, given that, besides verbs of desire (2), there are contexts such as those in (4) and (5), which seem to fulfill condition (3), and which are in the subjunctive. So, at best, (3) is a necessary but not a sufficient condition for the occurrence of the indicative. So, what is the condition licensing the subjunctive?

(4) Les interventions gouvernementales ont évité que les banques **fassent**SUBJ faillite.
     Government interventions have avoided that the banks go brankrupt

(5) Il est normal que les gouvernements **aient**SUBJ aidé les banques.
     It is normal that the governments rescued the banks

Moreover, there are contexts (polarity contexts) where both moods occur without a meaning difference: how do we reconcile such a fact with the idea that the distribution of the moods is semantically motivated? There are different proposals in the literature:

- The mood distribution is, in fact, not semantically motivated (e.g. Gross 1978).
- The subjunctive is semantically heterogeneous (e.g. Soutet 2000); in particular, it has been proposed that while the indicative is motivated, the subjunctive occurs when the indicative is not possible (e.g. Korzen 2003, Schlenker 2005).
- The distribution is semantically motivated, but each mood is not associated with its own constraint; rather, it is a shift from a context allowing for one mood to a context allowing for the other one, which motivates the alternation (e.g. Quer 2001).
- Each mood is associated with its own condition, but there are other constraints at work (e.g. Farkas 1992, 2003, Giorgi & Pianesi 1997).

Our proposal is closest to Farkas'. Its components are as follows:

(a) Each mood is associated with its own motivation condition. Their definition is more pragmatically oriented than is usually proposed.
(b) The two conditions do not exclude each other: there are contexts where they are both met.
(c) Other factors come into play, which can blur the effect of the conditions (a principle for the distribution of the two moods in a given language, grammaticalization of a mood, preferences).

2. Classification of the data

The distribution of the moods in complement clauses is summarized in the figure below.

```
                    mood in complement clauses in French
              /                                              \
   selected by the head predicate                  both moods are possible
        /           \                          /              |            \
   indicative    subjunctive       meaning differences   mixed pred.   polarity mood
```
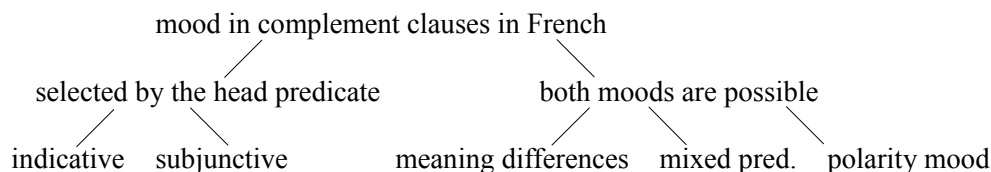
We start with the predicates which clearly select for a complement clause in a given mood in standard French. The data are known. We summarize them, basing our classification on semantic domains, which are neutral with respect to the problem at hand. The predicates selecting an indicative complement belong to three semantic classes. Although they belong to the same classes, we mention apart a few verbs (class (iv)), because they raise a difficulty when one aims at an exact definition of the condition allowing for the indicative. They have a futurate orientation (see Laca 2011): that is, their infinitival complement describes a situation posterior to that described by the head verb (9); their finite complement is usually in the future or conditional (= future of the past) tense (10); when it is in the past it denotes a result state (11a), and when in the present tense, it indicates epistemic uncertainty about the reality of the situation denoted by the complement (11b).

(i) communication: *affirmer* 'claim', *annoncer* 'announce', *dire* 'say', *écrire* 'write', *informer* 'inform', *prétendre* 'pretend', *faire l'annonce* 'make the announcement'. The complement denotes the content of the communication; there is no constraint on the respective time of the complement and the head situations.

(6)   Paul affirme {qu'il est$_{PRES}$ là / qu'il était$_{IMP}$ là / qu'il sera$_{FUT}$ là}.
        Paul claims that he is / was / will be there

(ii) belief, knowledge, and reasoning: *croire* 'believe', *juger* 'judge', *savoir* 'know', *persuader* 'persuade', *montrer* 'show', *être d'accord* 'agree', *se souvenir* 'remember'; *il échappe à* 'it escapes', *il s'ensuit* 'it follows', *il se trouve* 'it happens/turns out'; *clair* 'clear', *exact* 'exact', *évident* 'evident', *vrai* 'true'; *avoir l'intuition, l'idée, l'impression* 'to have the intuition/idea/impression'. These predicates are usually considered to describe propositional attitudes. They do not constrain the relative time of the two situations.

(7)   {Le professeur pense / Il est clair} que les élèves {sont / étaient / seront} sérieux.
        The teacher thinks / It is clear that the students are / were / will be serious-minded

(iii) perception: *entendre* 'hear', *percevoir* 'perceive', *sentir* 'feel/smell', *subodorer* 'scent', *voir* 'see'. Besides a finite complement, these verbs can also take an infinitival. With the infinitive, they denote physical perception (although sometimes indirect), while the operation is more abstract with a finite complement (Miller & Lowrey 2003). Nevertheless, at least in some cases, these verbs remain verbs of perception in that perception remains the source of the knowledge. They also do not constrain the relative time of the two situations.

(8) Le professeur subodore que les élèves {ne comprennent$_{PRES}$ pas / n'ont pas fait$_{CPAST}$ leur travail / ne feront$_{FUT}$ pas leur travail}.
The teacher feels that the students do not understand / have not done their homework / will not do their homework

(iv) verbs with a futurate orientation: *prédire* 'predict', *prévoir* 'foresee', *anticiper* 'anticipate', *promettre* 'promise', *décider* 'decide'.

(9) a. Nous avons {promis / décidé / prévu} d'aller vous voir.
We promised / decided / planned to go and see you
     b. Nous anticipons d'aller vous voir.
We anticipate going to see you

(10) Nous avons décidé que nous arrêterons$_{FUT}$ ce travail en début d'année.
We have decided that we will stop this work at the beginning of the year

(11) a. Nous décidons que nous en avons assez fait$_{CPAST}$ pour aujourd'hui.
We decide that we have done enough for today
      b. Nous {prédisons / prévoyons / ?anticipons} que nous sommes visés$_{PRES}$ par cette mesure.
We predict / foresee / anticipate that this measure applies to us

While the classification of the predicates taking an indicative complement is well accepted, there is no such consensus regarding those taking a subjunctive complement. They are varied (and more numerous than those selecting for an indicative; Gross 1978). Using distinctions based on semantic domains, we find modals (whatever their interpretation) (but see below §4.2), predicates denoting different attitudes of an agent (generally corresponding to the subject), or an action. Moreover, there are some predicates which are not easily grouped with others in terms of semantic domains; we mention them together here as class (viii).

(v) Modals: *il se peut* 'it may be the case', *possible* 'possible', *impossible* 'impossible'; *il faut* 'must', *nécessaire* 'obligatory'.

(12) a. Il faut que tu aies lu$_{CPAST}$ ce texte avant mardi.
You must have read this text before Tuesday
      b. Il est possible que vous rendiez$_{PRES}$ votre devoir demain.
It is possible that you hand in your homework tomorrow

(13) Il se peut qu'il soit venu$_{CPAST}$ et que nous n'en ayons rien su.
It is possible that he came without us knowing

(vi) Attitudes: (vi-a) Will and desire: *vouloir* 'want', *désirer* 'want, desire', *souhaiter* 'wish', *avoir envie* 'would like', *permettre* 'allow', *consentir à ce que* 'consent', *se résoudre à ce que* 'resign oneself', *condescendre à ce que* 'condescend', *tenir à ce que* 'be attached', *être prêt à ce que* 'be ready'.

(14) a. Le patron {voulait / souhaitait} que le travail soit fini$_{CPAST}$ le lendemain.
The boss wanted / wished that the job be finished for the following day

b. Paul souhaite que Marc ait été reçu_{CPAST} (mais il n'en sait rien).
Paul would like it that Marc passed his exam (but he does not know the result)

(vi-b) Evaluatives:

- factives: *regretter* 'regret', *se réjouir* 'be happy', *normal* 'normal', *bizarre* 'bizarre', *ému* 'moved', *étonné* 'surprised'
- non-factives: *craindre* 'be afraid', *redouter* 'dread', *préférer* 'prefer', *avoir intérêt à ce que* 'it had better be', *aimer (à ce) que* 'to like', *détester* 'hate'

(15) C'est drôle par ici, c'est tout plus grand que vers chez nous, c'est un quartier plus riche, c'est même bizarre que ça ne soit pas payant, tellement c'est joli … (P. Cauvin, *Monsieur Papa*, 1976, p. 170, Frantext)
It is funny around here, everything is bigger than around our place, it's a richer part of town, it's even bizarre that we don't have to pay, it's so pretty …

(16) Paul {regrette / craint} {que tu ne viennes pas / que tu ne sois pas allé au rendez-vous}.
Paul regrets / is afraid that you won't come / that you did not go to the meeting

(vi-c) Negative attitudes (communication, reasoning): *nier* 'deny', *douter* 'doubt', *contester* 'question', *douteux* 'doubtful', *exclu* 'excluded', *faux* 'false'.

(17) a. Je doute que je puisse_{SUBJ-PRES} venir / que cela ait été dit_{SUBJ-CPAST}.
b. *Je doute que je peux_{IND-PRES} venir / que cela a été_{IND-CPAST} dit.
I doubt that I will be able to come / that this has been said

(vii) Action verbs: (vii-a) Mandatives: *demander* 'ask', *demander à ce que* 'ask', *exiger* 'demand', *ordonner* 'order', *suggérer* 'suggest', *permettre* 'allow', *proposer* 'propose', *obtenir* 'obtain, manage'.

(18) On demande que le rapport soit terminé mardi.
We require that the report be finished by Tuesday

(vii-b) Causatives:

- implicative: *faire* 'make it so that', *empêcher* 'prevent', *éviter* 'avoid', *s'arranger pour que* 'manage', *réussir à ce que* 'succeed', *veiller à ce que* 'ensure'
- non-implicative: *essayer que* 'try', *s'employer à ce que* 'to apply oneself', *s'opposer à ce que* 'to be opposed', *viser à ce que* 'aim', *chercher à ce que* 'act so that'

(19) a. On s'est arrangés pour que Paul soit là à la reunion.
We managed to have Paul there for the meeting
b. On s'arrangera pour que Paul soit arrivé au moment où on en a besoin.
We will manage so that Paul will have arrived when we need him

(viii) Miscellaneous:

- certain verbs of belief and reasoning: *s'attendre à ce que* 'expect', *envisager* 'consider'

- verbs describing a course of action: *s'engager à ce que* 'commit oneself to', *s'exposer à ce que* 'expose oneself', *en arriver à ce que* 'to come to', *attendre que* 'wait'
- habituals: *il arrive que* 'it may be the case', *être habitué à ce que* 'be used to', *s'habituer à ce que* 'get used to'

There is a certain amount of arbitrariness in the classification, because predicates usually correspond to bundles of semantic features. For example, predicates of will and desire are related to mandatives (if people ask for something, it is usually because they want it); yet they differ from them in describing mental attitudes rather than actions (hence, they are stative). It is worth noting that these predicates are not homogeneous syntactically either. They usually take a complement clause introduced by *que*, but, in some cases, the complement may also be introduced by *à/de ce que* (*demander que / à ce que* 'ask', *s'attendre que / à ce que* 'expect', *se réjouir que / de ce que* 'be happy'), or must be so introduced (the complex complementizer is mentioned in the lists).

Many are stative, but not all of them. Modals and predicates of will and desire are stative (#*Il est en train d'être possible que Paul vienne*, 'It is being possible that Paul come', #*Paul est en train de vouloir que la commission prenne une décision*, 'Paul is wanting that the committee make a décision'), as well as most psychological verbs (#*Paul est en train de craindre que tu ne puisses pas venir* 'Paul is being afraid that you will not be able to come'). The others are not, except for adjectives (*Paul est en train de proposer que nous arrêtions le projet* 'Paul is proposing that we stop the project'; *Paul est en train de s'arranger pour que nous puissions venir* 'Paul is seeing to it that we may come').

Most of them are not factive, but some are: some evaluatives (such as *regretter*, see class (vi-b)). Moreover, some are implicative (the positive sentence implies the complement, the negative sentence implies the negation of the complement – or the reverse with negative verbs *empêcher, éviter*), see class (vii-b).

They are not homogeneous with respect to temporal orientation. Mandatives (class (vii-a)) and causatives (class (vii-b)) are futurate. Thus, the complement can contain an adverb denoting a time posterior to the situation of the head verb; if the subjunctive is past, it denotes a result, anterior to the time denoted by the adverb, but still posterior to that of the head verb as in (18) and (19). Modals and predicates of will and desire have two possibilities (Laca 2011). Modals are futurate if they have a deontic interpretation ((12) is parallel to (18) and (19)), while there is no temporal orientation if they are epistemic, and they indicate epistemic uncertainty if the subjunctive is in the past (13), like predicates of class (iv). Predicates of will and desire are generally futurate (see (14a)), but some (such as *souhaiter*) admit the two interpretations (deontic and epistemic uncertainty) with the past, as in (14a,b). On the other hand, evaluative and negative predicates (the latter belong to semantic classes which select the indicative) are not temporally oriented (see (15)–(17)).

3. Semantico-pragmatic conditions on mood selection
3.1. Condition on the indicative

On the basis of the classification in the preceding section, we formulate the condition on the motivation of the indicative mood as in (20).

(20) **Condition on the motivation of the indicative mood**
The indicative mood is motivated in a complement clause if the combination of the head and complement clauses is such that, when the tenses allow for an overlap of the two

situations (described by the head and the embedded clauses), the embedded clause expresses a proposition to the truth of which an agent is committed.

Although in line with (3), the definition in (20) is a bit more complicated. Note first that we do not relativize the condition to predicate classes, which are taken into account indirectly, by the effect they have on the interpretation of the complement clause: verbs of communication, of perception and propositional attitudes have in common that the complement clause expresses a proposition with an independent truth value; in addition, at least when the head clause is positive and declarative, they imply that an agent is committed to the truth value of this proposition. In general, this agent is denoted by the subject of the head verb: it is the (entity denoted by the) subject of *affirmer, penser, subodorer* in (6)–(8), *décider, prédire, prévoir, anticiper* in (10) and (11), who is committed to the truth of the proposition. In such cases, the speaker is not involved in the commitment. In other cases, the speaker himself is the agent rather than the subject, as for instance, with verbs such as *ignorer* 'ignore', *oublier* 'forget'; in still other cases, the predicate implies that the subject is committed but is not to be believed, as with *s'imaginer* 'imagine', *prétendre* 'claim' (see Soutet 2000:60). With an impersonal construction, the agent is either realized by an argument of the impersonal verb (21a), or contextually specified. It may be identified with the subject of a higher clause whose verb belongs to the same classes (21b), or it corresponds to the speaker (21c), or it can be enlarged to discourse participants, or people in general (21d).

(21) a.   Il lui / nous semble évident que le niveau de vie a augmenté.
           It seems to him/us that the standard of living has improved
      b.   Paul pense qu'il est évident que le niveau de vie a augmenté.
           Paul thinks that it is evident that the standard of living has improved
      c.   Il est évident que le niveau de vie a augmenté. Tu es bien d'accord ?
           It is evident that the standard of living has improved. You agree, I suppose
      d.   Il est évident que le niveau de vie a augmenté. Personne ne dira le contraire.
           It is evident that the standard of living has improved. Nobody will disagree

The reason why the condition cannot simply refer to the head predicates is that the mood may change if the predicate is negated or occurs in an interrogative clause (see (22) and below §4.3). On the other hand, it is not possible either to simply refer to the interpretation of the embedded clause. The reason is that there are cases where the interpretation of the whole sentence does not imply the existence of an agent committed to the truth of the embedded clause, as when the head predicate is in a modal environment (23). Hence, we must take into account the interpretation induced by the properties of the head clause (where the infinitival VP in (23a) counts as a clause). However, the influence of the context remains local, and does not go further than the clause containing the head predicate.

(22) Je ne crois pas que nous en {sommes$_{IND}$ / soyons$_{SUBJ}$} capables.
      I don't think that we are capable of this

(23) a.   Paul {peut / doit} penser que le niveau de vie {a$_{IND}$ / *ait$_{SUBJ}$} augmenté.
           Paul may / must think that the standard of living has improved
      b.   Il est possible que Paul dise que le niveau de vie {a$_{IND}$ / *ait$_{SUBJ}$} augmenté.
           It is possible that Paul says that the standard of living has improved

The semantico-pragmatic condition holds in a certain tense configuration, when the situation described by the complement and that described by the head clause overlap in time. This is aimed at integrating the futurate predicates (class (iv)) in the system: it is difficult to be committed to the truth of a proposition when it can only be realized in future time. Fortunately, these predicates are compatible with environments where the two situations overlap, so that the condition can be met. For instance, in (24), the predicates evaluate a property of a situation which is concomitant with the judgment although it can only be verified in the future.

(24)   Nous avions {décidé / anticipé / promis} que le travail pouvait$_{IND}$ être fait en deux jours. Et nous nous étions trompés !
        We had decided / anticipated / promised that the job could be done in two days. And we were mistaken

3.2. Condition on the subjunctive

Broadly speaking, the subjunctive mood is appropriate when the interpretation requires taking into account the possibility of *non-p* along with that of *p*. To interpret a sentence such as *Il est possible que Paul vienne* 'It is possible that Paul come', with a subjunctive, one must take into account situations in which Paul comes as well as situations in which Paul does not come. This is part of what the modal *il est possible* tells you. On the other hand, the interpretation of a sentence such as *Jean pense que Paul va venir* 'Jean thinks that Paul will come', with an indicative, does not require that one take into account situations in which Paul does not come. This is in essence the proposal in Farkas 1992, 2003 and Giorgi & Pianesi 1997. We return below to the definition of the condition. That such a condition is at work is evident with most of the predicates mentioned above as taking a subjunctive complement. It is inherent in the definition of modals (in a general way) (class (v)). With predicates of will and desire (class (vi-a)) and mandatives (class (vii-a)), the condition is met, since the situation described in the complement does not obtain, and nothing guarantees that the reality will conform to will or order. Negative predicates (class (vi-c)) differ from their positive counterparts in classes (i) and (ii) precisely in that the inherent negation requires comparing *p* and *non-p* (favoring *non-p*) (class (vi-c)).

Evaluatives (class (vi-b)) and causatives (class (vii-b)) deserve some comment. They have been a topic of interest in the study of mood in complement clauses in Romance languages in general (see in particular Farkas 1992, Quer 2001): they are evidence that the distribution of the moods cannot be assimilated to a broad distinction between realis (which would lead to indicative) and irrealis (which would lead to subjunctive) environments. Some evaluatives are factives (*regretter* 'to regret', *normal* 'normal'), and some causatives (*réussir* 'succeed', *empêcher* 'prevent') are implicatives; hence their complement describes a realis situation, yet they require the subjunctive. Similarly, they show that there is no simple solution in terms of the content types for complement clauses (Ginzburg & Sag 2000). Predicates whose complement denotes an outcome certainly require the subjunctive (will and desire, mandatives and causatives), and the complement of predicates taking the indicative denotes a proposition. However, the complement of evaluatives (*normal*), as well as negative attitudes (*douteux*), and modals (*possible*), which also take a subjunctive complement, denotes a proposition, just like that of predicates taking an indicative complement.

The analysis for evaluatives is as follows: the evaluation itself supposes a comparison between *p* and *non-p*. Simply put, one cannot regret or be happy that some situation is the case, or judge that a situation is normal, without thinking that things could have been different. Similarly with the non-factive predicates 'dread', 'prefer', 'like' etc. It is precisely the fact that

their interpretation requires a comparison between situations which differentiates this class from the predicates of judgment with an indicative complement (class (ii)). This is essentially the proposal in Villalta 2008 (see also Leeman 1994). We differ from Villalta in simplifying the process of comparison. Instead of having sets of alternative situations (or possible worlds) that are ranked according to their conformity to the description in the complement clause, we propose that it is sufficient to contrast *p versus non-p*.

Causatives are a different matter. One could say that negative causatives (*empêcher* 'prevent', *éviter* 'avoid', *s'opposer à ce que* 'to be opposed'), because they include a negation, are like the negative predicates of communication and judgment (class (vi-c)): they compare *p* and *non-p*. The agent acts in such a way that a possible situation (described by the *p* complement) does not get realized (this corresponds to *non-p*). This is not inaccurate, but does not cover the positive ones. In fact, causatives resemble predicates of will and desire. Certainly, they are action verbs rather than attitudes. But predicates such as *faire que* 'make it so that', *s'arranger pour que* 'manage', or *chercher à ce que* 'act so that' describe a change of state: they are transitional, that is, they describe a process whose end is a change of situations, starting with a situation described by *non-p*, and ending with a situation described by *p*. Of course, negative causatives do not describe the effectuation of a change, but their interpretation requires taking such a change in consideration.

The last difficulty is raised by modals describing circumstantial necessity, such as *il est nécessaire* 'it is necessary' in (25). Such uses of modals describe how things are, and could not be otherwise. Modals of circumstantial necessity contrast clearly with the habituals in the miscellaneous class (viii), which either indicate that a situation holds sometimes but not always (*il arrive que* 'it may be the case') or are transitional (*s'habituer à ce que* 'get used to', *être habitué à ce que* 'be used to'): getting used to or being used to a certain situation implies a period when this was not the case. One could suggest that modals of circumstantial necessity take into account both *p* and *non-p* in that they are broadly equivalent to 'not possible that *non-p*'.

(25)   a.   Il est nécessaire que la somme des angles d'un triangle {fasse$_{SUBJ}$ / *fait$_{IND}$} 180°.
            It is necessary that the sum of the angles of a triangle amount to 180°
        b.   Il est nécessaire que le médecin soit arrivé puisque sa voiture est dans la cour.
            It is necessary that the doctor is arrived, since his car is in the yard

However, such reasoning seems rather fragile: there is no principled limit to its application. Why should an expression such as 'think that *p*' not be equivalent to 'not think that *non-p*'? The relevant question is different, and shifts the analysis from semantics to pragmatics. We must ask what brings a speaker to say *il est nécessaire que p* rather than simply say *p*. That is, the speaker could have said (26) instead of (25).

(26)   a.   La somme des angles d'un triangle fait 180°.
            The sum of the angles of a triangle amounts to 180°
        b.   Le médecin est arrivé puisque sa voiture est dans la cour.
            The doctor is arrived, since his car is in the yard

Sentences in (25) and (26) refer to exactly the same situations. Thus, the difference does not concern reference: it is a matter of interaction. Behind the assertions in (25) there is a deduction: (25a) can be used as a step towards a conclusion, for instance to show to a child where his demonstration fails, and (25b) is not appropriate except as an argument used to convince a discourse participant of the reality of the situation; in this respect, its argumentative

force is stronger than that of the non-modalized (26b) (although the latter also contains the justification of the main clause), and the two sentences cannot be used in the same contexts. We conclude that an essential aspect of the use of the subjunctive is this interactive and deductive facet, even if, in many cases, the use of the mood can be presented in a simplified way (as a straightforward semantic matter).

Accordingly, while the condition on the subjunctive is usually written in semantic terms, we propose to formulate it as a pragmatic condition as in (27).

(27) **Condition on the motivation of the subjunctive mood**
The subjunctive is motivated when the speaker takes into account the fact that there may exist an agent who believes that *non-p* is possible.

Thus, in our analysis, it is not only the condition on the indicative which is pragmatic in that it appeals to an agent's commitment, but also the condition on the subjunctive which relies on a speaker being in an argumentative environment. In this, our proposal differs from all the existing ones.

3.3. The distribution of the two moods in French

It is not enough to state the semantico-pragmatic conditions which motivate the occurrence of the moods. One of the properties of these two conditions is precisely that they are not in complementary distribution: there are cases where both conditions are met. It is precisely what characterizes the class of evaluatives, at least the factive ones, as suggested in Farkas (1992). In (28) (= (15)) the speaker is committed to the truth of the proposition 'One does not have to pay to visit this part of town' (condition (20) is met), while at the same time s/he judges that one would expect things to be different, and by this evaluation introduces *non-p* ('one must pay to visit this part of town') (condition (27) is met).

(28) C'est drôle par ici, c'est tout plus grand que vers chez nous, c'est un quartier plus riche, c'est même bizarre que ça ne soit$_{SUBJ}$ pas payant, tellement c'est joli … (P. Cauvin, *Monsieur Papa*, 1976, p. 170, Frantext)
It is funny around here, everything is bigger than around our place, it's a richer part of town, it's even bizarre that we don't have to pay, it's so pretty …

If the complement clause of these predicates meets both conditions, we would expect that they are compatible with both moods. Indeed, this is what we find in Romanian, as shown in (29).[2] Since they require the subjunctive in the complement clause in (standard) French, it is necessary to add a rule for the distribution of the two moods. The motivation for the two moods can be the same in the two languages, but the rule which distributes them is different.

(29) Ion se bucură {**că vii**$_{IND}$ / **să vii**$_{SUBJ}$} la petrecere.
Ion is happy that you come to the party

(30) **Principle of distribution of the moods in French** (when the mood is motivated)
The complement clause is
(a) in the indicative if condition (20) is met and not condition (27);
(b) in the subjunctive if condition (27) is met (which allows for both (20) and (27) being met).

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[2]Thanks to G. Bîlbîie and A. Mardale for pointing out this fact to me.

By distinguishing between the semantico-pragmatic conditions on moods and the way a particular language sets the divide between their actual occurrences, we follow the methodology chosen by Giorgi and Pianesi, although the general picture (they aim at accounting for mood realization in Romance and Germanic languages in general) and the modelization (they use a model theoretic approach, where the conditions on the moods are not a priori compatible) are very different.

Since in most approaches the conditions are defined so that they are incompatible, let us emphasize our motivation. Our proposal contrasts particularly with analyses where only one mood is motivated, the other one being found in all the environments where the other one is not possible, as in Hopper 1995, Korzen 2003, Schlenker 2005. Hopper draws a classification of English predicates, which he applies to the problem of mood in complement clauses in Spanish, and which Korzen applies to French. Predicates which subcategorize for an indicative complement are said to be 'assertive', while all the others subcategorize for a subjunctive one. Leaving aside the speech act flavor of the term (as is largely accepted, it is whole utterances which are taken into account by speech acts, not part of them), this amounts to saying that the indicative complements denote a non-presupposed proposition to the truth of which an agent is committed. Subjunctive complements denote a presupposed proposition, or one to which no agent is committed (the matrix predicate is negated, or is a modal), or (we can add) is an outcome. What is crucial for us is the following: an analysis which supposes that one of the moods is legitimate when the other one is not fails to account for cases where both moods can occur without meaning differences, that is, the cases which we treat as mixed predicates (see §4.2, and evaluatives, which behave differently in French and Romanian, and allow for both moods in Romanian as in (29)). One advantage of our proposal is that mood variation, both within a language and between languages (specially among Romance languages) is expected in such environments.

While the two conditions can be met at the same time, still they entertain a certain relation: if the condition on the indicative is not met, then the condition on the subjunctive automatically applies. Consequently, the two moods cover the range of finite complement clauses.

Although it is difficult to find independent evidence, it seems that the verbs of reasoning and action in the miscellaneous classes (viii) contrast in this respect with verbs of class (ii) and (iv) in that there is no agent committed to the truth of the embedded proposition: *envisager* ('consider') contrasts with *penser* ('think'), *s'attendre à ce que* ('expect') contrasts with *croire* ('believe'), *s'engager à ce que* ('commit oneself to') with *promettre* ('promise'). The last contrast is not evident: why should the commitment be different with the two verbs? One possibility is that *promettre* and *s'engager à ce que* do not belong to the same domain: when one 's'engage' one pledges oneself to a course of action while a promise remains a commitment to the truth of a (future) proposition (even if it implies doing things to make it true). *Attendre* is even more difficult to analyze: it may be a sort of causative.

4. Where the two moods are possible

In the preceding section, we have examined predicates which select one or the other mood. We turn to cases where the two moods are possible.

4.1. Meaning differences

Certain predicates allow for the two moods, but with a meaning difference such that it is not always clear that we are still dealing with the same predicate. Well-known instances are

dire ('say') or *suggérer* ('suggest'): with the indicative, these are verbs of communication (class (i)), while they are verbs of influence (mandatives, class (vii-a)) when the complement clause is in the subjunctive.

(31) a. Paul a {dit / suggéré} que tu étais$_{IND}$ venu.
           Paul said / suggested that you had come.
      b. Paul a {dit / suggéré} que tu viennes$_{SUBJ}$ immédiatement.
           Paul said/ suggested that you (should) come immediately

Another example is that of *admettre* ('admit, accept'), *comprendre* ('understand'), *concevoir* ('understand') (see references in Soutet 2000), although the difference is more subtle.

(32) a. […] je crois comprendre que vous avez$_{IND}$ le désir d'en faire un métier, de gagner
           votre vie en publiant des livres. (A. Boudard, *Mourir d'enfance*, 1995, p. 227,
           Frantext)
           I seem to understand that you want to turn it into a job, to make a living by
           publishing books
      b. Je comprends que vous soyez$_{SUBJ}$ anticommunistes … Moi, à votre place je le serais
           aussi, c'est normal.
           It's understandable that you are anti-communists … In your stead, I would be too, it's
           normal (E. Rochant, *Un monde sans pitié*, 1990, p. 71, Frantext)

(33) Ell' m'emmerde, ell' m'emmerd', j'admets que ce Claudel
      Soit$_{SUBJ}$ un homm' de génie, un poète immortel,
      J' reconnais son prestige,
      Mais qu'on aille chercher dedans son œuvre pie
      Un aphrodisiaque, non, […] (G. Brassens, *poèmes et chansons*, 1981, p. 212, Frantext)
      She makes me mad, I accept that this Claudel is a man of genius, an immortal poet, I
      recognize his prestige, but that someone fetch in his pious work an aphrodisiac, no, […]

With the indicative, these verbs belong clearly to class (ii): they are verbs of reasoning. They remain verbs of reasoning with the subjunctive, but take on an evaluative trait: 'understandable, normal'. Moreover, with the subjunctive, it is not clear that the subject is committed to the truth of the proposition, in fact, the construction gives the opposite impression: if the agent commits himself, it is only temporarily, as a step in the argumentation. In particular, we often have the imperative *admettons que*, leading to: 'and now what follows?' *Admettre* in the combination with the subjunctive often occurs as the first gesture in a concessive structure: 'I grant you that *p*, but', which is exemplified in (33).

Whether or not one treats these usages as belonging to one lexeme or two, the behavior of such forms conforms to the above analysis.

4.2. Mixed predicates

Other predicates are compatible with both moods, without changing semantic class. Rather, they are sensitive to their environment, so that the subjunctive and the indicative tend to appear in different environments. However, this is but a tendency, both moods being possible in all environments. We give a number of cases which have been noted in the literature. A systematic search in corpora is needed, since the class has not been recognized as such, and the factors involved are not really known.

First, we have some modals: *probable* ('probable'), *vraisemblable* (likely'), *il semble* ('it seems'). While other epistemic modals such as *possible* ('possible'), and *il se peut* ('it may be') always require the subjunctive (see class ((v)), the former accept both moods (see Gaatone 2003 for *probable*).

(34) a. Il est **probable** que nous **essuierons**$_{\text{IND}}$ encore des pertes en Afghanistan.
          (lemonde.fr, 26/08/2006, attributed to B. Kouchner)
          It is probable that we will suffer more losses in Afghanistan

  b. Il est **probable** que l'une des premières retransmissions télévisées en direct **a**$_{\text{IND}}$ **été** réalisée aux Etats-Unis à la fin des années 1920 par Ernst Alexanderson.
          (cahiersdujournalisme.net, C. Jamet, no. 19, 2009)
          It is probable that one of the first live TV broadcasts was realized in the US at the end of the 20s by E. Alexanderson

  c. La ministre de la santé a expliqué qu'il était **probable** qu'au début de l'automne le virus **soit**$_{\text{SUBJ}}$ plus actif. (lefigaro.fr, 29/07/2009)
          The health minister explained that it was probable that at the beginning of autumn the virus would be more active

(35) a. Ils prennent bien soin de placer sur le dessus des paniers de grosses pierres. Car les escargots, sinon, s'évaderaient. **Il semble** que d'un commun effort, s'arc-boutant aux parois, ils **sont**$_{\text{IND}}$ capables de soulever les couvercles et ainsi retrouver la liberté.
          (J. Roubaud, *Nous, les moins-que-rien, Fils aînés de personne 12 (+ 1)* autobiographies, 2006, p. 179, Frantext)
          They are very careful to put big stones on the top of the baskets. Otherwise, the snails would escape. It seems that, in a joint effort, and pressing up against the sides, they are able to lift up the cover and thus recover their freedom

  b. Ils ont rendez-vous avec des notaires et ils visitent des propriétés de toutes sortes […] **Il semble** que mon père, pour une raison impérieuse, **veuille**$_{\text{SUBJ}}$ se mettre 'au vert'.
          (P. Modiano, *Un pedigree*, 2005, p. 63, Frantext)
          They make appointments with lawyers and visit all kinds of properties. It seems that my father, for a pressing reason, wants to move to the countryside

  c. Pourtant, **il me semble** que considérer l'enfant malade comme un saint **revient**$_{\text{IND}}$ à le nier deux fois. (P. Forest, *Tous les enfants sauf un,* 2007, p. 61, Frantext)
          Nevertheless, it seems to me that to consider a sick child as a saint amounts to treat him all the more as a non-entity

A paradigm such as (36) based on acceptability judgments (from Gaatone 2003) indicates that *probable* is sensitive to the context. In contrast with possibility, probability in itself favors *p* rather than *non-p*. As the interpretation of the main clause tends towards expressing speaker's certainty, the indicative becomes more acceptable. Similarly, while *il semble* is compatible with both moods (as regards speaker's acceptability) (see (35a,b)), *il me semble* clearly favors the indicative. Here, the explicit realization of the agent, as opposed to an implicit reference with *il semble,* gives more importance to the agent's commitment.

(36) a. Il est probable que le travail {est$_{\text{IND}}$ / ?soit$_{\text{SUBJ}}$} déjà achevé.
  b. Il est peu probable que le travail {?est$_{\text{IND}}$ / soit$_{\text{SUBJ}}$} déjà achevé.
  c. Il est improbable que le travail {*est$_{\text{IND}}$ / soit$_{\text{SUBJ}}$} déjà achevé.
          It is probable / not very probable / improbable that the work is finished

However, it must be stressed that these are preferences rather than clear-cut choices. Counting apart the cases of morphological syncretism, out of 110 instances of *il est probable* in Frantext since 1950, six are with the subjunctive and 89 with the indicative; out of 37 instances of *il est peu probable*, 20 are with the subjunctive, and seven with the indicative; out of seven instances of *il est très probable*, one is with the subjunctive and five with the indicative.

Verbs of fiction such as *rêver* 'dream' and *imaginer* 'imagine' are usually considered to require the indicative. They raise a difficulty, since it is debatable whether the subject denotes an agent who commits himself (Farkas 1992). It can be proposed that the dreamer or imaginer is indeed committed as long as the dream or the imagining lasts. However, these verbs are also compatible with the subjunctive in certain environments, for instance, if they are the complement of *pouvoir* ('be able'), or in a conditional clause (introduced by *si* 'if'), or if they are themselves in the imperative or gerund mood (*imaginons que* 'let's imagine that', *en imaginant que* 'imagining that'). These environments share the effect that the agent is less committed to the truth of the complement proposition. Similarly, although the verb *espérer* 'to hope' is often given as an instance of a predicate which, unlike its correspondents in the other Romance languages, takes the indicative, it can in fact take both moods: the subjunctive can appear in the same environments as with fiction verbs. It can even appear without such an environment, in perfectly standard utterances (37d).

(37)   a.   Paul espère qu'il {prendra$_{IND\text{-}FUT}$ / *prenne$_{SUBJ}$} la bonne décision.
             Paul hopes that he will make the right decision
       b.   On peut espérer qu'il {prendra$_{IND\text{-}FUR}$ / prenne$_{SUBJ}$} la bonne décision.
             We can hope that he will make the right decision
       c.   {Espérons / En espérant} {qu'il prendra$_{IND\text{-}FUT}$ / qu'il prenne$_{SUBJ}$} la bonne décision.
             Let us hope / With the hope that he will make the right décision
       d.   On fait le vin pour des amateurs éclairés – on espère en tout cas qu'ils le soient.
             (J.-R. Pitte, France Culture 05/11/2011)
             We make wine for enlightened lovers – we hope in any case that they are

As a last example, we mention the verb of communication *se plaindre* 'complain'.

(38)   a.   […] l'homme **se plaignait** que le commerce **allait**$_{IND}$ mal, tant de villages à l'intérieur du pays ayant été pillés par les reîtres. (M. Yourcenar, *L'œuvre au noir*, 1968, p. 754, Frantext)
             The man complained that the trade was in bad shape, so many villages in the country having been looted by the ruffians
       b.   On ne pouvait **se plaindre** que les théologiens chargés d'énumérer les propositions impertinentes, hérétiques, ou franchement impies tirées des écrits de l'accusé **n'eussent**$_{SUBJ}$ pas fait honnêtement leur tâche. (M. Yourcenar, *L'œuvre au noir*, 1968, p. 788, Frantext)
             One could not complain that the theologians who were in charge of enumerating the impertinent, heretical, or frankly irreligious propositions extracted from the accused's work had not done their task honestly

Again, this is not a clear-cut matter: out of the 25 instances in the data base Frantext (taking texts since 1950), 10 are with the subjunctive and five with the indicative (eight are morphologically indistinct). Schlenker (2005), who notes the alternation with this verb, suggests the following meaning difference: the indicative appears in a speech act report, while the subjunctive characterizes the description of an attitude. While this is an interesting

suggestion, the attested data are difficult to interpret, notably because it is not clear when there is a speech act report or not (the difficulty is particularly evident when one looks at its use in newspapers.)

Contrary to what we saw in the preceding section, there is no clear correlation with a meaning difference located in the predicate itself. It is the environment in which the predicate appears which may induce a difference. Moreover, the effect is a matter of preferences: the environment makes it more or less probable that one or the other mood will appear, but which one is chosen is never mandatory. Given these observations, it does not make sense to try to double the lexemes and organize them in different classes. The alternation here reveals a class of mixed predicates: their lexical semantics shares aspects with verbs taking an indicative complement (verbs of communication, reasoning and belief) on the one hand, and verbs taking a subjunctive complement (modals of possibility, reasoning without an agent's commitment) on the other. The role of the context is to favor one or the other aspect of this complex semantics.

4.3. Polarity mood

Finally, some environments inducing non-positive polarity may license an alternation between the two moods. The clearest case nowadays is negation. An inverted interrogative verb (*pense-t-il* lit. 'thinks-he') can also induce the subjunctive; for unclear reasons, an interrogative sentence introduced by the complementizer *est-ce que* favors the subjunctive much less (Huot 1986).[3] It is also possible to find a subjunctive in a conditional clause, although rarely. Thus, some verbs belonging to classes (i)–(iii) are compatible with a subjunctive complement in these environments.

(39) a. Et pourtant, **je ne crois pas** que tu **sois**$_{SUBJ}$ aussi loin de moi que tu le penses **ni** que je **sois**$_{SUB}$ aussi loin de toi que je le crains. (J. d'Ormesson, *La douane de mer*, 1993, p. 246, Frantext)
And yet, I don't think that you are as far from me as you think or that I am as   far from you as I fear

   b. – **Crois-tu** que ta religion **était**$_{IND}$ la seule à être vraie ?
– Je ne sais pas, lui dis-je. **Je ne croyais pas** que ma famille **était**$_{IND}$ la seule à être bonne. **Je ne croyais pas** que ma patrie **était**$_{IND}$ la seule à être juste. (J. d'Ormesson, *La douane de mer,* 1993, p. 271, Frantext)
– Do you think that your religion was the only one that was true ?
– I don't know, I said. I did not think that my family was the only one that was good, I did not think that my country was the only one that was just

   c. Alors, je me tuerai. Vous n'avez pas peur de la mort. Et moi, **croyez-vous** que je la **craigne**$_{SUBJ}$? (J. d'Ormesson, *Le bonheur à San Miniato*, 1987, p. 225, Frantext)
So, I will kill myself. You are not afraid of death. Do you think that I am afraid of it?

   d. **S'il se trouve** que ces démarches nous **aient** souvent paru, à nous-mêmes, et désespérées, et souvent inauthentiques, c'est que […] (P. Schaeffer, *Recherche musique concrète*, 1952, p. 124, Frantext)

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[3]As suggested in Mosegaard-Hansen 2001, the two interrogative forms do not play the same role in dialogues. However, the interaction of this property with the mood of the complement clause is unclear, and the suggestion by the same author that *est-ce que* interrogatives 'highlight the doubt' about the proposition, or 'focus on [its] reality' remains somewhat vague. It may be that this is a reflex of the history of the polarity subjunctive and of *est-ce que*. Polarity subjunctive in French is on the decline, while the use of *est-ce que* to introduce a yes/no question is relatively recent (it appears in the 16th century; see Grevisse & Goosse 2011).

> If it is the case that those moves have often seemed to us both hopeless and
> unauthentic, it's because […]

To our knowledge, there is no meaning difference between the sentence with an indicative or a subjunctive clause, which can be argued for with independent evidence (but see Huot 1986 for an attempt). This is precisely the observation which led Gross (1978) to abandon the hypothesis that the subjunctive mood was semantically motivated in contemporary French. French differs in this respect from Spanish and Catalan, where the mood difference is semantically driven in this context (see Quer 2001).

Although this is not usually pointed out (but see Soutet 2000), predicates normally taking an indicative are not the only ones to possibly shift mood in these polarity environments. Negative predicates (belonging to the same semantic domains of communication and belief), which take a subjunctive complement when they are in a positive declarative sentence, are compatible with an indicative when they are themselves negated (see above class (vi-c)). The examples in (40), which come from the same author, illustrate both possibilities. Again, no clear meaning difference has been shown to exist, even if French speakers like to feel that this might be the case.

(40) a. […] sa double obsession : les femmes et l'argent. Il **ne doutait pas** que les deux
choses **fussent**$_{SUBJ}$ liées […] (M. Tournier, *Le Roi des aulnes*, 1970, p. 258, Frantext)
his two obsessions: women and money. He did not doubt that they were linked
b. Il ne saurait le dire, mais **il ne doute pas** que chaque étape du voyage […] **aura**$_{IND}$ sa
contribution dans la formule de la cellule gémellaire […] (M. Tournier, *Les Météores*,
1975, p. 601)
He would not be able to explain, but he has no doubt that each stage of the journey
will make a contribution to the formula of the twin cell […]

In fact, if the semantico-pragmatic generalizations (20) and (27) were really conditions on the appropriateness of the two moods applying in all contexts (as we have mostly presented them, following usual practice), predicates of communication and belief should not be able to take an indicative complement when the predicate is negated or the clause is interrogative, since the subject fails to commit himself to the truth of the proposition: in (39b), there is no commitment of the entity denoted by the subject of *croire*, and no intervention of a different agent (since we are looking at dialogues in novels), no more than in (39a,c). We would expect that only the subjunctive be acceptable, but we find both. The case is even worse when the predicate is in a conditional structure: while the subjunctive is expected, sentences such as (39d) with a subjunctive are not impossible, but they are rare and belong to a high register; usually, one finds an indicative.

On the other hand, when negative predicates are themselves negated, the clause is roughly equivalent to a positive one with the corresponding positive predicate. Thus, *ne pas douter* is equivalent to 'believe', *ne pas contester* and *ne pas nier* to 'recognize', and *il n'est pas douteux* to 'it is true'. So, we expect that they take an indicative complement (the semantico-pragmatic conditions for the two moods are reversed), but we find both.

The question is: how come some predicates of belief and communication may alternate, accepting the same mood as in a positive declarative clause, when this mood is not (semantically and/or pragmatically) motivated? We propose an analysis in the next section in terms of (incomplete) grammaticalization.

4.4. The role of grammaticalization

In the preceding sections, we have presented two potential difficulties for the analysis of the moods in complement clauses. With the mixed predicates, both moods may appear because their semantics is complex, and both moods may be motivated. The role of the context is to allow one or the other aspect to come to the fore, thus favoring one or the other mood. With the polarity environments, only one mood is motivated, but both can be used.

The group of mixed predicates includes the evaluatives (class (vi-b)). At least with the factives (*regretter* 'regret'), the entity denoted by the subject (alternatively, the speaker, see §3.1) commits himself/herself to the proposition denoted by the complement, at the same time as s/he acknowledges that things might have been different. Unlike the predicates mentioned in §4.2, though, evaluatives always take the subjunctive in standard French (as opposed to Romanian, for instance, where they allow for both moods, see above (29)). To explain this different behavior, we appeal to grammaticalization: French has grammaticalized the subjunctive with this set of predicates. That is, the fact that they take a subjunctive complement clause is part of their subcategorization. The French lexicon includes for instance the specification that *regretter* takes a subjunctive complement. In other words, the association of predicates of a certain class with the choice of a mood has been frozen: the subjunctive is motivated, but the absence of the indicative with most predicates of this class cannot be explained on semantico-pragmatic grounds.

Appealing to grammaticalization in this case requires a more liberal use of the term than is usually done: grammaticalization studies are nearly uniquely concerned with the evolution of lexemes. Some authors (see Traugott 2003) do mention the relevance of constructions, but mostly in order to talk about constructions which evolve into lexemes. However, there does not seem to be any principled objection to applying the concept to the evolution of constructions which get frozen without giving rise to a lexeme. In fact, we find in Marchello-Nizia 2006 an account of the fixation of the relative order of the verb and the object NP complement since the 13th century in French, which appeals to grammaticalization. Certainly, instances of syntactic grammaticalization do not exhibit the properties usually associated with well-known instances of this process, but this results from the fact that most instances which have been studied concern the lexicon rather than syntax.

One might wonder why evaluatives have been specialized for a subjunctive complement. Becker (2010) shows that the gradual change from indicative selection in Old French to the dominance of subjunctive selection in the 17th century is correlated with emphasis on the comparative semantics underlying the subjunctive. However, this is insufficient to explain the disappearance of the indicative complement, while predicates such as *comprendre* retain both combinations (see §4.1). A possibility is that French uses the contrast in complement moods in order to organize lexical classes and contrasts. Such predicates cover the same semantic domains as those in the classes taking the indicative mood. However, they systematically differ from those precisely by their evaluative aspect. Hence, a systematic difference in mood may be a way to ground in the lexicon the existence of a systematic semantico-pragmatic difference.

The case is similar for the less massive cases mentioned in §4.2. Probability is distinct from possibility specifically in that probability is closer to indicating an agent's commitment, and similarly for the epistemic *il semble* ('it seems'), as opposed to possibility or necessity. These lexical contrasts probably favor keeping the indicative, although these predicates are modals, and modal structures strongly tend towards the use of the subjunctive. Finally, the fact that *espérer* ('hope') tends to be followed by the indicative is often presented as a mystery of the French subjunctive (specially as grammars often say that this is a rule). But it is less of a mystery when one recognizes that it is a mixed predicate, which may take the subjunctive in

certain environments. Again, the reason why the indicative is favored may come from a lexical contrast with *souhaiter* ('wish'). The two lexemes are very close, since they describe a positive attitude towards a situation whose existence is not certain. However, they are not synonymous. *Espérer* is closer to belief predicates, and *souhaiter* to desires. Thus, like belief predicates, one can hope for something and be wrong, which is not the case with *souhaiter*: no wish can be wrong, as is evident from the fact that wishes can go against what one knows to be the case, as shown by the contrast between (41a) and (41b) (Portner 1997). Moreover, like predicates of will and desire, *souhaiter* allows the conditional to license itself (it is not dependent), while this is not true of *espérer*, which requires a licensing context (Laca 2011). Thus, (41c) is not acceptable out of context, while (41d) is not problematic.

(41) a. Paul espérait que l'élection pourrait se dérouler correctement, mais il s'était trompé.
          Paul hoped that the elections would take place in a correct way, but he was wrong
      b. #Paul souhaitait que l'élection puise se dérouler correctement, mais il s'était trompé.
          Paul wished that the elections would take place in a correct way, but he was wrong
      c. #Paul espérerait que l'election se déroule correctement.
          Paul would hope that the elections take place in a correct way
      d. Paul souhaiterait que l'election se déroule correctement.
          Paul would hope (= like) that the elections take place in a correct way.

The alternation of the moods in polarity environments can be understood as a case of partial grammaticalization (grammaticalization in progress). That is, one of the moods is motivated while the other has become a property of the subcategorization of the lexeme. We suppose, then, that, when a predicate allows for both moods in polarity contexts and is specialized in positive declarative clauses, there are in fact two different lexemes. One is described as taking a sentential complement, the other as taking a complement whose verb is in a certain mood. The first is able to combine with a complement in the indicative or the subjunctive, depending on which condition ((20) or (27)) applies. The second is an instance of a grammaticalized construction, a verb such as *dire* or *croire* taking an indicative complement clause, and a verb such as *douter* taking a subjunctive complement, whatever the environment in which they occur. The two systems co-exist: this is a case of true variation. But this variation has to be studied for itself. We have to look at corpora and also make psycho-linguistic experiences relying on acceptability judgments of a great many speakers, in controlled conditions, in order to elucidate the conditions which favor one or the other possibilities (see Börjeson 1966 for an examination of texts, which is already 50 years old).

An indication that polarity subjunctive may be on the decline is that the possibility to spread to lower clauses, which is a characteristic of this type of occurrence in Spanish and Catalan (where the contrast is motivated), as opposed to selected subjunctive, seems very weak nowadays in French, as shown by (42b) which is not accepted by all speakers, even those who master the different registers (*contra* Huot 1986), hence the sign of variable acceptability '%'.

(42) a. Ce locuteur ne croit pas que sa famille **soit**$_{SUBJ}$ la seule à être digne de cet honneur.
          This speaker does not think that his family is the only one to be worthy of this honor.
      b. %Ce locuteur ne croit pas que sa famille **puisse**$_{SUBJ}$ penser qu'elle **soit**$_{SUBJ}$ la seule à être digne de cet honneur.
          This speaker does not think that his family says that they are the only one to be worthy of this honor.

Thus, grammaticalization is associated with a desemanticization of the alternation between the indicative and the subjunctive in that it freezes the relation between a given lexeme and a given mood in the complement. In some cases, it results in extending the use of the subjunctive, and in favoring its disappearance in other cases, but in all cases, it is the mood which appears in the positive declarative clauses which is frozen. Hence the change is unidirectional. Thus, this situation shares two important properties with usual instances of grammaticalization (desemanticization, unidirectionality). In standard French, the use of the subjunctive is alive, but its semantico-pragmatic motivation may be blurred by other factors.

To deal with the generalization of the subjunctive with evaluatives, we have added a principle of distribution of the moods (30) to the semantico-pragmatic conditions ((20), (27)). However, this solution is insufficient when one takes into account the smaller lexical contrasts with mixed predicates and the polarity mood. Indeed, we have seen cases where the indicative occurs although condition (27) is met or not excluded (e.g. with *probable*), and where the subjunctive occurs although condition (27) is not met (as with *ne pas douter*). Does that mean that generalizations concerning the motivation of the moods should be abandoned? We do not think so. They are, we maintain, good generalizations, although they allow for cases where they do not apply. In other words, they describe preferences rather than clear-cut rules. The alternation between indicative and subjunctive in the complement clauses in contemporary French is one phenomenon which shows that the grammatical system must allow for preferences (see e.g. Bresnan 2007).

References

Becker, Martin G. 2010. Principles of mood change in evaluative contexts: the case of French. *Modality and mood in Romance*, ed. by Martin G. Becker and Eva-Maria Remberger, 209–234. Berlin: de Gruyter.

Börjeson, L. 1966. La fréquence des subjonctifs dans les subordonnées introduites par que étudiée dans des textes français contemporains. *Studia Neophilologica* 38.3–64.

Bosque, Ignacio, and Violeta Demonte. 1999. *Gramática descriptiva de la lengua española*. Madrid: Espasa Calpe S.A. – Real Academia Española.

Bresnan, Joan. 2007. Is syntactic knowledge probabilistic? Experiments with the English dative alternation. *Roots: Linguistics in search of its evidential base*, ed. by S. Featherston and W. Sternefeld, 77–96. Berlin: Mouton de Gruyter.

De Mulder, Walter, and Danièle Godard. 2010. Le subjonctif. Ms. *Grande grammaire du français*, ed. by Anne Abeillé, Danièle Godard, and Annie Delaveau. Arles: Actes Sud, to appear 2014.

Farkas, Donka F. 1992. On the semantics of subjunctive complements. *Romance Languages and Modern Linguistic Theory: Papers from the 20th Linguistic Symposium on Romance Languages* (LSRL XX), ed. by Paul Hirschbühler and Konrad Koerner, 69–103. Amsterdam/Philadelphia: John Benjamins.

Farkas, Donka F. 2003. Assertion, belief and mood choice. Handout, Workshop on Conditional and Unconditional Modality, ESSLLI, Vienna, 2003.

Gaatone, David. 2003. La nature plurielle du subjonctif français. *La syntaxe raisonnée : Mélanges de linguistique générale et française offerts à Annie Boone à l'occasion de son 60e anniversaire*, ed. by Pascale Hadermann, Ann van Slijcke, and Michel Berré, 57–78. Louvain-la-Neuve: DeBoeck Duculot.

Ginzburg, Jonathan, and Ivan A. Sag. 2000. *Interrogative investigations*. Stanford: CSLI Publications.

Giorgi, Alessandra, and Fabio Pianesi. 1997. *Tense and aspect: From semantics to morphosyntax*. Oxford: OUP.

Godard, Danièle, and Walter De Mulder. 2011. Indicatif et subjonctif dans les complétives en français. *Cahiers de lexicologie* 98.148–160.

Grevisse, Maurice, and André Goosse. 2011. *Le bon usage*. Louvain-la-Neuve: DeBoeck-Duculot.

Gross, Maurice. 1978. Correspondance entre forme et sens à propos du subjonctif, *Langue française* 39.49–65.

Hooper, Joan B. 1975. On assertive predicates. *Syntax and semantics* 4, ed. by John P. Kimball, 91–124. New York: Academic Press.

Huddleston, Rodney D., and Geoffrey K. Pullum (eds). 2002. *The Cambridge grammar of the English language*. Cambridge: CUP.

Huot, Hélène. 1986. Le subjonctif dans les complétives : subjectivité et modélisation. *La grammaire modulaire*, ed. by M. Ronat and D. Couquaux, 81–111. Paris: Ed. de Minuit.

Korzen, Hanne. 2003. Subjonctif, indicatif et assertion : ou comment expliquer le mode dans les subordonnées complétives ? *Aspects de la modalité*, ed. by Meret Birkelund, Gerhard Boysen, and Poul S. Kjaersgaard, 113–129. Tübingen: Max Niemeyer Verlag.

Laca, Brenda. 2011. On the temporal orientation of intensional subjunctives in Spanish. Ms., U. Paris 8. To appear in *Sentence and Discourse*, ed. by Jacqueline Guéron.

Leeman, Danielle. 1994. *Grammaire du verbe français : des formes au sens, modes, aspects, temps, auxiliaires.* Paris: Nathan.

Marchello-Nizia, Christiane. 2006. *Grammaticalisation et changement linguistique*. Bruxelles: De boek.

Miller, Philip and Brian Lowrey. 2003. La complémentation des verbes de perception en anglais et en français. *Essais sur la grammaire comparée du français et de l'anglais*, ed. by Philip Miller and Anne Zribi-Hertz, 131–188. Paris: Presses Universitaires de Vincennes.

Mosegaard-Hansen, Maj-Britt. 2001. Form and function of yes/no interrogatives in spoken standard French. *Studies in Language* 25.463–520.

Portner, Paul. 1997. The Semantics of mood, complementation, and conversational force, *Natural Language Semantics* 5.167–212.

Quer, Josep. 2001. Interpreting mood. *Probus* 13.81–111.

Renzi, Lorenzo; Gianpaolo Salvi; and Anna Cardinaletti. 2001. *Grande grammatica italiana di consultazione.* Bologna: Il Mulino.

Schlenker, Philip. 2005. The lazy Frenchman's approach to the subjunctive (Speculations on reference to worlds and semantic defaults in the analysis of mood). *Proceedings of Going Romance XVII*. Online: `https://files.nyu.edu/pds4/public/)`.

Solà, Joan et al. (eds.) 2002. *Gramàtica del català contemporan*. Barcelona: Empuries.

Soutet, Olivier. 2000. *Le subjonctif en français*. Paris: Ophrys.

Traugott, Elizabeth Closs. 2003. Constructions in grammaticalization. *The handbook of historical linguistics*, ed. by Brian D. Joseph and Richard D. Janda, 624–647. Oxford: Blackwell.

Villalta, Elisabeth. 2008. Mood and gradability: an investigation of the subjunctive mood in Spanish. *Linguistics and Philosophy* 31.467–522.

Expressive intensifiers in German: syntax-semantics mismatches

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1. Introduction

Like many languages, German exhibits different possibilities for intensifying the meaning of a gradable adjective. The most obvious ways are by means of degree-morphology (*-er* for the comparative; *-st* for the superlative) or degree word like *very* 'sehr'. However, in this paper, we want to examine a special class of degree items, which we call *expressive intensifiers* (EIs) and which mainly belong to informal varieties of German. The most frequent EIs are *total* 'totally' and *voll* 'fully' (Androutsopoulos 1998), and more recently, *sau*, which is derived from the homophonous expression meaning 'female pig, sow'.[1]

(1)   Sophie ist {**sau/total/voll**} schnell.
        Sophie is EI   fast
        'Sophie is EI (≈ totally) fast.'

EIs like *sau* exhibit particular syntactic and semantic properties which set them apart from simple degree words and which, as we will show, pose some interesting puzzles for their syntactic and semantic analysis. These obstacles mainly stem from the fact that beside the standard position inside the DP in which EIs precede the adjective they intensify, as in (2), they can appear in a DP-external position in which the entire DP follows the EI.[2]

(2)   Du hast gestern   eine **sau** coole Party verpasst.
        you has yesterday a   EI cool party missed
        'Yesterday, you missed a EI cool party.'   (DP-internal position)

(3)   Du hast gestern   **sau** die coole Party verpasst.
        you has yesterday EI   the cool party missed
        'Yesterday, you missed EI a cool party.'   (DP-external position)

[1]See Kirschbaum (2002) for an overview over the metaphoric patterns according to which intensifiers evolve, both conceptually and diachronically. A general overview over the aspects of intensification in German is provided by van Os (1989).

[2]External EIs are pretty frequent in informal settings and can easily be found in the web. In addition, we backed up our own intuition with a questionnaire study with 265 subjects, which confirmed the contrasts we present in this contribution.

Semantically, the difference between EIs and standard degree elements is that beside their intensifying function, EIs convey an additional expressive speaker attitude, which is not part of the descriptive content of the sentence they occur in. That is, beside raising the degree to which the party was cool in (2), *sau* expressively displays that the speaker is emotional about the degree to which the party was cool.

This paper is structured as follows. In section 2 we will describe the syntax and semantics of EIs in the DP-internal position. We argue that EIs behave like degree elements and that they are the head of the extended degree projection of the adjective they modify. After that, we will turn to the syntax and semantics of the external position in section 3. As this description will show, the external position comes with some puzzling mismatches between the syntax and semantics of external-EI constructions. In section 4, we will provide a first suggestion for an analysis of the external-EI construction and try to sketch answers to what we think the four most important riddles they pose are. section 5 concludes.

2. Internal EIs

In this section, we describe the syntax and semantic behavior of internal expressive intensifiers. This will provide us with some first directions for a proper analysis.

2.1. The syntax of internal EIs

EIs and common degree words have the same range of uses, at least in adjectival contexts. Common intensity particles like *sehr* 'very' can occur with gradable adjectives regardless of the question of whether the adjective is used attributively, predicatively or adverbially. As the following examples show, this also holds for EIs.[3]

(4) Die Party ist **sau/sehr** cool.
the party is EI/very cool
'The party is EI/very cool.'

(5) Piet läuft **sau/sehr** schnell.
Piet runs EI/very fast
'Piet runs EI/very fast.'

(6) Du hast gestern eine **sau/sehr** coole Party verpasst.
you has yesterday a EI/very cool party missed
'Yesterday, you missed a EI/very cool party.'

Further similarities between *sau* and *sehr* 'very', that also give hints to the categorial status of EIs, are provided by their behavior with respect to other means of expressing degrees. As is well known, degree words like *very* are incompatible with other overt degree morphology (among many others, cf. Kennedy and McNally 2005). This holds for the comparative morpheme *-er* in (7) as well as for the superlative morpheme *-st* in (8). The same holds true for *sau* as the examples show.

(7) *Unsere Party ist **sau/sehr** cool-**er** als eure.
our party is EI/very cool-er than yours.

(8) *Unsere Party ist die **sau/sehr** cool-**ste** von allen.
our party is the EI/very cool-est of all

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[3]In addition, both ordinary degree words and EIs can also occur in adverbial contexts. However, this function is not freely available, EIs being even more restricted.

Another fact that illustrates that EIs and expressions like *very* both function as degree elements is that EIs and standard degree words cannot co-occur. This holds irrespectively of the particular ordering of *sau* and *sehr*.

(9)   a.   *Die Party ist **sau sehr** cool.   b.   *Die Party ist **sehr sau** cool.
            The party is EI   very cool.   The party is very EI   cool.

From this, we draw the conclusion that EIs are degree expressions, just like *very* or the comparative morpheme *-er*. We presuppose the common syntactic analysis of adjective phrases, in which gradable adjectives are dominated by an extended functional projection, a so-called degree phrase or DegP (cf. e.g. Abney 1987; Kennedy 1999; Corver 1997a). Internal EIs are the head of this phrase, just as degree elements like comparative morphemes, intensifiers or a positive morpheme, which is covert in languages like German or English (Kennedy 2007:5).

(10)   [$_{DP}$ die [$_{NP}$ [$_{DegP}$ sau [$_{AP}$ coole]] [$_{NP}$ Party]]]   'the EI cool party'

While this structural analysis of internal EIs is relatively uncontroversial and rather conservative, we will have to refine it in section 4 in order to account for the puzzles posed by the external variant, which we will discuss in section 3. But before that, we will discuss the semantic contribution of *sau*.

2.2. The semantics of internal EIs

Semantically, EIs increase the degree that is expressed by their adjective argument just like common intensifiers do. According to the 'standard theory' (Beck 2012), adjectives denote a relation between a degree and an entity (cf. e.g. von Stechow 1984; Kennedy and McNally 2005) and therefore are expressions of type $\langle d, \langle e,t \rangle \rangle$.

(11) $[\![cool]\!] = \lambda d \lambda x.x$ is cool to degree d ('x is d-cool')

Degree expressions like measure phrases, degree morphology or intensifiers apply to the adjective and determine the value of its degree argument. Measure phrases as in (12a) saturate the degree argument, while degree morphology quantifies over it (Heim 2001; Kennedy and McNally 2005:350).[4] The restriction imposed by intensifiers like *very* is such that relative to a comparison class, the degree must be higher than it should be the case if the positive adjective were used.

One semantic difference between *very* and *sau* is that *sau* expresses an even higher degree than *very*. That is, while *very cool* is cooler than just *cool*, *sau cool* is even cooler.

(12)   sau cool $\succ$ sehr cool $\succ$ cool

The more important semantic difference between *sau* and common intensifiers, however, is that beside their intensifying function, EIs convey an additional expressive speaker attitude.

(13)   Du hast gestern   eine **sau** coole Party verpasst.
            you has yesterday a   EI   cool party missed
            'Yesterday, you missed a EI cool party.'

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[4] An alternative view perceives adjectives as expressions of type $\langle e,d \rangle$, so-called measure phrases that map entities onto degrees (cf. e.g. Kennedy 2007). Degree expressions then turn these measure functions into properties. Nothing what we say in this paper hinges on choosing one approach over the other.

(14)   a.   Descriptive meaning of (13): 'Yesterday, you missed a very very cool party.'
       b.   Expressive meaning of (13): 'The speaker is emotional about how cool the party was.'

Crucially, this attitude is not part of the truth-conditional content of the utterance, while the descriptive component of *sau* is. This can be shown, for instance, by the denial-in-discourse test (cf. e.g. Jayez and Rossari 2004). The descriptive content of an EI can be denied directly, as in (15B), where B denies that the party was cool to the high degree expressed by *sau cool* but grants that it reaches the standard for being very cool.

(15)   A: Die Party war **sau** cool.
             'The party was EI cool'
       B: Nee, so cool war die Party nicht, auch wenn sie sehr cool war.
             no   so cool was the party not   even if   it   very cool was
             'No, the party wasn't that cool, even if it was very cool.'

In contrast, the expressive attitude conveyed by *sau* behaves differently. Denying an utterance on the basis that the attitude does not hold is not felicitous, as witnessed by the following example.

(16)   A: Die Party war **sau** cool.   B: #Nee, das ist dir doch egal.
             'The party was EI cool.'   no   that is you PART equal
                                                      'No, you don't care.'

A dialog as this one, however, should be perfectly possible if the evaluative component of *sau* were part of its truth-conditional content. If you nevertheless want to deny the attitude, you can do so, but you first have to make clear that you do not challenge the descriptive content.[5]

(17)   A: Die Party war **sau** cool.
             'the party war EI cool'
       B: Ja, stimmt, aber das ist dir   doch eigentlich egal.
             yes right   but that is you.DAT PART PART   equal
             'Yes, right, but you don't actually care about that.'

That you can only deny them if making use of special means is typical for non-truth-conditional content (cf. e.g. Horn 2008; von Fintel 2004).

Semantically, EIs are therefore two-dimensional expressions that contribute to both dimensions of meaning (cf. McCready and Schwager 2009). In addition to the data discussed in McCready 2010 or Gutzmann 2011, EIs hence add further evidence against Potts' (2005:7) claim that no lexical item contributes both descriptive and expressive meaning. Using McCready's (2010) terminology, EIs are *mixed expressives*.

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[5]Without the particles *doch* and *eigentlich*, which signal contrast or correction, such a reply becomes less acceptable. The following example also shows how hard it is to cancel the evaluative component even if the descriptive content is affirmed:

(i)   B: ?Ja   stimmt, aber das ist dir   egal.
             yes, right   but that is you.DAT equal
             'Yes, right, but you don't care about that.'

In all examples presented thus far, the expressive meaning of *sau* was a *positive* emotional attitude. However, whether the attitude is a positive or negative evaluation depends on the context, as the following two examples illustrate.

(18) Mann, es ist wieder **sau** kalt.
      man   it is again   EI   cold
      'Man, it's EI cold again!' (negative attitude)

(19) Bei dieser Hitze kommt das **sau** kalte Bier genau   richtig.
      at   this   heat comes the   EI   cold beer exactly right
      'In this heat, the EI cold beer comes just right' (positive attitude)

Due to lack of space, we cannot provide and motivate a formal account of the meaning of *sau* and other EIs in this paper. However, we are sure that this can easily be done, given that what we have presented here is not unique to EIs and that all the needed tools already exist. There are, for instance, different suggestions on how to handle multidimensional expressives. For instance, one could employ McCready's (2010) elaboration and modification of Potts' logic of conventional implicatures. McCready (2009) also studies the particle *man* which shows a similar context dependency of polarity of the expressed attitude.[6]

Before we now turn to the syntax and semantics of EIs in external position, note that what we have said with regards to the semantics of the internal position also holds for the external position. That is, external *sau* intensifies the adjective by imposing a higher restriction on the degree argument of the adjective and conveys an expressive speaker attitude towards the propositional content. However, as we will see in the following section, the semantics of the external position is connected with additional indefiniteness effects that are absent when the EI is in DP-internal position.

3. External EIs

Except for their expressive nature, EIs do not seem to behave differently from ordinary intensifiers when they occur inside the DP. The external position which we study now however shows some puzzling semantic and syntactic properties. As before, we will first discuss the syntax of external EIs and then address their semantics.

3.1. The syntax of external EIs

The biggest difference between EIs and non-expressive intensifiers is a syntactic one. What sets EIs apart from the well studied degree expressions is that they can occur in DP-external position in which they precede the entire DP. This is a rather surprising position for an intensifier to occur in. Crucially, this position is not available for standard degree elements.

(20) Du hast gestern   **sau/*sehr** die coole Party verpasst.
      you has yesterday EI/very   the cool   party missed
      'Yesterday, you missed EI/*very a cool party.'

---

[6]If we had the space, we would start by assigning *sau* the following mixed expressive of McCready's extended logic for conventional implicatures: $\langle\langle d,\langle e,t^a\rangle\rangle,\langle e,t^a\rangle\rangle \times \langle\langle d,\langle e,t^a\rangle\rangle,\langle e,t^s\rangle\rangle$, that is, the type of mixed expressive quantifiers over degrees. The superscripts are used to denote different classes of types (at-issue and shunting types respectively), they regulate the composition. Cf. McCready 2010 for the technical details.

What is crucial here is that the entire external-EI construction nevertheless behaves like a DP and not like a DegP. As shown by (20) and many other examples, it can serve as an argument for predicates that take DPs but not DegPs. Furthermore, it can be coordinated with other DPs, as witnessed by example (21).

(21) Du hast letzte Woche [_DP **sau** die coole Party] und [_DP ein tolles Konzert] verpasst.
      you has last   week   EI the cool part   and   a great concert   missed
      'Last week, you missed EI a cool party and a great concert.'

The previous example also illustrates that the entire structure [EI DP] forms a single constituent. This conclusion is also reached by Meinunger (2009), who provides different arguments to show that EIs indeed belong to the DP they precede. If they did not form a constituent, they should be able to be split apart. This is, however, impossible as the following examples show (cf. Meinunger 2009:124).

(22) a. ***Voll** haben wir jetzt den Deppen zum   Klassenlehrer bekommen.
          EI   have   we now the fool   to.the class-teacher gotten
          Intended: 'We've got a total fool for our head room teacher'
      b. ***Den Deppen haben wir jetzt **voll** zum   Klassenlehrer bekommen.
          the fool   have we now   EI   to.the class-teacher gotten

In contrast to our analysis of EIs as degree expressions that occupy the head position of DegP, Meinunger (2009) treats *voll* and *total* and other examples as adjectives. This cannot be correct though, for various reasons. First, while there are homophone adjectives for *voll* and *total*, this does not hold for *sau*, which otherwise patterns exactly like other EIs.

(23) a. die total-e   Katastrophe   b. *die **sau**-e Party
          the total-AGR catastrophe   the EI-AGR party

A second problem of Meinunger's treatment of EIs as adjectives is that it makes wrong predictions regarding the attributive adjective inside the external-EI construction. In order to show this, we first have to note that Meinunger (2009) only considers examples without an adjective inside the DP (e.g. Meinunger 2009:123).

(24) Mit Heiner haben wir dann **voll** die Katastrophe erlebt.
      with Heiner have we then full the catastrophe lived
      'With Heiner, we then ended up in total disaster.'

At first sight, such adjective-less external-EI constructions seem to militate against our analysis of EIs as degree expressions. However, as Meinunger (2009:127) himself notes, 'it seems certain that the given constructions can be used only if the descriptive content of the noun or the lower noun phrase may be conceived of as gradable and evaluable.' That is much in line with our degree approach to EIs. If an external EI is used with a DP that contains no adjective, the noun must be understood as a gradable expression and hence a degree interpretation becomes available again. However, if the semantics of the noun is unsuitable for a degree interpretation, external EIs are impossible with a bare noun.

(25) #Ich habe **sau** den Liter Saft getrunken.
      I   have EI   the liter juice drunken

Since Meinunger (2009) does not consider external-EI constructions that contain adjectives, a degree analysis is not evident for him, and hence, he analyzes them as adjectives. As said above, this makes wrong predictions if there is an adjective (the more common case). Recall that the main motivation to analyze EIs as the head of DegP was that it directly accounts for the fact that no other degree expressions can co-occur with the adjective when an EI is present.

(26)   Du hast **sau** die *{sehr coole / total coole / cool-ere   / cool-ste} Party verpasst.
        you has EI the   very cool   EI   cool   cool-COMP cool-SUP party missed

This restriction cannot be accounted for by Meinunger's (2009) adjective analysis, and we therefore conclude that it should be substituted by a degree analysis, like we suggested above.

The presence of a gradable adjective or, at least, a gradable noun is, however, not sufficient to license external EIs. It depends also on the syntactic form of the DP, especially on the determiner. While *sau* can occupy an external position if the DP is headed by a definite article like in example (20) above, this is not possible if the DP is a projection of an indefinite article, as the following example shows.

(27)   *Du hast gestern   **sau** eine coole Party verpasst.
         you has yesterday EI   a   cool party missed

Contrasting this restriction with the *definiteness effect*, which can be observed in existential constructions (Milsark 1977) or possessive constructions with *have* (Bach 1967), the EIs in external position could be said to be connected with an *indefiniteness* effect (Wang and McCready 2007). However, the syntax of EIs in this position is even more restricted, since it does not allow for other definite determiners. For instance, demonstrative pronouns, which are definite, are also impossible with external EIs. The same holds for possessive pronouns.

(28)   *Heute steigt   **sau** diese/ihre coole Party.
         today goes-on EI   that/her   cool party

Furthermore, EIs cannot occur in the external position of quantified DPs irrespective of the question of whether the quantifier is strong or weak.

(29)   *Heute steigen {**sau** alle / einige / die meisten / drei   / höchstens drei} coole(n) Partys.
         Heute goes-on EI all   some   the most   three at most   three cool   parties

All these examples illustrate that the syntactic structures that license EIs in DP-external position are very specific and highly restricted. Furthermore, only EIs are allowed in this position, while ordinary degree words like *sehr* 'very' are not, as it has been shown in (20). This contrasts with the DP-internal position, in which EIs are much less restricted and exhibit the same behavior as non-expressive intensifiers.

3.2. The semantics of external EIs

Beside the syntactic constraints that come with the external position, there is also a curious semantic effect. Even if external *sau* is restricted to occur only with a definite determiner, the DP is nevertheless interpreted as indefinite. The DP-external construction in (30a) therefore corresponds to the internal variant in (30b) and not as expected to (30c).

(30) a. Heute steigt   **sau** die coole Party.
          today goes-on EI   the cool   party
          'Today, EI the cool party is going on.'   (30a) = (30b) ≠ (30c)
      b. Heute steigt   eine **sau** coole Party.
          today goes-on a   EI   cool party
          'Today, a EI cool party is going on.'
      c. Heute steigt   die **sau** coole Party.
          today goes-on the EI   cool party
          'Today, the EI cool party is going on.'

That the requirement for an indefinite interpretation of a DP with an external intensifier is a semantic and not a pragmatic one can be illustrated by the fact that the DP-external use is incompatible with phenomena that require a definite interpretation like restrictive relative clauses or explicit contrast constructions.

(31) *Da   kommt **sau** der coole Typ, von dem   ich dir erzählt habe.
      there comes EI   the cool guy of whom I   you told   have
      Intended: 'There comes EI the cool guy I told you about.'

(32) *Ich habe **sau** den coolen Typen geküsst, nicht den langweiligen.
      I   have EI   the cool   guy   kissed   not   the boring
      Intended: 'I kissed EI the cool guy, not the boring one.'

Strong evidence for the observation that the external EI construction really is interpreted as being indefinite is provided by the classical test for indefinites, namely, the ability to occur in existential constructions, which are impossible with definites. External EIs pass this test whereas definite DPs with internal EIs show the common definiteness effect associated with existential constructions.

(33) Es gibt   **sau** den coolen Typen auf meiner Schule.
      it gives EI   the cool   guy   at my   school.
      'There is EI a cool guy at my school.'

(34) *Es gibt   den **sau** coolen Typen auf meiner Schule.
      it gives the EI   cool   guy   at my   school.

Another consequence of the indefinite interpretation is that the external-EI construction is at least marked when occurring sentence-initially like in (35). Since the so-called pre-field is considered a topic position, this is expected if DPs with external EIs are not referential expressions but rather generalized quantifiers, that is, expressions of type $\langle\langle e,t\rangle,t\rangle$ and not of type e.

(35) ??**Sau** die coole Party steigt   heute.
        EI   the cool party goes on today

More evidence for the indefinite interpretation is provided by proper names. In their ordinary use, proper names are always definite. Even if they do not require a determiner in standard German in order to have referential force, they combine freely with definite articles in (informal) German. When they do so, they are impossible with external EIs, but fine with internal ones.

(36)   a. *Ich treffe heute **sau** den coolen Peter.
            I   meet today EI the cool   Peter

        b. Ich treffe heute den **sau** coolen Peter.
            I   meet today the EI   cool   Peter

Note that (36a) is only unacceptable when *Peter* is used as a real proper name. In cases in which a proper name is used to denote a property instead of an individual, external EIs are possible. For instance, (37) is fine when used to express that some property that is saliently associated with Einstein holds to a high degree for Peter.

(37)   Peter ist sau der Einstein.
       Peter is EI   the Einstein
       'Peter is totally an Einstein'

The findings of our brief discussion of the syntax and semantics of EIs is summarized in Table 1. Internal EIs do not show a special relationship between their syntactic structure and their semantic interpretation. In the construction, the choice of the determiner is not restricted at all and the interpretation of the entire DP compositionally reflects which determiner is used. In contrast, when it comes to EIs in the external position, we can detect a mismatch between their form and their interpretation. Indefinite articles (as well as many other kinds of determiners) are impossible if the EI is located externally, but despite the presence of a definite article, the entire DP receives an indefinite interpretation. In the next section, we turn to this puzzle, raise some additional ones, and sketch an analysis of external EIs.

	syntax	←match→	semantics
internal	indefinite	✓	indefinite
	definite	✓	definite
external	*indefinite	(✓)	*indefinite
	definite	✗	indefinite

Table 1: Syntax-semantics (mis)matches with EIs

4. A sketch of an analysis

As the previous discussion has shown, EIs show interesting and rather unexpected behavior that raises many questions for an analysis of their syntax and semantics. We take the following four questions to be the most important ones from the perspective of the syntax-semantics interface.

(i)   *Position*   Given that degree elements commonly do not occur outside of the DP, what is the position in which external EIs reside?

(ii)   *Restriction to EIs*   Given that, except for their expressive meaning, internal EIs seem to behave like standard degree words, why is the external position only available for the former but not for the latter?

(iii)   *Restriction to definite articles*   Why is the external position only available for definite articles but neither for indefinite ones nor for quantified DPs?

(iv)   *Indefinite interpretation*   Why is the entire DP interpreted indefinitely, despite the fact that a definite article is required for the external position to be available in the first place?

In the following, we will give a tentative analysis for DP-external EIs that provides answers to these questions, even if we have to leave certain problems unsolved.

4.1. Position

In section 2.1 we showed that EIs fill the head position of the DegP, which is an extended functional projection of the adjective phrase. Therefore, EIs in external position must be located in a head position as well, given the standard structure preservation requirement that 'the landing site of head movement must always be another head' (Roberts 2001:113).[7] In order to provide a head position for the EI, we therefore need an extended projection that embeds the entire DP. Of course, it would be rather *ad hoc* to just stipulate such a projection solely to account for external *sau*. However, there are independent arguments for such an additional projection. For instance, Kallulli and Rothmayr (2008) argue for a quantifier phrase (QP) above the DP in order to deal with structures like *(ein) so ein cooler Typ* '(a) such a cool guy' in Bavarian German and argue that the intensifying element *so* 'such/so' fills the head of the QP.

(38)   [QP so [DP ein [NP [DegP cooler] [NP Typ]]]]

However, we think that Kallulli and Rothmayr's (2008) analysis of *so* is not adequate for various reasons. In brief, as shown by Lenerz and Lohnstein (2005) in an earlier study (not mentioned by Kallulli and Rothmayr 2008), *so* should better be analyzed as phrasal instead of being a head.[8] In order to account for preposed *so*, Lenerz and Lohnstein (2005) therefore propose that it may be raised to a specifier position of the DP, a solution which is not available for EIs, since they, as heads, cannot occur in such a position.

We therefore still need to provide a proper landing side for external EIs. Even if Kallulli and Rothmayr's (2008) proposal may be problematic for *so*, it can be a good starting point for EIs, at least for the syntactic side of the problem. Their approach is based on the general proposal put forward by Matthewson (2001), who, based on a semantic analysis of quantification in St'át'imcets (Salish), argues that what is traditionally considered to be a DP should be decomposed into a D- and a Q-projection, as in (39), such that a quantifier does not take an NP-complement but an entire DP. A similar structure is proposed for syntactic reasons, amongst others, by Giusti (1991) to account for phrases like *all die Studenten* 'all the students' in (40), in which there is both a quantifier and a determiner.

(39)   [QP Q [DP D [NP N]]]   (40)   [QP all [DP die [NP Studenten]]]

Even if it is not straightforwardly obvious why *sau* and its kin should be able to occur in this position, we propose to take Matthewson's (2001) decomposition and the basic insights of Kallulli and Rothmayr (2008) as a starting point and propose that *sau* is moved to the head of QP when it occurs in external position.[9]

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[7]We cannot delve into the recent discussion concerning head movement, that is, whether there is genuine syntactic head movement or whether it is rather a PF-phenomenon, cf. amongst many others, Koopman and Szabolcsi (2000); Boeckx and Stjepanovic (2001); Chomsky (2001); Matushansky (2006). However, if our analysis of EIs as the head of DegP is right, then the external EIs seem to support syntactic movement since, as shown in the previous section, the movement comes with a crucial semantic effect.

[8]Zimmermann (2011) discusses further problems of Kallulli and Rothmayr's (2008) approach.

[9]According to the approaches alluded to in the main text, external EIs are not really external since the QP is part of what is traditionally understood as a DP.

(41)   [$_{QP}$ **sau**$_i$ [$_{DP}$ die [$_{NP}$ [$_{DegP}$ t_i [$_{AP}$ coole]] Party]]]

Having suggested an answer to the question of what the position is in which external EIs are located, we now turn to the question why more common degree elements are excluded from this position.

4.2. Restriction to EIs

As we have seen in (20) in section 3.1 above, *sehr* 'very' and other non-expressive degree expressions cannot occur in the DP-external position, while *sau* and other EIs can. In order to implement this difference in the syntactic structure, *sehr* should receive a different syntactic analysis than *sau*. To motivate this however, we need more evidence to treat EIs differently from common degree words. Importantly, this additional difference has to go beyond the mere difference of the availability of the external position. This raises the question of in what respects EIs do not behave like non-expressive intensifiers even when they occur DP-internally, deviating from what we presented in section 2.1.

A first bit of evidence that EIs actually behave differently from *sehr* is provided by their behavior in elliptical answers. Whereas *sehr* can constitute a possible short answer that is elliptical for *die Party war sehr gut* 'the party was very good', this is impossible for *sau*. This holds for *yes/no*-questions as well as for *wh*-questions.

(42)   a.   War die Party cool?   Ja, sehr./*Ja, sau.
             Was the party cool?   *yes very yes* EI
        b.   Wie cool war die Party?   Sehr./*Sau.
             How cool was the party?   *very*   EI

A further important difference between *sehr* and *sau* concerns the ability to extract constituents from the degree phrases they embed. First, as the examples in (43) show, extracting the adjective is possible with *sehr* but not so with EIs. Similar facts hold for left dislocation construction in which a degree-element referring to a topicalized adjective is extracted from the degree phrase as illustrated by the examples in (44).

(43)   a.   Cool$_i$ ist Sophie sehr t_i.   b.   *Cool$_i$ ist Sophie sau t_i.
             cool is Sophie very   cool is Sophie EI
             'Sophie is very cool.'

(44)   a.   Cool, das$_i$ ist Sophie sehr t_i.   b.   *Cool$_i$, das ist Sophie sau t_i.
             cool that is Sophie very   cool   that is Sophie EI
             'Sophie is very cool.'

The same restriction also applies to *wh*-movement, which is possible for *sehr* but ill-formed with *sau*, as illustrated in (45).[10]

(45)   a.   Was$_i$ ist Sophie sehr t_i?   b.   *Was$_i$ ist Sophie sau t_i?
             what is Sophie very   what is Sophie EI
             'What is Sophie a lot?'

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[10]Some speakers of German do not find (45a) completely acceptable. However, even for those speakers, (45b) is worse and this is what is important here.

These contrasts in their syntactic behavior show that there must be a structural difference between standard degree words and EIs/*so*, especially given the fact that semantically, all these syntactic operations would be as intelligible for EIs as they are for non-expressive intensifiers.

How can this difference be accounted for? Corver (1997a,b), following Bresnan (1973), assumes that there are two kinds of degree elements. On the one hand, there are determiner-like degree elements, which head a DegP. On the other hand, he argues that there are also degree expressions that are more like quantifiers that project a QP inside the extended functional projection of the adjective. To distinguish this adjectival QP from the nominal one, we call it 'QegP' instead. According to this *Split degree system hypothesis* (Corver 1997b), the extended structure of an adjective phrase can be given as follows.

(46) $[_{DegP}$ Deg $[_{QegP}$ Qeg $[_{AP} \ldots]]]$

What is important for our concerns here is that Corver (1997b) observes differences between Deg- and Qeg-elements similar to the ones we described in (43)–(45). For instance, he shows that in Dutch, adjective phrases that are headed by Qeg-elements allow for extraction or split topicalization while those introduced by Deg-elements do not (Corver 1997b:127, Fn. 13). Based on the asymmetries in (42)–(45), we therefore assume that internal EIs are Deg-elements, while *sehr* is the head of the QegP. That is, even when in internal position, *sau* and *sehr* take up different positions. This accounts for their different behavior with respect to the syntactic phenomena just discussed.

Let us now turn to the question of why only EIs can be located in the external position but other degree elements cannot. Given the structural differences just discussed, this comes down to the question of why only Deg-elements can occur externally, whereas Qeg-elements cannot. As we argued for in the last subsection, the position of external EIs is the head position of the QP-layer on top of the DP. We assume that external EIs are base-generated in internal position and raised to the higher Q-position. Looking at the structures for EIs and standard degree elements in (47a) and (47b) respectively, we can see why only *sau* can be raised to Q^0 but not *sehr*. According to the head-movement constraint (Travis 1984), a head can only be moved to the next c-commanding head position and cannot skip an intervening head position (cf. also Roberts 2001). In contrast, degree elements like *sehr* 'very' that are located below Deg^0 in Qeg^0, cannot be moved to Q^0, since in this case, Deg^0 counts as an intervening head position and therefore, movement of *sehr* to Q^0 is blocked, as depicted in (47b).[11]

(47)   a. $[_{QP}$ sau$_i$ $[_{DP}$ die $[_{NP}$ $[_{DegP}$ t_i $[_{QegP}$ Qeg^0 $[_{AP}$ coole $]$ $]$ $]$ Party $]$ $]$ $]$
         b.   *$[_{QP}$ sehr$_i$ $[_{DP}$ die $[_{NP}$ $[_{DegP}$ Deg^0 $[_{QegP}$ t_i $[_{AP}$ coole $]$ $]$ $]$ Party $]$ $]$ $]$

We should note that in order for this to work, we have to make the plausible assumption that D^0 is not a proper landing site for head movement of degree elements, maybe because it is too different in terms of its features. Hence it does not count as an intervener with respect to the head movement constraint, which in its more recent incarnation is relativized to features (cf., e.g., Epstein et al. 1998; Ferguson 1996; Chomsky 2001).

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[11] An anonymous review mentions a further difference. While *sehr* can be iterated, EIs cannot.

(i)   a.   Es ist {sehr, sehr} / *{sau, sau} kalt.   b.   *Es ist sehr, arg,   besonders   kalt.
               it is very, very   EI   EI   cold   it is very acutely extraordinarily cold

While we agree on this, we are not sure how to implement this into the structure proposed in the main text. Allow DegP to be iterated at will seems to be too liberal, as degree-word iteration is not freely available.

A further problem for the analysis in (47a) is that definite DPs are commonly regarded as islands for extraction and therefore, moving *sau* to Q⁰ should not be possible. The empirical data, however, shows the contrary pattern, as external-EI constructions are possible with definite DPs but not with indefinite. In addition, we have seen that the seemingly definite external-EI constructions are interpreted as indefinite. That is, it could be the case that there is no definite article after all. We will return to this below when we discuss the remaining two problems.

Setting these problems aside, which we think could be solved, we conclude that, given the head-movement constraint as well as the split degree system hypothesis, which are both motivated independently of external EIs, the restriction of the DP-external position to EIs can be derived from the categorial difference between *sau* and *sehr*. In the following, we will try to come up with answers to the remaining two questions. However, as we will see, these are even harder to answer satisfactorily.

4.3. Restriction to definite articles

That external-EI constructions cannot co-occur with quantifiers, as shown in (29), is accounted for by the structural analysis we suggested above in §4.1. Since in quantified DPs, the Q-position is already occupied by the quantifying element, there is no head position outside the DP for an EI to be raised to. Furthermore, the structure in (41) correctly predicts that, in contrast to external-EI constructions, the internal position is freely available with quantified DPs.

(48)   Heute steigen alle / einige / die meisten / drei / höchstens drei **sau** coole(n) Partys.
       today goes-on all   some   the most   three   at most   three EI cool   parties
       'Today, all/some/the most/three/at most three EI cool parties are going on.'

That the external EI-construction is restricted to definite articles, however, does not fall out directly from the QP-DP structure proposed in (41) and (47a). Considering the obligatorily indefinite interpretation, to which we turn in the next subsection, this restriction is even more puzzling. At the moment, we can present some speculative thoughts on this questions.

A first direction in which to look for an answer is provided by the details of Matthewson's (2001) QP-DP-split system. According to her theory, the DP must denote an individual of type e.[12] The quantifier then takes the DP as an argument and yields a generalized quantifier (Matthewson 2001:153).

(49) $[_{QP:\langle\langle e,t\rangle,t\rangle}\ Q_{\langle e,\langle\langle e,t\rangle,t\rangle\rangle}\ [_{DP:e}\ D_{\langle\langle e,t\rangle,e\rangle}\ NP_{\langle e,t\rangle}]]$

It is therefore important for her system that the DP is definite, not indefinite.[13] If we assume that Matthewson's (2001) analysis carries over to German, the restriction to definite determiners follows. But even if there are cases like the one in (40), in which a distinction between Q and D is overt, it is not always obvious. A further instance where a division between Q and D seems to be transparent is the universal quantifier *jeder* 'every' in German, which can morphologically be decomposed into the quantifying part *je-* and a definite article *der*.[14]

[12]Plural individuals are also possible in Matthewson's (2001) semantics.

[13]One of the problems of the analysis presented by Kallulli and Rothmayr (2008) that Zimmermann (2011:213) points out is that they adopt Matthewson's (2001) analysis for an indefinite NP. Note, furthermore, that even if the determiner must be definite in her approach, the entire QP may nevertheless receive an indefinite interpretation, depending on the meaning of the quantifier. See Matthewson (2001:152-154) for details.

[14]See, for example, Sauerland 2004 and Kallulli and Rothmayr 2008. Leu (2009) criticizes this approach. Note that (50) is an instance of the pattern mentioned in the previous footnote. Even if the determiner *der* is definite, the

(50)   [_QP je- [_DP der [_NP Student]]]

The crucial question, however, is how indefinite DPs in German should be analyzed, when we use the approach developed by Matthewson (2001). An obvious way to go would be to argue that indefinite DPs are not QPs but bare DPs in which a generalized quantifier is created in the traditional way. Of course, this analysis would not be in the spirit of Matthewson (2001), as it runs counter her general no-variation hypothesis, which she defends in her paper.

A second approach is more in line with Matthewson's agenda and mirrors her suggested analysis of *every*. Some elements function as both quantifiers and determiners simultaneously. We do not want to determine the merits or shortcomings of these two suggestions. However, even if they are structurally very different and certainly have different consequences, they both can provide a straightforward answer to the question why external-EI constructions are impossible with indefinite articles. According to the first solution, there is no QP and therefore, there is no landing side for *sau* to be moved to. According to the second solution, the indefinite article serves the function of both Q and D and therefore, *sau* cannot occupy Q^0. However, it should be noted that these are preliminary suggestions rather than definite solutions to the posed problem, since the consequences of Matthewson's (2001) reformulation of the DP-structure for languages like German are not worked out in detail.

Before going on to the remaining question, let us mention that external-EIs are not the only construction that show a restriction to a specific determiner that is surprising given the interpretation of the determiner. This holds, for instance, for intensifying *that*-constructions in English, which can also precede the determiner. Although semantically, it would make perfect sense to have such constructions with definite articles, it is impossible.[15]

(51)   a.   I saw that cool a guy.
         b.   I saw a guy that cool.
         c.   *Yesterday, I finally saw the guy that cool, the one you told me about.
         d.   *Yesterday, I finally saw that cool the guy, the one you told me about.

Superlatives like in (52) are another construction that seem to come with strong preference for definite articles even if, at least in the so-called comparative reading (Heim 1995), it is interpreted as indefinite, as illustrated by the paraphrase.

(52)   Piet schmeißt die / *eine cool-ste Party
         Piet throws   the   a   cool-est party
         'Piet throws the coolest party'   ('Piet throws a cooler party than anyone else')

Not only for this, superlatives are interesting for our study, as they touch on further issues similar to the questions raised by EIs. The indefinite interpretation of a definite article just mentioned is the most prominent one to which we will turn to next.

4.4. Indefinite interpretation

The last question remaining is why the definite article is nevertheless interpreted as indefinite, an observation that is rather surprising considering the requirement for definite articles just mentioned. One way to account for this change in interpretation is on purely semantic grounds.

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entire quantifier *je-der* is indefinite.

[15]Thanks to Chris Barker, Erich Groat and Barbara Partee, who pointed this out to us.

The precise semantics for EIs, which has not been what we focussed on in this paper, could be defined such that external EIs combine with the DP in such a way that the definiteness of the articles is 'neutralized' or at least that it has no observable effect on the semantics of the entire structure. The definite article and its indefinite interpretation would then be 'part of the construction' (Barbara Partee, p.c.). For instance, Stump's (1981) compositional analysis of frequency adverbs can be thought to be an approach along these lines. The famous *occasional sailor* kind of examples can involve a similar shift in interpretation as external EIs show.

(53)   There was the occasional question making everyone think a lot.

The more recent approach to such cases developed by Zimmermann (2003) can be regarded as a semantic construction-approach as well. Even if he derives the right reading and an adequate structure by the formation of a complex quantifier by incorporating the adverb into the determiner at LF, 'compositionality does not extend into the complex quantifier' (Zimmermann 2003:257), that is, the meaning of the complex quantifier *the+occasional* is not determined by the meaning of its parts. Therefore, an approach that makes the entire external-EI construction responsible for the restriction to definite articles that are nonetheless interpreted indefinitely, may be plausible since similar ones may be needed anyway to deal with phenomena like (52) or (53). However, it may be not completely satisfying.

Another way to address this question is to take the mismatch between form and interpretation at face value. According to this view, the external-EI constructions do not involve a definite article but an indefinite one. Besides the obviously indefinite interpretation, the fact that external-EIs are possible in existential- or *have*-constructions without a definiteness effect can be a diagnostics for this, in contrast to internal EIs with definite articles.

(54)   a.   Da   ist {sau die} / *{die sau} coole Party.
              there is   EI   the   the EI   cool party
        b.   Ich habe {sau den} / *{den sau} coolen Freund.
              I   have EI   the   the EI   cool   boyfriend

In this respect, the external-EI construction relates again to superlatives for which a similar mismatch analysis has been suggested (cf., e.g., Heim 1995, Szabolcsi 1986). Note that in order to derive the comparative reading of a superlative by movement, the degree expression must be extracted from the DP at LF (cf. Heim 1995).

(55)   Piet [C -est] λd.[throws [the d-cool party]]

(56)   Piet throws a cooler party than any other element of the contextual salient set C.

This LF-extraction, however, faces the same problem as our overt extraction of *sau*. Since definite DPs are regarded as islands for extraction, raising the degree quantifier is unexpected. However, since it nevertheless seems to be possible and since the interpretation shifts from definite to indefinite, Heim (1995) assumes that the overt definite article is actually vacuous and the determiner which is instead interpreted at LF can be either a covert definite or indefinite determiner. That is, the actual LF for (52) is (57) instead of (55). Only when the abstract article A is indefinite, extraction becomes possible and with it the comparative reading.

(57)   Piet [C -est] λd.[throws [A d-cool party]]

The problem of external EIs is very similar to this, except for the fact that we are dealing with overt extraction instead of LF-movement. First, we have the unexpected extraction of a

degree expression out of a seemingly definite DP. Secondly, this DP is interpreted as indefinite. Accordingly, we can follow Heim (1995) and assume that the definite article is only superficially definite but actually an indefinite determiner. This would allow us to extract *sau* and by the same token would give us the observed indefinite interpretation. However, the question of why there is a mismatch between the observed form and interpretation in external-EI constructions remains unanswered in this approach, like in the construction-based approaches. Note, furthermore, that this analysis renders the argumentation from the previous subsection obsolete, for, by assumption, there is no definite article in the first place.

Besides this mismatch approach, it is also possible that there are more structural strategies available. For instance, a possible explanation could be based on the assumption of a functional projection for a definite interpretation, like, for example, the S(trong)DP in Zamparelli 2000. If it can then be shown that an EI in Q^0 prohibits the determiner from ending up in SD^0 (either by blocking movement or by disallowing the entire projection), the article has to be interpreted indefinitely. However, even in such an approach, the mismatch between the indefinite interpretation and the requirement of a definite determiner remains mysterious.

5. Conclusion

In this paper, we have addressed some of the puzzling properties exhibited by a particular class of degree elements in informal varieties of German which we called *expressive intensifiers*. What is special about these expressions is that they can occur in a position preceding the determiner where they nevertheless still intensify the adjective inside the DP. This position is not available for standard degree expressions. We have dealt with what we take to be the four most important questions raised by EIs, namely the questions of (i) what the position is in which external EIs are located; (ii) why only EIs but not standard degree elements like *sehr* 'very' can occur in that position; (iii) why external EIs are restricted to definite articles; and (iv) why the definite article is interpreted as indefinite. First, we assume that when in external position, EIs take up the head position of the QP, an additional extended functional projection of the NP that embeds the DP and whose existence is argued for by Matthewson (2001) and Giusti (1991) on independent grounds. Regarding the second question, we follow Corver's (1997a) split degree system hypothesis, according to which there are two kinds of degree elements. The first group, the Deg-elements, to which *sau* and other EIs belong, are located higher in the extended projection of the adjective and therefore can be moved to the head of the QP. In contrast, motivated by other differences between *sau* and *sehr*, we have analyzed *sehr* as a Qeg-element which is located below the DegP. According to Travis' (1984) head movement constraint, they cannot be moved to Q^0 because with Deg^0, there is an intervening head position which blocks this long movement. Next we showed how the restriction to definite determiners can be explained within Matthewson's Q-D-split system. Since an answer to this depends on how indefinite articles are analyzed, we sketched two possibilities both of which lead to the same explanation of the restriction, namely that the Q-position is not available as a landing side for *sau*. For the last question, we highlighted parallels between superlatives in their comparative reading and external EIs. Following Heim (1995) it could be assumed that the definite article is actually an indefinite one, which solved the extraction and interpretation obstacle. However, this requires treating the restriction to definite articles as an arbitrary part of the construction.

All of the four questions are worth studying in much more detail. And given the fact that we have not addressed the precise lexical semantics of EIs in this paper either, it should be ob-

vious that expressive intensifiers in German are an interesting subject for further investigations, especially since they combine interesting syntactic and semantic properties that do not match up as expected. This makes them an ideal object for exploring the syntax-semantics interface of not-well studied constructions.

References

Abney, Steven. 1987. *The English noun phrase in its sentential aspect*. MIT dissertation.

Androutsopoulos, Jannis K. 1998. *Deutsche Jugendsprache*. Frankfurt: Lang.

Bach, Emmon. 1967. *Have* and *be* in English syntax. *Language* 43.462–485.

Beck, Sigrid. 2012. Comparison constructions. *Semantics: An international handbook of natural language meaning*, ed. by Klaus von Heusinger, Claudia Maienborn, and Paul Portner, vol. 2,, 1341–1390. Berlin: de Gruyter.

Boeckx, Cedric, and Sandra Stjepanovic. 2001. Head-ing toward PF. *Linguistic Inquiry* 32.345–355.

Bresnan, Joan W. 1973. Syntax of the comparative clause construction in English. *Linguistic Inquiry* 4.275–343.

Chomsky, Noam. 2001. Derivation by phase. *Ken Hale: A life in language*, ed. by Michael Kenstowicz. Cambridge, MA: MIT Press.

Corver, Norbert. 1997a. The internal syntax of the Dutch extended adjectival projection. *Natural Language and Linguistic Theory* 15.289–368.

Corver, Norbert. 1997b. *Much*-support as last resort. *Linguistic Inquiry* 28.119–164.

von Fintel, Kai. 2004. Would you believe it? The king of France is back! *Descriptions and beyond*, ed. by Marga Reimer and Anne Bezuidenhout, 269–296. Oxford: Oxford University Press.

Epstein, Samuel D., Hisatsugu Kitahara, Ruriko Kawashima, and Erich Groat. 1998. *A derivational approach to syntactic relations*. Oxford: Oxford University Press.

Ferguson, Scott. 1996. Shortest move and object case checking. *Minimal ideas*, ed. by Werner Abraham, Samuel D. Epstein, Höskuldur Thrainsson, and C. Jan-Wouter Zwart, 97–112. Amsterdam: John Benjamins.

Giusti, Giuliana. 1991. The categorial status of quantified nominals. *Linguistische Berichte* 136.438–454.

Gutzmann, Daniel. 2011. Expressive modifiers & mixed expressives. *Empirical issues in syntax and semantics 8*, ed. by Olivier Bonami and Patricia Cabredo-Hofherr, 123–141. Online: `http://www.cssp.cnrs.fr/eiss8/gutzmann-eiss8.pdf`.

Heim, Irene. 1995. Notes on superlatives. Ms. Online: `http://semanticsarchive.net/Archive/TI1MTlhZ/Superlative.pdf`.

Heim, Irene. 2001. Degree operators and scope. *Audiatur vox sapientiae*, ed. by Caroline Féry and Wolfgang Sternefeld, 214–239. Berlin: Akademie Verlag.

Horn, Laurence R. 2008. On F-implicature. Myth-analysis and rehabilitation. Ms. Online: `http://www.eecs.umich.edu/~rthomaso/lpw08/Horn_LPW.pdf`.

Jayez, Jacques, and Corinne Rossari. 2004. Parentheticals as conventional implicatures. *Handbook of French semantics*, ed. by Francis Corblin and Henriëtte de Swart, 211–229. Stanford, CA: CSLI.

Kallulli, Dalina, and Antonia Rothmayr. 2008. The syntax and semantics of indefinite determiner doubling constructions in varieties of German. *The Journal of Comparative Germanic Linguistics* 11.95–136.

Kennedy, Christopher. 1999. *Projecting the adjective: The syntax and semantics of gradability and comparison*. New York: Garland.

Kennedy, Christopher. 2007. Vagueness and grammar: The semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* 30.1–45.

Kennedy, Christopher, and Louise McNally. 2005. Scale structure, degree modification, and the semantics of gradable predicates. *Language* 81.345–381.

Kirschbaum, Ilja. 2002. Schrecklich nett und voll verrückt. Muster der Adjektiv-Intensivierung im Deutschen. University of Düsseldorf dissertation. Online: `http://deposit.d-nb.de/cgi-bin/dokserv?idn=969264437&dok_var=d1&dok_ext=pdf&filename=`

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969264437.pdf.
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Koopman, Hilda, and Anna Szabolcsi. 2000. *Verbal complexes*. Cambridge, MA: MIT Press.

Lenerz, Jürgen, and Horst Lohnstein. 2005. Nur *so* – strukturaspekte der vergleichskonstruktion. *Deutsche Syntax*, ed. by Franz Josef d'Avis, no. 46 in Göteborger Germanistische Forschungen, 81–103. Gothenburg: Acta Universitatis Gothoburgensis.

Leu, Thomas. 2009. The internal syntax of *jeder* 'every'. *Linguistic Variation Yearbook* 9.153–204.

Matthewson, Lisa. 2001. Quantification and the nature of crosslinguistic variation. *Natural Language Semantics* 9.145–189.

Matushansky, Ora. 2006. Head-movement in linguistic theory. *Linguistic Inquiry* 37.69–109.

McCready, Eric. 2009. What man does. *Linguistics and Philosophy* 31.671–724.

McCready, Eric. 2010. Varieties of conventional implicature. *Semantics & Pragmatics* 3.1–57.

McCready, Eric, and Magdalena Schwager. 2009. Intensifiers. Talk given at the workshop on expressives and other kinds of non-truth-conditional meaning, DGfS 2009. Osnabrück.

Meinunger, André. 2009. Leftmost peripheral adverbs and adjectives in German. *Journal of Comparative German Linguistics* 12.115–135.

Milsark, Gary. 1977. Toward an explanation of certain peculiarities of the existential construction in English. *Linguistic Analysis* 3.1–29.

van Os, Charles. 1989. *Aspekte der Intensivierung im Deutschen*. Tübingen: Narr.

Potts, Christopher. 2005. *The logic of conventional implicature*. Oxford: Oxford University Press.

Roberts, Ian. 2001. Head movement. *The handbook of contemporary syntactic theory*, ed. by Mark Baltin and Chris Collins, 113–147. Oxford: Blackwell.

Sauerland, Uli. 2004. A comprehensive semantics for agreement. Ms.

von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3.1–77.

Stump, Gregory T. 1981. The interpretation of frequency adverbs. *Linguistics and Philosophy* 4.221–257.

Szabolcsi, Anna. 1986. Comparative superlatives. *MIT Working Papers* 8. 245–266.

Travis, Lisa. 1984. *Parameters and effects of word order variation*. MIT dissertation.

Wang, Linton, and Eric McCready. 2007. Aspects of the indefiniteness effect. *New frontiers in artificial intelligence*, ed. by T. Washio, K. Satoh, H. Takeda, and A. Inokuchi, 162–176. Heidelberg: Springer.

Zamparelli, Roberto. 2000. *Layers in the determiner phrase*. New York: Garland.

Zimmermann, Malte. 2003. Pluractionality and complex quantifier formation. *Natural Language Semantics* 11.249–287.

Zimmermann, Malte. 2011. On the functional architecture of DP and the feature content of pronominal quantifiers in Low German. *Journal of Comparative Germanic Linguistics* 14.203–240.

A frame-based semantics of the dative alternation in Lexicalized Tree Adjoining Grammars

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1. Introduction

It is well-known that the meaning of a verb-based construction does not only depend on the lexical meaning of the verb but also on its specific syntagmatic environment. Lexical meaning interacts with constructional meaning in intricate ways and this interaction is crucial for theories of argument linking and the syntax-semantics interface. These insights have led proponents of Construction Grammar to treating every linguistic expression as a construction (Goldberg 1995). But the influence of the syntagmatic context on the constitution of verb meaning has also been taken into account by lexicalist approaches to argument realization (e.g. Van Valin & LaPolla 1997). The crucial question for any theory of the syntax-semantic interface is how the meaning components are distributed over the lexical and morphosyntactic units of a linguistic expression and how these components combine. In this paper, we describe a grammar model that is sufficiently flexible with respect to the factorization and combination of lexical and constructional units both on the syntactic and the semantic level.

The proposed grammar description framework combines *Lexicalized Tree Adjoining Grammars* (LTAG) with *decompositional frame semantics* and makes use of a constraint-based, 'meta-grammatical' specification of the elementary syntactic and semantic structures. The LTAG formalism has the following two key properties (Joshi & Schabes 1997): (i) *Extended domain of locality*: The full argument projection of a lexical item can be represented by a single elementary tree. The domain of locality with respect to dependency is thus larger in LTAG than in grammars based on context-free rules. Elementary trees can have a complex constituent structure. (ii) *Factoring recursion from the domain of dependencies*: Constructions related to iteration and recursion are modeled by the operation of adjunction. Examples are attributive and adverbial modification. Through adjunction, the local dependencies encoded by elementary trees can become long-distance dependencies in the derived trees.

Bangalore & Joshi (2010) subsume the properties (i) and (ii) under the slogan 'complicate locally, simplify globally.' The idea is that basically all linguistic constraints are specified over the local domains represented by elementary trees and, as a consequence, the composition of elementary trees can be expressed by the two general operations substitution and adjunction. This view on the architecture of grammar, which underlies LTAG, has direct consequences for

semantic representation and computation. Since elementary trees are the basic syntactic building blocks, it is possible to assign complex semantic representations to them without necessarily deriving these representations compositionally from smaller parts of the tree. Hence, there is no need to reproduce the internal structure of an elementary syntactic tree within its associated semantic representation (Kallmeyer & Joshi 2003). In particular, one can employ 'flat' semantic representations along the lines of Copestake et al. (2005). This approach, which supports the underspecified representation of scope ambiguities, has been taken up in LTAG models of quantifier scope and adjunction phenomena (Kallmeyer & Joshi 2003; Gardent & Kallmeyer 2003; Kallmeyer & Romero 2008).

The fact that elementary trees can directly be combined with semantic representations allows for a straightforward treatment of idiomatic expressions and other non-compositional phenomena, much in the way proposed in Construction Grammar. The downside of this 'complicate locally' perspective is that it is more or less unconcerned about the nature of the linguistic constraints encoded by elementary trees and about their underlying regularities. In fact, a good part of the linguistic investigations of the syntax-semantics interface are concerned with argument realization, including argument extension and alternation phenomena (e.g. Van Valin 2005; Levin & Rappaport Hovav 2005; Müller 2006). Simply enumerating all possible realization patterns in terms of elementary trees without exploring the underlying universal and language-specific regularities would be rather unsatisfying from a linguistic point of view.

The mere enumeration of basic constructional patterns is also problematic from the practical perspective of grammar engineering (Xia et al. 2010): The lack of generalization gives rise to redundancy since the components shared by different elementary trees are not recognized as such. This leads to maintenance issues and increases the danger of inconsistencies. A common strategy to overcome these problems is to introduce a tree description language which allows one to specify sets of elementary trees in a systematic and non-redundant way (e.g. Candito 1999; Xia 2001). The linguistic regularities and generalizations of natural languages are then captured on the level of descriptions. Since LTAG regards elementary trees as the basic components of grammar, the system of tree descriptions is often referred to as the *metagrammar*. While the details of the approaches of Candito (1999) and Xia (2001) differ, they both assume canonical or base trees from which alternative constructions are derived by a system of lexical and syntactic rules. Crabbé (2005), by contrast, proposes a purely constraint-based approach to metagrammatical specification (see also Crabbé & Duchier 2005), which does not presume a principle distinction between canonical and derived patterns but generates elementary trees uniformly as minimal models of metagrammatical descriptions. We will adopt the latter approach for our framework because of its clear-cut distinction between the declarative level of grammatical specification and procedural and algorithmic aspects related to the generation of the elementary trees.

Existing metagrammatical approaches in LTAG are primarily concerned with the organization of general valency templates and with syntactic phenomena such as passivization and wh-extraction. The semantic side has not been given much attention up to now. However, there are also important semantic regularities and generalizations to be captured within the domain of elementary constructions. In addition to general semantic constraints on the realization of arguments, this includes also the more specific semantic conditions and effects that go along with argument extension and modification constructions such as resultative and applicative constructions, among others. In order to capture phenomena of this type, the metagrammatical descriptions need to include semantic constraints as well. In other words, analyzing the syntax-semantics interface given by elementary constructions that goes beyond the mere enumeration
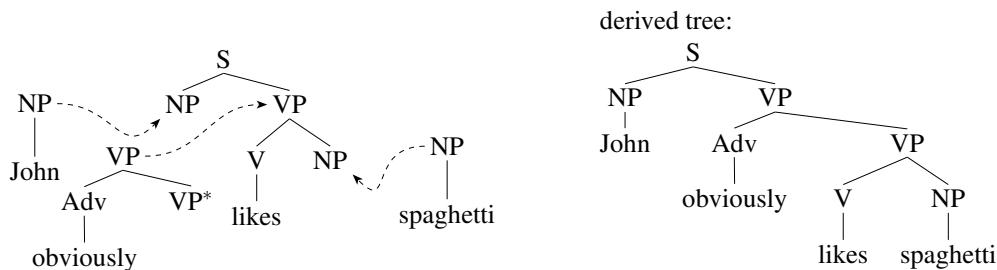
Figure 1: A sample derivation in TAG

of form-meaning pairs calls for a (meta)grammatical system of constraints consisting of, both, syntactic and semantic components. It must be emphasized that this conclusion does not imply a revival of the idea of a direct correspondence between syntactic and semantic (sub)structures, an assumption which LTAG has abandoned for good reasons.

The framework proposed in this paper treats the syntactic and the semantic components of elementary constructions as structured entities, trees, on the hand, and frames, on the other hand, without requiring that there be any structural isomorphism between them. The metagrammar specifies the syntactic and semantic properties of constructional fragments and defines how they can combine to larger constructional fragments. There is no need for a structural isomorphism between syntax and semantics simply because the relation between the syntactic and semantic components is explicitly specified. Below we illustrate this program of decomposing syntactic trees and semantic frames in the metagrammar by a case study of the dative alternation in English, which is is well-known to be sensitive to lexical and constructional meaning components.

A long-term goal of the work described in this paper is the development of a grammar engineering framework that allows a seamless integration of lexical and constructional semantics. More specifically, the approach provides Tree Adjoining Grammars with a decompositional lexical and constructional semantics and thereby complements existing proposals which are focused on standard sentence semantics. From a wider perspective, the framework can be seen as a step towards a formal and computational account of some key ideas of Construction Grammar à la Goldberg, since the elementary trees of LTAG combined with semantic frames come close to what is regarded as a construction in such approaches. Frameworks with similar goals are Embodied Construction Grammar (Bergen & Chang 2005) and Sign-Based Construction Grammar (Sag 2012).

2. LTAG and grammatical factorization
2.1. Brief introduction to TAG

Tree Adjoining Grammar (TAG; Joshi & Schabes 1997; Abeillé & Rambow 2000) is a tree-rewriting formalism. A TAG consists of a finite set of *elementary trees*. The nodes of these trees are labelled with non-terminal and terminal symbols, with terminals restricted to leaf nodes. Starting from the elementary trees, larger trees are derived by *substitution* (replacing a leaf with a new tree) and *adjunction* (replacing an internal node with a new tree). Sample elementary trees and a derivation are shown in Fig. 1. In this derivation, the elementary trees for *John* and *spaghetti* substitute into the subject and the object slot of the elementary tree for *likes*, and the *obviously* modifier tree adjoins to the VP node.
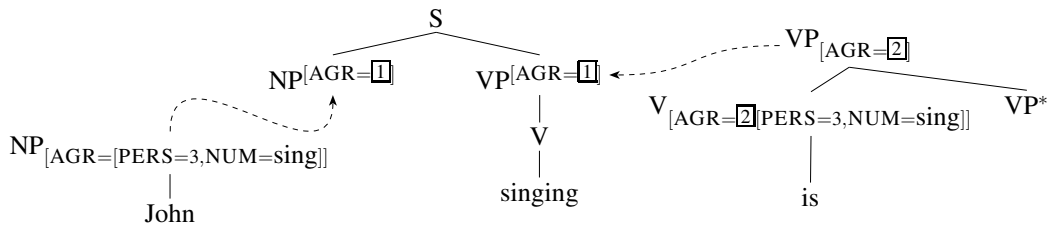
Figure 2: Agreement in FTAG

In case of an adjunction, the tree being adjoined has exactly one leaf that is marked as the *foot node* (marked with an asterisk). Such a tree is called an *auxiliary* tree. To license its adjunction to a node *n*, the root and foot nodes must have the same label as *n*. When adjoining it to *n*, in the resulting tree, the subtree with root *n* from the old tree is attached to the foot node of the auxiliary tree. Non-auxiliary elementary trees are called *initial* trees. A derivation starts with an initial tree. In a final derived tree, all leaves must have terminal labels. In a TAG, one can specify for each node whether adjunction is mandatory and which trees can be adjoined. The subscripts *NA* and *OA* indicate adjunction constraints: *NA* signifies that for this node, adjunction is not allowed while *OA* signifies that adjunction is obligatory.

In order to capture syntactic generalizations in a more satisfying way, the non-terminal node labels in TAG elementary trees are usually enriched with feature structures. The resulting TAG variant is called *feature-structure based TAG* (FTAG; Vijay-Shanker & Joshi 1988). In an FTAG, each node has a top and a bottom feature structure (except substitution nodes that have only a top). Nodes in the same elementary tree can share features. In an FTAG, adjunction constraints are expressed via the feature structures. During substitution and adjunction, the following unifications take place. In a substitution operation, the top of the root of the new initial tree unifies with the top of the substitution node. In an adjunction operation, the top of the root of the new auxiliary tree unifies with the top of the adjunction site and the bottom of the foot of the new tree unifies with the bottom of the adjunction site. Furthermore, in the final derived tree, top and bottom must unify for all nodes. Since nodes in the same elementary tree can share features, constraints among dependent nodes can be more easily expressed than in the original TAG formalism. Fig. 2 shows an example where the top feature structure is notated as a superscript and the bottom feature structure as a subscript of the respective node.

2.2. LTAG elementary trees

The elementary trees of a TAG for natural languages are subject to certain principles (Frank 2002; Abeillé 2002). Firstly, they are lexicalized in that each elementary tree has at least one lexical item, its *lexical anchor*. A *lexicalized* TAG (LTAG) is a TAG that satisfies this condition for every elementary tree. Secondly, each elementary tree associated with a predicate contains 'slots', that is, leaves with non-terminal labels (substitution nodes or foot nodes) for all and only the arguments of the predicate (*elementary tree minimality*). Most argument slots are substitution nodes, in particular the nodes for nominal arguments (see the elementary tree for *likes* in Fig. 1). Sentential arguments are realised by foot nodes in order to allow long-distance dependency constructions such as *Whom does Paul think that Mary likes?*. Such extractions can be obtained by adjoining the embedding clause into the sentential argument (Kroch 1989; Frank 2002).

As for semantic representation and the syntax-semantics interface, we basically build on
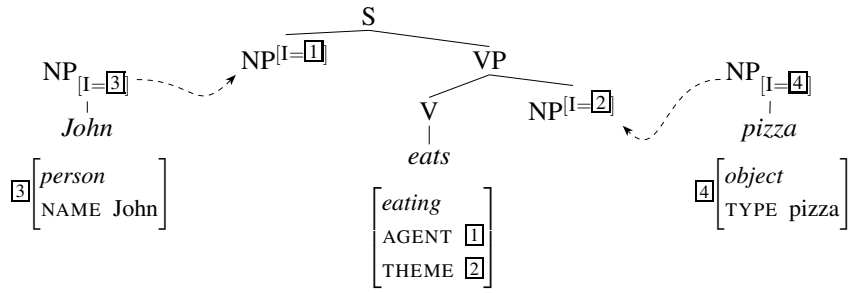
Figure 3: Syntactic and semantic composition for *John eats pizza*

approaches which link a semantic representation to an entire elementary tree (cf. §1) and which model composition by unifications triggered by substitution and adjunction. For example, in Gardent & Kallmeyer (2003) (see also Kallmeyer & Joshi 2003, Kallmeyer & Romero 2008), every elementary tree is paired with a set of typed predicate logical formulas containing meta-variables linked to features in FTAG structures. The syntactic composition then triggers unifications that lead to equations between semantic components.

The focus of the present paper is on a decompositional frame semantics for elementary LTAG trees. Fig. 3 illustrates the locality of linking in a frame-semantic approach by a simple example (which does not exploit the decompositional potential of frame representations). The substitutions give rise to unifications between ① and ③ and between ② and ④, which leads to an insertion of the corresponding argument frames into the frame of *eats*. Notice that the use of frames does not preclude an approach of the type described above for modeling semantic composition beyond the level of elementary trees, including the effect of logical operators such as quantifiers and other scope taking elements. But the technical details of such a combination remain to be worked out and are beyond the scope of this article.

2.3. Metagrammar and factorization

LTAG allows for a high degree of factorization inside the lexicon, that is, inside the set of lexicalized elementary trees. Firstly, unanchored elementary trees are specified separately from their lexical anchors. The set of unanchored elementary trees is partitioned into *tree families* where each family represents the different realizations of a single subcategorization frame. For transitive verbs such as *hit*, *kiss*, *admire*, etc. there is a tree family (see Fig. 4) containing the patterns for different realizations of the arguments (canonical position, extraction, etc.) in combination with active and passive. The node marked with a diamond is the node that gets filled by the lexical anchor; the 'empty' symbol ε indicates the trace of an extraction.
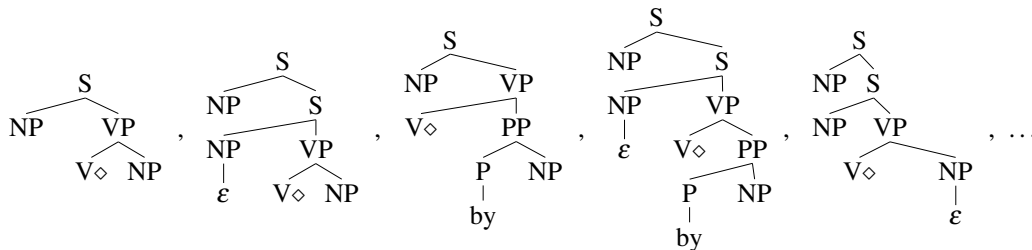
Figure 4: Unanchored tree family for transitive verbs

Class *CanSubj*

```
        S
       / \
     NP   VP
           ┆
           V◇
```

Class *DirObj*

```
       VP
      /  \
    V◇    NP
```

Class *Subj*
CanSubj ∨ *ExtractedSubj*

Class *ExtractedSubj*

```
            S
           / \
 NP[WH=yes]   S
             / \
           NP   VP
            |    ┆
            ε    V◇
```

Class *ByObj*
VP[VOICE=*passive*]

```
      /  \
    V◇    PP
         /  \
        P    NP
        |
        by
```

Class *ActV*
VP[VOICE=*active*]

```
        |
        V◇
```

Class *PassV*
VP[VOICE=*passive*]

```
        |
        V◇
```

Class *Transitive*
((*Subj* ∧ *ActV*) ∨ *ByObj* ∨ *PassV*) ∧ ((*DirObj* ∧ *ActV*) ∨ (*Subj* ∧ *PassV*))
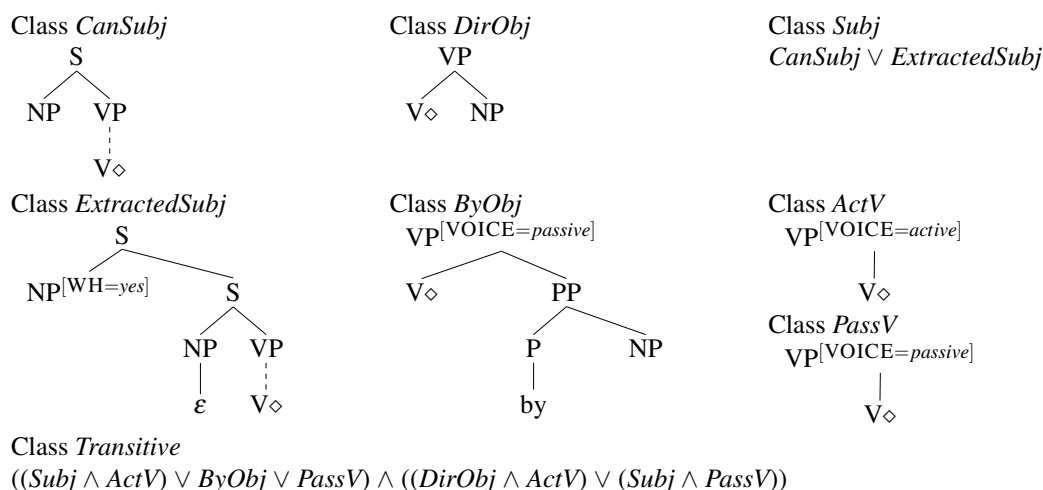
Figure 5: MG fragment for transitive verbs

Secondly, unanchored elementary trees are usually specified by means of a *metagrammar* (Candito 1999; Crabbé & Duchier 2005) which consists of dominance and precedence constraints and category assignments. The elementary trees of the grammar are defined as the *minimal models* of this constraint system. The metagrammar formalism allows for a compact grammar definition and for the formulation of linguistic generalizations. In particular, the metagrammatical specification of a subcategorization frame defines the set of all unanchored elementary trees that realize this frame. Moreover, the formalism allows us to define tree fragments that can be used in different elementary trees and tree families, thereby giving rise to an additional factorization and linguistic generalization. Phenomena that are shared between different tree families such as passivization or the extraction of a subject or an object are specified only once in the metagrammar and these descriptions become part of the descriptions of several tree families.

Let us illustrate this with the small metagrammar fragment given in Fig. 5, which is of course very incomplete in that many tree fragments are missing and features are almost totally omitted. The first two tree fragments describe possible subject realizations: the subject can be in canonical position, immediately preceding the VP, or it can be extracted, with a trace in the canonical subject position. The class *Subj* comprises the different subject realizations. Similar classes exist for the different realizations of the object, while in Fig. 5 only the canonical position class is listed. Furthermore, there is a class for the *by*-PP in a passive construction. This is used only for passive, therefore the tree fragment contains a corresponding feature VOICE = *passive*. Besides these argument classes, our fragment contains two classes for active/passive morphology. Finally, the class *Transitive* specifies for each argument its different grammatical functions: the first argument can be the subject of an active sentence or the *by*-PP of a passive sentence or it can be omitted in a passive sentence.[1] The second argument can be the direct object or it can be promoted to a subject in a passive sentence. If we assume that the metagrammar constraints require the identification of the lexical anchor nodes, then the set of minimal models of this class includes the first four trees in Fig. 4, among others. Note that the difference between canonical subject and extracted subject is factored out in the class *Subj*.

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[1]We are computing minimal models, this is why the third possibility in the disjunction signifies that this argument is not realized.

A similar factorization is possible within the semantics. The semantic contribution of unanchored elementary trees, that is, constructions, can be separated from their lexicalization, and the meaning of a construction can be decomposed further into the meaning of fragments of the construction. Due to this factorization, relations between the different parts of a syntactic construction and the components of a semantic representation can be expressed. In the following, we will use the metagrammar factorization of elementary trees in order to decompose the semantics of double object and prepositional object constructions.

3. Frame-based semantics and the dative alternation
3.1. Frame semantics and lexical decomposition

The program of Frame Semantics initiated by Fillmore (1982) aims at capturing the meaning of lexical items in terms of *frames*, which are to be understood as cognitive structures that represent the described situations or state of affairs. In their most basic form, frames specify the type of a situation and the semantic roles of the participants, that is, they correspond to feature structures of the kind used in Fig. 3 for representing eating situations. Frame semantics as currently implemented in the FrameNet project (Fillmore et al. 2003) basically builds on such plain role frames, and it is a central goal of FrameNet to record on a broad empirical basis how the semantic roles are expressed in the morphosyntactic environment of the frame evoking word.

In contrast to pure semantic role approaches to argument realization, many current theories of the syntax-semantics interface are based on predicate decomposition and event structure analysis (cf. Levin & Rappaport Hovav 2005). These theories assume that the morphosyntactic realization of an argument depends crucially on the structural position of the argument within the decomposition. Two simple notational variants of such a decomposition of the causative verb *break* are shown in (1), formulated along the lines of Van Valin & LaPolla (1997) and Rappaport Hovav & Levin (1998).

(1)　　$[[x\ \text{ACT}]\ \text{CAUSE}\ [\text{BECOME}\ [y\ \textit{BROKEN}]]]$

With respect to the goals of our project, a decompositional semantic representation is the natural choice since it allows us to associate specific components of the semantic representation with specific syntactic fragments. We integrate event structure decomposition with frame semantics.[2] That is, we use frames, understood as potentially nested typed feature structures with additional constraints, for representing decompositional templates of the sort shown in (1). Fig. 6a shows a fairly direct translation of this template into a frame representation. Note the different uses of CAUSE in (1) and Fig. 6. In (1), CAUSE expresses the causation relation between the activity and the change of state. In the frame representation, by contrast, the attribute CAUSE describes the 'cause component' of the causation scenario. The graph on the right of Fig. 6 can be regarded either as an equivalent presentation of the frame, or as a minimal model of the structure on the left if the latter is seen as a frame description. It is worth mentioning that there is also a fairly close correspondence of decompositional frame representations to event logical formulas in a neo-Davidsonian style. For if each subframe is interpreted as representing a reified subcomponent of the described event, then the structure shown in Fig. 6 gives rise to a formula like (2),

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[2]Koenig & Davis (2006), who make a similar proposal, put emphasis on the fact that the part of the frame relevant for argument linking can be a proper subframe of the semantic representation associated with the expression in question. That is, the 'referential node' of the frame need not coincide with the root of the frame. While we do not exploit this possibility in our analysis, we do not exclude it in principle.

a.
$$\begin{bmatrix} \textit{causation} \\ \text{CAUSE} \begin{bmatrix} \textit{activity} \\ \text{EFFECTOR } \boxed{1} \end{bmatrix} \\ \text{EFFECT} \begin{bmatrix} \textit{change-of-state} \\ \text{RESULT} \begin{bmatrix} \textit{broken-state} \\ \text{PATIENT } \boxed{2} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

b.
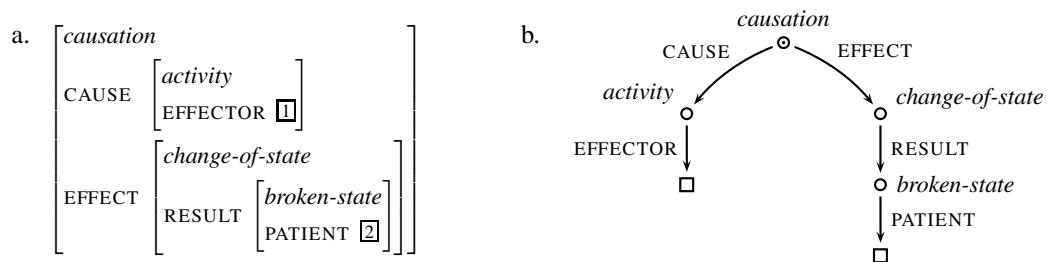
Figure 6: Possible frame representation for template (1)

in which the activity event e' is the cause component of the event e, and so on.

(2) $\quad \exists e \exists e' \exists e'' \exists s \, [\textit{causation}(e) \wedge \text{CAUSE}(e,e') \wedge \text{EFFECT}(e,e'') \wedge \textit{activity}(e') \wedge \text{EFFECTOR}(e',x)$
$\quad\quad \wedge \textit{change-of-state}(e'') \wedge \text{RESULT}(e'',s) \wedge \textit{broken-state}(s) \wedge \text{PATIENT}(s,y)]$

Frames allow us to combine two key aspects of template-based decompositions and of logical representations: Like decompositional schemas they are concept-centered and have inherent structural properties and like logical representations they are flexible and can be easily extended by additional subcomponents and constraints.

3.2. Semantic properties of the dative alternation

The English dative alternation is concerned with verbs like *give*, *send*, and *throw* which can occur in both the double object (DO) and the prepositional object (PO) construction as exemplified by (3).

(3) a. John sent Mary the book.
     b. John sent the book to Mary.

The two constructions are traditionally associated with a 'caused possession' (3a) and 'caused motion' (3b) interpretation, respectively. These two interpretations have often been analyzed by decompositional schemas of the type shown in (4a) and (4b), respectively.

(4) a. $[[x \text{ ACT}] \text{ CAUSE } [y \text{ HAVE } z]]$
     b. $[[x \text{ ACT}] \text{ CAUSE } [z \text{ GO TO } y]]$

In a similar vein, Krifka (2004) uses event logical expressions of the sort shown in (5) for distinguishing the two interpretations.

(5) a. $\exists e \exists s [\text{AGENT}(e,x) \wedge \text{CAUSE}(e,s) \wedge s : \text{HAVE}(y,z)]$
     b. $\exists e \exists e' [\text{AGENT}(e,x) \wedge \text{CAUSE}(e,e') \wedge \text{MOVE}(e') \wedge \text{THEME}(e',y) \wedge \text{GOAL}(e',z)]$

Following the general outline sketched in the previous section, (5b) could be translated into the frame representation shown in Fig. 7a. Version 7b, by comparison, is closer to template (4b) if we take $[x \text{ ACT}]$ to represent the activity subcomponent of the caused motion event. Frame 7c is a further variant based on the caused motion schema (6) taken from Van Valin & LaPolla (1997). In comparison with the first two frame versions, this representation tries to make explicit the resulting change of location of the theme.

(6) $\quad [\mathbf{do}(x,\emptyset)] \text{ CAUSE } [\text{BECOME } \mathbf{be\text{-}at}(y,z)]$

a.

$$
\begin{bmatrix}
\textit{causative-activity} \\
\text{EFFECTOR } \boxed{1} \\
\text{EFFECT }
\begin{bmatrix}
\textit{motion} \\
\text{THEME } \boxed{2} \\
\text{DESTINATION } \boxed{3}
\end{bmatrix}
\end{bmatrix}
$$

b.

$$
\begin{bmatrix}
\textit{causation} \\
\text{CAUSE }
\begin{bmatrix}
\textit{activity} \\
\text{EFFECTOR } \boxed{1}
\end{bmatrix} \\
\text{EFFECT }
\begin{bmatrix}
\textit{motion} \\
\text{THEME } \boxed{2} \\
\text{DESTINATION } \boxed{3}
\end{bmatrix}
\end{bmatrix}
$$

c.

$$
\begin{bmatrix}
\textit{causation} \\
\text{CAUSE }
\begin{bmatrix}
\textit{activity} \\
\text{EFFECTOR } \boxed{1}
\end{bmatrix} \\
\text{EFFECT }
\begin{bmatrix}
\textit{change-of-loc} \\
\text{RESULT }
\begin{bmatrix}
\textit{loc-state} \\
\text{THEME } \boxed{2} \\
\text{LOCATION } \boxed{3}
\end{bmatrix}
\end{bmatrix}
\end{bmatrix}
$$

Figure 7: Some frame representation options for caused motion

The difference between the DO and the PO variant and their respective interpretations has been observed to span a wider range of options than those described so far. Rappaport Hovav & Levin (2008) distinguish three types of alternating verbs based on differences in the meaning components they lexicalize: *give*-type (*lend*, *pass*, etc.), *send*-type (*mail*, *ship*, etc.), and *throw*-type verbs (*kick*, *toss*, etc.).[3] They provide evidence that verbs like *give* have a caused possession meaning in both kinds of constructions. The *send* and *throw* verbs, by comparison, lexically entail a change of location and allow both interpretations depending on the construction they occur in. The *send* and *throw* verbs differ in the meaning components they lexicalize: *send* lexicalizes caused motion towards a destination, whereas *throw* encodes the caused initiation of motion and the manner in which this is done. A destination is not lexicalized by *throw* verbs, which accounts for the larger range of directional PPs allowed for these verbs.

Beavers (2011) proposes a formally more explicit explanation of these observations based on a detailed analysis of the different types of results that determine the aspectual behavior of the verbs in question. He identifies four main types of results for ditransitive verbs: loss of possession, possession, leaving, and arrival. These results are associated with two different dimensions or 'scales': The first two results belong to the 'possession scale'; the latter two results are associated with a location or path scale. Only *give* verbs lexicalize actual possession as a result. *Send* verbs and *throw* verbs, by contrast, do not encode actual possession nor do they encode prospective possession when combined with the PO construction. The result condition that makes these verbs telic even if the theme does not arrive at the destination or recipient is the leaving of the theme from the actor. That is, the aspectually relevant result consists in leaving the initial point of the underlying path scale.

With respect to the goals of the present study, the main question is how the constructional meaning interacts with the lexical meaning. The DO construction encodes only *prospective* possession. Actual possession must be contributed by the lexical semantics of the verb. This is the case for *give* verbs, which explains why there is no difference between the DO and the PO constructions for these verbs as far as caused possession is concerned. All other alternating ditransitive verbs show such a difference since only the DO pattern implies prospective possession.[4] Beavers (2011) draws a distinction between different types of caused possession verbs. Verbs such as *give* encode pure caused possession without necessarily motion involved. Verbs

---

[3]For simplicity, we do not consider verbs of communication (*tell*, *show*, etc.) nor do we take into account differences in modality as between *give* and *offer* (Koenig & Davis 2001).

[4]The story is a bit more complicated: If the destination of the PO construction is human or human-like (e.g. an institution), there seems to be a conventional implicature that the (prospective) destination is also a (prospective) recipient, that is, (prospective) possession seems to be entailed in cases like *send the package to London*.

	lexical meaning				PO pattern	DO pattern
	#args	result	punct.	manner	motion	($\diamond$arrive)	($\diamond$receive)
give	3	receive	yes	no	no	receive (arrive)	receive
hand	3	receive	yes	yes	yes	receive (arrive)	receive
send	3	leave $\diamond$arrive	yes	no	yes	$\diamond$arrive	$\diamond$receive
throw	2	leave	yes	yes	yes	$\diamond$arrive	$\diamond$receive
bring	3	arrive	no	no	yes	arrive	receive

Table 1: Semantic classes of verbs in interaction with the DO and PO patterns

like *hand* and *pass*, by comparison, imply actual possession but also arrival of the theme via motion. The possession scale is 'two-point' or 'simplex' in that its only values are non-possession and possession. It follows that verbs which lexicalize caused possession are necessarily punctual since there are no intermediate 'points' on this scale. In contrast to *send* and *throw*, verbs like *bring* and *take* do encode arrival of the theme at the destination (Beavers 2011). That is, for these verbs of accompanied motion, the arrival is actual and not only prospective, and this property can be regarded as lexicalized since the verbs in question are basically three-place predicates. Verbs like *carry* and *pull*, which lexicalize a 'continuous imparting of force', behave differently (Krifka 2004). They are basically two-argument verbs, that is, they do not lexicalize a destination, and they are usually regarded as being incompatible with the DO pattern.[5]

In sum, the DO and PO constructions strongly interact with the lexical semantics of the verb.[6] Table 1, which builds on Beavers' analysis, gives an overview of the contribution of the lexicon and the constructions. Prospectivity is indicated by '$\diamond$'. For some of the verbs listed in the table, possible frame semantic representations are given in Fig. 8. Consider the frame for *send*. The change of location subframe is meant to encode motion towards the destination without necessarily implying arrival. Actual arrival would be encoded by a resulting location state as in Fig. 7c, that is, in analogy to the representation of actual possession in the entry for *give*. The representation for *throw* differs from that for *send* in that *throw* lexicalizes a certain type of activity, here simply encoded by a subtype *throw-activity* of *activity*. Moreover, it is inherent in the given representation that the destination of the entity thrown is not part of the lexical meaning of *throw*.[7]

---

[5]Krifka (2004) explains this fact by pointing out that the continuous imparting of force is a 'manner' component that is not compatible with a caused possession interpretation. The strict exclusion of the DO pattern for verbs accompanied motion like *carry* has been called into question by Bresnan & Nikitina (2010) on the basis of corpus evidence. Building on Krifka's approach, Beavers (2011:46f) explains the low frequency of the DO pattern by distinguishing between the different kinds of 'have' relations involved: the 'have' of control by the actor during the imparting of force and the final 'have' of possession by the recipient. He proposes a 'naturalness constraint' which largely, but not totally, excludes caused possession in cases where the actor has control on the theme at the final point of the event. Conditions of this type would naturally go into a detailed frame-semantic analysis elaborating on the ones given in this paper.

[6]The DO construction with caused possession interpretation also occurs for creation verbs with a benefactive extension as in *bake her a cake*. The PO pattern requires a *for*-PP in theses cases, which will not be taken into account in the following.

[7]In Fig. 8, there is no indication of the different types of causation involved. For instance, the initiation of motion encoded by *throw* could be captured by a subtype *onset-causation* of *causation*; cf. Kallmeyer & Osswald 2012.

$$
\begin{bmatrix}
\textit{causation} \\
\text{CAUSE} \begin{bmatrix} \textit{activity} \\ \text{EFFECTOR} \ \boxed{1} \end{bmatrix} \\
\text{EFFECT} \begin{bmatrix} \textit{change-of-loc} \\ \text{THEME} \quad \boxed{2} \\ \text{DESTINATION} \ \boxed{3} \end{bmatrix}
\end{bmatrix} \boxed{0}
\qquad
\begin{array}{c} V_{[E=\boxed{0}]} \\ | \\ \textit{sends} \end{array}
\qquad
\boxed{0}
\begin{bmatrix}
\textit{causation} \\
\text{CAUSE} \begin{bmatrix} \textit{activity} \\ \text{EFFECTOR} \ \boxed{1} \end{bmatrix} \\
\text{EFFECT} \begin{bmatrix} \textit{change-of-poss} \\ \text{THEME} \quad \boxed{2} \\ \text{RECIPIENT} \ \boxed{3} \\ \text{RESULT} \begin{bmatrix} \textit{possession} \\ \text{POSSESSOR} \ \boxed{3} \\ \text{POSSESSED} \ \boxed{2} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
\qquad
\begin{array}{c} V_{[E=\boxed{0}]} \\ | \\ \textit{gives} \end{array}
$$

$$
\boxed{0}
\begin{bmatrix}
\textit{causation} \\
\text{CAUSE} \begin{bmatrix} \textit{throw-activity} \\ \text{EFFECTOR} \ \boxed{1} \\ \text{THEME} \quad \boxed{2} \end{bmatrix} \\
\text{EFFECT} \begin{bmatrix} \textit{change-of-loc} \\ \text{THEME} \ \boxed{2} \end{bmatrix}
\end{bmatrix}
\qquad
\begin{array}{c} V_{[E=\boxed{0}]} \\ | \\ \textit{throws} \end{array}
$$

Figure 8: Possible frame representations for some of the lexical items in Table 1

It goes without saying that a full account of the dative alternation has to cope with a lot more phenomena than the distinction between caused motion and caused possession interpretations and their sensitivity to the lexical semantics of the head verb. The distribution of the DO and PO variants of the alternation is known to be influenced by various other factors, including discourse structure effects, heaviness constraints, and the definiteness, pronominality, and animacy of recipient and theme (cf. Bresnan & Ford 2010). Correspondingly, a full grammar model would have an information structure component, ordering constraints which are sensitive to constituent length, and so on, and, in addition, would allow for defeasible and probabilistic constraints. While we think that our grammar framework is well-suited for implementing requirements of this sort, they are beyond the scope of the present study, which is primarily concerned with modeling the influence of narrow verb classes on constructional form and meaning.

4. Analysis of DO versus PO constructions

Modeling the data above in our approach calls for a sufficiently detailed decomposition of the semantics of verbs and constructions using frames represented as typed feature structures. Moreover, the semantic frames and their subcomponents are to be associated with morphosyntactic trees and tree fragments. Note that this paper does not deal with idiomatic expressions like *give somebody the creeps*. Such expressions are not decomposed into a DO construction meaning and a lexical item meaning. Instead, idiomatic lexicalized elementary trees have multiple anchors, here *give* and *creeps*, and they can be associated with specific meanings (cf. Abeillé & Schabes 1989).

4.1. Unanchored elementary trees

Concerning the form of the syntactic elementary trees, we partly follow the choices made in the TAG grammar of English developed by the XTAG group (XTAG Research Group 2001). This grammar employs a tree family for ditransitive verbs with two NPs and a tree family for verbs selecting for an object NP and a PP. In the PO construction we are interested in, the PP has to be a directional PP. Some verbs are more restricted than others concerning the choice of the preposition due to the interplay of the properties of the event participant determined by the

a.

S
NP[I=1]   VP
V◇[E=0]   NP[I=3]   NP[I=2]

$$\begin{bmatrix} causation \\ \text{CAUSE} \begin{bmatrix} activity \\ \text{EFFECTOR} & \boxed{1} \end{bmatrix} \\ \boxed{0} \\ \text{EFFECT} \begin{bmatrix} change\text{-}of\text{-}poss \\ \text{THEME} & \boxed{2} \\ \text{RECIPIENT} & \boxed{3} \end{bmatrix} \end{bmatrix}$$

b.

S
NP[I=1]   VP
V◇[E=0]   NP[I=2]   VP
V_{NA}   PP[I=3]
ε

$$\begin{bmatrix} causation \\ \text{CAUSE} \begin{bmatrix} activity \\ \text{EFFECTOR} & \boxed{1} \end{bmatrix} \\ \boxed{0} \\ \text{EFFECT} \begin{bmatrix} change\text{-}of\text{-}loc \\ \text{THEME} & \boxed{2} \\ \text{DESTINATION} & \boxed{3} \end{bmatrix} \end{bmatrix}$$
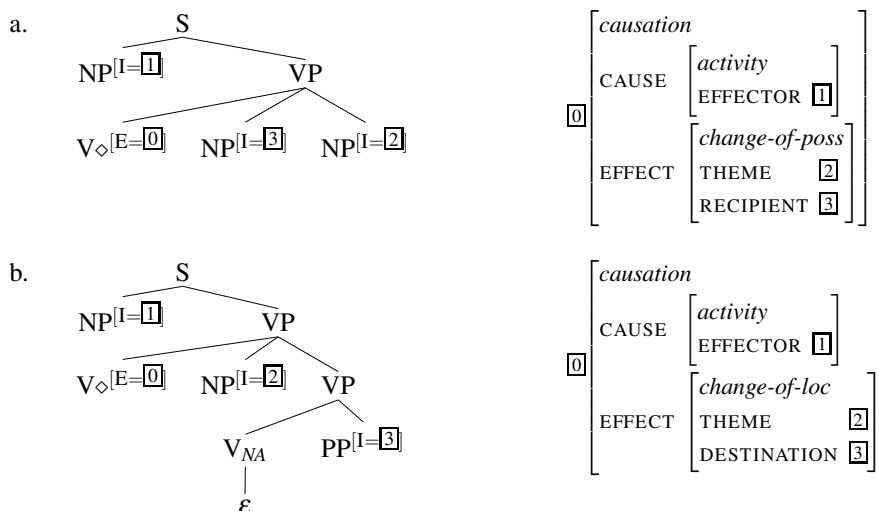
Figure 9: Unanchored elementary trees and semantics of the DO and PO constructions

verb and the properties determined by the preposition. For instance, if the verb *give* is combined with an *into*-PP, then the meaning of the preposition implies that the NP embedded in the PP has to be some kind of container, which is difficult to reconcile with a change-of-possession interpretation of the verb. We leave the exact frame-based modeling of such restrictions for future research. Notice also that there are PO constructions in which a specific preposition is treated as a coanchor of the elementary tree. This is the case for phrasal verbs like *believe in*, where the preposition is lexicalized with the verb and does not add any separate semantic information.

The base trees of the DO and PO families are depicted on the left side of Fig. 9. The lower VP node in the PO tree is inspired by the XTAG proposal and allows for the adjunction of adverbial modifiers between the direct object and the PP object.[8] The semantics of the DO construction is a (prospective) caused possession meaning which gets further constrained when linking it to a specific lexical anchor. Fig. 9a shows how the unanchored tree is linked to its semantic frame. The identities between the I features in the syntactic tree (which keep track of the denoted individuals) and the thematic roles in the semantic frame provide the correct argument linking. The semantics of the PO construction differs in that it triggers a caused motion instead of a caused possession interpretation; see Fig. 9b. The E feature of the V node describes an event; its value is the frame of the elementary tree. When anchoring the tree with a lexical item, this feature unifies with the E feature of the lexical item and thereby guarantees unification of the lexical and the constructional frame.

4.2. Metagrammar decomposition

The unanchored trees for the two constructions and their associated semantic frames can be further decomposed in the metagrammar. Some of the tree fragments in the metagrammar are used by both constructions, some are specific to one of them. In the following, we restrict ourselves to the base trees when explaining the syntactic and semantic decomposition. Of course,

---

[8]The empty V tree below this additional VP carries a *NA* (null adjunction) constraint, that is, this node does not allow for adjunction.

Class *Subj*
export: *e*
identities: $e = \boxed{0}$
syntactic dimension

$$
\begin{array}{c}
\text{S} \\
\text{NP}^{[\text{I}=\boxed{1}]}[\text{AGR}=\boxed{2}] \quad \text{VP}[\text{AGR}=\boxed{2}] \\
\text{NP} \prec \text{VP} \qquad \text{V}_\diamond{}^{[\text{E}=\boxed{0}]}
\end{array}
$$

semantic dimension
$\boxed{0}\begin{bmatrix} event \\ \text{EFFECTOR} \ \boxed{1} \end{bmatrix}$

Class *DirObj*
export: *e*
identities: $e = \boxed{0}$
syntactic dimension

$$
\begin{array}{c}
\text{VP} \\
\text{V}_\diamond{}^{[\text{E}=\boxed{0}]} \quad \text{NP}^{[\text{I}=\boxed{1}]}
\end{array}
$$

semantic dimension
$\boxed{0}\begin{bmatrix} event \\ \text{GOAL} \ \boxed{1} \end{bmatrix} \lor \boxed{0}\begin{bmatrix} event \\ \text{THEME} \ \boxed{1} \end{bmatrix}$

Class *IndirOjb*
export: *e*
identities: $e = \boxed{0}$
syntactic dimension

$$
\begin{array}{c}
\text{VP} \\
\text{V}_\diamond{}^{[\text{E}=\boxed{0}]} \quad \text{NP}^{[\text{I}=\boxed{1}]} \\
\text{V} \prec \text{NP}
\end{array}
$$

semantic dimension
$\boxed{0}\begin{bmatrix} causation \\ \text{EFFECT} \begin{bmatrix} change\text{-}of\text{-}poss \\ \text{RECIPIENT} \ \boxed{1} \end{bmatrix} \end{bmatrix}$

Figure 10: MG classes for subject, direct object, and indirect object

other argument realizations are possible as well and should be taken into account in the meta-grammar classes. For instance, the subject NP class *Subj* should not only contain the base subject realization shown on the left of Fig. 10 but also a tree fragment for an extraposed subject, for a wh-extracted subject, for a relativized subject, etc. Some of these tree fragments will contribute different aspects to the semantics. We leave this aside for the moment, since the focus of this paper is on the dative alternation and its semantics. In this paper, we treat only the active base case, assuming that other cases can be captured along the lines sketched in Fig. 5.

Let us first consider the classes needed for the DO construction. Some of the classes are just small tree fragments that do not use any other class. These are, for instance, the ones for the different arguments, namely, for the subject NP, the direct object NP, and the indirect object NP. The first two are fairly general; they occur in many of the elementary trees and do not constrain the semantics. The three argument classes are shown in Fig. 10. Only the roles relevant for our constructions are given, there are of course more possible roles for these arguments. Each class has a name, a declaration of variables that one can refer to when using this class (the export variables), a list of equations, and a syntactic dimension and a semantic dimension. The syntactic dimension contains a tree description that is depicted in the usual way in the figure. That is, solid lines indicate immediate dominance, dotted lines indicate dominance and the order of sisters indicates linear precedence (but not necessarily immediate linear precedence). Furthermore, $\prec$ denotes immediate linear precedence. In the class *Subj*, for instance, the tree description tells us that there are three nodes n_1, n_2, n_3 with labels S, NP, and VP such that n_2 has a top feature I with value $\boxed{1}$. Furthermore, n_1 immediately dominates n_2 and n_3 (depicted by the edges of the tree) and n_2 immediately precedes n_3. The representation is a bit sloppy since it mixes node variables with node categories. The realization of the third argument as an NP (i.e. the use of the class *IndirObj*) is responsible for the caused possession meaning. Therefore this class contributes a frame fragment in its semantics that tells us that the meaning is a causation whose effect is a change of possession where the argument contributed by this class denotes the recipient.[9]

Concerning the semantic dimension, we assume this to be a description of a typed feature structure. When we say 'unification', speaking of combining frames in the metagrammar, we

---

[9]Again, this is of course not the only way this syntactic fragment can be used; other semantic contributions of indirect objects must be specified in the metagrammar as well.

Class *VSpine*
syntactic dimension

$\text{VP}_{[\text{AGR}=\boxed{1}]}$
|
$\text{V}_{\diamond}{}_{[\text{AGR}=\boxed{1}]}$

Class *n0V*
export: e
use classes V_1 =VSpine, N_1 =Subj
identities: $V_1.V = N_1.V$, $e = N_1.e$

Class *n0Vn1*
export: e
use classes V_1 =n0V
N_2 =DirObj
identities: $V_1.V = N_2.V$, $e = N_2.e$

Class *DOConstr*
use classes V_1 =n0Vn1, N_3 =IndirOjb
identities: $V_1.V = N_3.V$
semantic dimension

$$V_1.e \begin{bmatrix} \textit{causation} \\ \text{EFFECTOR} \quad \boxed{1} \\ \text{THEME} \qquad \boxed{2} \\ \text{GOAL} \qquad \boxed{3} \\ \text{CAUSE} \quad \begin{bmatrix} \textit{activity} \\ \text{EFFECTOR} \quad \boxed{1} \end{bmatrix} \\ \text{EFFECT} \quad \begin{bmatrix} \textit{change-of-poss} \\ \text{THEME} \qquad \boxed{2} \\ \text{RECIPIENT} \quad \boxed{3} \end{bmatrix} \end{bmatrix}$$

Figure 11: MG classes for transitive verbs and the DO construction

actually mean conjunction and feature value equation. So far, our impression is that we need only a simple feature logic without quantification or negation.

Now we combine our small tree fragments into larger ones, thereby defining further MG classes. We add a class *VSpine* that takes care of the percolation of features (for instance AGR) along the verbal spine. This class combines with the subject class into the *n0V* class that in turn combines with classes for further arguments. The definition of the class for active transitive verbs is shown in Fig. 11.[10] What is still missing here is a fully elaborate linking theory that determines the possible combinations of semantic roles for a given unanchored syntactic tree, for example, along the lines of Van Valin (2005). We leave this issue for future research.

The further combination with the class for the indirect object is shown in Fig. 11. The minimal model of *DOConstr* is the unanchored tree from Fig. 9a. In addition to the frame shown in Fig. 9a, we include a specification of the thematic roles on the top level of the frame that serves to obtain the correct identifications of participants when unifying with the frame of the lexical anchor. We will come back to this when treating lexical anchoring in §5.

Now let us consider the PO construction. Here, the *n0Vn1* class is used again. For the third argument, we use the class *DirPrepObj* for a directional PP-argument. The PP contributes the goal of some change of location. The higher class *POConstr* arises from a combination of the *n0Vn1* class and the class for the directional PP (Fig. 12). The change of location frame contributed by the PP is embedded under the EFFECT attribute of the frame of the verb and it is enriched with a role THEME that is the event participant contributed by the direct object. Finally, we can define a class *DAltConstr* as the disjunction of *DOConstr* and *POConstr*. This way, we obtain a single tree family containing trees for both constructions. Depending on whether we have a PP or a direct object, only the corresponding part of the family can be selected. The minimal referent of the class *DAltConstr* contains the two trees from Fig. 9.[11]

---

[10] Note that we assume that whenever we use a class, its meta-variables ($\boxed{0}$, $\boxed{1}$, etc.) get instantiated with fresh values. This avoids unintended unifications.

[11] As mentioned above, the classes corresponding to elementary tree families usually have more than one minimal referent since all possible realizations of an argument (topicalization, extraposition, relativization, etc.) have to be taken into account.

Class *DirPrepObj*
export: *e*
identities: $e = \boxed{0}$
syntactic dimension

$$VP_1$$

$V_1\diamond \qquad VP_2$

$V_{2NA} \qquad PP^{[I=\boxed{1}]}$

$\mid$

ε
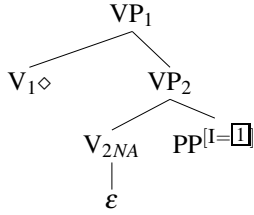
$V_1 \prec^* VP_2, V_2 \prec PP$

semantic dimension

$$\boxed{0}\begin{bmatrix} \textit{change-of-loc} \\ \text{DESTINATION} \quad \boxed{1} \end{bmatrix}$$

Class *POConstr*
use classes V_1 =n0Vn1, N_3 =DirPrepObj
identities: $V_1.V = N_3.V$
semantic dimension

$$V_1.e \begin{bmatrix} \textit{causation} \\ \text{EFFECTOR} \quad \boxed{1} \\ \text{THEME} \quad \boxed{2} \\ \text{GOAL} \quad \boxed{3} \\ \text{CAUSE} \quad \begin{bmatrix} \textit{activity} \\ \text{EFFECTOR} \quad \boxed{1} \end{bmatrix} \\ \text{EFFECT} \quad N_3.e \begin{bmatrix} \textit{change-of-loc} \\ \text{THEME} \quad \boxed{2} \\ \text{DESTINATION} \quad \boxed{3} \end{bmatrix} \end{bmatrix}$$
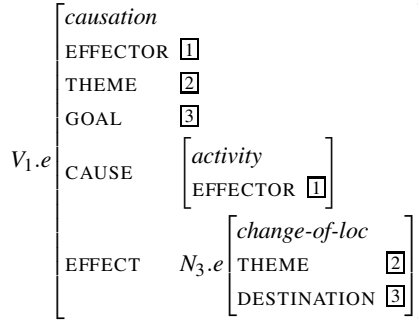
Class *DAltConstr*
use classes DOConstr $\vee$ POConstr

Figure 12: MG classes for the PO construction

$V_{[E=\boxed{7}]}$

$\mid$

throws

$$\boxed{7}\begin{bmatrix} \textit{causation} \\ \text{CAUSE} \quad \begin{bmatrix} \textit{throw-activity} \\ \text{EFFECTOR} \quad \boxed{8} \\ \text{THEME} \quad \boxed{9} \end{bmatrix} \\ \text{EFFECT} \quad \begin{bmatrix} \textit{change-of-loc} \\ \text{THEME} \quad \boxed{9} \end{bmatrix} \end{bmatrix}$$

$$S$$

$NP^{[I=\boxed{1}]} \qquad VP$

$V\diamond^{[E=\boxed{0}]} \quad NP^{[I=\boxed{2}]} \qquad VP$

$V_{NA} \qquad PP^{[I=\boxed{3}]}$

$\mid$

ε

$$\boxed{0}\begin{bmatrix} \textit{causation} \\ \text{CAUSE} \quad \begin{bmatrix} \textit{activity} \\ \text{EFFECTOR} \quad \boxed{1} \end{bmatrix} \\ \text{EFFECT} \quad \begin{bmatrix} \textit{change-of-loc} \\ \text{THEME} \quad \boxed{2} \\ \text{DESTINATION} \quad \boxed{3} \end{bmatrix} \end{bmatrix}$$
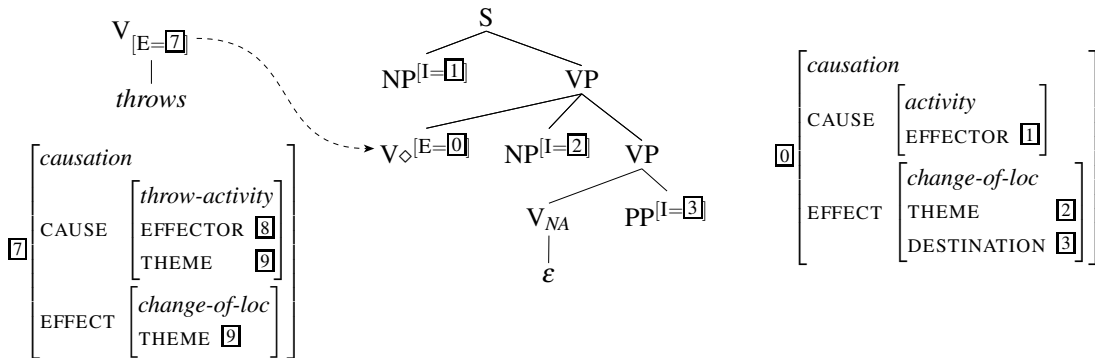
Figure 13: Lexical selection of the elementary tree for *throws* in the PO construction

5. Lexical anchoring for DO and PO constructions

Once the unanchored tree families are computed via compilation of the corresponding MG classes, these trees are anchored by lexical items. The lexical anchor that is substituted into the anchor node contributes parts of a semantic frame (see Fig. 8 above for some lexical items and their semantic frames). Because of the unifications of the syntactic E features on the V nodes, the frames of the unanchored tree and of the lexical anchor unify. The example in Fig. 13 shows the lexical anchoring of the PO construction with the anchor *throws* (with top level roles omitted for reasons of space). The resulting anchored elementary tree has a semantic frame that is the unification of the frames $\boxed{7}$ and $\boxed{0}$. (Recall that *throw-activity* is a subtype of *activity*.)

The idea is, of course, that if the lexical anchor frame and the construction frame are not compatible with each other, then unification fails. However, in some cases where standard unification fails we actually want the two frames to unify. An example is the unification of the frame of *sends* that represents a caused change of location and the frame of the DO construction which represents a caused change of possession. The two frames are given in Fig. 14. Even though they do not unify we want them to combine. The meaning of the combined frame (i.e. of the

181

$$
\begin{array}{ll}
\textit{sends} & \text{DO construction} \\[4pt]
\begin{bmatrix}
\textit{causation} \\
\text{EFFECTOR} \quad \boxed{8} \\
\text{THEME} \qquad \boxed{9} \\
\text{GOAL} \qquad \boxed{10} \\
\text{CAUSE} \quad
\begin{bmatrix}
\textit{activity} \\
\text{EFFECTOR} \quad \boxed{8}
\end{bmatrix} \\
\text{EFFECT} \quad
\begin{bmatrix}
\textit{change-of-loc} \\
\text{THEME} \qquad \boxed{9} \\
\text{DESTINATION} \quad \boxed{10}
\end{bmatrix}
\end{bmatrix}
&
\begin{bmatrix}
\textit{causation} \\
\text{EFFECTOR} \quad \boxed{1} \\
\text{THEME} \qquad \boxed{2} \\
\text{GOAL} \qquad \boxed{3} \\
\text{CAUSE} \quad
\begin{bmatrix}
\textit{activity} \\
\text{EFFECTOR} \quad \boxed{1}
\end{bmatrix} \\
\text{EFFECT} \quad
\begin{bmatrix}
\textit{change-of-poss} \\
\text{THEME} \qquad \boxed{2} \\
\text{RECIPIENT} \quad \boxed{3}
\end{bmatrix}
\end{bmatrix}
\end{array}
$$
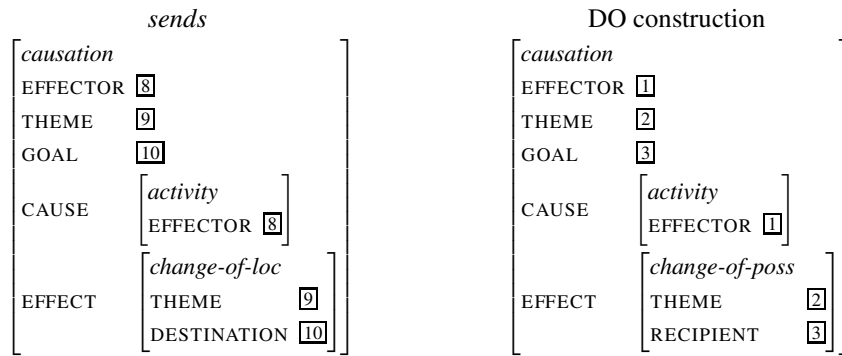
Figure 14: Lexical frame and construction frame of *sends* and the DO construction

$$
\begin{array}{l}
\text{S} \\
\;\;\diagup \quad \diagdown \\
\text{NP}^{[I=\boxed{8}]} \quad \text{VP} \\
\qquad\qquad \diagup \;|\; \diagdown \\
\text{V}^{[E=\boxed{0}]} \;\; \text{NP}^{[I=\boxed{3}]} \;\; \text{NP}^{[I=\boxed{2}]} \\
\;\;|\; \\
\textit{sends}
\end{array}
\qquad
\boxed{0}
\begin{bmatrix}
\textit{causation} \\
\text{EFFECTOR} \quad \boxed{8} \\
\text{THEME} \qquad \boxed{2} \\
\text{GOAL} \qquad \boxed{3} \\
\text{CAUSE} \quad
\begin{bmatrix}
\textit{activity} \\
\text{EFFECTOR} \quad \boxed{8}
\end{bmatrix} \\
\text{EFFECT} \quad
\left\{
\begin{bmatrix}
\textit{change-of-loc} \\
\text{THEME} \qquad \boxed{2} \\
\text{DESTINATION} \quad \boxed{3}
\end{bmatrix},
\begin{bmatrix}
\textit{change-of-poss} \\
\text{THEME} \qquad \boxed{2} \\
\text{RECIPIENT} \quad \boxed{3}
\end{bmatrix}
\right\}
\end{bmatrix}
$$
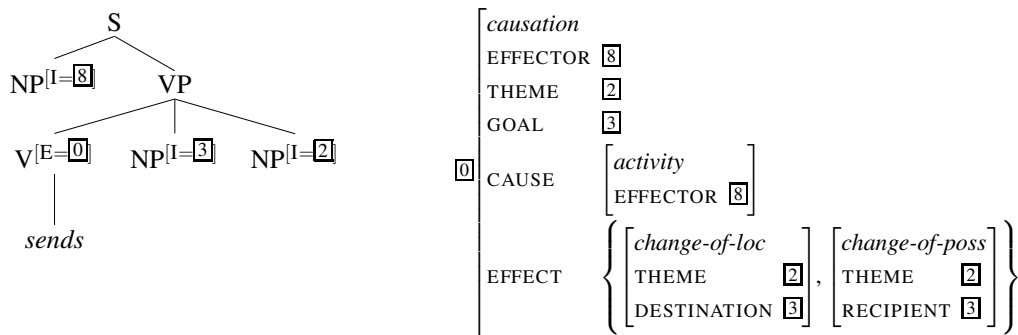
Figure 15: Anchored tree for *sends* with the DO construction

DO construction anchored with *sends*) is, roughly, a causation with effects along different dimensions or 'scales': there is a change of location of the theme and at the same time the theme undergoes also a change of possession.

There are different ways to avoid the mismatch between the two frames. The possibility we choose in this paper is to use set-valued attributes and to assume a special set unification for these. In our case, the attribute EFFECT would have a set of changes as value. When unifying two such sets, the following strategy is adopted: for two elements belonging to the respective sets, if they are of the same type or one is of a subtype of the other, they must unify and the result is part of the resulting set. Otherwise, we take the two elements to describe different aspects that should be considered as a conjunction. We therefore add each of them to the resulting set of frames. In our example, this would lead to the anchored tree in Fig. 15. Note that, in order to obtain the intended identifications between participants of events, we need the top level roles here. They make sure the destination of the change of location is identified with the recipient of the change of possession since both are co-indexed to the GOAL roles of their frames.[12]

6. Conclusion

LTAG is a lexicalized tree grammar formalism with an extended domain of locality and rich possibilities for factorizing syntactic and semantic information on a metagrammatical level. In

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[12]An alternative approach, which does not require set-valued attributes, would be to treat the different changes as two different perspectives on the effect of the causation event, represented by two different attributes of the frame. But the details and the consequences of this solution have to be left to future research.

this paper, we propose to exploit this for an implementation of a detailed syntax-related semantic decomposition of both constructional and lexical meaning components. As a case study we have described a model for the dative alternation in English. Our LTAG analysis separates the lexical meaning contribution from the contribution of the construction, taking advantage of LTAG's separation between unanchored elementary trees and lexical anchors. Furthermore, we have factorized the two constructions (double object and prepositional object) into smaller fragments, some of which are shared between the two constructions.

Our analyses have demonstrated that below the level of lexicalized elementary trees and their semantic representations, the metagrammar formalism in LTAG allows us to identify those fragments of syntactic structure that are the potential carriers of meaning. This is partly due to the abstraction from surface structure that comes with LTAG's adjunction operation and the resulting extended domain of locality. As semantic representations we have used decompositional frames represented as typed feature structures, which encode rich semantic information. So far, it seems that the metagrammar descriptions of trees and frames can be rather simple in the sense of being first order tree or feature logics without quantification and negation. The formal properties of our framework need to be further investigated examining a larger range of semantic phenomena. Moreover, we aim not only at theoretically modeling certain linguistic phenomena but also at implementing corresponding grammar fragments. The tools for implementing and testing LTAG grammars are already available, though they need to be adapted to our needs concerning the feature logic we choose.[13]

References

Abeillé, Anne. 2002. Une grammaire électronique du français. CNRS Editions.

Abeillé, Anne, and Owen Rambow. 2000. Tree Adjoining Grammar: An Overview. Tree adjoining grammars: Formalisms, linguistic analyses and processing, ed. by Anne Abeillé and Owen Rambow, 1–68. CSLI Publications.

Abeillé, Anne, and Yves Schabes. 1989. Parsing idioms in tree adjoining grammars. Proceedings of EACL 1989.

Bangalore, Srinivas, and Aravind K. Joshi. 2010. Introduction. Supertagging: Using complex lexical descriptions in natural language processing, ed. by Srinivas Bangalore and Aravind K. Joshi, 1–31. MIT Press.

Beavers, John. 2011. An aspectual analysis of ditransitive verbs of caused possession in English. Journal of Semantics 28.1–54.

Bergen, Benjamin K., and Nancy Chang. 2005. Embodied Construction Grammar in simulation-based language understanding. Construction grammars. Cognitive grounding and theoretical extensions, ed. by Jan-Ola Östman and Mirjam Fried, 147–190. John Benjamins.

Bresnan, Joan, and Marilyn Ford. 2010. Predicting syntax: Processing dative constructions in American and Australian varieties of English. Language 86.186–213.

Bresnan, Joan, and Tatiana Nikitina. 2010. The gradience of the dative alternation. Reality exploration and discovery: Pattern interaction in language and life, ed. by Linda Uyechi und Lian-Hee Wee, 161–184. CSLI Publications.

Candito, Marie-Hélène. 1999. Organisation modulaire et paramétrable de grammaires électroniques lexicalisées. Application au français et à l'italien. Université Paris 7 dissertation.

Copestake, Ann, Dan Flickinger, Carl Pollard, and Ivan A. Sag. 2005. Minimal recursion semantics: An introduction. Research on Language and Computation 3.281–332.

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[13]We will use the metagrammar compiler XMG (`https://sourcesup.cru.fr/xmg/`) and the TAG parser TuLiPA (`https://sourcesup.cru.fr/tulipa/`).

Crabbé, Benoit. 2005. Grammatical development with XMG. Proceedings of LACL 2005, Lecture Notes in Artificial Intelligence 3492, 84–100. Springer.

Crabbé, Benoit, and Denys Duchier. 2005. Metagrammar redux. Constraint solving and language processing, ed. by Henning Christiansen, Peter Rossen Skadhauge, and Jørgen Villadsen, LNCS 3438, 32–47. Springer.

Fillmore, Charles J. 1982. Frame semantics. Linguistics in the morning calm, ed. by The Linguistic Society of Korea, 111–137. Hanshin Publishing Co.

Fillmore, Charles J., Christopher R. Johnson, and Miriam R. L. Petruck. 2003. Background to FrameNet. International Journal of Lexicography 16.235–250.

Frank, Robert. 2002. Phrase structure composition and syntactic dependencies. MIT Press.

Gardent, Claire, and Laura Kallmeyer. 2003. Semantic Construction in FTAG. Proceedings of EACL 2003, 123–130.

Goldberg, Adele E. 1995. Constructions: A construction grammar approach to argument structure. University of Chicago Press.

Joshi, Aravind K., and Yves Schabes. 1997. Tree-Adjoining Grammars. Handbook of formal languages vol. 3. beyond words, ed. by Grzegorz Rozenberg and Arto Saloma, 69–123. Springer.

Kallmeyer, Laura, and Aravind K. Joshi. 2003. Factoring Predicate Argument and Scope Semantics: Underspecified Semantics with LTAG. Research on Language and Computation 1.3–58.

Kallmeyer, Laura, and Rainer Osswald. 2012. An Analysis of Directed Motion Expressions with Lexicalized Tree Adjoining Grammars and Frame Semantics. Proceedings of WoLLIC 2012, ed. by Luke Ong and Ruy de Queiroz, LNCS 7456, 34–55. Springer.

Kallmeyer, Laura, and Maribel Romero. 2008. Scope and situation binding in LTAG using semantic unification. Research on Language and Computation 6.3–52.

Koenig, Jean-Pierre, and Anthony R. Davis. 2001. Sublexical modality and the structure of lexical semantic representations. Linguistics and Philosophy 24.71–124.

Koenig, Jean-Pierre, and Anthony R. Davis. 2006. The KEY to lexical semantic representation. Journal of Linguistics 42.71–108.

Krifka, Manfred. 2004. Semantic and pragmatic conditions for the dative alternation. Korean Journal of English Language and Linguistics 4.1–32.

Kroch, Anthony. 1989. Asymmetries in long-distance extraction in a Tree Adjoining Grammar. Alternative conceptions of phrase structure, ed. by Mark R. Baltin und Anthony S. Kroch. University of Chicago Press.

Levin, Beth, and Malka Rappaport Hovav. 2005. Argument realization. Cambridge University Press.

Müller, Stefan. 2006. Phrasal or lexical constructions. Language 82.850–883.

Rappaport Hovav, Malka, and Beth Levin. 1998. Building verb meanings. The projection of arguments: Lexical and compositional factors, ed. by Miriam Butt and Wilhelm Geuder, 97–134. CSLI Publications.

Rappaport Hovav, Malka, and Beth Levin. 2008. The English dative alternation: A case for verb sensitivity. Journal of Linguistics 44.129–167.

Sag, Ivan. 2012. Sign-Based Construction Grammar: An informal synopsis. Sign-based construction grammar, ed. by H. Boas and I. Sag. CSLI Publications.

Van Valin, Robert D., and Randy J. LaPolla. 1997. Syntax. Cambridge University Press.

Van Valin, Robert D., Jr. 2005. Exploring the syntax-semantics interface. Cambridge University Press.

Vijay-Shanker, K., and Aravind K. Joshi. 1988. Feature structures based tree adjoining grammar. Proceedings of COLING, 714–719.

Xia, Fei. 2001. Automatic grammar generation from two different perspectives. University of Pennsylvania dissertation.

Xia, Fei, Martha Palmer, and K. Vijay-Shanker. 2010. Developing tree-adjoining grammars with lexical descriptions. Supertagging: Using complex lexical descriptions in natural language processing, ed. by Srinivas Bangalore and Aravind K. Joshi, 73–110. MIT Press.

XTAG Research Group. 2001. A Lexicalized Tree Adjoining Grammar for English. Tech. rep., Institute for Research in Cognitive Science, University of Pennsylvania.

The (non)universality of syntactic selection and functional application

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Nothing beats diversity for finding out what is truly universal about natural languages. But the importance of diversity goes beyond the obvious fact that universality can be recognized only in the face of diversity. Coming to grips with languages that differ in important ways from more familiar languages forces us to recognize implicit analytical assumptions. Rather than assuming a requisite 'traditional' way of analyzing certain data, we must instead acknowledge the assumptions our analysis depends upon, assumptions that demand justification. Confronting an 'exotic' language (where *exotic* means distinct from what we know) forces us to ask what the empirical basis is for an analysis; it can also drive us to conceive of a new and different organization of the grammatical systems of the languages we already know much about. In short, it can wake us up from a dogmatic slumber. For some, the idea that languages are quite diverse in their grammatical systems is a given (e.g. Evans and Levinson 2009), so drawing attention to the value of diversity is not new. We pose a further question in this paper: What takes the place of features that are often thought to be universal but that we show are only very frequent? To put it another way, we engage in a kind of *reconstruction* of our analytical tools using the rather 'exotic' language Oneida, a Northern Iroquoian language.

We will make two bold claims about Oneida that make the description of Oneida look different from most (if not all) descriptions of other languages and that provide the incentive for our reassessment of how to think about possible grammatical systems.[1]

Claim 1. *There is no syntactic selection of phrases by verbs (or nouns) in Oneida.*

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[1]Throughout this paper, we will abstract away from important differences among syntacticians and semanticists on how to best account for the generalizations which Oneida challenges, or the importance of these generalizations. But, we believe that something roughly equivalent to syntactic selection and functional application is part and parcel of the model of (most) natural languages in all extant frameworks. For instance, although the constructionist approach presented in Goldberg 1995 does not discuss the relation between verbs and subjects or objects in terms of syntactic selection, her notion of *profiling* of participant roles embodies the bulk of what we mean by *syntactic selection*. Similarly, although Langacker (1987) points out the limits of compositionality and does not adopt lambda-calculus and the concept of functional application to model the compositional aspects of semantic combinatorics, his notions of elaboration and elaboration sites embody the critical aspects of both for our purposes.

Claim 2. *Semantic composition of verb meanings and external NPs in Oneida is a matter of conjunction of predications and co-indexing rather than application of a function to an argument.*

The first claim bears resemblance to other analyses, in particular to the Pronominal Argument Hypothesis proposed in Jelinek 1984 and Mithun 1986, to the analysis put forth in Van Valin 1985, or to the analysis of Mohawk (another Northern Iroquoian language) given in Baker 1996. But our claim is more radical. These other approaches all assume that arguments of verbs in polysynthetic languages and/or non-configurational languages are realized as they are in English; they are just realized in another guise. So Jelinek and Mithun, for example, assume that pronominal clitics or prefixes realize arguments and that they are the equivalent of external phrases in English, and Baker assumes that null *pro*s realize arguments. Our claim is bolder: Nothing realizes arguments in Oneida, and heads do not select dependent phrases. To put it another way, syntactic selection, a fundamental concept for modeling the syntax of natural languages since Adjuckiewicz 1935 (and foreshadowed to some degree by Bloomfield 1933), is simply not relevant for Oneida. We call languages like Oneida, in which syntactic selection of dependents by heads plays almost no role, *direct syntax* languages. The second claim challenges an assumption that dates back to an idea attributed to Geach 1972, namely the pairing of lambda-calculus style functional application with syntactic rules.[2] Given space limitations, we will not be able to fully discuss all of the evidence in favor of either claim. Nor will we be able to address possible alternative analyses. What we do hope to accomplish is convince readers that, when thinking about the universality of syntactic selection and functional application, the evidence we have become accustomed to finding in well-studied languages is missing in Oneida, and that the way things work in Oneida challenges our notions of what is universal across languages.

1. Pronominal prefixes in Oneida

Oneida looks quite different on the surface from English. Semantic arguments[3] are morphologically referenced (with one systematic exception, discussed below), but most of the time, arguments are not expressed via independent phrases. Consider the passage in (1).[4] None of the Oneida verbs in (1) co-occurs with an external NP, in stark constrast to the English translation

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[2]Jeff Good pointed out to us (p.c.) that the work of David Gil on Riau Indonesian (see Gill 1994 and Gill 2008) bears some resemblance to our work. Even though Gil does not discuss the 'exotic' nature of Riau in terms of the absence of syntactic selection and functional application and Riau's 'excentricity' is somewhat different from Oneida's, Gil's claims and ours are clearly related. We defer a comparison between the two languages and the two approaches to another venue.

[3]By semantic arguments, we mean the participants in the situation described by the verb that are strongly associated with the meaning of the verb, in the sense of Koenig et al. 2003.

[4]A raised period in the Oneida examples represents vowel length. ʌ is a mid, central, nasalized vowel, and *u* is a high or mid-to-high, back, nasalized vowel. Voicing is not contrastive. Abbreviations for morpheme glosses are: AGT (agent), CAUS(ative), CISLOC(ative), COIN(cident), DU(al), EXCL(usive person), FACT(ual mode), FEM(inine), FUT(ure mode), HAB(itual aspect), JN (joiner vowel), MASC(uline), OPT(ative mode), PART(itive), PAT(ient), PL(ural), PNC (punctual aspect), POSS(essive), REFL(exive), REP(etitive), SG (singular), SRF (semireflexive), STV (stative aspect), TRANSLOC(ative), Z/N (zoic or neuter gender). Zoic gender is used for certain female persons and animals. The symbol > indicates a proto-agent acting on a proto-patient; for example, 3MASC.SG>1SG should be understood as 3rd person masculine singular acting on first person singular. A colon indicates that in a more abstract phonological analysis, the Oneida string corresponding to the components separated by the colon could be segemented into distinct morphemes. Square brackets correspond to what, in some analyses, are analyzed as zero morphemes.

in (2), which contains several NPs (pronominal or otherwise). Although NPs can co-occur with verbs in Oneida, as (3) shows, they do so infrequently.

(1) Né·=s wí· né·n tshiwahu·níseʔ lon-uʔwéskwani-heʔ
    so it's   long time ago   3MASC.PL.PAT-enjoy-HAB

    a-hati-yʌt-a-kó·n-aʔ   kʌ́·, tahnú·=s   kwí·
    OPT-3MASC.PL.AGT-wood-JN-go.somewhere.to.harvest-PNC eh   and=usually link

    kwahotokʌ́·u tsiʔ wa-hu-nakla·kó·   tho
    just for real   that FACT-3MASC.PL.AGT-move.away:PNC there

    y-a-hu-náklat-eʔ   tsiʔ nú·
    TRANSLOC-FACT-3MASC.PL.AGT-settle-PNC where

    ye-hoti-yoʔtʌ́-st-aʔ.
    TRANSLOC-3MASC.PL.PAT-work-CAUS-HAB

(2) 'A long time ago they used to like to go cut wood, and so they would move away and
    settle wherever they were working.' (Mercy Doxtator, *Some woodcutters get a visitor*,
    recorded 1996)

(3) wa-hati-kwe·ní·   wa-huwá-li-ʔ   thikʌ́ ʌtilú
    FACT-3MASC.PL.AGT-able:PNC FACT-3PL>3MASC.SG-kill-PNC that   raccoon

    'They were able to kill that raccoon.' (Clifford Cornelius, *A lifetime working*, recorded
    1994)

Some of our argumentation will rely on the fact that not all semantic arguments are referenced morphologically, and so we begin with a brief description of so-called pronominal prefixes in Oneida.

Transitive and intransitive prefixes   Oneida has transitive (portmanteau-like) prefixes that occur with verbs that denote two- or three-place relations (hereafter, polyadic verbs), as shown in (4). (Pronominal prefixes are bolded in this section for easy identification.) Oneida also has two classes of prefixes, Agent and Patient, that occur with verbs that denote one-place or zero-place relations (hereafter, monadic and medadic verbs), as shown in (5) and (6) with monadic verbs, or in (7) and (8) with medadic verbs. Whether a particular verb occurs with Agent versus Patient prefixes is semantically motivated, but as can be seen from the contrast between (5) and (6), or between (7) and (8), in many cases verbs lexically select either Agent or Patient prefixes.

(4) wa-**hí**-kwaht-eʔ
    FACT-**1SG>3MASC.SG**-invite-PNC
    'I invited him'

(5) waʔ-t-**k**-ashʌ́tho-ʔ
    FACT-DUALIC-**1SG.AGT**-cry-PNC
    'I cried'

(6) waʔ-t-**wak**-hʌ·léht-eʔ
    FACT-DUALIC-**1SG.PAT**-holler-PNC
    'I hollered, yelled'

(7) **yo**-kʌnol-ú
3Z/N.SG.PAT-rain-STV
'it's raining'

(8) **w**-ʌ·té·
3Z/N.SG.AGT-be.light:STV
'it's daylight, it's light out'

Only animate arguments are referenced by pronominal prefixes   A salient property of pronominal inflection in Oneida (and generally in Iroquoian) is that inanimate semantic arguments are never referenced. As a result, Agent and Patient prefixes, which otherwise occur with monadic and medadic verbs, also occur with polyadic verbs that have only one semantic argument that is animate. For example, the Agent prefix *ha-* is used in (9), despite the fact that sharpening requires two participants, because an axe is inanimate. Examples such as (9) support the hypothesis that inanimate semantic arguments are not referenced *phonologically* on Oneida verbs.

(9) kʰáleʔ ʌ-**ha**-hyoʔthi·yát-eʔ   lao-to·kʌ́·
    and   FUT-**3MASC.SG.AGT**-sharpen-PNC 3MASC.SG.POSS-axe

    'and he will sharpen his axe' (Clifford Cornelius, *A lifetime working*, recorded 1994)

(All verbs in Oneida must have a pronominal prefix, so if there are no semantic arguments that are animate, the zoic singular prefix is used as a default inflecton; the zoic singular is abbreviated z/n in the morpheme glosses to reflect the fact that the prefix references zoic arguments and is also used as a default when all semantic arguments are inanimate (or neuter). The verbs in (7) and (8) are examples having this default inflection.)

Aspectually-conditioned Agent/Patient prefix alternation   There is strong evidence that semantically dyadic verbs with only one animate argument are not only phonologically like intransitive verbs (in that they occur with Agent and Patient prefixes), they are *inflectionally* like intransitive verbs too. The distribution of Agent and Patient prefixes is partly conditioned by aspect. Monadic and medadic verbs that lexically select Agent prefixes take Agent prefixes only in the habitual and punctual aspects; in the stative aspect they take the corresponding Patient prefixes. For example, the inflected form of the verb *-atukoht-* 'pass by' in (10) takes an Agent prefix because it is in the punctual aspect, while the form in (11) takes the corresponding Patient prefix because it is in the stative aspect.

(10) wa-**h**-atu·kóht-eʔ
     FACT-**3MASC.SG.AGT**-pass.by-PNC
     'he passed by, he passed on, he died'

(11) **lo**-(a)tukóht-u
     3MASC.SG.PAT-pass.by-STV
     'he has gone by, he has passed on, he has died'

Crucially, polyadic verbs with only one animate argument undergo the same prefix alternation as monadic and medadic verbs. For example, *-ʔlholok-* 'cover' is a polyadic verb, as seen by the form in (12), which has a transitive prefix because there are two animate arguments. But, the forms in (13) and (14) have only one animate argument, and they have the same distribution

188

of Agent and Patient prefixes as the forms in (10) and (11) above, i.e., the punctual aspect form in (13) has an Agent prefix while the corresponding stative aspect form in (14) has a Patient prefix.

(12) waʔ-**khe**-ʔlho·lók-eʔ
      FACT-**1SG>3FEM.SG**-cover-PNC
      'I covered her up' (e.g. with a blanket)

(13) waʔ-**ke**-ʔlho·lók-eʔ
      FACT-**1SG.AGT**.cover-PNC
      'I covered (it) up'

(14) **wake**-ʔlhol-ú
      1SG.PAT-cover-STV
      'I have covered (it) up'

The fact that semantically dyadic or triadic verbs with *only one* animate argument are subject to the same language-specific, aspectually conditioned, absolutely regular, intransitive prefix class alternation, strongly suggests that inanimate arguments are not part of the morphosyntactic representation (in the sense of Anderson 1992) of Oneida verbs. Morphologically, dyadic or triadic verbs with only one animate argument are *inflectionally* intransitive.

No verb can have three animate arguments   Furthermore, there is evidence that the grammatical 'invisibility' of inanimate semantic arguments is more than phonological or inflectional. An inkling of this wider 'invisibility' is found in an interesting restriction. Oneida has no equivalent of English *introduce someone to someone*, i.e. no underived triadic verb with *three* animate arguments. This restriction amounts to more than a mere lexical gap since, whenever a triadic verb is derived (e.g. via an applicative (benefactive) suffix), one of the two arguments of the base must be inanimate in the *derived* stem, as (15) shows.

(15)   a.   *-ahseht-* 'hide something', *-yaʔtahseht-* 'hide someone' (*-yaʔt-ahseht-* literally, 'body-hide')[5]
       b.   *-ahseht-ʌ(ni)-* 'hide something from someone', *-yaʔtahseht-ʌ(ni)-* *hide someone from someone[6]

(15) shows that the 'invisibility' of inanimate semantic arguments is more than inflectional; it affects the range of interpretations of verb stems, derived and underived. In all grammatical respects—phonological, derivational, inflectional—inanimate arguments are simply 'invisible' to verbs. Under the widespread assumption that, aside from added arguments (e.g. resultatives) and expletives, syntactic complements and subjects reflect 'visible' semantic arguments of verbs, the fact that inanimate arguments are 'invisible' to derivational verbal morphology suggests that NPs (*wh-* or not) denoting inanimate entities and CPs (which also denote inanimate entities) are not syntactically selected by a verbal head. And, if NPs whose referents are

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[5]That certain verbs require the incorporated root *-yaʔt-* with transitive prefixes was observed first by Woodbury 1975 in her study of noun incorporation in Onondaga, another Northern Iroquoian language.

[6]Woodbury (2003:234) gives the form *waʔshagoyaʔdahséhdęʔ* 'he hid a [dead] body from her, he hid her body', showing that, in contrast to Oneida, the *form* is possible in Onondaga, but the *meaning* precludes a third animate argument. A parallel Oneida form, supplied by Ray George, is ʌ-*khe-yá·t-u-ʔ* FUT-1SG>3PL-body-give-PNC 'I will give them the body' (e.g. a doll's body, or a body after someone dies). The stem *-u-* 'give' occurs with an inanimate argument below in (36).

inanimate are not selected by verbal heads, neither are NPs whose referents are animate, at least if we want to avoid positing *two* entirely distinct sets of syntactic rules or constraints, one for animate arguments, another for inanimate arguments. In other words, the phonological, inflectional, and derivational 'invisibility' of inanimate semantic arguments suggests that no phrase is syntactically selected and that external NPs, when they occur, be they animate, as in (16), or inanimate, as in (17), occur in adjoined positions.

(16)   waʔ-utat-atkátho-ʔ   kaʔikʌ́ yakukwé
        FACT-3FEM.SG>3FEM.SG-see-PNC this   woman

        'she saw this woman'

(17)   wa-h-atkátho-ʔ   thikʌ́ ká·slet
        FACT-3.MASC.SG.AGT-see-PNC that   car

        'he saw that car'

2. There is no need for syntactic arguments in Oneida

The previous section shows that, as far as verbs are concerned, inanimate arguments are 'invisible'. Consequently, under standard assumptions, external phrases are not selected by verbs. Of course, this evidence is only suggestive. Although improbable, it could be that derivational and inflectional morphology do not have a grammatical use for inanimate semantic arguments, but syntax does. However, it seems syntax does not have a use for selected dependents either. More precisely, none of the usual behavioural reflexes of syntactic selection are present in Oneida. In fact, the absence of any reflexes of syntactic selection is what woke us up from our dogmatic slumber and motivated us to carefully examine what empirical evidence there *could be* for syntactic selection in languages that do not display it on their sleeves. For convenience, we will talk in terms of evidence for a level of syntactic argument structure, but our use of argument structure terminology is simply a matter of convenience. What matters is whether Oneida has syntactic constraints that cannot be reduced to semantic natural classes, and that would require positing something more than semantic arguments and inflectional morphosyntactic structure à la Anderson 1992.

We can appeal to syntactic argument structure for three kinds of phenomena: (i) phrase-structural projection constraints (the obligatory local realization of semantic arguments and their linear order); (ii) valence alternations (passives, middles, ditransitives); (iii) binding constraints (principle A, B or C, bound pronominal interpretations, *wh*-traces, VP-ellipsis or VP anaphors, VP-reduction/co-ordination rules, control structures). Examples of each these three phenomena from English are given in (18)–(20).

(18)   Mary loves John. (= inflection + syntactic obligatoriness + linear order)

(19)   John is unhappy about not being loved. (= valence alternations)

(20)   Mary$_i$ loves herself$_i$. (= binding constraints)

Getting things right syntactically for sentences like those in (18)–(20) requires making reference to more than semantic classes (arguably, as not all syntacticians agree on some of these issues), typically a *syntactic* ordering of semantic arguments or, more generally, what we call syntactic argument structure. What is striking about Oneida is that all this evidence in favor of syntactic argument structure is absent. Below, we examine each kind of possible motivation for a syntactic level of argument structure.

Syntactic obligatoriness and word order   The most obvious reason to introduce a syntactic level of argument structure is the need to model the obligatory co-occurrence of verbs with phrases as well as the order of phrases. This has been at the root of the first explicit model of such dependencies, the work on syntactic connectivity by Ajdukiewicz (1935), which was the initial impetus for subsequent categorial grammar work. But, as we mentioned before, no external phrase is *required* to co-occur with verbs in Oneida. In fact, between 10% and 25% of 'sentences' have one NP; .8% have two NPs in our 4,800+ sentence corpus. Furthermore, there is no syntactically required ordering of NPs when they do occur: NPs are pragmatically ordered (Mithun 1987) (although CPs almost always follow the verb that they correspond to a semantic argument of). So argument structure, subcategorization, or the like is simply not going to be very useful for Oneida.

Furthermore, when NPs occur, the relation between external NPs and verbs is quite different from the relation of selected NPs to verbs in other languages. First, NPs are not necessarily local dependents of verbs; they can be unbounded 'dependents'. More interestingly, the relation between pronominal prefixes and external phrases is not necessarily one of co-indexing, as one would expect if external phrases were selected by verbs. The relation is something like *referential overlap*. In (21), for example, the referent of the external NP *Mercy* is a *subset* of the set of entities referenced by the pronominal prefix and reciprocally, in (22), the referent of the external phrase *onatʌ·ló·* 'friends' is a *superset* of the set of entities referenced by the pronominal prefix. In the end, the relation between verbs and external phrases *does* seem fundamentally different from what it is in languages such as English, and the syntactic mechanisms we use to model this kind of dependency in English are superfluous in Oneida.

(21) yah thau·tú·   oskánhe usa-yaky-atnutólyaht-eʔ   Mercy
      it cannot occur together OPT:REP-1EXCL.DU.AGT-play-PNC Mercy

      'Mercy and I can't play together anymore, I can't play together with Mercy anymore.'
      (Norma Jamieson, *A wish comes true*, recorded 1994)

(22) nʌ kwí· waʔ-utat-hlo·lí·=n   on-atʌ·ló·
      so then FACT-3FEM.SG>3FEM.SG-tell:PNC=DEF 3ZOIC.PL.PAT-friends

      'She's telling her friend...' (i.e. 'she is telling her, not 'she is telling them') (Mercy
      Doxtator, *Berries and bellies*, recorded 1994)

Valence alternations   Valence alternations of the kind illustrated in (23) involve reordering semantic arguments, or the members of an argument-structure list, or the phrase-structural realization of semantic arguments. This reordering leads to a different order of syntactic expressions (and for many syntacticians, a different syntactic configuration). Valence alternations provide *syntactic* motivation for a syntactic level of argument structure to the extent that the statement of this reordering (whether encoded lexically or phrase-structurally) cannot be reduced to an operation on semantic representations.

(23) a. Mary gave a book to John.
      b. Mary gave John a book.

Now, there are derivational affixes that affect pronominal inflection in Oneida. There is a reflexive/reciprocal prefix *-atat-* that induces a shift from transitive to intransitive prefix since it affects the number of semantic arguments, as shown in (24). The anticausative use of the semireflexive *-at-* also induces a shift, either from an animate prefix to the default z/n, as shown

in (25), or from transitive to intransitive prefix. But crucially, the reflexive/reciprocal and the semireflexive affect the distribution of pronominal prefixes because they alter the *meaning* or *conceptual structure* of the stems to which they attach. This means that analyses of these prefixes do not require reference to any syntactic representation of argument structure, and they do not provide evidence for that level of representation or for its phrase-structural equivalent in more 'constructionist' approaches (such as Goldberg 1995 or Ramchand 2008).

(24)   a. **li**-nut-ú
           1SG>3MASC.SG-feed-STV
           'I have fed him'

      b. waʔ-**k**-atát-nut-eʔ
           FACT-**1SG.AGT**-REFL-feed-PNC
           'I fed myself'

(25)   a. waʔ-té-**k**-yahk-eʔ
           FACT-DUALIC-**1SG.AGT**-break-PNC
           'I broke it'

      b. waʔ-t-**w**-át-yahk-eʔ
           FACT-DUALIC-**3Z/N.SG.AGT**-SRF-break-PNC
           'It broke'

Oneida also has causative, instrumentals, and benefactive (applicative) suffixes that, conversely, induce a shift from an intransitive to a transitive prefix, or induce restrictions on the animacy of other semantic arguments as per the constraint on expressibility we discussed above. But again, although all these derivational affixes affect inflectional constraints, they do so only indirectly, that is, they do so because they affect the meaning of the stem to which they attach (cf. also Mithun 2006 on the related language Mohawk). In other words, all derivational processes are *morpholexical operations* rather than *morphosyntactic operations* in the sense of Ackerman 1992: They can be modeled as operations on conceptual structure/meaning. Crucially, there are no passives, middles, or other inverse constructions whose statement would require reference to something more than semantic structure, that is, to a syntactic level of argument structure.

Binding constraints   In your typical language, there are grammatical constraints on co-indexing that require an ordering of semantic arguments (so-called subject/object asymmetries). Such constraints also provide evidence for a *syntactic* notion of argument structure. Yet again, there are no such syntactic constraints in Oneida. There are no syntactic anaphors (see Baker 1996 for a similar claim for Mohawk, a closely related Northern Iroquoian language). There are no principle C violations that involve two nominals (Baker 1996), and there is no clear evidence that principle C plays a role in Oneida (*contra* Baker 1996). There are no infinitives with controlled unexpressed subjects (Baker 1996) or *syntactic* control in general. There are no VP anaphors, VP reduction, or VP ellipsis (contra Baker 1996). There are no consistent Condition on Extraction Domains effects in Oneida (*contra* Baker 1996). The systematic absence of such constraints confirms what the 'loose,' infrequent, and unbounded relation between verbs and external phrases suggests. There is something fundamentally different in how verbs and external phrases are related in Oneida.

3. Direct syntax versus selectional syntax

What we suggested in the previous section is that there are no behavioural reflexes of selectional syntax in Oneida (again, space limitations prevented us from doing much more than sketching the evidence for our claim). Now, the absence of behavioural reflexes of syntactic selection does not mean it is not there. However, given that the semantic relation between external phrases and verbs is not one of co-indexing, but instead one of referential overlap, it is unclear what the use would be for syntactic selection or for a syntactic level of argument structure. Of course, one can nevertheless model the syntax of Oneida using a syntactic level of argument structure. That is to say, since there are also no facts that contradict a syntactic level of argument structure, there is no impediment to imposing on Oneida the structure of a language such as English. No facts threaten to prove the analysis wrong. Modern syntactic frameworks have a rich enough toolkit to take care of languages even as recalcitrant as Oneida. Syntactic argument structure would be 'universal', because there is no fact that violates the assumption too much. But there are consequences of positing such a structure for Oneida. It would severely weaken the empirical bite of the notion of syntactic universal. The universality of argument structure would not be a discovery about languages or language, it would simply follow from an a priori descriptive bias. As such, treating Oneida and English alike would seriously undermine the quest for syntactic universals. Perhaps a greater consequence of clinging to the view that Oneida syntax is selectional after all, is that it would result in losing sight of *why* Oneida behaves so differently from languages like English. In contrast, the hypothesis that syntactic selection is only one (the most common) method for building up sentences but that another method also exists, what we call *direct syntax*, accounts for the cluster of properties that separates Oneida and English.

So, from here on, we take the kind of evidence we sketched in the previous section to suggest that how words and phrases are put together in Oneida departs radically from traditional assumptions about syntactic structure. Oneida is an example of *direct syntax*, where by *direct syntax* we mean a relation between phrases that is not mediated by syntactic argument structure or its equivalent. Verbs (and nouns) have no argument structure, no valence (subcategorization) information, nor features that license head movement into various projections à la Ramchand 2008 or any such mechanism. Oneida verbs include only agreement information relevant for inflectional morphology. The relation between a verb and phrases that specify one of its semantic arguments can be stated informally (and simplifying somewhat for now) as follows: The index of dislocated phrases that co-occur with a verb overlap with a semantic argument of that verb. The 'bonding' of the two co-occurring expressions reduces to a semantic relation between the two expressions, namely overlap of the referent of indices. (For ease of exposition, from now on we will talk in terms of co-indexing when what we mean is index overlap.)

(26) illustrates the difference between an English-style lexical entry and an Oneida-style lexical entry. We use a (simplified) Head-driven Phrase Structure Grammar representation for illustrative purposes. Although in an HPSG approach syntactic selection is lexically encoded, nothing crucial for our point hinges on that lexical bent. What is critical is that the mechanisms responsible for syntactic selection — the (syntactic) ARG-ST and VALENCE attributes in (26a), are absent from the Oneida entry in (26b). All that the Oneida entry includes is agreement information (encoded in a morphological AGR attribute) that serves as input to the inflectional realizational rules of morphology.

(26) a.

$$\begin{bmatrix} \textit{English-transitive-verb} \\ \text{SEM} \quad \begin{bmatrix} \text{ACTOR} & \boxed{3} \\ \text{UNDERGOER} & \boxed{4} \end{bmatrix} \\ \text{VALENCE} \quad \begin{bmatrix} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle \boxed{2} \rangle \end{bmatrix} \\ \text{ARG-ST} \quad \langle \boxed{1}\text{XP}_{\boxed{3}}, \boxed{2}\text{XP}_{\boxed{4}} \rangle \end{bmatrix}$$

b.

$$\begin{bmatrix} \textit{Oneida-dyadic-verb} \\ \text{SEM} \quad \begin{bmatrix} \text{ACTOR} & \boxed{3} \\ \text{UNDERGOER} & \boxed{4} \end{bmatrix} \\ \text{MORPH} \begin{bmatrix} \text{MORPHSYN} \begin{bmatrix} \text{AGR} & \langle \boxed{3}, \boxed{4} \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$
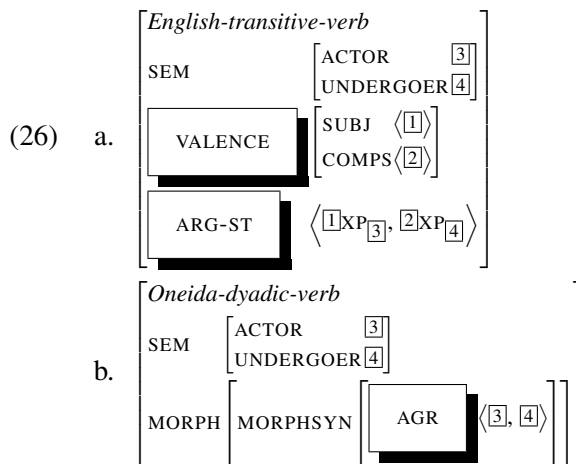
4. A conjunctive mode of semantic composition

Traditional models of semantic composition are well-suited to selectional syntax. To each syntactic selector-selected pair we can associate a semantic functor-argument pair. Semantic composition, then, takes on a simple form (at least in general; of course matters are complex in practice): As one syntactically combines heads and selected dependents one applies the meaning of those heads to the meaning of those selected dependents. Although one needs more complex modes of composition than functional application (see Chung and Ladusaw 2004, and discussion in von Fintel and Matthewson 2008), functional application remains the building block of semantic composition for languages whose syntax relies on syntactic selection. In this section, we discuss what the interface between syntax and semantics looks like in a language whose syntax is direct rather than selectional. If the typical model of semantic composition assumes a relation of syntactic selection between a head and a dependent, what are the consequences for semantics (in particular for semantic composition) of having a direct syntax? How shall we think of semantic composition if functional application is not an available tool? Our informal description of what direct syntax means for the relation between verbs and external NPs gives a flavor of our answer: The combination of NPs and verbs involves a mere co-indexing of the NP with a semantic argument of the verb (and as we will see, a conjunction of the predicates associated with the noun and verb meanings). We call the mode of semantic composition, which is the flip-side of direct syntax, a *conjunctive mode of semantic composition* or *conjunction cum co-indexing*.

Before examining in some detail how conjunction cum co-indexing works, we first compare it informally to functional application. The traditional lock-step building of syntactic phrases and functionally reduced meanings is illustrated in Figure 1.

Of course, this lock-step procedure applies more widely than to the combination of verbs and proper names. It applies also within NPs (and all the way down, in the ideal case), as shown in Figure 2. We informally represent the difference between the two modes of semantic composition—functional application and conjunction cum co-indexing—in Figure 3.

That all that is required for composing meanings is identification of variables (x_1 in Figure 3) and conjunction of predications is not as new as it may seem. In his musings on the true role of (bound) variables in logic, Quine (1976:304) already said as much: '[T]he essential services of the variable are the permutation of predicate places and the linking of predicate places by identity.'

$$met'(m, j)$$

Mary: m $\lambda y.met'(y, j)$

met: $\lambda x.\lambda y.met'(y,x)$ John: j
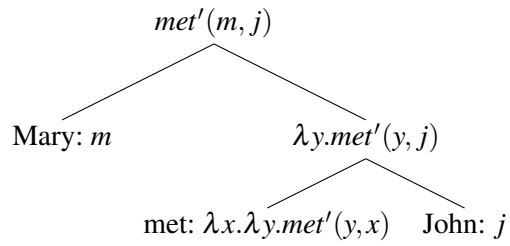
Figure 1: Syntactic selection and semantic composition in vanilla lambda-calculus

$$every'(\lambda x.dog'(x), \lambda y.sleep'(y))$$

$\lambda Q.every'(\lambda x.dog'(x), Q)$ $\lambda y.sleep'(y)$

$\lambda P.\lambda Q.every'(P,Q)$ $\lambda x.dog'(x)$
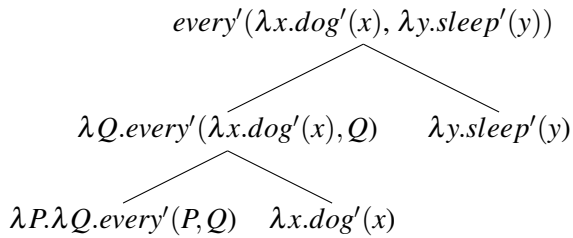
Figure 2: It's syntactic selection and functional application all the way down

$f(a)$ $P(\ldots \mathbf{x_1} \ldots) \wedge Q(\ldots \mathbf{x_1} \ldots)$

$\lambda x.f(x)$ a $P(\ldots)$ $Q(\ldots)$

(a) Compositionality in selectional syntax languages

(b) Compositionality in direct syntax languages

Figure 3: An informal comparison of the 'basic' modes of composition in selectional and direct syntax languages

Abstracting away from the particulars of the various algebraic logics that Quine proposes as possible substitutes for a more traditional first-order predicate logic, three critical aspects of how complex formulas are built are relevant for our purposes: (i) conjunction of atomic formulas, (ii) identification of variables within conjuncts and across conjuncts, and (iii) selection of a variable for 'outside composition,' that is, selection of a variable within a formula which will be targeted by an operator that outscopes that formula. As we now show, all three features of Quine's reanalysis play an essential role in our model of the syntax/semantics interface of Oneida. We focus in this paper on three of the five major constructions we have identified in Oneida. For considerations of space, the description is informal or semi-formal, and we focus on the semantic effect of the syntactic combination, in particular on the conjunctive mode of semantic composition (see Koenig and Michelson 2012 for details on the syntactic component of these constructions).

4.1. How a conjunctive mode of semantic composition works

We discuss the most frequent construction first, the combination of a verb and an external NP. The semantic content of words and phrases is represented through the values of two attributes, INDEX and CONTENT. The value of the INDEX attribute stands for the (discourse) referent of an expression; the value of the CONTENT attribute for the semantic content of a word or phrase. We assume that values of the INDEX attribute are sorted so as to distinguish between nominal and situational indices. We illustrate our use of these attributes on the first of the three constructions we discuss, namely, the construction responsible for combining a verb and an NP, informally described in (27a). As is traditional in HPSG, identically numbered tags represent shared information. Thus, the presence of the two tags $\boxed{1}$ ensures that the meanings of the two daughters share a variable.

(27) a. A phrase with a nominal index i and a phrase with a situational index j, one of whose participants is i, can form a phrase with index j.

  b. *nominal-dislocation* $\Rightarrow$
$$\begin{bmatrix} \text{INDEX} & \boxed{1}e_{sit} \\ \text{CONTENT} & \exists x(\boxed{4}Q(\boxed{1}e,\boxed{3}x) \land \boxed{2}P(\boxed{3}x)) \end{bmatrix}$$

$$\begin{bmatrix} \text{INDEX} & \boxed{1}e_{sit} \\ \text{CONTENT} & \boxed{4}\,Q(\boxed{1}e,\boxed{3}x) \end{bmatrix} \qquad \begin{bmatrix} \text{INDEX} & \boxed{3}x_{nom} \\ \text{CONTENT} & \boxed{2}\,P(\boxed{1}x) \end{bmatrix}$$
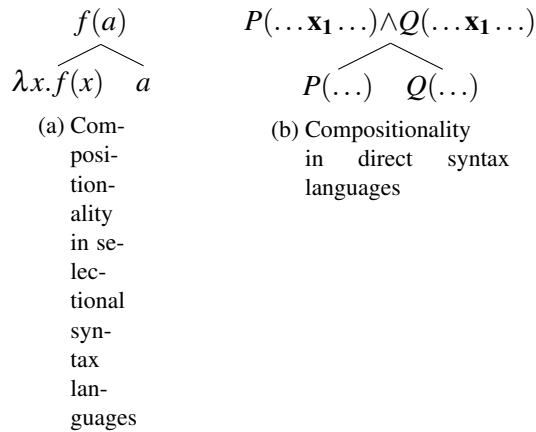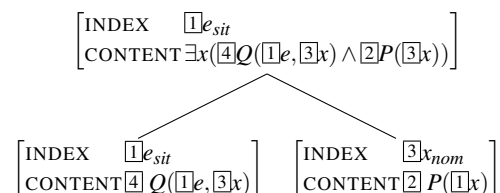
In (27), the left daughter corresponds to the verb, and the right daughter to the NP. For ease of exposition, we describe the construction as the local combination of a verb (a situation-denoting phrase) with an NP. As mentioned before, in reality the dependency between the NP and the verb can be unbounded. Note also that the order of the two daughters is not a matter of grammar. The *nominal dislocation* construction says that the content of the combination of an NP and a verb will include the conjunction of the content of the NP together with that of the verb (or sentence) it is adjoined to.[7] Aside from existential closure, the construction says that the content of the mother node is the conjunction of the contents of the daughters (with identically numbered tags $\boxed{2}$ and $\boxed{4}$ indicating, as usual, shared information).

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[7]Our informal statement of the construction is loosely based on Lexical Resource Semantics, see Richter and Sailer 2004. We simplify the representation and include existential closure of co-indexed variables so as to make our semantic contents look more familiar to readers. We treat semantic arguments of verbs as definite by default (represented here, informally, as pronouns). We also omit issues having to do with the underspecification of semantic scope, as they are not relevant to the main purpose of this paper.

(28) illustrates the effect of this construction on the sentence in (3) (simplifying somewhat for expository purposes).

(28)
$$\begin{bmatrix} \text{INDEX} & \boxed{1}\,e \\ \text{CONTENT} & \exists x(\boxed{2}\,sharpen'(\boxed{1}e,\,`he\text{'},x) \wedge \boxed{4}\,axe(x)) \end{bmatrix}$$

$$\begin{bmatrix} \text{\textsc{ʌ-ha-hyoʔthiˑyát-eʔ}} \\ \text{INDEX} & \boxed{1}\,e \\ \text{CONTENT}\,\boxed{2}\,sharpen'(\boxed{1}e,\,`he\text{'},\boxed{3}x) \end{bmatrix} \quad \begin{bmatrix} \text{\textsc{lao-toˑkʌ́ˑ}} \\ \text{INDEX} & \boxed{3}\,x \\ \text{CONTENT}\,\boxed{4}\,axe'(\boxed{3}x) \end{bmatrix}$$
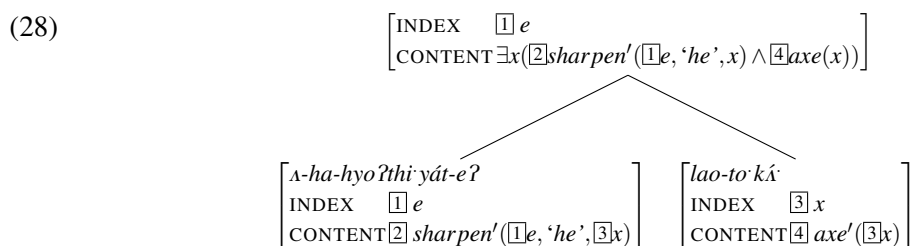
4.2. The importance of index selection when doing semantic composition

The second of the three constructions we discuss is the nominal equivalent of the first construction. This construction licenses the adjunction of a nominal that further specifies properties of one of the arguments of the head noun. We distinguish this construction from the previous construction, since adjunction of nominal phrases to nominal phrases is strictly local.

(29)   a.   A phrase with a nominal index i and a phrase with a nominal index j, both of which are related by a relation R, can form a phrase denoting j.

       b.   *nominal-adjunction* $\Rightarrow$
$$\begin{bmatrix} \text{INDEX} & \boxed{3}\,y \\ \text{CONTENT} & \exists x(\boxed{2}\,P(x) \wedge \boxed{4}\,Q(x)) \end{bmatrix}$$

$$\begin{bmatrix} \text{INDEX} & \boxed{1}\,x_{nom} \\ \text{CONTENT}\,\boxed{2}\,P(\boxed{1}x) \end{bmatrix} \quad \begin{bmatrix} \text{INDEX} & \boxed{3}\,y_{nom} \\ \text{CONTENT}\,\boxed{4}\,Q(\boxed{3}y,\boxed{1}x) \end{bmatrix}$$
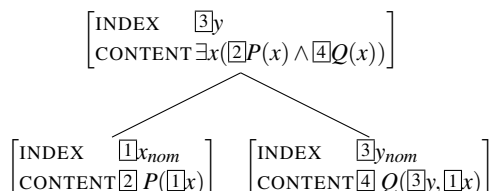
This construction, which is stated informally in (29a), is interesting because it illustrates the importance of the INDEX attribute in performing semantic composition. Recall that Quine had 'permutation of predicate places' as one of the two essential functions of variables. This formulation may seem rather odd to readers. One reason permutation of predicate places is so important in Quine's algebraic logic is that it allows a particular predicate place to be 'visible' to external combinators. In our approach, this 'service' of variables is assigned to the index of the mother node. The index of the mother node determines which argument is 'visible" to larger constructions in which a particular construction is embedded. For example, in (29) the index of the right daughter is selected as the index of the phrase, as indicated by the tag $\boxed{3}$.

The point of our introducing (29) here is that we need not only identify the argument positions of two predicates in our semantic representations, we need also to select one argument position for the purpose of external composition. We illustrate the importance of specifying which daughter contributes its index to the whole phrase with the complex kinship expression in (30).

(30)   Tahnúˑ aknulháˑ   onulhaʔkʌ́   tsha-h-anáklat-eʔ   Bill
      and   my mother her late mother COIN-3MASC.SG.AGT-be.born-PNC Bill

      neʔ thóˑneʔ néˑ t-yakaw-ʌheˑy-ú.
      at that time it's CISLOC-3FEM.SG.PAT-die-STV

      'And my mother's mother died when Bill was born.' (Olive Elm, *Visits to my auntie's*, recorded 1993)

As shown by the statement of the nominal dislocation and nominal adjunction constructions in (27) and (29), respectively, the combination of the contents of each subexpression is conjunctive in nature. Simplifying somewhat, the net effect of the use of these two constructions is a semantic content equivalent to the formula in (31). The semantic composition of the contents of the two NPs ensures the identification of the $\boxed{y}$ variable, and ensures that the daughter of x is the mother of z. What the conjunction of the contents of these two NPs does not indicate is which of the three variables (whose values correspond to the three kins) will serve as argument of the predicate *died*. In other words, we need a way of indicating which of the kin expressions will be the variable identified with one of the arguments of the verb. This is the purpose of the INDEX attribute. The specification of the mother node's CONTENT attribute specifies how to combine the meaning of the two subexpressions: in our essentially conjunctive mode of composition, variable identification and predicate conjunction. The INDEX attribute specifies which subexpression's variable will be targeted by the construction in which this subexpression participates.

(31) $\exists x,y,e(mother'(x,\boxed{y}) \wedge late\_mother'(\boxed{y},z) \wedge died'(e,?))$

Now, index selection can be done lexically (as for kinship terms, see Koenig and Michelson 2010), but it is also one of the functions of syntactic constructions. As semanticists, we typically take this role for granted because the mode of composition we think of is functional application. When syntactic constructions involve selection, we can use the order (and type) of lambda operators to make sure the right variable is 'visible' for composition with an external functor. So, if we combine a syntactic expression S, whose meaning is of the form $\lambda x.P$, with another syntactic expression E, the lambda operator tells us which argument of P is 'visible' for semantic composition, that is, the variable that is abstracted by the lambda operator. In our conjunctive mode of composition for (non-syntactically-selective) Oneida, this job is done by specifying the index of the phrase (which is roughly equivalent to specifiying what the phrase describes/denotes). We illustrate this use of the value of the INDEX semantic attribute for the sentence in (30) in (32).[8]

(32) $\left[\text{CONTENT} \, \exists y(\boxed{4}\exists x(\boxed{2}mother'('I',x) \wedge \boxed{3}late\_mother'(x,\boxed{1}y)) \wedge die'(e,\boxed{1}y)) \right]$

$\left[\begin{array}{l} \text{INDEX} \quad \boxed{1}\,y \\ \text{CONTENT}\,\boxed{4}\exists x(\boxed{2} \wedge \boxed{3}) \end{array} \right]$

$\left[\text{CONTENT}\,\boxed{5}\,die'(e,\boxed{1}y) \right]$
tyakawʌheꞏyú

$\left[\text{CONTENT}\,\boxed{2}\,mother'('I',\boxed{6}x) \right]$
aknulháꞏ

$\left[\text{CONTENT}\,\boxed{3}\,late\_mother'(\boxed{6}x,\boxed{1}y) \right]$
onulhaʔkʌ́
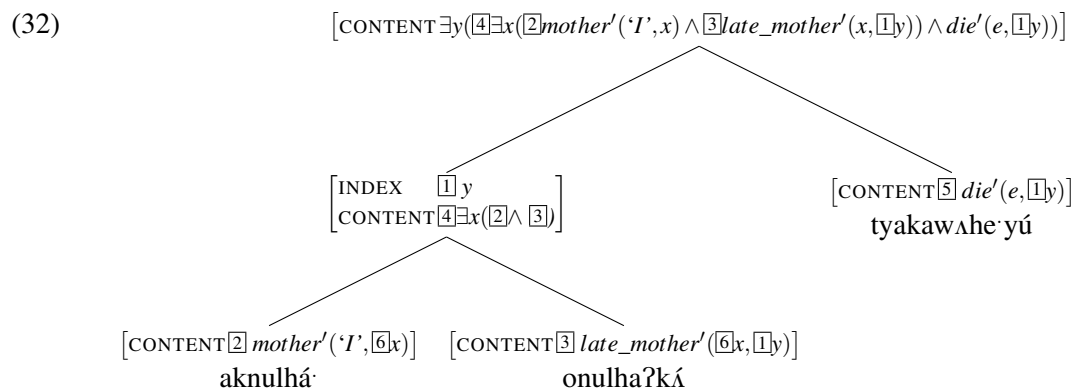
A conjunctive mode of composition can do quite a lot, especially if we avail ourselves of the equivalence between $\forall x(P \rightarrow Q)$ and $\neg\exists x(P \wedge \neg Q)$. However, it cannot do all that is needed to model the semantics of natural languages, at least under standard assumptions about what is universally expressed in natural languages. In particular, it does not seem to be able to model

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[8]The conjunctive mode of semantic composition we are proposing to pair with our non-selective syntax will probably remind readers of DRT-style composition rules (see Kamp and Reyle 1993 and van Eijck and Kamp 1997).

the full panoply of natural language quantificational expressions. Since Barwise and Cooper 1981, quantification over entities has been analyzed as relations between sets (so called $<1,1>$ quantifiers, see Peters and Westertåhl 2006). Typically, the way things work, as we illustrated above in Figure 2, is through functional application: The determiner, which denotes the quantificational relation between two sets, combines (in the simplest case) with a set-denoting nominal expression (e.g. a noun), and the result of this combination combines with the VP, which itself denotes a set. If we are correct in our observations about Oneida, this compositional sequence, involving functional application, is not available in Oneida. So how is quantification expressed in a direct syntax language? We address this question in the next section.

5. How to express quantification without functional application

To present Oneida's quantificational expressions, we need to briefly present the third major Oneida syntactic construction we alluded to above. Semantically, this construction switches a situational index to a nominal index. It is the construction used to model Oneida's internally-headed relative clauses, one of the two ways of forming relative clauses in Oneida. Its semantics is informally stated in (33a).

(33) a. A phrase with a situational index j can form a phrase with nominal index i provided that index corresponds to a participant in the situation associated with j.

   b. *IHRC* $\Rightarrow$

$$\begin{bmatrix} \text{INDEX} & \boxed{1} \\ \text{CONTENT} & \boxed{2} \end{bmatrix}$$
$$|$$
$$\begin{bmatrix} \text{INDEX} & e_{sit} \\ \text{CONTENT} & \boxed{2}\, P(\ldots \boxed{1}_{nom} \ldots) \end{bmatrix}$$

The basic answer to the question of how quantification is expressed in Oneida is that it is expressed as it is in mathematics. More specifically, the quantity expression serves as an argument of a relation, not a relation itself. An easy way to highlight the difference is to consider the two ways of representing the meaning of a sentence like (34), namely, the representations in (35a) and (35b). The two 'translations' are equivalent, at least if, as in Landman 1996, we allow predicates to take plural individuals by default and derive atomic event reading through a distributive operator.

(34) Three rabbits hopped.

(35) a. $three'(\lambda x.rabbit'(x), \lambda y.hopped(y))$

   b. $\exists s(rabbit'(s)) \wedge cardinality'(s,3) \wedge hopped'(s)$

The main argument for assuming that (35a) is a better representation of the meaning of (34) for English is that it generalizes to all determiners, including those whose meaning cannot be represented as in (35b). However, the Oneida way of expressing quantification is more like (35b). Quantification expressions in Oneida have three salient structural properties. First, the quantity expression is a clause headed by a (count) verb (meaning, e.g. 'be a certain amount, amount to' or 'be the whole of, be complete'). We call this clause the *count clause*. Second, the count verb for cardinal quantification incorporates a noun stem that indicates what is being counted. Third, the count clause functions like an internally-headed relative clause that is co-indexed with an argument of the main verb (i.e. is related to the main verb via the standard dislocation structure), as indicated by the literal translation of (36).

199

(36) Áhsʌ ni-ka-nláht-a-ke   ʌ-té-sk-u-ʔ
      three PART-3Z/N.SG.AGT-leaf-JN-amount FUT-CISLOC-2SG>1SG-give-PNC

      'The [tobacco] leaves that amount to three, you are to hand them to me.' (Olive Elm, *How I got started working in tobacco*, recorded 1998)

In Oneida there are several different ways of expressing quantity, including the use of distinct verb stems, depending on whether the cardinality of what is being counted is one, two, or more than two, whether what is being counted is inanimate or animate, and whether what is being counted is or is not part of a sentence that involves a possession relation. We concentrate on one verb stem here, *-ke* 'be a certain amount, amount to', illustrated in (36). Our analysis applies, *mutatis mutandis*, to other count verbs. The stem *-ke* is used for counting two or more entities. The incorporated noun *-nlaht-* 'leaf' indicates what is being counted. Thus, the incorporated noun, as is typical of one of the uses of noun incorporation in Oneida, indicates the category of one of the verb's semantic arguments. With verbs that are used for counting animates, the pronominal prefix on the verb references what is being counted; in (36) what is being counted is inanimate, and so the pronominal prefix is the default z/n prefix. Finally, *áhsʌ* 'three', at the beginning of the count clause, indicates how many leaves there are. The count clause can thus be translated as 'they leaf-amounted to three'.

The count clause is adjoined to the main clause, and the only connection between the count clause and the main clause is semantic: The count verb and the main verb share one semantic argument, the argument that corresponds to the leaves in (36). Of course, this kind of looser semantic connection is what our conjunctive mode of semantic composition is meant to accommodate, in particular, the *nominal dislocation* construction represented in (27). But additionally, as in the case of complex kinship expressions, which argument position (variable) within the count clause is to be co-indexed with a semantic argument of the main verb is critical. Selection of the right variable again falls upon the INDEX attribute, illustrated in the description of the IHRC construction stated in (33b). (37) shows semi-formally how the meaning of (36) arises from the use of the *IHRC* and *nominal dislocation* constructions, respectively. (In addition, we assume that the semantic effect of noun incorporation is to specify, via an additional conjunct, the category of one of the arguments of the verb that the noun incorporates into; this additional conjunct is *leaf'(y)* in (37).)

(37)

$$\begin{bmatrix} \text{INDEX} & \boxed{3} \\ \text{CONTENT} & \exists y \boxed{2}(amount'(\boxed{5}e', \boxed{1}y, 3) \wedge leaf'(y) \wedge \boxed{4}give'(\boxed{3}e, \text{'you'}, \boxed{1}y, \text{'}I\text{'})) \end{bmatrix}$$

$$\begin{bmatrix} \text{INDEX} & \boxed{1} \\ \text{CONTENT} & \boxed{2}(amount'(\boxed{5}e', \boxed{1}y, 3) \wedge leaf'(y)) \end{bmatrix} \qquad \begin{bmatrix} \text{INDEX} & \boxed{3} \\ \text{CONTENT} & \boxed{4}give'(\boxed{3}e, \text{'you'}, \boxed{1}y, \text{'}I\text{'}) \end{bmatrix}$$

$$\begin{bmatrix} \text{INDEX} & \boxed{5}e'_{sit} \\ \text{CONTENT} & \boxed{2} \; amount'(\boxed{5}e', \boxed{1}y, 3) \end{bmatrix}$$
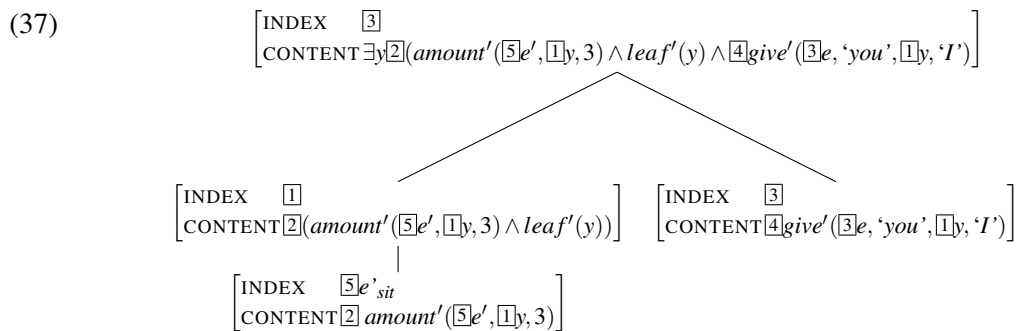
Our analysis of count clauses of the kind found in (36) illustrates how a conjunctive mode of semantic composition can model quantification in Oneida. Interestingly, nothing special needs to be added to the three main syntactic constructions we have already introduced and which are needed independently to model the rest of Oneida, that is, nominal dislocation, nominal adjunction, and internally-headed relative clauses. 'Mathematical' models of quantification (i.e.

models of quantification that resemble those presented in arithmetic) can be expressed through our conjunction cum coindexing and index selection mode of semantic composition, which we claim is appropriate for direct syntax languages such as Oneida.

But the conjunctive semantics we introduced cannot model all types of quantification. The problem is best illustrated by the difference in semantic acceptability of the following two English sentences:

(38) √Those rabbits amounted to/numbered three.

(39) #Those rabbits amounted to/numbered most.

The sentence in (38), the closest equivalent to the meaning of Oneida count clauses, is felicitous, but (39) is semantically unacceptable. The crucial difference between the two is that (38) involves cardinal quantification whereas (39) involves proportional quantification. The contrast suggests that the 'mathematical' expression of quantification is appropriate for cardinal quantification, but not for proportional quantification. So, if count clauses are the only way to express quantification over entities in Oneida, then the structure that Oneida uses to express quantification has expressive limitations.

We can characterize more precisely Oneida's predicted expressive deficit: Truly proportional quantification will be absent.[9] Cardinal quantification can be expressed through count clauses, where the number name is an argument of a predicate which is roughly translatable as *be a certain number*, *amount to*, *number*. But proportional quantification cannot be expressed through count clauses, for two reasons. First, because Oneida is a non-selective language, quantifiers cannot select for a syntactically expressed restriction. There cannot be an equivalent of *most rabbits* because *most* cannot select a nominal or NP. Oneida's non-selectiveness would at most allow a contextual specification of the quantifier's restriction or a further specification, as an adjunct, of the restriction argument. Second, and more importantly, words expressing a quantity are arguments, not predicates, and it is this that makes (39) infelicitous. *Most* cannot felicitously be an argument of *be a certain amount, amount to, number*. This means that count clauses of the kind we have described are inadequate for expressing truly proportional quantification. The inability of count clauses to express proportional quantification has two possible outcomes. One possibility is that Oneida does not express quantification with a single syntactic structure (such as the Det+Nominal construction of English), and the highly influential approach which allowed a unified treatment of the determiners of English and other languages, specifically the Generalized Quantifiers approach initiated in Barwise and Cooper 1981, is not available in Oneida. Instead, Oneida would have two entirely distinct ways of quantifying over entities: one for cardinal quantification (via the structure described above for count clauses) and another for proportional quantification (although the latter would have to be more restricted than in English because of the non-selective nature of Oneida).

The second possibility is that Oneida does not have truly proportional quantification in the technical sense of the term. It seems this second, more radical possibility, is what is the case; there are no words in Oneida for *most*, or for any other truly proportional quantifier. The best one can do is use a word that means, roughly, 'often, lots of times,' *yotká·teʔ*, that is, the best one can do is quantify over eventualities rather than entities (through count clauses). Interestingly, there is a way of expressing *half*. 'Half' is expressed with the verb stem *-ahsʌnʌ* plus the

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[9]By *truly proportional* quantifiers we mean quantifiers that cannot be modelled through first-order means. *All*, *every*, *each*, are typically analyzed as proportional quantifiers but they *can* be reanalyzed as first-order quantifiers. In contrast, *most* cannot (see Barwise and Cooper 1981).

coincident and dualic prefixes, meaning 'half(way), middle'. But this expression, which is the only expression that seems to correspond to proportionality over sets of entities when considering its English translation, actually does not involve a type $<1,1>$ quantifier but rather a usual quantity as argument expression. Consider a more common spatial use of the verb illustrated in (40). In that use, the verb denotes a relation between two distances. The sentence in (40) is therefore more faithfully glossed as 'how far we have gone is half (the distance we have to travel)'. In other words, the distances (the quantities in non-spatial uses of the verb) are treated as first-order individuals, not as properties of sets or relations among sets.

(40) nʌ   uhte   tshaʔ-te-w-ahsʌnʌ́·   niyo·lé· niyukwe·nú.
      then probably COIN-DUALIC-3Z/N.SG.AGT-half how far we (pl) have gone

      'then I guess we had gone halfway (to the store, along the railway tracks) (Barbara Schuyler, *A ghost sighting*, recorded 2008)

The absence of proportional quantifiers is not an accidental lexical gap. It is part of a more general pattern: There is no (quantificational) partitive construction in Oneida that corresponds to English *X of them*. Consider the excerpt in (41) from a dialogue about hockey, produced by Mercy Doxtator in 1998. (41a) sets up a set of boys who all have on skates. (41b), a few lines later, discusses what some of these boys were wearing. Count clauses are used to talk about the two boys wearing black shirts and the three boys wearing white uniforms. These count clauses take exactly the same form as if one were talking about a set of two boys, not a *subset* of the set of boys who put on skates. In other words, the partitive meaning is inferred; it is not grammatically encoded. The general absence of (quantificational) partitive construction may be taken as evidence that the absence of quantifiers corresponding to English *most* is not merely an accidental gap. It reflects a general fact about Oneida structures that express quantifications: Quantities are treated as individuals and serve as arguments of predicates, they are not themselves predicates. And that constructional fact itself reflects the non-selective or direct nature of Oneida syntax.

(41) a. Kwáh lati-kwekú   te-hon-ateʔkhé·tslut-eʔ
          Just   3MASC.PL.AGT-all DUALIC-3MASC.PL.PAT-put.on.skates-STV

          'All of them have on skates.'

      b. Te-hni-yáshe   o-ʔswʌ́·t-aʔ
          DUALIC-3MASC.DU.AGT-be.together[STV] 3Z/N.SG.PAT-black-NOUN.SUFFIX

          lon-atyaʔtawí·t-u   kháleʔ áhsʌ
          3MASC.PL.PAT-put.on.a.shirt-STV and   three

          ni-hatí   o-wískl-aʔ
          PART.3MASC.PL.AGT[be.that.many.STV] 3Z/N.SG.PAT-white-NOUN.SUFFIX

          ni-hu-hkwʌnyó·tʌ
          PART-3MASC.PL.AGT-have.on.an.outfit[STV]

          'Two of them have on black shirts and three of them have on white uniforms.'

6. Conclusion

In this paper, we have outlined a picture of Oneida that challenges what linguists, implicitly or explicitly, take to be two universals of syntax and the syntax/semantics interface: the syntac-

tic selection of dependent phrases by heads, and the concomitant use of functional application to combine the meanings of heads and selected dependents. If we are correct, the existence of languages like Oneida means we may have to revise our views on what can vary across languages and what is truly universal. Argument realization, for example, in the sense of Levin and Rappaport 1985, would not be a universal component of the syntax/semantics interface of natural languages. At a deeper level, Oneida's direct syntax suggests that what we have been accustomed to thinking are the fundamental phenomena of syntax may be only one of the ways that syntax can look like. Argument realization, binding, control, valence alternations, raising, VP anaphors, constraints on extraction, and so forth are simply not part of Oneida syntax. Consequently, syntax is about more than these phenomena. But what is also interesting is how much one can do with a direct syntax and a conjunctive mode of semantic composition. Most of our communicative needs seem to be met by this 'simpler' kind of syntax and this 'simpler' semantics (as the absence of functional application removes (some of) the need for higher-order types). As mentioned earlier, the fact that a conjunctive mode of composition is good enough for most aspects of the semantics of natural language is nothing new to scholars who adopt a DRT approach to natural language semantics. However, it is news to see a language making so much use of that mode of semantic composition. It is also news that we do not need functional application to model composition (but see footnote 2 for some parallels between Riau Indonesian, as described by Gil, and Oneida). Even more interesting, in some sense, is the fact that the kind of expressive limitations one would expect to find in a language that uses a direct syntax and a conjunctive mode of semantic composition are indeed true of Oneida: Truly proportional quantifiers and quantificational partitive constructions seem to be systematically absent in Oneida. This is not to say Oneida could not have developed constructions to express proportional quantification. The point is that direct syntax is geared towards a 'mathematical' way of expressing quantification, and this way of expressing quantification does not allow for the expression of proportional quantification. How Oneida deals with the absence of proportional quantifiers and partitives in general can be understood in the context of tenseless languages. The absence of tense does not mean event descriptions are not ordered temporally. It just means that temporal ordering is a matter of inference (although defaults play an important role in this respect: see Langacker 1991 and Bohnemeyer and Swift 2004). Similarly the absence of proportional quantifiers or partitives does not mean those concepts are not expressed. The subset-superset relation is merely inferred.

We began this paper by stressing the (rather obvious) importance of 'exotica' when trying to uncover universals. In this concluding paragraph, we go back and consider what Oneida has taught us. First and foremost, it has taught us that the venerable, 75-year-old approach to syntactic combinatorics (or an equivalent approach) is not universally at the core of the grammar of natural languages. It has also taught us that the 40-year-old use of functional application (or an equivalent approach) as the basic method for achieving semantic combinatorics is not universally needed. Finally, it has taught us that the 30-year-old generalized quantifier approach to natural language quantification is but one option and $<1,1>$ quantifiers are not universally present in natural languages. But 'exotica' not only can help us discover what is or is not universal, they can also help us uncover what we took for granted; in other words, help us reconstruct our analytic tools. An Oneida-centric reconstruction of syntax and the syntax/semantics interface looks eerily like Quine's algebraic dream: Conjunction, variable identification, variable selection for external combinators (in this paper, index selection). The Oneida constructions accomplish that much, but nothing more. This algebraic 'purity' of Oneida's syntax/semantics
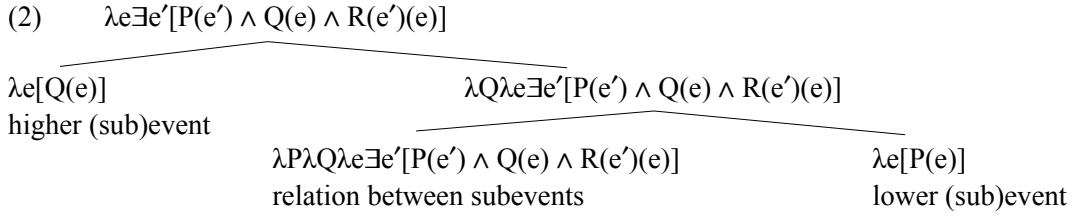
raises, of course, the question of why Oneida (and possibly some isolating languages such as Riau Indonesian) is such an odd man out and at one extreme of syntactic selection. We leave an answer to this question to another venue.

References

Ackerman, Farrell. 1992. Complex predicates and morpholexical relatedness: Locative alternation in Hungarian. *Lexical matters*, ed. by Ivan Sag and Anna Szabolcsi, 55–83. Stanford: CSLI Publications.

Ajdukiewicz, Kazimierz. 1935. *Die syntaktische Konnexität*. Studia Philosophica 1.1–27.

Anderson, Stephen. 1992. *A-morphous morphology*. Cambridge: Cambridge University Press.

Baker, Mark. 1996. *The polysynthesis parameter*. Oxford: Oxford University Press.

Barwise, John, and Robin Cooper. 1981. Generalized quantifiers and natural language. *Linguistics and Philosophy* 4.159–219.

Bloomfield, Leonard. 1933. *Language*. Chicago: Chicago University Press. 1984 reprint.

Bohnemeyer, Jürgen, and Mary Swift. 2004. Event realization and default aspect. *Linguistics and Philosophy* 27.263–296.

Chung, Sandra, and William Ladusaw. 2003. *Restriction and saturation*. Cambridge, Mass.: MIT Press.

van Eijck, van, and Hans Kamp. 1997. Representing discourse in context. *Handbook of logic and language*, ed. by Johan Van Benthem and Alice Ter Meulen, 179–237. Cambridge, MA: MIT Press.

Evans, Nicholas, and Stephen Levinson. 2009. The myth of language universals: Language diversity and its importance for cognitive science. *Behavioral and Brain Sciences* 32.429–448.

von Fintel, Kai, and Lisa Matthewson. 2008. Universals in semantics. *The Linguistic Review* 25.139–201.

Geach, Peter. 1972. A program for syntax. *Semantics of natural language*, ed. by Donald Davidson and Gilbert Harman, 483–497. Dordrecht: Reidel.

Gil, David. 1994. The structure of Riau Indonesian. *Nordic Journal of Linguistics* 179–200.

Gil, David. 2008. How complex are isolating languages? *Language complexity*, ed. by Matti Miestamo, Kaius Sinnemaki, and Fred Karlsson, 109–131. Amsterdam: John Benjamins.

Goldberg, Adele. 1995. *Constructions: A construction grammar approach to argument structure*. Chicago: Chicago University Press.

Jelinek, Eloise. 1984. Empty categories, case, and configurationality. *Natural Language and Linguistic Theory* 2.39–76.

Kamp, Hans, and Uwe Reyle. 1993. *From discourse to logic*. Dordrecht: Kluwer.

Koenig, Jean-Pierre, Gail Mauner, and Breton Bienvenue. 2003. Arguments for adjuncts. Cognition 89.67–103.

Koenig, Jean-Pierre, and Karin Michelson. 2010. Argument structure of Oneida kinship terms. *International Journal of American Linguistics* 76.169–205.

Koenig, Jean-Pierre, and Karin Michelson. 2012. Invariance in argument realization: The case of Iroquoian. Manuscript, Department of Linguistics, University at Buffalo.

Landman, Fred. 1996. Plurality. *Handbook of contemporary semantic theory*, ed. by Shalom Lappin, 425–457. Oxford: Blackwell.

Langacker, Ronald. 1987. *Foundations of cognitive grammar*, vol. 1. Stanford: Stanford University Press.

Langacker, Ronald. 1991. *Foundations of cognitive grammar*, vol. 2. Stanford: Stanford University Press.

Levin, Beth, and Malka Rappaport Hovav. 2005. *Argument realization*. Cambridge, UK: Cambridge University Press.

Michelson, Karin, and Mercy Doxtator. 2002. *Oneida-English/English-Oneida dictionary*. Toronto: University of Toronto Press.

Mithun, Marianne. 1986. Disagreement: the case of pronominal affixes and nouns. *Proceedings of the Georgetown University Round Table Conference on Languages and Linguistics*, 50–66. Washington, D.C.: Georgetown University Press.

Mithun, Marianne. 1987. Is basic word order universal? grounding and coherence in discourse. *Typological studies in language*, ed. by Russell Tomlin, vol. 11, 281–328. Amsterdam: John Benjamins.

Mithun, Marianne. 2006. Voice without subjects, objects or obliques: Manipulating argument structure in agent/patient systems. *Voice and grammatical relations*, ed. by Tasaku Tsunoda, Yoshihiro Nishimitsu, and Taro Kageyama, 195–216. Amsterdam: John Benjamins.

Peters, Stanley, and Dag Westerståhl. 2006. *Quantifiers in language and logic*. Oxford: Clarendon Press.

Quine, Willard van. 1976. *The ways of paradox and other essays*. Revised edition. Cambridge, Mass.: Harvard University Press.

Ramchand, Gillian. 2008. *Verb meaning and the lexicon: A first phase syntax*. Cambridge: Cambridge University Press.

Richter, Frank, and Manfred Sailer. 2004. Basic concepts of lexical resource semantics. *Esslli 2003 – course material*, Collegium Logicum, vol. 5. Kurt Gödel Society Wien.

Van Valin, Robert. 1985. Case marking and the structure of the Lakhota clause. *Grammar inside and outside the clause*, ed. by Johanna Nichols and Anthony Woodbury, 363–413. Cambridge: Cambridge University Press.

Woodbury, Hanni. 1975. *Noun incorporation in Onondaga*. New Haven, CT: Yale University dissertation.

Woodbury, Hanni. 2003. *Onondaga-English/English-Onondaga dictionary*. Toronto: Toronto University Press.

A finer look at predicate decomposition: evidence from causativization

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1. Introduction: radical predicate decomposition

In this paper, we establish an argument supporting radical predicate decomposition (RPD) whereby subevental components of an event description are represented independently from relations between them. At least since Dowty 1979, much evidence has been discussed in the literature that certain classes of verbs (e.g. accomplishments), be they morphologically simplex or derived, consist of more than one semantic component. The precise content and properties of these components are still a matter of debate. In a family of theories that argue for a syntactically represented predicate decomposition (Pylkkänen 2002, Borer 2005, Zubizarreta & Oh 2007, Ramchand 2008, Travis 2010, Tubino Blanco 2011), the fundamental assumption is that subevent descriptions appear together with their relations to a subordinate subevent, as in (1).

(1) $\lambda e \exists e'[Q(e) \land P(e') \land R(e')(e)]$

$$\begin{array}{c} \text{XP} \\ \diagup \quad \diagdown \\ \end{array}$$

X	YP
$\lambda P \lambda e \exists e'[Q(e) \land P(e') \land R(e')(e)]$	$\lambda e[P(e)]$

In (1), which is an instance of what we call standard predicate decomposition (SPD), the denotation of XP is a predicate of events that fall under the extension of the predicate Q, introduced by the X head. These events enter the R relation to an event from the extension of P, another predicate of events denoted by YP, the complement of X. On this view, crucially, both Q and R come out as part of the denotation of the X head. Commonly, the R relation is conceived of as CAUSE, and subevents in a complex event description are understood as causally related.

We propose instead that subevents and relations are distinct components of event structure, as in (2). In (2), two components of event structure, event predicates P and Q, are represented independently from the relation R between events from their extensions. Our narrow claim is

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that *semantic composition* works along the lines of (2), whereby introducing a 'higher' (sub)event and its relation to a 'lower' (sub)event are distinct steps of derivation.

(2)   λe∃e′[P(e′) ∧ Q(e) ∧ R(e′)(e)]

λe[Q(e)]   λQλe∃e′[P(e′) ∧ Q(e) ∧ R(e′)(e)]
higher (sub)event

               λPλQλe∃e′[P(e′) ∧ Q(e) ∧ R(e′)(e)]   λe[P(e)]
               relation between subevents   lower (sub)event

The wider claim is that subevents and their relations are represented independently *in the syntax*. We argue the heads contributing a subevent (e.g. Folli's (2002) and Ramchand's (2008) *v/init* and V/*proc*) are mediated by a relation-introducing Aktionsart element, as in (3).

(3)   [*v*P … *v* [AktP … Akt [VP … V …]]]
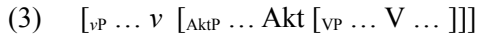
Below, we mostly discuss evidence for RPD that comes from causativization. In §2, we address the semantics of causal relations in Tatar (Altaic, Turkic) and argue that it varies independently from the descriptive content of subevental heads, which supports our narrow claim. In §3, we develop an argument from the semantics and morphology of denominal verbs that supports the wider claim. Finally, in §4, we examine cross-linguistic data from Tundra Nenets, Malagasy, and Hindi (the latter two originally discussed by Travis (2010) and Ramchand (2008)). We argue that properties of the causative in these languages, problematic for previous SPD proposals, receive a principled explanation on the RPD analysis along the lines of (3).

2. Semantic evidence

Our first argument, supporting the narrow claim that the subevental content of event structure and relations between subevents involves distinct steps of derivation, as in (2), runs as follows. Since setting up a relation and introducing an event predicate are distinct operations, (2) predicts that the descriptive content of event predicates corresponding to the higher (sub)event (P in (2)) and properties of the relation (R in (2)) vary independently. Assume that have two classes of predicates, α and β, and two relations, π and ρ. If (2) is correct, we expect that all the four logical possibilities, the Cartesian product of {α, β} and {π, ρ}, should be empirically real. α-type events should enter both π and ρ relations, same for β-type events. If (1) tells us a true story, the default expectation is the opposite: given that characteristics of the relation are always tied to a specific event predicate (thus, in (1) the predicate Q and the R relation form a denotation of the X head), we should only regularly find two options of the four logically possible.

What we need to test this prediction are a set of different types of event descriptions {α, β, …} and a set of different relations {π, ρ, …}. We would then be able to check if every member of the former can occur in combination with every member of the latter. For constructing the first set, one can rely on the semantic distinction independently motivated in the literature starting from Rappaport Hovav & Levin 1998; see a recent discussion in Rappaport 2008, Levin & Rappaport Hovav 2010, and Koontz-Garboden & Beavers 2012. We know that many natural language predicates are specified for the manner of action (these are 'manner verbs' in Rappaport Hovav and Levin's terms). Classical examples are *wipe* and many other verbs of surface contact, whose meaning includes rich information about the activity performed by the external argument. Other verbs, for example, *break* or *kill*, are underspecified for manner:

kill is compatible with wide variety of the agent's activities that bring about the death of the patient: shooting, poisoning, hitting with the hammer, etc. It is only in a context that the exact nature of the activity can be identified (or still left unclear). Therefore, manner specified (or [+ms]) versus manner underspecified ([-ms]) are classes of event descriptions that are suitable for our purposes.

For identifying a set of relations between subevents, we can make use of the observation that the composition of complex event predicates (those consisting of more than one subevental component, as in (1) and (2)) cannot be reduced to a single causal relation. Rothstein (2004) argues convincingly that for predicates like 'read a novel', the reading activity and the subevent of the novel getting read enter what she calls an incremental relation (INCR), not the one of immediate causation. Besides, the causal relation itself comes in at least two varieties, direct, or immediate (I-CAUSE), and not necessarily immediate, or general (G-CAUSE). (I-CAUSE and G-CAUSE will be discussed shortly, and INCR will play a key role in the discussion from §3.) All these options, once proven empirically real, can serve for our experimental purposes, too.

For the reasons of space, below we will examine a small subset of logical possibilities generated by the sets {[+ms], [-ms]} and {INCR, I-CAUSE, G-CAUSE}. We will show that the same [-ms] event predicate is free to combine with both I-CAUSE and G-CAUSE relations. (Other combinations, which would make our argument complete, are dealt with in Lyutikova & Tatevosov 2010.) Given the architecture in (2), this is exactly what we predict. In a world according to (1), this co-occurrence pattern comes out as a mysterious coincidence.[1]

With this general outline of the argument, we take into account causativization data from Tatar (Altaic, Turkic). Causatives give us a good opportunity to observe a complex event structure in which relations between subevents can be different and thus offer a way of telling (1) and (2) apart. The difference is illustrated in (4) and (5):

(4) alim   kerim-ne   ü-**ter**-de.
     Alim   Kerim-ACC   die-**CAUS**-PST.3SG
     1. 'Alim killed Kerim.'
     2. *'[Having paid $10,000 to the killer,] Alim organized Kerim's assassination.'
(5) ukɨtučɨ   alim-ne   jariš-ta   eger-**t**-te.
     teacher   Alim-ACC   competition-LOC   run-**CAUS**-PST.3SG
     1. 'The teacher made Alim run at the competition (e.g. by pushing him on the lane).'
     2. '[Having convinced the coach that Alim is a good runner,] the teacher organized
     Alim's running at the competition.'

In (4), the unaccusative verb 'die' undergoes causativization. (4) is only compatible with the scenario in which the agent's action is an immediate cause of the patient's death (exactly as what happens to the lexical verb *kill* in English). In contrast, the causative in (5) accepts two

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[1]As the anonymous reviewer points out, 'one could still make the case that both <I-CAUSE> and <G-CAUSE> are just variants of a more general cause relation, and in that case the point … that we are dealing with a mysterious coincidence becomes moot.' In fact, an implication of our proposal is that these relations should be taken as primitive rather than derived from something else, e.g. from a more general relation comprising them both. For the reasons of space, we are not able to discuss conceptual and empirical (dis)advantages of the alternatives in any detail and only briefly mention the main reason that motivates our choice. One can observe, language after language, that I-CAUSE/G-CAUSE distinction is in some way or other manifested in the grammar. Grammatical phenomena where (in)directness of causation is revealed range from the morphological shape of causative morphemes to case marking of main arguments of a predicate and (albeit less directly) in scope of adverbials (see below), binding phenomena and constraints on VP-ellipsis. This provides evidence that for natural languages, the two types of causation constitute distinct pieces of conceptual vocabulary, even if this need not be so for logic and philosophy.

scenarios: in (5.1), there still is an immediate causal relation between the teacher's acting and Alim's running, but in (5.2), the causal chain connecting these two events can contain intermediate causes (e.g. convincing the coach, the coach making his decision, etc.).

In the literature, a number of grammatical manifestations of the immediate/non-immediate distinction are cited.[2] One of the most striking ones is that the non-immediate causative allows for adverbials to scope over subevents independently. (6) is three-way ambiguous, but (7) is not:

(6) marat eki minut ečendä alsu-dan täräz-ne ač-**tïr**-dï.
     Marat two minute within Alsu-ABL window-ACC open-**CAUS**-PST.3SG
     1. 'In two minutes, Marat made Alsu open the window.' (The duration of the total of causing and caused subevents is two minutes.)
     2. 'It took two minutes for Marat to make Alsu open the window (in a second).' (The duration of the causing subevent is two minutes.)
     3. 'What Marat did (in two hours) was make Alsu open the window in two minutes.' (The duration of the caused subevent is two minutes.)
(7) marat čiläk-ne tul-**dïr**-dï.
     Marat bucket-ACC fill.intr-**CAUS**-PST.3SG
     1. 'In two minutes, Marat filled the bucket.'
     2. *'It took two minutes for Marat to make the bucket fill (in an hour).'
     3. *'What Marat did (in a second) was make the bucket fill in two minutes.'

In terms of Kratzer (2005), in (4.1) Alim's activity is *a causing of* Kerim's being dead, while in (4.2), had this interpretation been available, paying $10,000 would have been the event that *causes* Kerim's being dead. The same difference is observed in (5.1) and (5.2). Therefore, the causative in (4), given that (4.2) is inappropriate, is based on the relation of immediate causation. The causative in (5), compatible with both scenarios, introduces a more general relation comprising immediately and non-immediately related events. The semantics of these two relations can be represented as in (8) (quasi-formally, which suffices for our current purposes):

(8) a. $\| \text{I-CAUSE}(e')(e) \| = 1$ iff e is the (mereological) sum of all the members of a causal chain with the maximal element e'. (Kratzer 2005)
     b. $\| \text{G-CAUSE}(e')(e) \| = 1$ iff e is a (mereological) sum of some members of a causal chain with the maximal element e', provided that the minimal element in that chain is part of e.[3]

Given that (4) and (5) involve the different causal relations in (8a) and (8b), the question is:

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[2]This distinction is known under different labels including manipulative versus directive, contactive versus distant (or non-contactive), Saksena 1982), immediate versus mediated (Kulikov 2001), causer-controlled versus causee-controlled (Shibatani 2002). The distinction has been a constant topic in the studies of causativization phenomena since late 1960s and one of the central issues surrounding the debate on lexical and syntactic causatives (Lakoff 1965, Fodor 1970, McCawley 1972, Shibatani 1973, Yang 1976).

[3]Kratzer's (2005) analysis of immediate causation ('causaing of') is based on the following reasoning. Suppose we have an event description of the form $\lambda e \exists e'[P(e') \wedge Q(e) \wedge R(e')(e)]$. This property of events is true of any event which falls under P and *is also a completed event of causing some Q-event*. For Kratzer, this means that the whole causal chain leading to the Q-event, including this Q-event itself, must be in the denotation of P. Kratzer's definition in (8a) captures this intuition. (8b), however, is not Kratzer's relation of indirect causation, in which e causes e' iff e is *the minimal element in a causal chain leading to e'*. Since (5.1) and (5.2) comprise both direct and indirect causation, the desired relation has to include both as a special case. We believe that (8b) does precisely this. It should be emphasized, however, that nothing in what follows hinges on the specifics of (8a-b).

Do these relations correspond to different descriptive properties of the causing subevent or are those properties the same in (4) and (5)? As far as one can tell, there are good reasons to believe that in both (4) and (5) we are dealing with the same event predicate over causing subevents.

In languages like Tatar, causing subevents are underspecified for descriptive content. In much the same way as English lexical result verbs like *break*, (4) is compatible with a wide variety of the agent's activities that bring about the death of the patient. Like result verbs in English, causatives like 'kill' in Tatar accept manner specifying adjuncts, as illustrated in (9) for 'break'. The same holds for 'make run' in (10):

(9) alim   ujɨnčɨk-nɨ   tašla-p   /   sug-ɨp   sɨn-dɨr-dɨ.
    Alim   toy-ACC   throw-CONV   hit-CONV   break-CAUS-PST.3SG
    'Alim broke the toy by throwing / hitting it.'

(10) ukɨtučɨ alim-ne   tert-ep   /   trener-ne   ɨšandɨr-ɨp   jarɨš-ta
     teacher Alim-ACC push-CONV   coach-ACC   convince-CONV   competition-LOC
     eger-t-te.
     run-CAUS-PST.3SG
     1. 'The teacher made Alim run at the competition by pushing him.'
     2. 'Having convinced the coach, the teacher organized Alim's running at the competition.'

Another property indicative of verbs like 'break', not speficied for manner, is that thematic characteristics of the external argument are flexible (e.g. Kratzer 1996, Alexiadou et al. 2006, Koontz-Garboden & Beavers 2012): not only agents, but also natural forces, events and a certain class of instruments are licensed as subjects in sentences like (11)–(12):

(11) ǯil   täräz-ne   sɨn-dɨr-dɨ.
     wind window-ACC   break-CAUS-PST.3SG
     'The wind broke the window.'

(12) ǯiŋü-e-neŋ   teläg-e   alim-ne   jarɨš-ta   eger-t-te.
     victory-3-GEN   desire-3   Alim-ACC   competition-LOC run-CAUS-PST.3SG
     'The desire to win made Alim run at the competition.'

Further diagnostics for the lack of manner specification can be found in Koontz-Garboden & Beavers 2011; (9)–(12) will suffice for our survey. We believe that (9)–(12) point towards a clear conclusion: they involve a causing subevent underspecified for descriptive content. Predicates of causing subevents can have whatever events in their extension that can bring about a subordinate subevent, the causee becoming dead in (4) or running in (5). Furthermore, with no evidence for the opposite, one can make a stronger claim: in (4) and (5), we are dealing with the same [-ms] predicate, not with two distinct ones.

Lyutikova and Tatevosov (2010) argue that the descriptive properties of causing subevents come out as a free variable over event predicates that receives its value from the assignment. This allows those descriptive properties to vary with the context, which seems to be exactly what we need to capture the meaning (4) and (5):
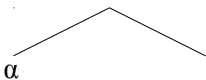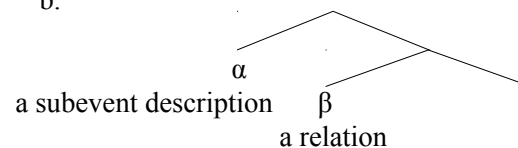
(13) $\lambda e[Q_C(e)]$

In our system, (2), both I-CAUSE and G-CAUSE are introduced independently from Q_C and before Q_C, so when Q_C appears, I-CAUSE or G-CAUSE are already there. The derivation of (4) and (5) would look, leaving out irrelevant details, as in (14) and (15):

211

(14)

v' $\lambda e \exists e'[\text{die}(e') \wedge \text{theme}(\text{kerim})(e') \wedge Q_C(e) \wedge \text{I-CAUSE}(e')(e)]$

    v AktP $\lambda Q \lambda e \exists e'[\text{die}(e') \wedge \text{theme}(\text{kerim})(e') \wedge Q(e) \wedge \text{I-CAUSE}(e')(e)]$

$\lambda e[Q_C(e)]$

       Akt   VP $\lambda e[\text{die}(e) \wedge \text{theme}(\text{kerim})(e)]$

$\lambda P \lambda Q \lambda e \exists e'[P(e') \wedge Q(e) \wedge \text{I-CAUSE}(e')(e)]$

              'Kerim die'

(15)

v' $\lambda e \exists e'[\text{run}(e') \wedge \text{agent}(\text{alim})(e') \wedge Q_C(e) \wedge \text{G-CAUSE}(e')(e)]$

    v AktP $\lambda Q \lambda e \exists e'[\text{run}(e') \wedge \text{agent}(\text{alim})(e') \wedge Q(e) \wedge \text{G-CAUSE}(e')(e)]$

$\lambda e[Q_C(e)]$

       Akt vP $\lambda e[\text{run}(e) \wedge \text{agent}(\text{alim})(e)]$

$\lambda P \lambda Q \lambda e \exists e'[P(e') \wedge Q(e) \wedge \text{G-CAUSE}(e')(e)]$

              'Alim run'

We follow Harley 2008, Travis 2010, Miyagawa 2012 and much other literature in that the causative of unaccusatives involves is single vP, while causativization of unergatives and transitivies results in a double vP configuration. In Lyutikova & Tatevosov 2010, we argue that for languages like Turkic the choice between I-CAUSE and G-CAUSE is fully determined by structural considerations. If an unaccusative configuration is causativized, the causative morpheme takes VP as its complement, as in (4), and the causal relation is necessarily I-CAUSE. When a transitive or unergative verb gets causativized, the causative merges with vP, not VP, which leads to the G-CAUSE interpretation, as in (5).[4] (14) is a predicate that contains events in its extension that immediately cause an event of Kerim's dying. (15) is a predicate of events that (not necessarily indirectly) bring about an event of Alim's running. All we need to complete the derivation is introduce an external argument (e.g. by Event Identification: Kratzer 1996, Pylkkänen 2002).

To recapitulate, the evidence from Tatar consists of two parts. First, the causal relation comes in two varieties, I-CAUSE and G-CAUSE. Secondly, no matter which of the two causative configurations is built up, it involves the same predicate of causing subevents underspecified for descriptive content. What we get, then, is exactly what we have been looking for: a case where the relation varies independently from the properties of an event predicate that introduces causing subevents. RPD provides a principled explanation for this fact: since relations and subevent descriptions appear in the structure at distinct steps of derivation, the integration of the latter into the event structure is correctly predicted to be blind to the properties of the former.

If the above reasoning is correct, we have an argument that RPD provides a right view of how the event structure is built in terms of semantic composition. This is a narrow claim of this

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[4]The anonymous reviewer rises the following question: since whether or not I or G-cause is chosen hinges on whether transitive/unergative or unaccusative verbs are causativized, does this not indicate that the relation and the event description do not vary independently? We believe that this generalization such. reflects a significant fact about syntax of causative configurations, not about their semantics. Our central claim that properties of subevent descriptions vary independently from relations between them would have been undermined if there existed unaccusative or unergative event descriptions. But, as standardly assumed, unaccusativity / unergativity only has to do with the position where the argument is merged and is irrelevant for identifying descriptive properties of (sub)events. The distribution of $\text{Akt}_{\text{I-CAUSE}}$ and $\text{AKT}_{\text{G-CAUSE}}$ in (14)–(15) is thus to be derived from (language-specific) selectional requirements of these morphemes, not from the semantic environment in which they occur. Moreover, in §3.4 we will see a language where both morphemes are licensed in the same syntactic configuration.

paper. The wider claim is that subevents and their relations are also representationally distinct, as shown in (3). In the next section, we will discuss evidence supporting this wider claim.

3. Morphological evidence
3.1. The two classes

So far we have argued that subevents and their relations involve distinct steps of semantic derivation. However, it does not necessarily follow from this that they correspond to distinct pieces of syntactic structure. For it may be the case that two semantic operations occur when the same syntactic head is interpreted, an example being what Pylkkänen (2002) calls Voice Bundling. In Voice Bundling, causativization and introduction of the external argument, distinct steps of semantic derivation, happen as two subsequent steps of interpretation of the same head. Similarly, one can imagine that introduction of a relation and of a subevent description correspond a single piece of syntactic structure, as in (16a). (16a) is thus to be told apart from (16b), where the two are not only interpretationally, but also representationally distinct:

(16)   a.   b.

         α   α
Step 1: a relation   a subevent description   β
Step 2: a subevent description   a relation

Our second argument is based on the fact that (16a-b) make different predictions as to the spell-out of the event structure. If (16b), based on (3), is correct, the expectation is: not only are subevents and relations are independent for the interpretation mechanism, they are *spelled out* independently as well. We expect to encounter a situation where properties of the relation hosted by the Akt head in (3) have visible consequences for the morphology. In what follows, we present evidence suggesting that this prediction is borne out, hence alternatives to (3) cannot be correct. Specifically, will examine a class of denominal verbs in Tatar collected in Kirpo & Kudrinskij 2011 and show that their morphological shape is indeed sensitive to the properties of Akt.

Among denominal verbs in Tatar, two classes are especially prominent, which differ as to the morphological make-up of the transitive member of the causative-inchoative pair. Transitive/causative verbs from class 1 are derived by the *-la-* morpheme (LA henceforth), while a corresponding intransitive/inchoative involves an additional piece of morphology, the *-n-* morpheme (N).

(17)   **Class 1: transitive (causative) verbs in *-la*, inchoative verbs in *-la-n***
         jüeš-lä 'wet' / *jüeš-lä-n* 'get wet' (*jüeš* 'wet')
         ansat-la 'lighten (tr.)' / *ansat-la-n* 'lighten (intr.) (*ansat* 'light, easy')
         jäšel-lä 'make green, paint green' / *jäšel-lä-n* 'acquire green color' (*jäšel* 'green')
   *maj-la* 'oil, lubricate' / *maj-la-n* 'get oiled, soak up oil' (*maj* 'oil')

For verbs from class 2, the direction of derivation is apparently the opposite: the transitive member of the pair looks like a product of causativization of a *-la-n-* intransitive verb by the morpheme TYR we have already dealt with:

(18)   **Class 2: inchoative verbs in *-la-n*, transitive (causative) verb in *-la-n-dɨr***
         jalkaw-la-n 'become lazy' / *jalkaw-la-n-dɨr* 'make lazy' (*jalkaw* 'lazy')
         jaxšɨ-la-n 'improve (of a person) (intr.)' / *jaxšɨ-la-n-dɨr* 'improve, make good (of a person) (tr.)' (*jaxšɨ* 'good')

213

čül-lä-n 'turn into a desert (intr.)' / *čül-lä-n-der* 'turn into a desert (tr.)' (*čül* 'desert')
saz-la-n 'get waterlogged' / *saz-la-n-dɨr* 'make waterlogged, waterlog' (*saz* 'swamp')
mumijä-lä-n 'get mummified'/ *mumijä-lä-n-der* 'mummify' (*mumijä* 'mummy')

An obvious way of treating class 1 and class 2 verbs would be based on the assumption that morphological asymmetry reflects distinct structures they project. In a Marantz-style framework (Marantz 1997, Alexiadou et al. 2006), one is tempted to analyze class 1 transitive verbs as in (19):

(19)

v_{TR}
LA   √
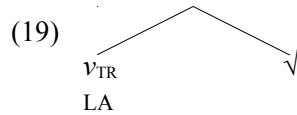
Their anticausative/inchoative variants would then be represented as in (20), where N can be thought of as a spell-out of a functional head that takes *v*P as its complement. Given that class 1 and class 2 inchoatives are morphologically identical, the structure in (20) naturally extends to class 2 inchoatives. Following the same logic, class 2 transitives would involve an extra projection where the causative morpheme is merged, as in (21).

(20)   (21)

F F_2
N   *v*   √   TYR F_1
       LA   N   *v*   √
                                                         LA
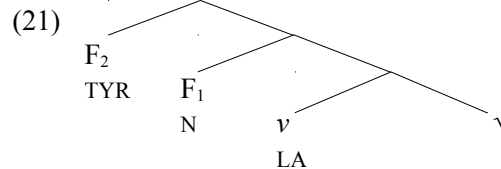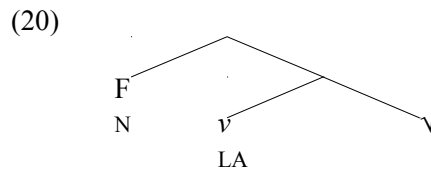
(19) and (21) reflect a huge derivational asymmetry between class 1 and 2 transitives, the latter representing more complex event structure, with one more subevent and one more thematic role brought in by the TYR morpheme. Whatever consequences this complexity can have, we expect to observe them when comparing class 2 and class 1 verbs. It should be also noted that (21) is essentially the structure Guasti (2005) and Folli and Harley (2007) assign to Romance analytic causatives with *faire* plus an infinitive. If this parallelism is taken seriously, class 2 Tatar causatives are expected to be indirect, like their Romance counterparts.

The problem is that there is no detectable difference between class 1 and class 2 transitives. They are identical in terms of argument structure, case marking of arguments, and eventuality type: all involve a nominative subject and an accusative object, all license agents, events, and natural forces as external arguments, and most are accomplishments. These characteristics are illustrated in (22).

(22) **Class 1:** External argument: agent, event, or natural force, nominative
Internal argument: theme, accusative; eventuality type: telic
marat / jaŋɨr külmäg-e-n   jüeš-lä-de.
Marat   rain   shirt-3-ACC   wet-LA-PST
'Marat / the rain wet his shirt.'
(23) **Class 2:** External argument: agent, event, or natural force, nominative
Internal argument: theme, accusative; eventuality type: telic
ukɨtuči / universität-tä   uku-ɨ   marat-nɨ   jaklaw-la-n-dɨr-dɨ.
teacher   university-LOC   study-3   Marat-ACC lazy-LA-N-TYR-PST.3SG
'The teacher / studying at the university made Marat lazy.'

More significantly, all involve direct causation, as evidenced by the fact that the scope of temporal adverbials must include both subevents (cf. the indirect causative in (6)):

(24) marat eki   minut ečendä külmäg-e-n   jüeš-lä-de.
     Marat two   minute within shirt-3SG-ACC wet-LA-PST.3SG
     'Marat wet his shirt in two minutes.'
     1. *'Marat did something in two minutes so that the shirt got wet (in a second).'
     2. *'Marat did something (in a second) so that the shirt got wet in two minutes.'

(25) ukɨtučɨ eki   zɨl   ečendä marat-nɨ jaklaw-la-n-dɨr-dɨ.
     teacher two   year within Marat-ACC lazy-LA-N-TYR-PST
     'The teacher made Marat lazy in two years.'
     1. *'The teacher did something in two years so that Marat become lazy (in a week).'
     2. *'The teacher did something (in a month) so that Marat became lazy in two years.'

Finally, no differences in internal complexity between class 1 and class 2 verbal predicates by looking at scopal ambiguities with adverbials like 'almost' and 'again' (von Stechow 1995, Rapp & von Stechow 1999) as well as under negation. (Due to space limitations we are not able to cite corresponding examples here; see Tatevosov and Kirpo 2012.)

One can conclude that two types of transitives, contrary to the initial assumption, are structurally identical and semantically alike. Moreover, everything in (22)–(27) (morphosyntax, scope of temporal adverbials, scope of negation) suggests that both types are derived result verbs like 'break' and project as much as a *v*P. Given that, the very fact that class 2 transitives consist of four pieces of morphology (root – LA – N – TYR) starts being problematic: in an SPD system, the *v*P does not contain enough projections to host all the four.

In what follows, we propose an RPD analysis based on the assumption that class 1 and class 2 transitives are structurally identical, and the difference only emerges when the structure is spelled out. We believe that this analysis, which crucially relies on AktP in between *v*P and VP, as in (3), captures more facts with less stipulations than the alternative outlined in (19)–(21). But to make the analysis work, we need to figure out what exactly the structure being spelled out looks like and what determines the choice between the two spell-out options.

3.2. The two relations

A solution to the puzzle begins to emerge if we take into account a lexical semantic peculiarity that verbs from class 2 share. They all involve what Rothstein (2004) calls an incremental relation between activity and change-of-state subevents.

For Rothstein, events e and e′ are incrementally related, (28), iff there is a contextually salient function that maps every member of the incremental chain of e′, (29), to a cotemporaneous part of e. For instance, for predicates like *read a novel* the relation between activity and change of state is incremental, since for any (contextually relevant) part of the reading activity there must be a corresponding part of the process of the novel getting read and vice versa.

(26) INCR(e′)(e)(C(e′)) (e is incrementally related to e′ with respect to the incremental chain C(e′)) iff there is a contextually available one-one function μ from C(e′) onto PART(e) such that $\forall e \in C(e')[\tau(e) = \tau(\mu(e))]$

(27) C(e), an incremental chain for e, is a set of parts of e such that (i) the smallest event in C(e) is the initial bound of e, (ii) e ∈ C(e), and (iii) $\forall e', e'' \in C(e)$, e′ ≤ e″ or e″ ≤ e′.

For verbs from class 1, the relation between the activity and change of state is not incremental (and for some cannot be incremental). Rather, it is a more general relation of immediate causation, I-CAUSE. Take 'wet' as an example again. It is fully compatible with at least two types of scenario. It can be the case that every subevent of the theme getting wet corresponds to some portion of the agent's activity (imagine that the agent spatters water over the theme). But it can also be the case that the whole subevent of getting wet occurs at the very final part of the activity (e.g. the agent takes the object and throws it into the water). The same two options obtain with verbs like 'make green': the agent can accomplish this by gradually laying the green paint on the surface of the patient as easily as by putting it into the dye. In the latter case, the whole subevent of getting green occurs after the agent's activity. Therefore, verbs from class 1 do not meet the crucial criterion of Rothstein's incrementality: the change of state does not require contemporaneous input of the agent's activity.

Verbs from class 2 are minimally different in that the nature of change which the internal argument undergoes is incompatible with scenarios where the change occurs at the final part of the activity. Such verbs refer to temporally stable properties that, under normal circumstances, come into existence gradually. Moreover, they all require this gradual change be brought about by some temporally coextensive causing event. Take *jalkaw-la-n-dɨr* 'make waterlogged (lit. turn into a swamp)' or *čül-lä-n-der* 'turn into a desert' as an example. The result state of events referred to by these verbs are 'be (like) a swamp' or 'be (like) a desert', respectively:

(28) växši-lär   šäxär-ne   čül-lä-n-der-de-lär.
     barbarian-PL   city-ACC   desert-LA-N-TYR-PST-PL
     'Barbarians turned the city into a desert.'
(29) jaŋgɨr-lɨ   ʒäj   kɨr-nɨ   saz-la-n-dɨr-dɨ.
     rain-ATR   summer   field-ACC   swamp-LA-N-TYR-PST
     'A rainy summer waterlogged the field.'

In both (28) and (29), the change of state where the city turns into a desert and the field into a swamp is conceived of as happening in a way described by Rothstein: the progress of these changes is dependent on a temporally coextensive causing subevent. The more barbarians act, the more the city looks like a desert, and the more the rainy summer lasts, the more the field resembles the swamp. Setting up a scenario that breaks an incremental relation (e.g. 'The bomb turned the city into a desert') leads to a drastic decrease in acceptability. Therefore, the right generalization about the class membership of a denominal verb seems to be as follows: whenever the relation between the activity and change-of-state subevents is incremental, the verb falls within class 2; otherwise, it is a member of class 1.

We propose that RPD can provide a principled explanation for the distribution of class 1 and class 2 transitives. If the class membership depends on whether the relation is I-CAUSE or INCR, the prediction derivable from RPD is straightforward: the head where the relation is located is expected to be spelled out in different ways depending on the properties of the relation. With this in mind, we are ready to lay the analysis out.

3.3. The two spell-out patterns

Our wider theoretical claim is that the structure of *v*P looks as in (32):

(30)   [$_{v\text{P}}$ ... *v* [$_{\text{AktP}}$ ... Akt [$_{\text{VP}}$ ...V... [$_{\text{XP}}$ ... X ...]]]]

In line with Folli 2002, Ramchand 2008, Travis 2010, Borer 2005, Zubizarreta & Oh 2007 we

assume a syntactic view of event structure. V and *v* correspond to Ramchand's (2008) *init* and *proc*; Akt is what makes (32) an RPD theory. The closest analogue of Akt found in the literature is Travis' (2010) Inner Aspect; for the reasons of space we do not go into further detail, but see Lyutikova & Tatevosov 2010 for discussion. In (32), we are abstracting away from the internal structure of XP where the non-verbal component originates.

To account for the distribution of denominal verbs in Tatar, we only have to make two additional assumptions. One of them is about the syntactic configuration associated with transitive and inchoative verbs from both classes; another has to do with the spell-out of this configuration.

We have seen that an analysis in (19)–(21) that posits a derivational asymmetry between class 1 and class 2 transitives runs into serious complications. We propose instead that class 1 and class 2 verbs project the same structure in both transitive and inchoative configurations, shown in (31). Inchoative clauses only differ from transitives as to the second-order feature (in the sense of Adger & Svenonius 2011) [TR]/[INCH] on *v*, as seen in (31a-b). This assumption puts the analysis in line with the family of approaches where the inchoatives and transitives are derived by different 'flavors' of *v* (e.g. Folli & Harley 2005):

(31) a. Transitive: [$_{vP}$ ... v_{TR} [$_{AktP}$ ...]]
      b. Inchoative: [$_{vP}$ ... v_{INCH} [$_{AktP}$ ...]]

The Akt head bears the feature [INCR]/[I-CAUSE], which determines if the relation between the activity and change of state is incremental or a relation of immediate causation, as in (32a-b):

(32) a. Incremental: [... [$_{AktP}$ ... Akt$_{INCR}$ [$_{vP}$ ...]]]
      b. Immediate causation: [... [$_{AktP}$ ... Akt$_{I-CAUSE}$ [$_{vP}$ ...]]]

Our second assumption has to do with the spell-out of the structure. We assume a 'nanosyntactic' approach to the spell-out that has recently gained a grown popularity by offering elegant solutions to a number of complicated issues (e.g. Caha 2009, Taraldsen 2009). Three basic principles of this approach are given in (33)–(35) (Starke 2009:3–5):

(33) *Superset principle*: A lexically stored tree matches a syntactic node iff the lexically stored tree contains the syntactic node.
(34) *The biggest match principle*: The biggest match always overrides the smaller matches.
(35) *Elsewhere principle*: If several lexical items match the root node, the candidate with least unused nodes wins.

From the nanosyntactic point of view, a lexical item is a pairing of phonological representation with a syntactic subtree, the latter determining what syntactic configuration can be spelled out by the item. Finally, we assume the subset principle for second order features:

(36) *Subset principle for second order features*: If a node A in a tree being spelled out and a node α in a lexically stored subtree match, the set of second-order features on α must be a subset of those on A.

Lexical entries for LA, N, and TYR are specified in (37) ('⇔' symbolizes a correspondence between a phonological exponent and a subtree being spelled out).

(37) a. LA ⇔ [$_{vP}$ v_{TR} [$_{AktP}$ Akt$_{I-CAUSE}$ [$_{vP}$ V]]]

b. N ⇔ [$_{vP}$ v_{INCH} [$_{AktP}$ Akt]]

c. TYR ⇔ [$_{vP}$ v_{TR} [$_{AktP}$ Akt$_{CAUSE}$]], where CAUSE ∈ {I-CAUSE, G-CAUSE}

Since out of the three items in (37), only LA is specified for the VP node, it is the only option for spelling out VP. In effect, LA always surfaces in denominal verbs regardless of what features v and Akt bear. The spell-out of other components depends on their featural content.

Class 1 verbs are based on the I-CAUSE relation. Depending on the TR/INCH feature on v, two configurations are theoretically available. In (48), the whole structure is spelled out by LA. Other competitors (N for Akt$_{I-CAUSE}$ and TYR for v_{TR} and Akt$_{C-CAUSE}$) lose to LA according to (34), since LA is the biggest match. In (39), N is the only option for spelling out v_{INCH}. It competes with LA for Akt$_{CAUSE}$, but loses the competition due to (35): unlike N, LA bears the I-CAUSE feature and is thus more 'specific'.

(38) $\underbrace{[_{vP} \ldots v_{TR} [_{AktP} \ldots Akt_{I-CAUSE}}_{LA} [_{VP} V [_{XP} \ldots X \ldots]]]]$ Class 1; transitive

(39) $\underbrace{[_{vP} \ldots v_{INCH}}_{N} \underbrace{[_{AktP} \ldots Akt_{I-CAUSE}}_{LA} [_{VP} V [_{XP} \ldots X \ldots]]]]$ Class 1; inchoative

Class 2 verbs differ crucially in that they are based on the INCR relation. This prevents LA, specified as Akt$_{I-CAUSE}$, from realizing Akt$_{INCR}$ and, due to monotonicity of spell-out, from realizing v as well. The role of LA is thus restricted to spelling out VP. Akt$_{INCR}$ is lexicalized by N in both causative and inchoative configurations, as in (40) and (41), respectively. In addition, N spells out v_{INCH} in (41), where it is the only candidate. It cannot lexicalize v_{TR}, however, due to the feature mismatch, and this is where TYR takes over, (40).

(40) $\underbrace{[_{vP} v_{TR}}_{TYR} \underbrace{[_{AktP} Akt_{INCR}}_{N} \underbrace{[_{VP} V}_{LA} [_{XP} \ldots X \ldots]]]]$ Class 2; transitive

(41) $\underbrace{[_{vP} v_{INCH} [_{AktP} Akt_{INCR}}_{N} \underbrace{[_{VP} V}_{LA} [_{XP} \ldots X \ldots]]]]$ Class 2; inchoative

We believe that the analysis just outlined has a number of attractive properties. First, it suggests that class 1 and class 2 transitives are reduced to the same syntactic configuration consisting of projections of v, Akt and V. Transitives that belong to class 1 and class 2 are then correctly predicted to be identical in all relevant respects, and their similarities exemplified in (22)–(25) follow naturally. Secondly, and crucially, representing the relation between subevents within AktP opens a way of explaining why class 1 and class 2 transitives have different morphological shapes: the analysis allows to relate this difference to the semantic opposition between I-CAUSE and INCR, hence to account for the observations in §3.2. If the Akt head introduces I-CAUSE, it is spelled out by the LA morpheme, as well as V and v_{TR}. If, on the other hand, Akt is specified as [INCR], LA is no longer available, and N is called for; v is then realized by TYR, 'the causative morpheme'.

We are in a position of summarizing the argument for RPD based on this material. There are two classes of denominal transitives in Tatar, which only differ as to the properties of the relation between subevents (INCR versus I-CAUSE) and morphological makeup, being identical in all other respects. This suggests that both classes are associated with the same hierarchical structure, and the difference has to do with the way this structure is phonologically realized. Assuming RPD with the Akt head in between v and V enables us to account for two facts. First, a transitive verb under relevant circumstances is realized by four, not three, pieces of morphology, whereby the Akt head receives a unique spell-out, distinct from the exponents of

other heads. Secondly, spell-out patterns co-vary with the properties of the relation: Akt realized by a separate piece of morphology only if the relation is INCR. Crucially, RPD, where the relation is represented as a separate head, is a necessary precondition for this type of analysis. In this way, the composition of denominal verbs in Tatar provides us with an argument for RPD.

3.4. Cross-linguistic evidence

Denominal verbs in Tatar only serve one configuration where the Akt head can receive a designated spell-out: the INCR feature on Akt triggers a phonological realization of Akt distinct from v and V. In all other configurations where the causative morphology is attested, Akt has no overt realization. This is illustrated in (42a-b), where (42a) exemplifies the causative of an unaccusative verb, and (42b) is a product of further causativization of (42a):

(42) a. marat   čiläk-ne   tul-**dɨr**-dɨ.
          Marat   bucket-ACC   fill.intr-**CAUS**-PST.3SG
          'Marat filled the bucket.'
      b. alim   marat-tan   čiläk-ne   tul-**dɨr-t**-tɨ.
          Alim   Marat-ABL   bucket-ACC   fill.intr-**CAUS-CAUS**-PST.3SG
          'Alim made Marat fill the bucket.'

(43) $[_{vP}\ v_{TR}\ [_{AktP}\ Akt_{\text{I-CAUSE}}\ \underbrace{[_{VP}\ V\ ...\ ]]]}$ tul-**dɨr**
      $\underbrace{\hphantom{[_{vP}\ v_{TR}\ [_{AktP}\ Akt_{\text{I-CAUSE}}}}_{\text{TYR}}\ \underbrace{\hphantom{[_{VP}\ V}}_{\text{TUL}}$

(44) $[_{vP}\ v_{TR}\ [_{AktP}\ Akt_{\text{G-CAUSE}}\ [_{vP}\ v_{TR}\ [_{AktP}\ Akt_{\text{I-CAUSE}}\ [_{VP}\ V\ ...\ ]]]]]]$ tul-**dɨr-t**
      $\underbrace{\hphantom{[_{vP}\ v_{TR}\ [_{AktP}\ Akt_{\text{G-CAUSE}}}}_{\text{TYR}}\ \underbrace{\hphantom{[_{vP}\ v_{TR}\ [_{AktP}\ Akt_{\text{I-CAUSE}}}}_{\text{TYR}}\ \underbrace{\hphantom{[_{VP}\ V}}_{\text{TUL}}$

Given lexical entries in (33), this is exactly what one expects. For v_{TR} in (43) and (44), TYR is the only suitable candidate. For Akt, TYR is a better choice than N for two reasons. First, N is underspecified for the CAUSE feature on Akt, which makes it an elsewhere candidate according to (36). Secondly, TYR can spell out both v_{TR} and Akt nodes with no part of its lexically stored tree being unused. For N, its lexically stored v_{INCH} node is wasted, and N loses to TYR according to (34). LA has no chances to spell-out v and Akt either. In case of lexical verbs like 'fill' in (42), V is lexicalized by the verb root, hence the V node in the lexical tree of LA is necessarily unassociated. The immediate effect of this is: LA loses the competition for v and Akt to TYR in any verbal environment; it is denominal configurations only where LA can surface.

Therefore, the crucial lexical property of the morpheme TYR is that it is able to lexicalize both Akt$_{\text{I-CAUSE}}$ and Akt$_{\text{G-CAUSE}}$ nodes, which is reflected in its specification CAUSE in (37c) comprising both I-CAUSE and G-CAUSE.[5] If our RPD account for Tatar causativization is correct, we can derive a number of further predictions about cross-linguistic variation.

On the view advocated above, whether Akt receives an overt morphological realization depends on featural specifications of lexical items competing for realizing v and Akt. We expect that languages can vary along two dimensions: what information is lexically stored in the subtree associated with the causative morpheme and what are properties of other competitors. Specifically, we can expect to find a language minimally different from Tatar in a way represented in (45):

(45) a. PHON$_1$ ⇔ $[_{vP}\ ...\ v_{INCH}\ [_{AktP}\ ...\ Akt\ ]]$ ('inchoative morpheme')
      b. PHON$_2$ ⇔ $[[_{vP}\ ...\ v_{TR}\ [_{AktP}\ ...\ Akt_{\text{I-CAUSE}}\ ]]$ ('causative morpheme')

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[5]To make this part of the analysis fully explicit one would need a reasonable feature geometry where I-CAUSE and G-CAUSE are dependent on the CAUSE node, to which TYR in Tatar makes reference. We leave a full elaboration of this idea for a future occasion.

(45a) is exactly like its Tatar counterpart in (35b). PHON₂ in (45b), 'the causative morpheme', however, differs from TYR in that it is specified for the Akt$_{\text{I-CAUSE}}$ node rather than for both Akt$_{\text{I-CAUSE}}$ and Akt$_{\text{G-CAUSE}}$. We predict, then, that in such a language, direct causatives would look exactly like in Tatar, but in indirect causatives, the inchoative morpheme would show up inside the causative morphology, as shown in (46)–(49):

(46) $[_{vP} \cdots v_{\text{INCH}} [_{\text{AktP}} \cdots \text{Akt}_{\text{I-CAUSE}} [_{VP} \cdots]]]$ I-CAUSE; inchoative
         $\underbrace{}_{\text{PHON}_1}$

(47) $[_{vP} \cdots v_{\text{TR}} [_{\text{AktP}} \cdots \text{Akt}_{\text{I-CAUSE}} [_{VP} \cdots]]]$ I-CAUSE; transitive
         $\underbrace{}_{\text{PHON}_2}$

(48) $[_{vP} \cdots v_{\text{INCH}} [_{\text{AktP}} \cdots \text{Akt}_{\text{G-CAUSE}} [_{VP} \cdots]]]$ G-CAUSE; inchoative
         $\underbrace{}_{\text{PHON}_1}$

(49) $[_{vP} \cdots v_{\text{TR}} [_{\text{AktP}} \cdots \text{Akt}_{\text{G-CAUSE}} [_{VP} \cdots]]]$ G-CAUSE; transitive
         $\underbrace{}_{\text{PHON}_2}$ $\underbrace{}_{\text{PHON}_1}$

As far as we can tell, this is exactly what happens in Tundra Nenets (Uralic, Samoyedic), illustrated in (50)–(51):

(50) a. manʲ   petʲa-nə   malʲca-mə   tira-**bta-*l*-pta**-w.
          I   Peter-DAT   shirt-ACC   dry.intr-**PTA-*L*-PTA**-1SG
          'I made Peter dry his shirt.'
     b. *manʲ   petʲa-nə   malʲca-mə   tira-**bta-bta**-w.
          I   Peter-DAT   shirt-ACC   dry.intr-**PTA-PTA**-1SG
     c. *manʲ   petʲa-nə   malʲca-mə   tira-***l*-bta-bta**-w.
          I   Peter-DAT   shirt-ACC   dry.intr-***L*-PTA-PTA**-1SG
     d. *manʲ   petʲa-nə   malʲca-mə   tira-***l*-pta-*l*-pta**-w.
          I   Peter-DAT   shirt-ACC   dry.intr-***L*-PTA-*L*-PTA**-1SG

(51) petʲa   malʲca-mə   tira-**bta-*l*-ŋa**.
     Peter   shirt-ACC   dry.intr-**PTA-*L*-3SG**
     'Peter started drying his shirt.'

(50) shows a double causative configuration derived from the unaccusative verb stem 'dry (intr.)', which allows us to observe the morphological realization of both Akt-*v* sequences. The first instance of the causative creates the direct causative 'dry', and the second one derives the indirect causative 'make dry'. The resulting configuration and its spell-out are shown in (52):

(52) $[_{vP} \underbrace{v_{\text{TR}}}_{\text{PTA}} [_{\text{AktP}} \underbrace{\text{Akt}_{\text{G-CAUSE}}}_{L} [_{vP} \underbrace{v_{\text{TR}} [_{\text{AktP}} \text{Akt}_{\text{I-CAUSE}}}_{\text{PTA}} [_{VP} \cdots \text{'dry'} \cdots]]]]]]$

Our focus here is the spell-out of the Akt heads. The PTA morpheme is associated, by hypothesis, with the subtree in (45b). It lexicalizes the lower Akt$_{\text{I-CAUSE}}$ for the same reason that TYR does in Tatar in (43): the inchoative L in (45a) is a weaker competitor, since, first, it is underspecified for the second-order features on Akt and, secondly, it does not make use of the v_{INCH} part of its subtree. This is evidenced by ungrammaticality of (52c-d), where L shows up in between the causative morphology and the verb stem. Things are different for the higher Akt$_{\text{G-CAUSE}}$: PTA is not suitable for lexicalizing Akt$_{\text{G-CAUSE}}$, due to the feature mismatch, and L is the only candidate. Attaching PTA on top of another PTA morpheme with no L occurring in between is correctly predicted to yield an ungrammatical sentence in (52b).

Finally, (53) shows the inchoative configuration corresponding to (51), where L spells out both higher Akt and higher v_{INCH}:

(53) $[_{vP}\ v_{\text{INCH}}\ [_{\text{AktP}}\ \underbrace{\text{Akt}_{\text{G-CAUSE}}}_{\text{L}}\ [_{vP}\ \underbrace{v_{\text{TR}}\ [_{\text{AktP}}\ \text{Akt}_{\text{I-CAUSE}}}_{\text{PTA}}\ [_{vP}\ \ldots\ \text{'dry'}\ \ldots\ ]]]]]$

Once again, RPD coupled with minimal additional assumptions about the structure of lexical items involved in the derivation correctly predicts the appearance of a certain piece of morphology in between two instances of the causative. The cross-linguistic variation is thus reduced to a simple lexical parameter.

We have argued that the difference between Tatar and Tundra Nenets comes from the feature specification on the 'causative morpheme'. These languages, however, are fundamentally similar in that whenever Akt is realized by an item distinct from the causative morpheme, the same item shows up in the inchoative configuration: N in Tatar and L in Tundra Nenets are both specified for the v_{INCH} node in addition to the Akt node. However, properties of such morphemes can be subject to cross-linguistic variation, too. A natural expectation is to find a lexical item which is only associated with the Akt node, possibly with an additional G-CAUSE/I-CAUSE/INCR specification:

(54)   PHON ⇔ $[_{\text{AktP}}\ \text{Akt}_{(\text{G-CAUSE}/\ldots)}\ ]$

We suggest that causativization data from Malagasy and Tagalog, discussed extensively in Travis 2010, can be analyzed as involving a morpheme like (54). These languages exhibit a pattern similar to (50) from Tundra Nenets: the two instances of the causative element are separated by a piece of morphology (-*f*- (F) in (55b), derived from (55a)). For Travis, F is an exponent of the Event head. On her view, it delimits a complete event structure built in the lexicon, which the higher -*an*- morpheme takes as a complement.

However, we believe that reanalyzing F in terms of Akt gains clear empirical advantages. Problematic for the Event Phrase analysis is the very fact that F can only appear in between two instances of the causative. If it marks completeness of the event structure, it is unclear why it is not free to occur in a configuration where no higher causative has been merged. This is not an option, however: Travis' discussion suggests that nothing of the form in (55c) exists in Malagasy.

(55)   a.   m-**an**-sitrika
            AT-**AN**-hide.intr
            'Y hides X.'
       b.   m-**an**-*f*-**an**-sitrika
            AT-**AN**-**F**-**AN**-hide.intr
            'Z makes Y hide X.'
       c.   *m-*f*-an-sitrika
            AT-**F**-**AN**-hide.intr

Within our system, on the other hand, F would be analyzed as a realization of Aktionsart, not of Event, as in (56). Moreover, if its lexical subtree looks like (54), the fact that it can only occur in between two *v*-heads falls out with no additional assumptions:

(56) $[_{\text{EP}}\ \underbrace{\text{E}_{[\text{-CASE}]}}_{\text{M}}\ [_{vP}\ \underbrace{v_{\text{TR}}}_{\text{AN}}\ [_{\text{AktP}}\ \underbrace{\text{Akt}_{\text{G-CAUSE}}}_{\text{F}}\ [_{vP}\ \underbrace{v_{\text{TR}}\ [_{\text{AktP}}\ \text{Akt}_{\text{I-CAUSE}}}_{\text{AN}}\ [\ldots\ \text{'hide.intr'}\ \ldots\ ]]]]]]$

Furthermore, the inchoative clause, parallel to (51) from Tundra Nenets, would never be derived, since F is not a legitimate candidate for spelling out v_{INCH}.

If the RPD analysis of Tatar, Tundra Nenets, and Malagasy is correct, it can shed a new light on the structure of Hindi causatives discussed by Ramchand (2008). Hindi presents a slightly different case as compared to what we have dealt with so far. In both Tatar and Tundra Nenets, G-CAUSE only appears when a transitive or unergative configuration is causativized, that is, when the causative structure merges on top of vP. Causatives of unaccusatives are always immediate. In Hindi, unaccusatives license both direct and indirect causation, the difference being reflected in morphological marking, *-aa-* (AA) versus *-vaa-* (VAA) in (57a-b):

(57) a. Anjum-ne   makaan   ban-**aa**-yaa.
       Anjum-ERG   house   make-**AA**-PERF.M.SG
       'Anjum built a house.'
    b. anjum-ne   (mazdurx-se)   makaan   ban-**vaa**-yaa.
       Anjum-ERG   labourers-INSTR   house   make-**VAA**-PERF.M.SG
       'Anjum had a house built by the labourers.'

Ramchand argues that both types of causative are to be represented within the same vP, not by means of a double vP configuration, and proposes to analyze (57a-b) as (58a-b), respectively. (We couple her *init*/*proc* notation with the v/V notation used throughout this paper.)

(58) a. [$_{initP/v\text{P}}$ Anjum [$_{init/v}$ **-aa-**] [$_{procP/V\text{P}}$ makaan [$_{proc/V}$ ban] [$_{resP}$ <makaan> [$_{res}$ <ban>]]]]
    b. [$_{initP/v\text{P}}$ Anjum [$_{init/v}$ **-aa-**] [$_{procP/V\text{P}}$ <Anjun> [$_{proc/V}$ **-v-**] [$_{resP}$ makaan [$_{res}$ ban]]]]

Ramchand suggests that VAA is to be decomposed into V and AA. In both (58a-b), AA spells out the v head; the *res(ultative)* head is realized by the verb root 'get built'. The difference has to do with the spell-out of V. Ramchand argues that if the direct AA causative is built, as in (60a), V is taken care of by the root. In case of the indirect causative in (60b), V is realized by the V element of the decomposed VAA morpheme. On Ramchand's (2008:182) view, indirectness of causation is an epiphenomenon of two subevents corresponding to V and *res* not being identified by the *same* lexical content.

Whether indirectness is epiphenomenal or should be recognized in its own right is addressed in Lyutikova & Tatevosov 2010. The analysis in (58) suffers from another complication, as Ramchand herself (2008: 168) acknowledges: 'the *-v-* of the indirect causative is actually closer to the root than the *-aa-* piece of the morphology that the direct and indirect causatives share'. We believe that an RPD alternative to (58b) effectively solves the problem with no additional effort. We already have everything we need, namely, lexical entries for the causative morpheme and for the Aktionsart element:

(59) a. *aa* ⇔ [[$_{v\text{P}}$ v_{TR} [$_{AktP}$ Akt$_{\text{I-CAUSE}}$]]   (cf. (47b), Tundra Nenets)
    b. v ⇔ [$_{AktP}$ Akt]   (cf. (56), Malagasy)

Following Ramchand in that direct and indirect causatives are both projected within a single vP, and turning her SPD structures into RPD structures, we assign (60) and (61) to (57a) and (57b), respectively.

(60) $\underbrace{[_{v\text{P}} \ldots v_{\text{TR}} [_{AktP} \ldots \text{Akt}_{\text{I-CAUSE}}}_{\text{AA}} [_{\text{VP}} \ldots \text{'be.built'} \ldots]]]$

(61) $[_{vP} \cdots v_{TR} \underbrace{[_{AktP} \cdots Akt_{G\text{-}CAUSE}}_{V} [_{VP} \cdots \text{'be.built'} \cdots]]]$
$\qquad\quad\underbrace{\phantom{[_{vP} \cdots v_{TR}}}_{AA}$

As (60) and (61) show, Hindi causativization reduces to what we have independently observed in Tundra Nenets and Malagasy. The AA morpheme realizes both v_{TR} and $Akt_{I\text{-}CAUSE}$ in (60), defeating V in the competition for $Akt_{I\text{-}CAUSE}$ due to the biggest match principle in (34). However, it fails to realize $Akt_{G\text{-}CAUSE}$ in (61), and this is where V shows up. If (61) is on the right track, the required ordering falls out with no effort at all: if V is an instance of Akt, the position in between the root and AA is just the right place for it to appear.

5. Summary and conclusion

We have argued for radical predicate decomposition, which assumes, unlike standard decomposition, that relations between subevents in the event structure are represented independently both semantically and syntactically. We have presented three sets of causativization facts – semantic, morphological, and cross-linguistic – that support this claim. Subevents and their relations are independent, since, first, their semantic properties vary independently, secondly, they can be spelled out by distinct morphological exponents, and thirdly, because the independence predicts correctly the cross-linguistic variation. To the extent that our arguments are solid, we believe that RPD offers a more appealing view of event structure than the SPD alternative. Conceptually, it allows to eliminate a problematic assumption that descriptive properties of subevent descriptions must be tightly connected to characteristics of relations between subevents. Empirically, it enables a simple and elegant explanation for the otherwise mysterious connection between the type of causation and pieces of morphology that appear inside the causative morpheme in languages like Tatar, Tundra-Nenets, Malagasy, and Hindi.

References

Adger, David, and Peter Svenonius. 2011. Features in minimalist syntax. *The handbook of linguistic minimalism,* ed. by Cedric Boeckx, 27–51. Blackwell.

Alexiadou, Artemis; Elena Anagnostopoulou; and Florian Schäfer. 2006. The properties of anticausatives crosslinguistically. *Phases of interpretation,* ed. by Mara Frascarelli, 187–211. Berlin: Mouton.

Borer, Hagit. 2005. *Structuring sense: An exo-skeletal trilogy.* Oxford University Press.

Caha, Pavel. 2009. *The nanosyntax of Case.* Ph.D. dissertation, University of Tromsø.

Chierchia, Gennaro. 2004. A semantics for unaccusatives and its syntactic consequences. *The unaccusativity puzzle*, ed. by Artemis Alexiadou, Elena Anagnostopoulou, and Martin Everaert, 22–59. Oxford University Press.

Dowty, David R. 1979. *Word meaning and Montague grammar.* Dordrecht: Reidel.

Fodor, Jerry. 1970. Three reasons for not deriving 'kill' from 'cause to die'. *Linguistic Inquiry* 1.429–438.

Folli, Rafaella. 2002. *Constructing telicity in English and Italian.* PhD dissertation, University of Oxford.

Folli, Rafaella, and Heidi Harley. 2005. Flavours of *v*: Consuming results in Italian and English. *Aspectual inquiries*, ed. by Paula Kempchinsky and Roumyana Slabakova, 95–120. Dordrecht: Springer.

Folli, Rafaella, and Heidi Harley. 2007. Causation, obligation and argument structure: on the nature of little *v. Linguistic Inquiry* 38.197–238.

Guasti, Maria T. 2005. Analytic causatives. *The Blackwell Companion to Syntax,* ed. by Martin

Everaert and Henk van Riemsdijk. Vol. 1, 142–172. Malden: Blackwell Publishing.

Harley, Heidi. 2008. On the causative construction. *Oxford handbook of Japanese linguistics*, ed. by Shigeru Miyagawa and Mamoru Saito, 20–53. Oxford: Oxford University Press.

Kirpo, Lidija, and Maxim Kudrinskij. 2011. Tatar derivational morphology database. Technical report 12-04. Moscow State University.

Koontz-Garboden, Andrew. 2009. Anticausativization. *Natural Language and Linguistic Theory* 27.77–138.

Koontz-Garboden, Andrew, and John Beavers. 2012. Manner and Result in the roots of verbal meaning. *Linguistic Inquiry* 43.331–369.

Kratzer, Angelika. 1996. Severing the external argument from its verb. *Phrase structure and the lexicon,* ed. by Johan Rooryck and Laurie A. Zaring, 109–137. Dordrecht: Kluwer.

Kratzer, Angelika. 2005. Building resultatives. *Event arguments in syntax, semantics, and discourse*, ed. by Claudia Maienborn and Angelika Wöllstein-Leisen, 177–212. Tubingen: Niemeyer.

Kulikov, Leonid. 2001. Causatives. *Language typology and language universals: an international handbook*, ed. by Martin Haspelmath, Ekkehard König, Wulf Oesterreicher; and Wolfgang Raible. Vol. 2, 886–898. Berlin: Walter de Gruyter.

Lakoff, George. 1965. *On the nature of syntactic irregularity.* PhD dissertation, Indiana University.

Levin, Beth, and Malka Rappaport Hovav. 2010. *Lexicalized meaning and Manner/Result complementarity.* Ms., Stanford University and The Hebrew University of Jerusalem.

Lyutikova, Ekaterina, and Sergei Tatevosov. 2010. Causativization and event structure. Ms., Moscow State University.

Marantz, Alec. 1997. No escape from syntax: Don't try morphological analysis in the privacy of your own lexicon. *University of Pennsylvania Working Papers in Linguistics* 4.201–225.

McCawley, James D. 1972. *Syntactic and logical arguments for semantic structures*. Bloomington, Indiana: Indiana University Linguistics Club Edition.

Miyagawa, Shigeru. 2012. Blocking and causatives: Unexpected competition across derivations. *Case, argument structure, and word order*, Chapter 8, 202–223. Routledge.

Pylkkänen, Liina. 2002. *Introducing arguments*. PhD dissertation, MIT.

Ramchand, Gillian. 2008. *Verb meaning and the lexicon: A first phase syntax*. Cambridge University Press.

Rapp, Irene, and Arnim von Stechow. 1999. *Fast* 'almost' and the visibility parameter for functional adverbs. *Journal of Semantics* 16.149–204.

Rappaport Hovav, Malka, and Beth Levin. 1998. Building verb meanings. *The projection of arguments: lexical and compositional factors*, ed. by Miriam Butt and Wilhelm Geuder, 97–134. Stanford, CA: CSLI Publications.

Rothstein, Susanne. 2004. *Structuring events: A study in the semantics of lexical aspect*. Malden, MA: Blackwell Publishing.

Saksena, Anuradha. 1982. Contact in causation. *Language* 58.820–831.

Shibatani, Masayoshi. 1973. Semantics of Japanese causatives. *Foundations of Language* 9.327–373.

Shibatani, Masayoshi (ed.) 2002. *The grammar of causation and interpersonal manipulation*. Amsterdam and Philadelphia: Benjamins.

Starke, Michal. 2009. Nanosyntax: A short primer to a new approach to language. *Nordlyd* 36-1.1–6.

Taraldsen, Knut Tarald. 2009. Lexicalizing number and gender in Lunigiana. *Nordlyd* 36-1.113–127.

Tatevosov, Sergei, and Lidija Kirpo. 2012. Deriving verb classes in Tatat. Ms., Moscow State University.

Travis, Lisa DeMena. 2010. *Inner aspect: The articulation of VP.* Dordrecht: Springer.

von Stechow, Arnim. 1996. The different readings of *wieder* 'again': A structural account. *Journal of Semantics* 13.87–138.

Yang, In-Seok. 1976. Semantics of Korean causation. *Foundations of Language* 14.55–87.

Zubizarreta, Maria L., and Eunjeong Oh. 2007. *On the syntactic composition of manner and motion*. Cambridge, MA: MIT Press.

Negation-resistant polarity items

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1. Introduction

The interaction between polarity-sensitive indefinites (henceforth PSIs) and negation can tell us a lot about the underlying semantics of these indefinites. We generally see a two-way split in the distribution of such indefinites. On one hand, we have items such as *ever* and *in weeks* that can only survive if embedded in a negative environment, as in (1), while on the other, we have indefinites such as *some girl* and *someone* that resist the scope of negation, as in (2).

(1)   a.   I don't think Mary *ever* visited me at school.
       b.   She hasn't seen that guy around the department *in weeks*.

(2)   a.   *John didn't talk to *some girl*.
       b.   *I didn't eat *something* today.

In this paper we focus on the second type of PSIs, which can, more generally, be labeled as negation-resistant indefinites. The main property of these items is that they appear to be in complementary distribution with negative polarity items (henceforth NPIs) of the type in (1); unlike NPIs which can only receive the interpretation of a narrow scope indefinite with respect to negation, *some girl* and *someone* cannot be interpreted with narrow scope. Despite this parallel, these items have been offered diverging analyses in the literature based on the fact that they behave differently in non-negative environments. Items such as *some girl* have been argued to be existential free choice items, or epistemic indefinites (see e.g. Kratzer and Shimoyama 2002, Alonso-Ovalle and Menéndez-Benito 2010, Fălăuş 2010, Chierchia 2011) that give rise to an ignorance inference, while those of the *someone* type are labeled positive polarity items, henceforth PPIs (Szabolcsi 2004, Homer 2011b). However, as of yet there has been no attempt to offer an analysis of these two types of items framed within one and the same system, a system that would be able to account for the distribution of all types of PSIs, including NPIs. In other words, those analyses that tackle the distribution of epistemic indefinites illustrate how NPIs ought to be couched within the respective frameworks without discussing PPIs, while those dealing with PPIs integrate NPIs but ignore the epistemic indefinites. The problem we are faced with at this stage in the development of a complete understanding of the polarity system at large is that these two sets of analyses do not converge on an account of NPIs, thus making the search

for a uniform account of PSIs untenable. In this paper I plan to show that such unification is possible and ultimately desirable. In particular, I will argue that an exhaustification-based system, already shown to account for the distribution of epistemic indefinites and NPIs, can be extended to account for the distribution of PPIs as well.

This paper is organized as follows. In §2 I offer an overview of the distribution of the *someone*-type PPIs and sketch two previous attempts at accounting for their distribution. Space limitations will prevent me from offering the details of these analyses but I hope to persuade readers that despite their success at accounting for PPIs and NPIs, these accounts are limited in their ability to carry over to epistemic indefinites. In §3 I introduce the exhaustification-based framework within which recent accounts of NPIs and epistemic indefinites have been couched. Finally, §4 provides a new analysis of PPIs couched within this framework, ultimately showing that unification of these polarity indefinites is possible. Cross-linguistic data that signals the existence of typological differences within PPIs is also brought in, and I will show how this analysis can account for, and in fact predict such differences without any additional stipulations. The last section concludes and discusses some open issues.

2. *Someone* indefinites – the distribution

PPIs in the scope of clausemate negation can only receive a wide scope reading, as seen in (3). When these indefinites appear in the immediate scope of clausemate negation, the surface scope interpretation is unavailable unless explicitly used in a denial context, as illustrated in (4).

(3)   I didn't see something.

   a. $^{\checkmark}$ There is a thing such that I didn't see it. $^{\checkmark}\exists{>}\neg$

   b. * There is nothing that I saw. $^{*}\neg{>}\exists$

(4)   A: I heard John talked to someone at the party yesterday.
    B: No, actually. John DIDN'T talk to someone.

However, not all negative environments disallow PPIs from their immediate scope at logical form, as shown in (5).

(5)   a.   John didn't call someone. *not${>}$PPI
   b.   No one called someone. *no one${>}$PPI
   c.   John came to the party without someone. *without${>}$PPI
   d.   I rarely get help from someone. $^{\checkmark}$rarely${>}$PPI
   e.   At most five boys called someone. $^{\checkmark}$at most${>}$PPI
   f.   Few boys read something. $^{\checkmark}$few${>}$PPI
   g.   Only Jonathan ate something. $^{\checkmark}$only${>}$PPI

Descriptively, the environments that *someone* is resistant to are those that qualify as 'strongly' negative: clausal negation, negative quantifiers and *without*. Observe that the sentences which allow the indefinite to have narrow scope, (5d-f), have the same truth conditions upon replacing *someone* with *anyone*. In addition to these cases, PPIs can also be interpreted in the scope of negation whenever the negative element is not in the same clause as the PPI, as shown in (6).

(6)   a.   I don't think that John called someone. $^{\checkmark}$not${>}[_{CP}$ PPI
   b.   Nobody thinks that he called someone. $^{\checkmark}$nobody${>}[_{CP}$ PPI

To summarize, these indefinites can only be interpreted as taking wide scope with respect to a strongly negative element such as clausal negation, negative quantifiers and *without*, unless the negative element is extra-clausal.

Returning to the case of clausemate negation, observe that PPIs can scope below a local negation as long as the indefinite is not in the immediate scope of the negative operator. In (7), the universal quantifiers *every* and *always* intervene at logical form between the negative operator and the indefinite.

(7) a. Not every student said something. $^\checkmark$not>every>PPI
     b. John didn't say something at every party. $^\checkmark$not>every>PPI
     c. John doesn't always call someone. $^\checkmark$not>always>PPI

Lastly, observe that an otherwise infelicitous structure (*neg>PPI) can be rescued if it is embedded in a negative environment. The strength of the higher negative operator is irrelevant in terms of its ability to rescue the structure. In other words, we see in (8b-d) that *doubt*, *surprise* and *only* act as rescuers despite the fact that these elements would not qualify as strong enough to disallow PPIs from taking narrow scope.

(8) a. I don't think that John didn't call someone. $^\checkmark$not>not>PPI
     b. I doubt that John didn't call someone. $^\checkmark$doubt>not>PPI
     c. I'm surprised that John didn't call someone. $^\checkmark$surprise>not>PPI
     d. Only John didn't call someone. $^\checkmark$only>not>PPI

2.1. Previous accounts of PPIs

Szabolcsi (2004) observes that in some instances PPIs and NPIs appear to have complementary distributions, suggesting that they are sensitive to the same properties. At the same time, PPIs, but not NPIs, are sensitive to locality restrictions and require the presence of a second negation. She analyses PPIs as being endowed with two NPI features which are dormant unless activated by a DE operator. In the presence of a DE operator, that is, an NPI licensor, both features become active, but only one of them is licensed. Since only one of the NPI features gets licensed, then for the same reason that NPIs cannot survive in positive contexts, [Neg ... PPI] will not either, hence the need for further embedding in a DE environment; this is what Szabolcsi refers to as 'double licensing.' For more details on how this analysis is implemented, I refer the reader to Szabolcsi 2004. While this analysis is relatively successful at accounting for the data presented above, and can, by virtue of its setup, account for the majority of the distributional restrictions exhibited by NPIs, it is fundamentally flawed in that it lacks the ingredients necessary to explain why epistemic indefinites such as *some linguistics professor* give rise to modal inferences of the sort presented below:

(9) Jo married some linguistics professor.
     There is a professor that Jo married and the speaker doesn't care who this professor is.

An analysis that relies solely on the interaction between the indefinite and the presence of NPI-like features will fall short when it comes to deriving this ignorance/indifference inference. Note that *some NP* and *someone* differ with respect to whether this inference is present, with the latter lacking it, hence the difference in classification: *some NP* elements have been labeled epistemic indefinites while *someone* elements PPIs. The focus of this paper will be on *someone* PPIs.

Another analysis for PPIs that is designed to simultaneously account for the distribution of PPIs and NPIs is developed in detail in Homer 2011b. The driving force behind this proposal is that these indefinites are sensitive to the monotonicity of their environments. Homer proposes that (i) licensing is computed on syntactic environments, and (ii) the monotonicity of the constituents with respect to the position of the PSI is what matters rather than some structural relationship. He proposes the following licensing conditions for NPIs and PPIs, and more generally for PSIs:

(10)   Homer's (2011b) licensing conditions on PSIs:

      a.   *Licensing Condition of NPIs*:
          An NPI α is licensed in sentence S only if there is an eligible constituent A of S containing α such that A is DE with respect to the position of α.

      b.   *Licensing Condition of PPIs*:
          A PPI is licensed in sentence S only if it is contained in at least one eligible constituent A of S which is not DE with respect to its position.

      c.   *Licensing Condition of Polarity Items*:
          A PSI π is licensed in sentence S only if it is contained in at least one eligible constituent A of S which has the monotonicity properties required by π with respect to the position of π and all other PSIs in A are licensed within A.

This account too is compelling enough in its descriptive power; however, similarly to the account in Szabolcsi 2004, it relies on licensing generalizations that are merely descriptive and lack in explanatory value. Furthermore, it makes no reference to the existence of other PSIs and thus leaves no room in its design to expand it so as to account for the distribution of these items.

In the following section, I introduce a new framework that has paved the way for a family of analyses that aim to account for the distribution of polarity items. Unlike the accounts just mentioned, these were designed specifically to handle NPIs and free choice items (FCIs), including epistemic indefinites, yet leaving out PPIs. The goal of this paper is to show that this framework is superior to previous ones in that it can allow for a straightforward integration of PPIs. I will begin by offering an overview of this system, and then move on to §4, where I propose an analysis of PPIs within this framework.

3. An exhaustification-based approach to the polarity system

For the remainder of this paper, I adopt an analysis of polarity-sensitive items that takes their restricted distribution to be a product of the interaction between the lexical semantics of these items and the contexts in which they occur, following in large part the work in Chierchia (2006), Fălăuş (2010) and Gajewski (2011). Before delving into the realm of polarity-sensitive items, however, let's first consider the case of scalar implicatures, a phenomenon closely related to the matter at hand.

3.1. Scalar implicatures and silent exhaustification

The main insight that I will adopt for this analysis is that scalar implicatures (henceforth SIs), should be viewed as a form of exhaustification of the assertion, an approach rigorously defended in Chierchia, Fox, and Spector (to appear). The authors argue that SIs come about as a result of active alternatives and the way the grammar chooses to use up these alternatives, via

covert alternative-sensitive operators that must apply at some point in the derivation in order to 'exhaust' the active alternatives. Two such operators are assumed to be at work when calculating implicatures: **O** (covert counterpart of *only*) and **E** (covert counterpart of *even*).[1]

(11) a. **O**(p) = p $\wedge$ $\forall$q$\in$$\mathscr{A}$lt(p) [p$\nsubseteq$q $\rightarrow$ $\neg$q]
         (the assertion p is true and any alternative q not entailed by p is false)
      b. **E**(p) = p $\wedge$ $\forall$q$\in$$\mathscr{A}$lt(p) [p$\triangleleft_c$q]
         (p is less likely than q iff p entails q and q does not entail p)

Consider the examples below, where the relevant alternatives are brought about by association with focus (Rooth 1992):

(12) John talked to [a few]$_F$ of the students.

      a. Alternatives: {John talked to a few of the students, John talked to many of the students, John talked to most of the students, John talked to all of the students}
      b. **O**(John talked to [a few]$_F$ of the students) = John talked to a few of the students and he didn't talk to many/most/all of the students.

(13) A: Was the party well-attended?   B: Yes, people were dancing [in the hallway]$_F$!

      a. Alternatives: {People were dancing in the hallway, People were dancing in the dining room, People were dancing in the living room}
      b. **E**(People were dancing [in the hallway]$_F$) = (People were dancing in the hallway and that people were dancing in the hallway is less likely than that people were dancing in the dining/living room)

In (12), exhaustification proceeds via **O** and in doing so all non-entailed alternatives are eliminated. That is, it negates all statements which, upon replacing the focused element with its alternatives, entail the assertion. Exhaustifying with **E** is more emphatic than exhaustification with **O**, and we can see this in (13) where exhaustifying via **E** strengthens the speaker's assertion by adding the implicature that people dancing in the hallway is less likely than people dancing in any other place.

Focus is not a prerequisite for active alternatives, however. Scalar items, which are lexically endowed with alternatives, are also prone to this type of semantic enrichment. Relevant examples include the elements of a Horn-scale: *<one, two, . . . >*, *<or, and>*, *<some, many, all>*, *<few, no>*, *<sometimes, often, always>*. If the context is such that the alternatives are relevant, then they will be activate and thus will have to be factored into the meaning via an exhaustification operator. Take for example (14) where we see that the scalar elements *one* and *or* have the potential to give rise to enriched meanings. These scalar implicatures ($\rightsquigarrow$ will henceforth be used to indicate an implicature) come about by exhaustification of their respective alternatives, *two, three, . . .* and *and*, which we assume are relevant in the context of these utterances.

(14) a. I talked to two boys yesterday.
          $\rightsquigarrow$ I didn't talk to three or more boys.
      b. I talked to Mary or John yesterday.
          $\rightsquigarrow$ I didn't talk to both of them.

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[1]The only difference between *only* and **O** is that **O** asserts rather than presupposes that its prejacent is true. For the purposes of this exposition I will ignore this difference.

Beyond scalar alternatives, scalar items are also optionally endowed with sub-domain alternatives. Fox (2007) convincingly argues for their presence based on the free choice effects observed with disjunction in the scope of possibility modals. That is, aside from the scalar alternative of the disjunction, the conjunction, we also have to take into account its sub-domain alternatives, that is, the individual disjuncts. Deriving the implicature in (15) would not be possible without also having access to the sub-domain alternatives. I refer the reader to Fox 2007 for the details of how these alternatives are exhaustified so as to derive this implicature.

(15)   You can eat ice cream or cake. $\rightsquigarrow$ You can eat ice cream and you can eat cake.

    a. $\diamond$[eat ice cream $\vee$ eat cake] $\rightsquigarrow$ $\diamond$eat ice cream $\wedge$ $\diamond$eat cake

    b.   Scalar-alt: $\diamond$[eat ice cream $\wedge$ eat cake]

    c.   Sub-Domain-alt: $\diamond$eat ice cream, $\diamond$eat cake

What we saw in this section is that we can derive SIs in a purely compositional way by looking at the interaction between alternatives and the method by which they get factored into meaning. We saw above two sources of alternative activation: focus, on the one hand, and the lexical semantics of the scalar item, on the other. In the above cases, the alternatives, whatever their source, are only optionally available, which is supported by the fact that these SIs are cancelable. This optionality is precisely the dimension along which NPIs, and PSIs more generally, differ from their regular indefinite counterparts – NPIs must obligatorily activate alternatives. This analysis of NPIs, pursued by Krifka (1995) and further advanced by Chierchia (2006) and Chierchia (2011), takes their distribution to be a product of the alternatives they activate and the way the grammar takes these alternatives into account.

3.2. NPIs from an exhaustification-based perspective

Krifka (1995) and Chierchia (2011), among others, assume that NPIs are minimally different from regular indefinites in that they obligatorily activate alternatives, which, like all instances of active alternatives, need to be factored into the meaning of the utterance. NPIs are commonly split into two main classes, the *any* type and minimizers like *sleep a wink*. The differences among them can be classified based on the type of alternatives they activate and the method in which these alternatives get factored into meaning. The remainder of this section deals with each type of NPI in turn.

Consider the following dialogue, and in particular B's response which contains the NPI *any*.

(16)   A: Did Mary read books during her summer vacation?
       B: No, Mary didn't read any books.

In using an NPI in her response, B conveys the meaning that Mary didn't read any of the books in the domain of discourse. In a sense, this response brings into discussion the existence of all types of books (books about cats, logic, cooking, etc.) and asserts that none of them are such that Mary read them. These 'types' of books are precisely the sub-domain alternatives claimed to always be active when an NPI like *any* is used.[2] I take NPIs to be existential indefinites that obligatorily activate smaller domain alternatives. Schematically, the alternatives can be represented as in (17), with D containing three books, and its six sub-domains containing one or two books each.[3]

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[2]NPIs also have a scalar alternative, the conjunction of the disjuncts. However, in the scope of negation this alternative will always be weaker, and thus its role in the derivation negligible.

[3]I use *a, b, c* as shorthand for the sub-domain alternatives, that is, the books in D.

(17) a.   any book = $\exists x \in D$. x is a book.
      b.   ALTs: $\{\exists x \in D'.\ D' \subset D$ and x is a book$\}$
                 $\{a, b, c\}$
      c. $\{a, b\}$ $\{b, c\}$ $\{a, c\}$
             $\{a\}$ $\{b\}$ $\{c\}$

Recall the discussion on SIs where it was argued that activating alternatives means having to incorporate them into the meaning. NPIs like *any* do so via the covert operator **O**. Syntactically, one can think of NPIs as involving a form of agreement with this operator: NPIs bear the feature [+D] which must be checked by an operator carrying the same feature, an exhaustifying operator is. Doing so allows us to encode the need to exhaustify alternatives in the syntax. Semantically, NPIs must occur in a DE environment in order to satisfy the requirements of the exhaustification operator. This operator targets the alternatives and eliminates them just as long as they are stronger than (entail) the assertion; otherwise exhaustification by **O** is vacuous and simply returns the original assertion. Observe that in the scope of sentential negation the alternatives are all entailed by the assertion, since not reading any book whatsoever entails not reading a specific kind of book. Thus (18) turns out to be interpreted as a plain negative existential statement.

(18)   Mary didn't read any book.

       a.   Assertion: $\neg \exists x \in D[book(x) \wedge read(Mary,x)]$
       b.   Alternatives: $\{\neg \exists x \in D'[book(x) \wedge read(Mary,x)]: D' \subset D\}$
       c.   **O**(Mary didn't read any book) = Mary didn't read any book

In fact, all environments that license inferences from sets to subsets will allow NPIs to appear in their scope since the alternatives (the subsets) are entailed by the assertion (superset), hence the general description of NPI licensors as DE operators.

In UE contexts, the alternatives are stronger than the assertion; entailments hold from subsets to supersets since reading a book about cats entails reading any book whatsoever. Since the alternatives entail the assertion, exhaustification by **O** requires them to be negated. Negating these stronger alternatives amounts to saying that for any possible book, Mary didn't read it, which is in clear contradiction with the assertion which says that Mary read a book. So while the syntactic requirement of NPIs is met, that is, the [+D] feature is checked by **O**, the semantic requirement is not, rendering NPIs in UE contexts ungrammatical.

Another class of NPIs, discussed largely by Lahiri (1998), consists of those of the 'emphatic' variety, exemplified by Hindi *ek bhii* 'even one' and English minimizers *give a damn*, *sleep a wink*, etc. What distinguishes these NPIs from the *any*-type is the fact that they activate not sub-domain alternatives, but rather degree alternatives (e.g. degree of care, of sleep). They also differ in terms of what method of exhaustification they appeal to, namely **E**, which requires the assertion to be the least likely among its alternatives. As with **O**, exhaustification with **E** is contradictory in UE contexts. In these environments, the alternatives entail the assertion since for any $d' > d$, if something is true of d', then it must be true of d, given the monotonic structure of degree semantics. Since the alternatives entail the assertion, the requirements of **E** are not met. This is so because for something to be less likely than something else, it cannot be entailed by it. In DE environments, on the other hand, the entailment relations are reversed and the result of exhaustification is semantically coherent since all the alternatives are weaker, and hence more likely than the assertion. An example of a minimizer in a DE environment is provided in (19).

(19)   Mary didn't sleep a wink.

    a. Assertion: $\neg$sleep(Mary, d_{min})

    b. Alternatives: $\{\neg \text{sleep}(\text{Mary, d'})]: d'>d_{min}\}$

    c. **E**(Mary didn't sleep a wink) =
      $\neg \text{sleep}(\text{Mary}, d_{min}) \wedge \forall d'>d_{min} [\neg \text{sleep}(\text{Mary}, d_{min})] \lhd_c [\neg \text{sleep}(\text{Mary}, d')]$

One can see then how these distributional restrictions can be explained straightforwardly as soon as a compositional semantics of NPIs is adopted. Essentially, what such an alternative-based account says is that NPIs are low elements on a scale and, unlike regular indefinites, obligatorily activate alternatives. Their need to be in negative contexts falls out automatically once we look at the interaction between the types of alternatives being activated and the way they are factored into meaning. For the purposes of this overview I assumed that the different types of PSIs are specified for which exhaustifier is invoked, that is, they carry either a [+D_E] or a [+D_O] feature, which dictates which exhaustifying operator they can enter into a checking relation with.[4] While this choice can be thought of as a form of agreement, the hope is to have a more principled analysis in the end.[5]

Yet another dimension along which NPIs vary is determined by the strength of the operator. Take the NPIs *ever* and *in weeks* and observe that *in weeks* is acceptable in a subset of the environments that can support *ever*.

(20)   a. Nobody has *ever* been to New York.

      b. Nobody has been to New York *in weeks*.

(21)   a. Few people have *ever* been to New York.

      b. *Few people have been to New York *in weeks*.

Gajewski (2011), following Chierchia 2004, accounts for this variation in terms of whether or not the non-truth conditional meaning (presupposition or implicature) of the negative element is taken into account in the exhaustification of the NPI. The basic idea is simple and I encourage the interested reader to refer to these works for the details of the implementation. What distinguishes *in weeks* from *ever* is that exhaustifying the former requires us to take into account the non-truth conditional aspects of meaning as well, that is, to include any implicatures and presuppositions that the assertion gives rise to. Once we consider the enriched meaning of the assertion, *in weeks* will no longer be in a downward entailing context in (21b) since *few* gives rise to the implicature *but some*, and the exhaustification of the NPI will no longer be able to proceed consistently since the alternatives are stronger and yet not excludable without arriving at a contradiction.

(22)   Few people have been to New York *in weeks*. $\rightsquigarrow$ Few people have been to New York *in weeks* but some people have been to New York *in weeks*.

On the other hand, the enriched meaning of (20) is equivalent to the assertion since *nobody*, unlike *few*, occupies the strong endpoint of its scale and therefore does not introduce an implicature. To reiterate, the difference between *ever* and *in weeks* is that the latter, but not former, is exhaustified with respect to the enriched meaning of the assertion. In the case of sentential nega-

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[4]I would like to thank to Hedde Zeijlstra (p.c.) for this suggestion.

[5]Chierchia (2011) proposes an 'optimal fit' principle that would take **O** as the default exhaustifier unless the alternatives being acted upon are linearly ordered with respect to entailment, as is the case with minimizers. As we will see later, however, we still need to maintain that some indefinites, and in particular PPIs, can only appeal to exhaustification via **E**, regardless of the shape of their alternatives.

tion, negative quantifiers and *without*, the enriched meaning will be equivalent to the assertion since no implicatures are available, thus both types of NPIs will be acceptable in their scope. In the scope of *few* and other implicature/presupposition-carrying elements, however, only weak NPIs like *ever* can survive since their exhaustification proceeds only with respect to the truth conditional meaning; strong NPIs like *in weeks* are sensitive to the presence of implicatures and presuppositions and cannot survive in such environments.

3.3. Epistemic indefinites from an exhaustification-based perspective

Much advancement has been made in our understanding of free choice items and epistemic indefinites. Since the focus of this paper is on PPIs and showing how they can be integrated within the larger domain of polarity sensitivity, I will not discuss the details of the analyses proposed for these items. I direct the interested readers to Kratzer and Shimoyama 2002, Alonso-Ovalle and Menéndez-Benito 2010, Fălăuş 2010, Liao 2011 and Chierchia 2011, among others, for complete analyses. Below I merely hint at the general line of attack taken in these accounts to convince the reader that an exhaustification-based approach is equipped with the necessary tools to derive and explain the distribution of these items. Most relevant for this paper is that neither Szabolcsi's, nor Homer's approach can be extended to derive their distribution.

Under the present framework, the distribution of epistemic indefinites can be seen as the result of the interaction between the types of alternatives activated by the lexical item, and the method in which these alternatives get used up by the grammar. What distinguishes epistemic indefinites from both NPIs and PPIs is the presence of a modal which, in combination with the active alternatives and the way they are exhaustified, gives rise to the ignorance effect. That is, exhaustification occurs with respect to the modalized alternatives, similarly to the approach taken in Fox (2007) to derive the free choice effects with disjunction. This modal can be overt as in (23a), but this is not a requirement since we encounter, cross-linguistically, many cases where we observe the same epistemic effect without the presence of an overt modal. Spanish *algún*, for example, can surface even in the absence of an overt modal, as shown in (23b).

(23)   a.   Mary is allowed to skip some problem on this homework.
           b.   María se casó con algún estudiante del departamento de lingüística.
               'María married some student from the department of linguistics.'

4. Integrating PPIs within the polarity system

In this section I turn to PPIs and argue for an exhaustification-based account of their meaning, similar in nature to that presented for NPIs above. I begin by offering an analysis of PPIs as dependent indefinites and follow by demonstrating how this analysis can straightforwardly explain the distributional restrictions I noted in §2, repeated in the table in (24). To facilitate the presentation, this section will be organized according to the six PPI distributional restrictions listed in (24). The behavior of NPIs in these environments is also included in order to make the connection among these two types of PSIs more transparent.

(24)   a.

Environment	PPI	NPI
$[_{CP} \ldots \text{PSI}]$	✓	*
$[_{CP} \text{neg} \ldots \text{PSI}]$	*	✓
$[_{CP} \text{neg} \ldots \text{Q} \ldots \text{PSI}]$	✓	*

b.

Environment	PPI	NPI
$\text{neg} [_{CP} \ldots \text{PSI}]$	✓	✓
$[_{CP} \text{few} \ldots \text{PSI}]$	✓	✓
$\text{neg} \ldots \text{neg} \ldots \text{PSI}$	✓	✓

4.1. PPIs within an exhaustification–based framework

The goal of this paper is to argue that PPIs are just another type of PSI and thus should be offered an account that can be couched in a uniform approach to polarity-sensitivity. I have claimed that the exhaustification-based framework provides us with the necessary tools. As reviewed above, the variation among different dependent indefinites can be reduced to two ingredients: the types of alternatives activated and the way they are factored into meaning.

The main claim I want to advance in this paper is that PPIs, like NPIs, have active alternatives that require exhaustification. Unlike NPIs, however, they must activate a different set of alternatives from NPIs, since appealing to sub-domains will not give us the attested distributional patterns. Given the existence of sub-domain alternatives, it is not inconceivable that some PSIs activate super-domain alternatives instead.[6] This is precisely the direction I will pursue here. Essentially, we want PPIs to behave like minimal scalar items in the scope of negation. As far as their alternatives are concerned, what this means is that they form a sequence of larger domains such that, when negated, each of them entails the assertion. One way to visualize this is as in the figure below in (25) where the smaller the domain, the fewer individuals it contains.

(25) a. DE: entailment holds from sets to subsets
$\forall D' \supset D\ (\neg\exists x \in D'[P(x)]) \rightarrow (\neg\exists x \in D[P(x)])$
all alternatives entail the assertion

  b. UE: entailment from subsets to supersets
$\forall D' \supset D\ (\exists x \in D[P(x)]) \rightarrow (\exists x \in D'[P(x)])$
all alternatives are entailed by the assertion
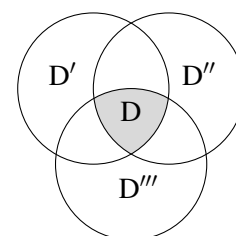
Turning to the second component of this analysis, I argue that PPIs appeal to the same method of alternative-exhaustification as minimizers do, that is, via the **E** operator. As discussed in the previous section, there are two different types of exhaustification operators: *any*-NPIs are exhaustified by **O** while minimizers are exhaustified by **E**. Assuming that the choice of operator is encoded in the feature carried by the PSI, I submit that PPIs carry the feature $[+D_E]$ which can only be checked by a c-commanding operator carrying the same feature, that is, **E**. With these ingredients in place, we can now move on to the account of the distributional restrictions presented in §2.

4.2. Positive environments

We saw before that PPIs are acceptable in any type of positive context, including plain episodic sentences. Whenever a PSI is present in a structure we need to check that both the syntactic requirement – checking the feature on the indefinite – and the semantic requirements – those imposed by the exhaustifying operator – are satisfied. Consider the example in (26).

(26) John saw someone$_{[+D_E]}$.

  a. Assertion: $\exists x \in D[saw(John,x)]$

  b. Alternatives: $\{\exists x \in D'[saw(John,x)]: D \subset D'\}$

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[6]It remains to be determined if this can be argued for elsewhere in the polarity system, but one place we could begin with is the observation that free-choice items that are otherwise restricted to non-negative modal environments can, if stressed, be embedded in the scope of negation (Fălăuş (p.c.)).

Since PPIs are endowed with the $[+\text{D}_\text{E}]$ feature, an operator carrying the corresponding feature must be inserted in order to check the PPI's feature, namely **E**. In order for (26) to be semantically coherent, we need to check that the requirements of the **E** operator are satisfied. Recall that exhaustification by **E** yields the assertion that all propositions containing an alternative of the PPI are more likely than the original proposition, with likelihood being defined in terms of entailment, repeated below in (27).

(27) $p \lhd_c q$ if $p \rightarrow q$ and $q \nrightarrow p$ (*p is less likely than q iff p entails q and q does not entail p*)

Given that the alternatives activated by PPI are super-domains and the entailments in (25b) say that in UE contexts, if something holds true of a domain, it will hold true of any super-domain (e.g. *I saw a or b* entails *I saw a or b or c*), it follows that the assertion will entail all the alternatives and thus be less likely than any of them, satisfying the requirement of the **E** operator. This can be formalized as in (28):

(28) $\mathbf{E}_{[\text{D}_\text{E}]}$ John saw someone$_{[+\text{D}_\text{E}]}$ =
        $\exists x {\in} D[\text{saw}(\text{John},x)] \wedge \forall D' {\supset} D\ [(\exists x {\in} D\ [\text{saw}(\text{John},x)]) \lhd_c (\exists x {\in} D'\ [\text{saw}(\text{John},x)])]$

4.3. Clausemate negation

Let's turn next to the problematic cases involving PPIs in the scope of a clausemate negation. Consider the deviant sentence in (29). As before, we need to verify that both the syntactic and semantic requirements are met. Syntactically, the **E** operator must adjoin in order to check the feature on the indefinite. While this satisfies the syntactic requirement, it gives rise to an inconsistency in the semantics. Consider below what happens when we try to exhaustify.

(29)   *John didn't see someone$_{[+\text{D}_\text{E}]}$.
        a.   Assertion: $\neg \exists x {\in} D[\text{saw}(\text{John},x)]$
        b.   Alternatives: $\{\neg \exists x {\in} D'[\text{saw}(\text{John},x)]: D {\subset} D'\}$
        c. $\mathbf{E}_{[\text{D}_\text{E}]}$ John didn't see someone$_{[+\text{D}_\text{E}]}$ =
              $\neg \exists x {\in} D[\text{saw}(\text{J},x)] \wedge \forall D' {\supset} D\ [(\neg \exists x {\in} D\ [\text{saw}(\text{J},x)]) \lhd_c (\neg \exists x {\in} D'\ [\text{saw}(\text{J},x)])]$

Unlike in the positive case, the alternatives acted upon by the **E** operator are now negated, as shown in (29b). Their exhaustification will result in a contradiction in virtue of the fact that the assertion in (29a) is entailed by the alternatives (e.g. *I didn't see a or b or c* entails *I didn't see a or b*). To reiterate, this is so because it runs contrary to the requirement of **E**, which calls for the alternatives to be entailed by the assertion, that is, be more likely than the assertion.

Exhaustification operators are assumed to be propositional and therefore adjoin at the IP level, above the locus of negation. While this is a necessary assumption in order to derive the deviance of structures akin to that in (29), it has predictive power beyond this particular construction. Consider, for example, the case of metalinguistic negation, illustrated below in (30).

(30)   John DIDN'T see someone.

In these instances, the PPI can be interpreted with narrow scope as long as the negation is focused. Under the present analysis the negation would have to undergo movement to a focus position residing higher in the clause than the IP, an account widely attributed to these constructions outside of this domain. Having the negation move higher in the clause allows for the exhaustification of the PPI to occur below negation, where it proceeds coherently.

4.4. Intervention effects

Observe the contrast in (31), where we see that a universal quantifier intervening between the PPI and the negation at LF can rescue the otherwise deviant configuration [neg...PPI].

(31)   a.   *John didn't give Mary something.   *not>PPI
          b.   ✓John didn't give everyone something.   ✓not>∀>PPI

The only cases of intervention that have been dealt with in the framework of alternative-based semantics for PSIs are those involving an implicature-inducing element intervening between the DE operator and an NPI. Relevant examples are provided below in (32).[7]

(32)   a.   ✓Anna didn't tell Mary to eat anything.   ✓not>NPI
          b.   *Anna didn't tell everyone to eat anything.   *not>∀>NPI

The proposal, as advanced by Chierchia (2006) and Gajewski (2011), says that in the sentences above, universal quantifiers such as *everyone* disrupt the DE-ness required by the NPI to survive. Being themselves scalar items with the potential of having active alternatives, these quantifiers find themselves in a structural position, the scope of an exhaustifying operator, where they must obligatorily activate their scalar alternatives.[8] Once these alternatives are taken into account, the previously DE environment created by the negation is no longer DE due to the implicature brought about by the intervening quantifier, as shown below with *always*.

(33)   John didn't always read any novels.
        ⤳ John sometimes read any novels.

In effect, what happens in this case is that the alternatives of the NPI end up being exhaustified in an UE environment, which results in semantic deviance.

Returning to the cases involving PPIs and intervention, I will now show how this analysis carries over. Unlike with NPIs, an intervening universal rescues the otherwise illicit configuration, allowing the PPI to scope under a local negation. As before, the idea is that the universal quantifier, being in a DE context, gives rise to an implicature that reverses the entailment inferences, from DE to UE, shown below in (34).

(34)   John didn't always call someone.
        ⤳ John sometimes called someone.

We see that once the SIs of the quantifier are taken into account, the PPI finds itself in a UE context, a context that allows for the consistent exhaustification of the PPI's alternatives.

The fact that PPIs and NPIs are both sensitive to the presence of an intervener falls out immediately since, in this framework, PSIs belong to the same class of elements as scalar items and are thus expected to crucially interact when local to each other. This framework is furthermore superior in that it predicts that only end-of-scale elements (*always* but not *sometimes*) should disrupt/rescue the licensing of the PSI since only such items give rise to SIs that can reverse the monotonicity of the environment. For more details, see Chierchia (2006) and Gajewski (2011).

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[7]Intervention by presuppositional elements such as *too* is also attested. Possible approaches to the integration of presuppositional elements within the domain of interveners are discussed in Homer 2011b and Chierchia 2011.

[8]I assume this obligatory activation of alternatives is due to a syntactic checking condition which states that whenever an alternative-bearing element (e.g. scalar items) finds itself in the scope of an exhaustifying operator, its alternatives need to be taken into account in the calculation of implicatures.

4.5. Extra-clausal negation

A crucial characteristic that distinguishes PPIs and NPIs is the fact that PPIs, and not NPIs, exhibit what appears to be a locality restriction. The relevant data is repeated in (35), where we see that the locality of negation with respect to the PPI is crucial to the availability of a narrow scope reading.

(35)   a.   John didn't hear someone.   *not>PPI

          b.   I don't think that John heard someone. $^\checkmark$ not>$[_{CP}$ PPI

This locality restriction can be shown to fall out immediately under the present approach, which takes the distribution of PPIs to be the result of their semantic and syntactic requirements. The reason why the PPI can be interpreted as a narrow scope indefinite in (35b) but not (35a) rests on the fact that the exhaustification operator can adjoin below the negation in (35b) but not in (35a), allowing the PPI to be interpreted as a regular indefinite in the former but not the latter. Given that **E** is an IP-level operator, in the case of an extra-clausal negation there exists an intermediate position above the PPI and below the negation where **E** can adjoin, a position not available with clausemate negation. In other words, we have the following LF scope relations for these cases:

(36)   a.   scope relations at LF for (35a):   **E** > not > PPI $\longrightarrow$ semantic deviance

          b.   scope relations at LF for (35b):   not > **E** > PPI $\longrightarrow$ narrow scope reading

Let's consider in more detail what happens in (35b). The PPI *someone* carries the $[+D_E]$ feature, which needs to be checked by an operator carrying the same feature, namely **E**. Syntactically, this operator could enter the derivation at any IP-level position above the PPI. Semantically, however, it needs to be lower than negation, otherwise the requirements of the **E** operator would not be satisfied since the alternatives of the PPI, if negated, would all be stronger and thus less likely than the assertion. In the case of (35b), **E** can adjoin at the IP-level of the embedded clause, above the PPI and yet under the negation. Once exhaustified, the PPI's assertive component will be equivalent to that of an indefinite, and (35b) will end up being interpreted as having an indefinite in the scope of negation. In (35a), on the other hand, the first IP-level where **E** can adjoin ends up being above the negation, and as discussed in detail in the previous section, this '**E** > not > PPI' configuration leads to a semantic crash. The reason why the NPIs I have considered so far do not exhibit similar locality restrictions is because in their case, the semantic requirement is satisfied as long as the exhaustification operator can adjoin higher than the negation, a condition which will never be incompatible with the syntactic requirement.

4.6. Other DE environments

Given the analysis I presented up to this point, one would be in a position to draw the following descriptive generalization regarding the distribution of PPIs: any clausemate entailment-reversal operator, that is, a DE operator, precludes PPIs from taking narrow scope. However, looking at the data below, one can see that this generalization falls apart since another environment where NPIs like *anyone* and PPIs overlap in their distribution is in the presence of DE operators such as *few* and *at most five*.

(37)   a.   Few/at most five students talked to anyone yesterday. $^\checkmark$ few>NPI

          b.   Few/at most five students talked to someone yesterday. $^\checkmark$ few>PPI

In §4.3, I showed that in the presence of clause mate negation, a DE operator, PPIs cannot have a narrow scope reading. Since *few* is a DE operator and reverses the entailment relations, we would expect PPIs to exhibit similar behavior in the scope of this operator as well, contrary to the data in (37). Recall, however, the contrast between *ever* and *in weeks*, repeated in (38).

(38) a. Few people have *ever* been to New York.
      b. *Few people have been to New York *in weeks*.

In the discussion of NPIs, we saw that there is variation among these indefinites with respect to their ability to survive in the scope of DE operators that do not occupy the endpoint of their scale, a category which the determiners *few* and *at most five* belong to. I want to argue that the same variation is present in the domain of PPIs, with the *someone*-type PPIs behaving on par with the *in weeks*-type NPIs in that both are sensitive to the presence of non-truth conditional aspects of meaning, such as implicatures. To reiterate, the idea is that when we exhaustify *someone*, we need to do so with respect to the enriched meaning, which in the case of *few* is *few but some*, which no longer creates a DE environment. So, to the extent that we can attribute the unacceptability of (38b) to the fact that the non-truth conditional aspects of meanings interfere with and impede the licensing of strong NPIs, we can also maintain that the acceptability of (37b) is the result of exhaustification with respect to the enriched meaning.[9]

We find support for adopting this approach from Dutch where we see that PPIs exhibit the same type of variation we saw with English NPIs. The PPI *allerminst* 'not in the least' is unacceptable even in the scope of non-end of scale DE determiners such as *few*, suggesting that it is not sensitive to non-truth-conditional aspect of meaning. Contrast this with the PPI *een beetje* 'a bit' which is similar in distribution to the English *someone*. The data below is taken from van der Wouden (1997).

(39) a. *De monnik is niet allerminst gelukkig.
          The monk isn't happy in the least.
      b. *Niemand is allerminst gelukkig.
          Nobody is happy in the least.
      c. *Weinig monniken zijn allerminst gelukkig.
          Few monks are happy in the least.

(40) a. *De monnik is niet een beetje gelukkig.
          The monk isn't a bit happy.
      b. *Niemand is een beetje gelukkig.
          Nobody is a bit happy.
      c. Weinig monniken zijn een beetje gelukkig.
          Few monks are a bit happy.

---

[9]There is another way to consider when accounting for these facts. If we look back at the account I provided for extra-clausal negation, we can see why this generalization breaks down. The reason has to do with the fact that DE operators such as *few* on one hand, and *not* on the other, occupy different positions in the clause. More specifically, while sentential negation occurs somewhere between the IP and VP level, that is, lower than the target of adjunction of **E**, operators such as *few* and *at most five* are generated in the subject position, meaning that the nominal constituent which contains them must undergo EPP-driven movement to a position higher in the clause, above the adjunction target of **E**. We see, then, that the difference between these two classes of operators could be governed not by a semantic divide (DE versus anti-additive operators), but rather based on their syntactic position. *Few* and the like are interpreted high enough in the clause that the exhaustifying operator could adjoin and check for semantic consistency below them, in an UE context where no deviance arises. Negative quantifiers, however, pose a problem for this account since they too are in subject position and yet disallow PPIs from taking narrow scope.

What this data shows us is that PPIs, similarly to NPIs, can be sensitive to non-truth conditional aspects of meaning, offering further support for an integration of PPIs within the larger domain of polarity items. Before concluding, it is worth pointing out that presuppositional elements belong to the same class of licensers as *few* in that they too may or may not allow PPIs to survive in their scope depending on whether or not the PPI is sensitive to the non-truth-conditional components.[10] One such example is provided by *only*, given in (41).

(41)   Only John ate something.   ✓only>PPI

Note that *only* is similar to *few* in that it licenses weak NPIs (e.g. *any/ever*) but not strong NPIs (e.g. *in weeks*). What distinguishes *only* from *few*, however, is that *only* carries a presupposition, its prejacent, rather than an implicature. In our discussion above we concluded that English PPIs like *something* are sensitive to the non-truth-conditional aspects of meaning, so an element like *only* is correctly expected to allow PPIs of this kind to survive in its scope given that it generates a presupposition that disrupts the entailment relations. The current analysis predicts that the Dutch PPI *allerminst* 'not in the least', which was shown to be insensitive to implicatures based on the ungrammaticality of (39c), should also be insensitive to presuppositions and thus disallowed from the scope of *only*. This prediction is indeed borne out as shown in the examples below where a clear contrast is observed between it and *een beetje* 'a bit', a PPI sensitive to the non-truth-conditional aspects of meaning, be they implicatures, shown in (40c), or presuppositions, shown in (42).

(42)   a.   *Alleen Jan is allerminst gelukkig.
               Only John is in the least happy.
         b.   Alleen Jan is een beetje gelukkig.
               Only John is a bit happy.   (Mark de Vries p.c.)

4.7. Rescuing by negation

In this section I discuss the rescuing-by-negation facts. The observation is that if we further embed a sentence such as (43) in a DE context as in (44), the result becomes consistent. Specifically, we can conclude that being embedded under two DE operators is equivalent to being in a positive environment for the purposes of exhaustification. Given that the alternatives are super-domains, the requirements of **E** are satisfied as every alternative is weaker and thus more likely than the assertion. The derivation is provided below in (44).

(43)   *John didn't see someone$_{[+D_E]}$.   *not>PPI

(44)   Few people thought that John didn't see someone$_{[+D_E]}$.   ✓few>not>PPI
         a.   Assertion: $\neg(\neg\exists x\in D[saw(John,x)])$
         b.   Alternatives: $\{\neg(\neg\exists x\in D'[saw(John,x)]): D\subset D'\}$
         c. $\mathbf{E_D}$ [Few people thought that John didn't see someone$_{[+D_E]}$] =
               $\neg(\neg\exists x\in D[saw(John,x)]) \wedge \forall D'\supset D\ [(\neg(\neg\exists x\in D\ [saw(John,x)])) \lhd_c$
               $(\neg(\neg\exists x\in D'\ [saw(John,x)]))] =$
               $\exists x\in D[saw(John,x)] \wedge \forall D'\supset D\ [(\exists x\in D[saw(John,x)]) \lhd_c (\exists x\in D'\ [saw(John,x)])]$

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[10]I would like to thank an anonymous reviewer for suggesting I include presuppositional items in this discussion.

It's worth noting that the second layer of negation does not have to be a sentential negation as long as it can support entailment-reversal inferences. So while *few* and *only* are ruled out as 'anti-licensers' for some PPIs (*someone* and *een beetje*), as discussed in the previous subsection, they should qualify as good rescuers for any type of PPI since they have the capacity of reversing the entailment inferences. Regardless of whether the PPI looks only at the assertive component or at all components of meaning, a second DE operator should have the same effect nonetheless in that the environment will no longer support DE inferences, consistent with the requirements of exhaustification of the PPI's alternatives via **E**. This prediction is borne out in the case of the Dutch *een beetje* which behaves similarly to the English *someone* in that it can be rescued by any DE operator, as shown in (45b-c); contrast this with the unacceptable (45a).

(45) a. *Niemand is een beetje gelukkig.
          Nobody is a bit happy.
      b. Weinig mensen denken dat niemand een beetje gelukkig is.
          Few people think that nobody is a bit happy.   (Mark de Vries p.c.)

Contrary to the prediction made by this analysis, however, *allerminst* is not rescuable, since the addition of a DE operator to (46a) does not improve the acceptability of the PPI, as in (46b).[11]

(46) a. *Niemand is allerminst gelukkig.
          Nobody is happy in the least.
      b. *Weinig mensen denken dat niemand allerminst gelukkig is.
          Few people think that nobody is happy in the least.

The lack of rescuing effects can only be accounted for under the present analysis if we stipulate that this PPI, and others like it, need to enter into a local checking relation with the exhaustifying operator checking its feature. While for PPIs like *someone* and *een betje* the exhaustifier **E** can adjoin as high as the matrix clause, above the second DE operator as in (44c), whereby satisfying both the syntactic and semantic requirements, the feature on *allerminst* imposes an additional syntactic requirement that it must be checked locally. That is, the highest level **E** can adjoin is above the embedded DE operator, as in (47b). The problem with this configuration, however, is that while it satisfies the syntactic requirement, it does not satisfy the semantic one. This additional syntactic stipulation accounts for the data point in (46b) by guaranteeing that there will never be a configuration involving *allerminst* and a clausemate DE operator where both the syntactic and semantic requirements are satisfied.

(47) a. $\mathbf{E_D}$ [Weinig mensen denken dat [niemand allerminst$_{[+DE]}$ gelukkig is] ✓sem *syn
      b. [Weinig mensen denken dat $\mathbf{E_D}$ [niemand allerminst$_{[+DE]}$ gelukkig is] *sem ✓syn

Lastly, it appears that DE operators are not the only ones capable of salvaging an otherwise illicit configuration. Homer (2011a) presents the data in (48) as evidence against an analysis à la Szabolcsi's 'double licensing', which takes PPIs to be rescued by two stacked NPI-licensers.

(48) a. I hope he didn't steal something.   ✓hope>not>PPI
      b. Make sure that he didn't steal something!   ✓make sure>not>PPI
      c. I'm glad you didn't buy me something.   ✓glad>not>PPI

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[11] This is independently observed by Iatridou and Zeijlstra (2011) where it's shown that this also holds true of other PPIs that otherwise have the same distribution as *allerminst*. The authors do not offer an analysis for these facts.

Prima facie it appears to be the case that *hope*, *make sure* and *glad* are not DE and thus cannot license NPIs, an observation which would also render the analysis presented here inappropriate. Crnič (2011), however, provides examples where overt instances of *even* associating with the lowest element of a scale (e.g. *one*) are attested in the scope of non-negative desire statements and imperatives, as shown in (49a-b). As for *glad*, Crnič shows that this operator can license stressed *any*, as in (49c).

(49)   a.   I hope to someday make even one video of that quality.
       b.   Show me even one party that cares for the people!
       c.   I am glad that ANYONE likes me.

Note that in order for *even* to associate with low elements on a scale, it cannot occur in upward-entailing contexts, which we also know to be the case for *any*. Crnič takes stressed *any*[12] and overt instances of *even* associating with a low scalar element to behave on par with minimizers, that is, to activate alternatives that require exhaustification via **E**. The details of his analysis are beyond the scope of this paper, but the crux of his argument rests on providing a semantics for desire predicates and imperatives such that the interaction between them and the activated alternatives will yield consistent inferences, wherein the prejacent will be less likely than its alternatives. In a nutshell, we can conclude from his analysis that given the appropriate semantics for desire predicates and imperatives, elements requiring exhaustification by **E** can be shown to survive in their scope. What this means for the present analysis is that inserting **E** above these operators will allow for consistent exhaustification of the PPI in structures such as in (48) since, in effect, this analysis predicts that the 'not > PPI' configuration behaves like an NPI in need of exhaustification by **E**. Given that in the current analysis the acceptability of PPIs rests on their ability to be consistently exhaustified via **E**, the data in (48) are not only consistent with this exhaustification-based account, but in fact offer independent support for the choice of exhaustifier (**E** over **O**).

5. Conclusion

In this paper, I have argued that PPIs can and should be integrated into the more general polarity system. I claimed that this can be accomplished by adopting a framework that analyzes the dependency of these items as an interaction between their lexical semantics, activation of super-domain alternatives, and the method in which they compose with the other elements of the structure, by exhaustification via a covert operator **E**. Adopting this analysis allows us to account for the distributional differences noted in §2, namely a PPI's behavior with respect to negation, the syntactic position of an entailment-reversing operator, intervention, and rescuing facts. This proposal enables us to see what PPIs have in common with, and how they differ from other polarity sensitive items by maintaining a uniform analysis for all such items. Future research needs to probe further into the distribution of positive polarity items cross-linguistically to determine what other variation is observed across these items and whether this analysis is able to account for it.

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[12]Stressed *any* had already been analyzed as being exhaustified via **E**, unlike its unfocused counterpart which calls for exhaustification via **O**, by Krifka (1995).

References

Alonso-Ovalle, Luis, and Paula Menéndez-Benito. 2010. Modal indefinites. *Natural Language Semantics* 18.1–31.

Chierchia, Gennaro. 2004. Scalar implicatures, polarity phenomena, and the syntax/pragmatics interface. *Structures and beyond*, ed. by Adriana Belletti, vol. 3, 39–103. Oxford: Oxford University Press.

Chierchia, Gennaro. 2006. Broaden your views. implicatures of domain widening and the 'logicality' of language. *Linguistic Inquiry* 37.535–590.

Chierchia, Gennaro. 2011. Meaning as inference: The polarity system. Ms., Harvard.

Chierchia, Gennaro, Danny Fox, and Benjamin Spector. to appear. The grammatical view of scalar implicatures and the relationship between semantics and pragmatics. Ms., Harvard and MIT.

Crnič, Luka. 2011. How to get *even* with desires. *Proceedings of SALT 21*.

Fălăuş, Anamaria. 2010. Alternatives as sources of semantic dependency. *Proceedings of SALT 20*, 406–427.

Fox, Danny. 2007. Free Choice Disjunction and the Theory of Scalar Implicatures. *Presupposition and implicature in compositional semantics*, ed. by Uli Sauerland and Penka Stateva, 71–120. New York: Palgrave Macmillan.

Gajewski, Jon. 2011. Licensing Strong NPIs. *Natural Language Semantics* 19.109–148.

Homer, Vincent. 2011a. On the dependent character of PI licensing. Handout, *SALT 2011*.

Homer, Vincent. 2011b. *Polarity and modality*. UCLA dissertation.

Iatridou, Sabine, and Hedde H. Zeijlstra. 2011. Negation, polarity and deontic modals. Ms., MIT/University of Amsterdam. Online: `lingBuzz$/$001431`.

Kratzer, Angelika, and Junko Shimoyama. 2002. Indeterminate pronouns: The view from Japanese. *Proceedings of the Third Tokyo Conference on Psycholinguistics*, ed. by Yukio Otso, 1–25.

Krifka, Manfred. 1995. The semantics and pragmatics of polarity items. *Linguistic Analysis* 25.209–257.

Lahiri, Utpal. 1998. Focus and negative polarity in Hindi. *Natural Language Semantics* 6.57–123.

Liao, Hsiu-Chen. 2011. *Alternatives and exhaustification: Non-interrogative uses of Chinese* Wh-*words*. Harvard University dissertation.

Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1.75–116.

Szabolcsi, Anna. 2004. Positive polarity – negative polarity. *Natural Language and Linguistic Theory* 22.409–452.

van der Wouden, Ton. 1997. *Negative contexts: Collocation, polarity and multiple negation*. London: Routledge.