Dislocation triggers uninterpretability

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1. Introduction

In current minimalism (Chomsky 1995, 2000, 2001, 2005ab, pestesky and Torrego 2006, 2007) all syntactic operations (Move, Agree) are said to be applied in order to satisfy licensing requirements encoded by features that Lexical Items (LI's) are made of. Such licensing requirements are mostly formalised in terms of probe-goal systems in which some formal features are said to be uninterpretable (or unvalued in more recent terms) and search in their syntactic domain for interpretable or valued counter features ([iF]), with which they establish a relation Agree. As a result of Agree the uninterpretable (or unvalued) feature [uF] is deleted before having reached the interface with the Conceptual-Intentional system. This is illustrated in (1).

(1) $[X_{[\sout{uF}]} \ldots [\ldots Y_{[iF]} \ldots]]$

Thus, without the presence of a feature [iF] in the search domain of X no feature checking relationship could have been established and the sentence would have been ruled out.[1] In this framework Move is defined as a superfunction of Agree (Move = Agree + Pied-Pipe + Merge). In cases of movement, the strength of [uF] on $X_{[uF]}$ forces $Y_{[iF]}$ to remerge to a position close enough to check X's [uF]. Currently, the strength of a feature is expressed in terms of a subfeature [EPP] of [uF]. [uF] carries a feature [EPP] that demands that [uF] be checked under spec-head configuration:[2]

(2) $[Y_{[iF]} \; X_{[\sout{uF}][\sout{EPP}]} \ldots [\ldots \sout{Y_{[iF]}} \ldots]]$

All proposals that seek to explain syntactic operations by means of feature checking relations crucially hinge on four assumptions:

(3) a. Full Interpretation (uninterpretable material is not allowed to occur at the interfaces LF/PF);
b. The existence of uninterpretable formal features;
c. Syntactic operations Move/Agree are able to delete uninterpretable features;
d. Move is triggered by additional features (otherwise Agree alone could do the job);

[1] Unless X would move up to a higher clausal position in which it could find a matching [iF].
[2] Not all analyses take Move to be a superfunction of Agree triggered by special featural properties on the goal such as [EPP]. According to other analyses feature checking must always take place under spec-head agreement, but allow cross-linguistic variation whether it must be the entire LI that moves to a position close enough to the goal, or whether the relevant formal feature [iF] can raise by itself. See Grohmann et al. 2005 for a discussion of the different approaches.

Let us discuss these four assumptions in more detail. The first assumption, Full Interpretation, is (within the generative paradigm) the least questioned of these four assumptions. Originally proposed in Chomsky 1986, Full Interpretation guarantees that LF, i.e. the level of representation that forms the input for semantic computation, contains only those syntactic elements that are semantically relevant. Features that lack semantic content are thus not allowed to appear at LF. After spell-out, phonological features are stripped of and sent to PF, ensuring that at the PF side no feature shows up that is not phonological in nature. The joint force of Full Interpretation and the separation of phonological features after spell-out demands disappearance of those features that lack both phonological and semantic content.

This immediately brings up the second assumption: the existence of uninterpretable features. In minimalism, LI's are thought to exist of three different types of features: phonological, semantic and formal features. Formal features are valued for semantic interpretability: A feature [uF] is uninterpretable and needs to be checked against a feature [iF]. However, the adoption of features [uF] raises immediately two questions: (i) why would there be uninterpretable formal features in the first place, and (ii) how can their existence be proven? Note that it does not suffice to say that the appearance of certain syntactic operations proves their existence, since this type of reasoning would be circular: the triggering mechanism of syntactic operations Move/Agree is defined in terms of uninterpretable formal features. Thus, independent evidence is needed to motivate the existence of uninterpretable formal features. In this paper I provide new data and an analysis to confirm the existence of uninterpretable formal features.

The third assumption, namely that uninterpretable formal features trigger syntactic operations Move/Agree, is only motivated by conceptual (and to a large extent stipulated) arguments. The general argumentation behind the idea that uninterpretable formal features can be deleted under Move and Agree is that two poorly understood syntactic phenomena (dislocation and uninterpretability) can be reduced to one phenomenon. Hence Move and Agree are possible, but only allowed if their application prevents a derivation from crashing, i.e. to prevent a violation of Full Interpretation at LF.

The fourth assumption is that Move must be triggered by additional features, for instance by [EPP] features. Otherwise it cannot be explained why Agree alone cannot delete all instances of uninterpretable formal features, given the fact that Move is a superfunction of Agree. Such a view takes dislocation to be *uneconomical*. If application of Move is uneconomical, it can only be triggered if a sentence without Move (i.e. with mere application of Agree) is ruled out. Such a perspective is rather stipulative, since nothing forbids dislocation in the first place: the operation Merge does not have to be restricted to external Merge as has been pointed out by Chomsky 2005b. Hence, the question remains open whether it is correct to think of Move as an operation that is less economic than Agree.

In this paper I address four questions that follow rise from the above considerations:

i. How can the existence of uninterpretable material be motivated?
ii. Why does natural language exhibit uninterpretable material in the first place?
iii. Why are uninterpretable formal features deleted under Agree?
iv. Why is Move triggered if the simpler operation Agree could establish a feature checking relation in the first place?

The aim of this paper is to answer the four questions raised above. The first part of this paper is empirical. Its purpose is to show that the assumption that lexical material may not directly contribute to the semantics of the sentence (in other words, that it contains uninterpretable features) is essentially right. I argue that many phenomena that have traditionally been accounted for beyond the domain of generative grammar, such as doubling phenomena, can be explained once it is assumed that natural language contains a large amount of uninterpretable material and that uninterpretability should be taken to be a core property of natural language.

In the second part of this paper I argue however that it is not uninterpretable formal features that trigger Move/Agree, but that it is a property of natural language that it must be exhibit Move/Agree in the first place. This view implies that Move and Agree are equally economic operations. I take Move/Agree to follow from a prosodic economy condition that prefers as many semantic markers to be expressed on one and the same LI as possible. I provide a view of syntax in which conflicting semantic and phonological conditions force the availability of syntactic operations Move/Agree. Moreover, I demonstrate that the operation Agree can be realised if and only if lexical material is allowed to lack both semantic and phonological content.

This paper is organised as follows. In the next section I discuss a number of instances of doubling (i.e. the presence of a semantic operator/property is manifested more than once in the morphosyntax) in natural language and I demonstrate that this material is indeed uninterpretable. In section 3, I provide a new view on the architecture of grammar arguing that language is an optimal solution to interface conditions that are to some extent conflicting. In section 4, I explain how it follows from this new perspective that Move and Agree exist as independent marking strategies and I demonstrate that Agree calls uninterpretable features into being. Section 5 concludes.

2. Uninterpretable material in natural language

In order to determine whether uninterpretable material exists in natural language, one should first clarify what is exactly meant by uninterpretable material. Since in minimalist terms features are the building blocks of LI's, the question amounts to asking for the definition of an uninterpretable feature. In a recent paper Svenonius 2006 provides the following definitions for uninterpretable features:

(4) For any F, and any modules X and Y,
   a. F is an X-internal feature iff F is an X feature and not a feature of any other module
   b. F is an X-Y interface feature iff F is an X feature and a Y feature

(5) For any X-Y interface feature F,
   a. F is interpretable iff it corresponds systematically to some part of a well-formed X representation and some part of the corresponding Y representation
   b. F is uninterpretable otherwise

Applying these definitions to the syntactic and semantic modules, this comes down to:

(6) For any F,

a. F is a syntax-internal feature iff F is a syntactic feature and not a feature of any other module
b. F is a syntax-semantics interface feature iff F is a syntactic feature and a semantic feature

(7) For any syntax-semantics interface feature F,
a. F is interpretable iff it corresponds systematically to some part of a well-formed syntactic representation and some part of the corresponding semantic representation
b. F is uninterpretable otherwise

Following Svenonius' definitions, uninterpretability is undefined for syntax-internal features (or any other X-internal feature for that matter). This means that an uninterpretable syntactic feature must have some kind of a semantic counterpart. Let's take gender as an example. Gender is a syntax-semantics interface feature, since it is controlled by agreement, and it contributes to the semantics. Now let us look at the following examples:

(8) a. gato bonito
Portuguese[3]
cat.MASC beautiful.MASC
[MASC] [MASC]
'beautiful tomcat'
b. gata bonita
cat.FEM beautiful.FEM
[FEM] [FEM]
'beautiful cat'

The question rises whether each instance of [FEM] in (8) contributes to the corresponding semantic representation of (8). In the examples above the gender features are manifested twice: Once on the noun and once on the adjective. The gender feature on the noun clearly contributes to the meaning of the word. *Gato* ('tomcat') has a different meaning than *gata* ('cat'). However, things are not that clear for the adjective. At first sight, not every instance of [FEM] in (8) corresponds to the semantics of (8). Assuming that the English word *tomcat* has the same denotation as Portuguese *gato*, and the English phrase *beautiful tomcat* has the same semantics as *gato bonito*, *bonito* should have the same semantic denotation as *beautiful*: the set of beautiful individuals, and not the set of beautiful, male individuals. However, one could argue that *bonito* indeed denotes the set of beautiful, male individuals and that by entailment the reading in combination with the interpretation of *gato* the same interpretation of *beautiful tomcat* is derived, along the lines of (9)

(9) $\exists x[\text{Beautiful'}(x) \,\&\, \text{Male'}(x) \,\&\, \text{Tomcat'}(x)] \Leftrightarrow \exists x[\text{Beautiful'}(x) \,\&\, \text{Tomcat'}(x)]$

Semantically speaking, nothing forbids calling the gender feature on the adjectives in (8) interpretable. This leads however to several pragmatic questions. Following this line of reasoning the semantics of *gato bonito* would actually correspond to that of *beautiful male tomcat*. However, intuitively this appears to be incorrect. The reading of *beautiful male tomcat* that comes to mind is one in which amongst the set of tomcats some tomcats are

[3] Data taken from Grohmann et al. 2005.

said to be more male than others. Of that set of more male tomcats, the tomcat in question must be a beautiful one. Hence intuitively the semantic feature [MASC] on *bonito*, contrary to the one on *gato*, seems semantically empty. According to 0, [MASC] is then uninterpretable on *bonito*, as it does not correspond to the semantic representation of the sentence.

The fact that the semantic emptiness of the gender marker on *bonito* cannot be proven follows from the fact that if a particular proposition expresses that a particular object is said to be member of this set twice, it is always truth-conditionally equivalent to a proposition in which the object is only said to be member of this set once (see (9)). Although it seems natural to assume that features corresponding to semantic properties are not always interpretable, semantic properties alone are insufficient to demonstrate that natural language indeed exhibits uninterpretable material in the sense of Svenonius 2006.

Hence in order to answer the question whether natural language exhibits uninterpretable material, more investigation is needed. One phenomenon that comes to mind is case. Structural case features have been said to be (semantically) uninterpretable on nouns (see Vergnaud's famous unpublished letter, Chomsky 1995, Grohmann et al. 2005). However, the fact that case is not (semantically) interpretable on nouns does not render it an uninterpretable feature in the sense of 0. If case is not a feature of the semantic module, but only a purely syntactic feature, it cannot be an uninterpretable feature in the first place since uninterpretability is only defined for interface features. The question is however whether case is indeed a purely syntactic feature. Recent proposals have argued on different grounds that case, traditionally thought to be a purely syntactic feature, without any semantic counterpart, is indeed an interface feature. Bittner and Hale 1996 have proposed to consider nominative case as marker for type *e* interpretation (with other cases being markers of other semantic types). Other analyses have taken nominative case to be the uninterpretable counterpart of tense on verbs (Pestesky 2006, 2007) and accusative case as marker of certain aspectual properties (Svenonius 2002, Kratzer 2004). Under such an approach, realisations of case thus mark specific properties that are manifested overtly or covertly on other elements (mostly verbs). Case is then a result of a doubling phenomenon.[4] Take for instance Pesetsky and Torrego's account of nominative case being an uninterpretable tense feature [uT]. According to Pesetsky and Torrego tense is interpretable on finite verbs.[5] This means that the semantic tense operator is manifested twice in the morphosyntax, but does not give rise to an iterative reading.

If case is indeed a reflex of the marking of a particular semantic operator on another LI, such as tense on finite verbs, case is clearly a doubling phenomenon (i.e. a phenomenon in which the presence of a semantic operator is marked more than once in the morphosyntax), and the case feature itself must be uninterpretable. However, if tense marking is not overtly realised, it cannot be excluded that nominative case systematically corresponds to the semantic tense operator without adopting additional assumptions. Hence, the above search to uninterpretable features leads to the conclusion that the evidence for uninterpretable features can only be provided by instances of doubling: multiple morphosyntactic manifestations of a single semantic operator. Note that the fact that tense is not a semantic *property* (such as gender) but a semantic *operator*, makes a crucial difference. The problems that surface when discussing the semantic value of features corresponding to semantic properties disappear when operators are taken into account. It is by no means the case that an iterative reading of two identical operators always entails a concord reading, i.e. a reading in which only one of the two is

[4] This approach is not uncontroversial. (Sigurdsson 2006) for instance proposes that case marking is a purely phonological phenomenon.

[5] But see (Von Stechow 2002) who argues that tense marking on finite verbs must be uninterpretable as well.

semantically interpreted. In the next subsection I therefore discuss several examples of doubling, demonstrating that this phenomenon is much more wide-spread than has standardly been assumed and thus providing ample evidence for the existence of uninterpretable features. I present phenomena such as Negative Concord, Modal Concord and other doubling phenomena in quite some detail. I argue that in all these cases uninterpretable features must be involved. This makes the empirical claim that natural language exhibits uninterpretable material sufficiently strong, and therefore the view that features that correspond to semantic properties may be uninterpretable on particular LI's as well.

2.1 Cases of doubling: Negative Concord

In languages such as Dutch and German every morpohosyntactically negative element corresponds to a semantic negation. Consequently, whenever two such elements occur in the same clause, the semantics of this clause also contain two negations. Such languages are called Double Negation (DN) languages after the law of Double Negation according to which two negations cancel each other out. Examples of multiple negative expressions in Dutch can be found in (10) below.

(10) a. *Niemand* zei *niets* Dutch
Nobody said nothing
DN: 'Nobody said nothing' = 'everybody said something'
b. *Geen* mens was daar *niet* bij
No man was there NEG at
DN: 'No man wasn't there' = 'everybody was there'

The fact that there is a 1:1 correspondence between morphosyntactically negative elements and semantic negations is not surprising from a compositional perspective. The semantics of the sentences in (10) follows immediately from the lexical semantics of the negative items. However, DN languages are typologically quite rare. Moth languages that exhibit multiple negative items in one clause do not exhibit DN readings (cf. Haspelmath 1997, Zeijlstra 2004). In contrast to DN languages, many languages exhibit Negative Concord (NC). In NC constructions multiple morphosyntactically negative elements correspond to only one semantic negation.

One can distinguish two different types of languages with respect to NC: (i) Strict NC languages, in which multiple (clause-internal) negative elements (both negative markers and n-words[6]) yield only one semantic negation; and (ii) Non-strict NC languages, where either a preverbal n-word or a preverbal negative marker establishes an NC relation with a postverbal n-word. However, a preverbal negative marker in this type of language may not follow preverbal n-words. An example of a Strict NC language is Czech (11), an example of a Non-strict NC language is Italian, as is illustrated in (12) below.

(11) a. Milan *(*ne*-)vidi *nikoho* Czech
Milan NEG.saw n-body
'Milan doesn't see anybody'
b. Dnes *(*ne*-)volá *nikdo*

[6] The term *n-word* is due to Laka (1990) and defined in Giannakidou (2006) as elements that seem to exhibit semantically negative behaviour in some contexts, but semantically non-negative behaviour in other contexts.

Today NEG.calls n-body
'Today nobody calls'

c. Dnes *nikdo**(*ne-*)volá
Today n-body NEG.calls
'Today nobody calls'

(12) a. Gianni *(*non*) ha telefonato a *nessuno* Italian
Gianni NEG has called to n-body
'Gianni didn't call anybody'

b. Ieri *(*non*) ha telefonato *nessuno*
Yesterday NEG has called n-body
'Yesterday nobody called'

c. Ieri *nessuno* (**non*) ha telefonato (a *nessuno*)
Yesterday n-body NEG has called to n-body
'Yesterday nobody called (anybody)'

In (11)-(12) the negative semantics of several negative elements seems to have disappeared. Since such a disappearance runs against compositionality, this phenomenon immediately calls for an explanation. Two kinds of solutions come to mind. A first solution would be to allow some mode of interpretation in the semantic component to unify all negative elements into one negative quantifier. A good candidate for such an account would be polyadic quantification (which turns *n* unary quantifiers into one *n*-ary quantifier). Such an analysis has been advocated for by De Swart and Sag 2002 following Haegeman and Zanuttini 1996. Alternatively one could assume that not every morphosyntactic instance of negation is actually semantically negative. This has been suggested by Ladusaw 1992 and adopted by many scholars. Most of these scholars have argued that n-words (negative indefinites in NC languages (following terminology and definitions by Laka 1990 and Giannakidou 2006b) are in fact Negative Polarity Items (NPI's). In the next subsection I provide arguments that negative morphology in NC languages must sometimes be taken as a realisation of uninterpretable features in the sense of Svenonius 2006.

2.1.1 NC as syntactic agreement

In this section I present the outlines of a theory of NC in terms of syntactic agreement, which is an elaboration on previous work published in Zeijlstra (2004). First, I demonstrate how such a theory predicts the correct readings of NC constructions. Second, I show that this approach solves several problems that other theories of NC have been facing. Although space limitations prevent me here from addressing these issues at full length, I argue that these arguments present robust evidence in favour of the syntactic agreement approach and therefore for the existence of uninterpretable features.

In accordance with the remarks presented above, n-words are taken to be semantically non-negative indefinites that are marked syntactically by means of a feature [uNEG]. Such a feature needs to stand in an Agree relation with a negative operator that carries [iNEG]. Since one single negative operator may license multiple n-words, NC is thus nothing more than an instance of multiple Agree. The semantic representation of an n-word is thus as in (13).

(13) $||\text{n-Q}|| = \lambda P.[Q(x) \,\&\, P(x)]$, where $Q \in \{\textbf{Human'}, \textbf{Thing'}, \ldots\}$

The semantics of the negative operator is then as in (14), where (∃) indicates that this negative operator is able to bind free variables.[7]

(14) $||Op_{\neg[iNEG]}|| = \neg(\exists)$[8]

A final assumption to be made here is that checking relations between higher [iF]'s against lower [uF]'s are allowed, as has been put forward by Adger 2003 amongst many others over the past years.

On the basis of the above-mentioned assumptions, one is already able to analyse NC as an instance of Agree: multiple elements carrying [uNEG] check their feature against a single negative operator that carries [iNEG]. However, such an analysis would be allowing free inclusion of the abstract negative operator, as inclusion of the abstract negative operator is unconstrained. One cannot simply put as many abstract negative operators in the sentence as one likes. In essence, the abstract negative operator $Op_{\neg}$ is a regular lexical item, only with zero phonology. This zero phonology can easily be explained as a result of some economy condition whose exact nature will be discussed later in this paper (section 4).

(15) Only if a particular sentence is grammatical and none of the overt elements is responsible for the grammaticality of the sentence, the sentence must be grammatical due to a covert element. (Given multiple Agree no second $Op_{\neg}$ may be assumed if the first one is able to check all present [uNEG] features).

It can be shown that negation behaves differently in Strict and Non-strict NC languages with respect to the scope of quantifying DPs. This is shown in (16). Although Czech *moc* ('much') dominates the negative marker, it is outscoped by negation. This reading is however not obtained in a similar construction in Italian, where *molto* ('much') is not in the scope of negation, although Italian, contrary to Czech, requires additional stress on preposed quantifying objects.[9] This is an indication that Italian *non*, contrary to Czech *ne*, is the phonological realisation of $Op_{\neg}$.

(16) a. Milan moc *ne*jedl — Czech
Milan much NEG.eat.PERF
¬ > much: 'Milan hasn't eaten much'
*much > ¬: 'There is much that Milan didn't eat'

b. Molto *non* ha mangiato Gianni — Italian
Much NEG has eaten Gianni
*¬ > much: 'Gianni hasn't eaten much'
much > ¬: 'There is much that Gianni didn't eat'

[7] In this analysis I take n-words to be indefinites in the Heimian sense. However, this is not required for this analysis. If n-words are taken to be existential quantifiers the readings that come out are identical.

[8] In the previous section I used the notion $Op_{\neg}$ in order to represent the abstract negative operator. Strictly speaking, (14) only represents the semantics of this abstract negative operator. However, as I have discussed before, the semantics of the covert and overt negative operator must be identical.

[9] The fact that *molto* in (16b) must receive extra stress indicates that it is focussed (otherwise it could not have been fronted). However, this focus effect does not influence the scopal order in the interpretation. If in (16b) a focussed *molto* had appeared in a position after *non*, it would have received the interpretation ¬ > much.

Apart from that, in some Strict NC languages the negative marker in particular constructions may be left out if it is preceded by an n-word, something to be expected on functional grounds if the negative marker carries [uNEG] (if an n-word precedes it, the negative marker is no longer needed as a scope marker). This is for instance the case in Greek (a Strict NC language) with *oute kan* ('even'). If *oute kan* precedes the negative marker *dhen*, the latter may be left out. If it follows *dhen*, *dhen* may not be removed (as Giannakidou's 2006a) examples show in (17)). This forms an argument that Greek *dhen* is in fact not semantically negative itself. As Greek is a Strict NC language, this strengthens the assumption that in Strict NC languages the negative marker carries [uNEG].

(17) a. O Jannis *(*dhen*) dhiavase *oute kan* tis Sindaktikes Dhomes[10] Greek
The Jannis NEG reads even the Syntactic Structures
'Jannis doesn't read even Syntactic Structures'

b. *Oute kan* ti Maria (*dhen*) proskalese o pritanis
Even the Maria NEG invite the dean
'Not even Maria did the dean invite'

Probably the strongest argument in favour of a treatment of negative markers in Non-strict Negative Concord languages is that no known Non-strict NC language exhibits so-called True Negative Imperatives (TNI's). What is meant by TNI's is exemplified in (18) for Polish. In Polish, the negative marker always precedes the finite verb. This does not only hold for indicative verbs, but also for imperative verbs. As (18) shows, sentences with indicative and imperative verbs are negated in the same way. Therefore, Polish is said to allow TNI's: the sentence with the imperative verb can be negated in the same way indicative sentences are negated.

(18) a. (Ty) *nie* pracujesz Polish
you NEG work.2SG
'You aren't working'

b. Pracuj!
Work.2SG.IMP
'Work!'

c. *Nie* pracuj! (TNI)
NEG work.2SG.IMP
'Don't work!'

Things are different however in a language like Spanish, as illustrated in (19). In Spanish the negative marker *no* always occurs in preverbal position ((19)a). However, if the verb has an imperative form as in (19)b, it may not be combined with this negative marker (see (19)c). Spanish does not allow TNI's. In order to express the illocutionary force of an imperative[11], the imperative verb must be replaced by a subjunctive ((19)b). Such constructions are called Surrogate Negative Imperatives (SNIs).[12]

(19) a. Tu *no* lees Spanish
NEG read.2SG
'You don't read'

[10] Example taken from Giannakidou (2006).
[11] Negative sentences with the illocutionary force of an imperative are often referred to as prohibitives.
[12] See Van der Auwera (2005) (and references therein) for many more examples of languages that ban TNI's and the way those languages express SNIs.

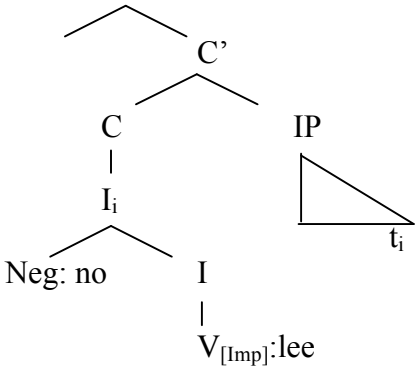
b. ¡Lee!
Read.2SG.IMP
'Read!'

c. *¡*No* lee! (*TNI)
NEG read.2SG.IMP
'Don't read'

d. ¡*No* leas! (SNI)
NEG read.2SG.SUBJ
'Don't read'

Han 2001, finally, argues that the ban on TNI's does not follow from any syntactic requirements that have been violated, but from a semantic violation: the imperative operator (i.e. the operator that encodes the illocutionary force of an imperative, Op_{IMP} hereafter) may not be in the scope of negation. Op_{IMP} is realised by moving V_{imp}, carrying a feature [IMP], to C°. Han takes negation in Romance languages to head a projection somewhere high in the IP domain. Hence, V_{imp} head-adjoins first to negation, and then as a unit the negative marker and V_{imp} move further to C° (or Force° in Rizzi's (1997) terms). As a result Op_{IMP} remains in the c-command domain of negation, which violates the constraint that negation may only operate on the propositional content of the clause. The structure (20) is thus ill formed.

(20) * Spanish



This means that it is predicted that in all Non-strict NC languages TNI's are banned. This prediction is indeed born out (cf. Zeijlstra (2006)). In languages that have a negative marker that is semantically non-negative, the marker's [uNEG] feature can have been checked by an abstract operator when it was inserted below C°. Note that such a generalisation is always unidirectional. It does not guarantee that all Strict NC languages allow TNI's as TNI's can be banned on different grounds as well.[13]

On the basis of these three arguments I conclude that negative markers in Strict NC languages carry [uNEG] and those in Non-strict NC languages carry [iNEG]. Now let us see how this proposal applies to Czech (Strict NC) and Italian (Non-strict NC).

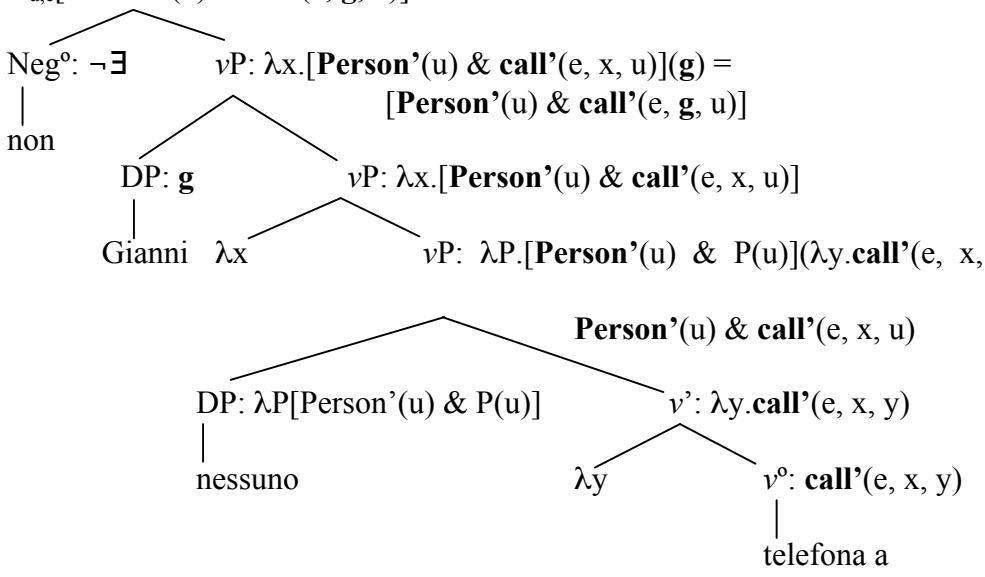
Now let us see how the exact NC readings come about. I discuss Italian first, where *non* is the phonological realisation of the negative operator. A sentence such as (21) has a syntactic form as in (22). Under syntactic Agree all [uNEG] features are deleted and as a result the correct semantic reading follows immediately, as shown in (23).[14]

[13] See Han 2001 and Zeijlstra 2006 for a thorough discussion of these facts.
[14] Neglecting all tense effects.

(21) Gianni *non* telefona a *nessuno* Italian
Gianni NEG calls to n-body
'Gianni doesn't call anybody'

(22) [$_{Neg^o}$ non$_{[iNEG]}$ [$_{vP}$ Gianni a nessuno$_{[\sout{uNEG}]}$ telefona]]

(23) Neg': $\neg\exists_{u,e}$[**Person'**(u) & **see'**(e, **g**, u)]

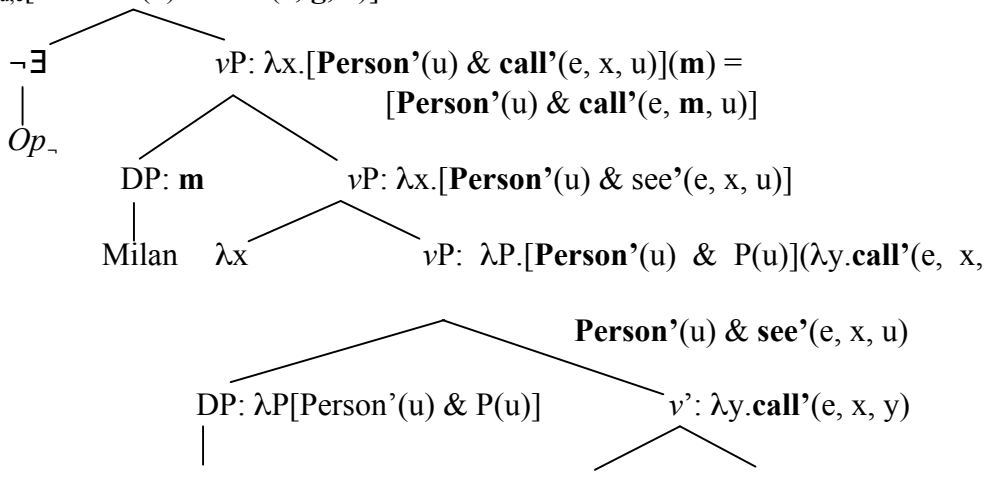


In a slightly similar way the correct syntax and semantics can be provided for Czech NC constructions, where negation is introduced by $Op_{\neg}$ and where both the n-word and the negative marker *ne* are checked against this negative operator, as shown in (24)-(25).

(24) Milan *ne*-vidi *nikoho* Czech
Milan NEG.sees n-body
'Milan doesn't see anybody'

(25) [$_{vP}$ $Op_{\neg[iNEG]}$ [$_{vP}$ Milan *ne*vidi$_{[\sout{uNEG}]i}$ *nikoho*$_{[\sout{uNEG}]}$ t_i]][15]

(26) *vP*: $\neg\exists_{u,e}$[**Person'**(u) & **see'**(e, **g**, u)]



[15] I assume that Czech *ne* is base-generated on V° by means of head adjunction (cf. Zeijlstra (2004) for a more detailed analysis). Therefore a functional projection NegP is not required and therefore excluded.

nikoho λy v^o: **see'**(e, x, y)
|
nevidi

The reader will notice that in principle all NC readings can be analysed likewise. Negation is induced either by a negative marker that carries [iNEG] or by the abstract negative operator, whose presence is licensed by the economy condition in (15).

Note that this explanation for NC also predicts the differences between Strict and Non-strict NC languages. If n-words are indefinites that have to be bound (i.e. c-commanded) by the negative operator, it follows immediately that no n-word is allowed to precede the negative marker *non* in Italian as in such a case the indefinite would outscope negation. In Czech on the other hand, nothing forbids such constructions. Since the preverbal negative marker is not the phonological realisation of the negative operator, it must be licensed by an abstract negative operator. If that operator is in a position higher than the preverbal subject, both the preverbal n-word and the negative marker can have their features [uNEG] checked against the abstract $Op_{\neg}$'s [iNEG] feature:

(27) a. Dnes *nikdo**(*ne*-)volá Czech
Today n-body NEG.calls
'Today nobody calls'
b. [Dnes [$Op_{\neg[iNEG]}$ [nikdo$_{[\sout{uNEG}]}$ [nevola$_{[\sout{uNEG}]}$]]]

(28) a. Ieri *nessuno* (**non*) ha telefonato (a *nessuno*) Italian
Yesterday n-body NEG has called to n-body
'Yesterday nobody called (anybody)'
b. *[Ieri [*nessuno*$_{[uNEG]}$ [*non*$_{[iNEG]}$ ha telefonato [a *nessuno*$_{[\sout{uNEG}]}$]]]]

The only way to render (28) grammatical is to introduce a second negative operator in the sentence. The sentence is then expected to have a DN reading (although it has three morphosyntactically negative elements). Such constructions are indeed found: if the preverbal n-word receives heavy stress, the reading that is yielded is a reading that contains two semantic negations, as shown below.

(29) *NESSUNO non* ha telefonato a *nessuno* Italian
N-body NEG has called to n-body
'Nobody didn't call'

2.1.2 Advantages of the syntactic agreement analysis

Thus far I have shown that the syntactic agreement approach predicts the correct readings of NC constructions, and that it explains the distinction between Strict and Non-strict NC languages. I now demonstrate that the analysis presented above has strong advantages over the previous analyses that take n-words either as negative quantifiers or that take n-words to be NPIs. Although I realise that I cannot do full justice to these approaches in this small amount of text I find it necessary to illustrate how the syntactic agreement approach tackles several of the problems that these approaches have been facing.

2.1.2.1 N-words as negative quantifers

Zanuttini 1991, Haegeman and Zanuttini 1996 and de Swart and Sag 2002 argue that n-words are semantically negative unary quantifiers. NC is obtained through a process of polyadic quantification where *k* n-words turn into one *k*-ary quantifier (a mechanism that these scholars also adopt for multiple questions). A strong prediction of such theories is that isolated n-words always keep their negative reading. The problem is then why examples such as (30) are ungrammatical.

(30) *Gianni ha visto *nessuno* Italian
Gianni has seen n-body
'Gianni hasn't seen anybody'

Note that the syntactic agreement analysis does not rule out these constructions either. In principle *nessuno* could be licensed by an abstract negative operator. However, since the economy condition in (15) can only be implemented as a parsing condition (since such conditions cannot be taken to be part of the derivational procedure) *Op¬* must be introduced immediately before the highest element carrying [uNEG], as an unchecked [uNEG] functions as a signpost to the parser that an element carrying [iNEG] is needed. Hence *Op¬* must precede *nessuno* within its VP in situ position. The reading that is yielded then is one in which sentential negation cannot result, as the event variable (introduced in the highest V position (cf. Chung and Ladusaw 2004) amongst others) is not bound by an operator that falls under the scope of negation. Such readings are pragmatically very odd and therefore hardly available. Herburger 2001 presents some examples of such sentences, which are common.

(31) El bébé está mirando a nada[16] Spanish
The baby is looking at n-thing
'The baby is staring at nothing'
∃e[**look'**(e) & Agent(e, **b**) & ¬∃x[**thing**'(x) & Patient(e, x)]]

The prediction, which the syntactic agreement proposal but not the negative quantifier approach makes, namely that sentences such as (30) are most often semantically infelicitous rather than syntactically ungrammatical is thus borne out.

Note that under the negative quantifier approach the parametric variation between NC and DN languages disappears. (de Swart and Sag 2002) argue that this distinction is not a matter of grammar, but of language usage and they base their arguments on examples from English and French, in which often both readings are available (in English NC is non-standardly available in many dialects). However, these languages are known to be in change with respect to the DN/NC distinction (French is currently changing from an NC language into a DN language, whereas (non-standard) English is on its way of becoming an NC language), which explains why both readings are being attested. In other languages such ambiguity hardly exists.

Finally, De Swart & Sag argue that quantifier resumption may only take place if two quantificational terms share a particular feature. In the case of resumption of *Wh* terms, this is the feature [Wh]; in the case of negative terms, this feature is [Anti-Additive]. This feature system prevents resumption of quantifiers of different types. A problem for the negative quantifier analysis is that many n-words may also occur in non-anti-additive downward entailing contexts.

[16] Example taken from Herburger (2001).

(32) Dudo que vayan a encontrar *nada*[17] Spanish
Doubt.1SG that will.3pl.SUBJ to find n-thing
'I doubt that they will find anything'

Such examples can however be explained, once it is assumed that, despite the fact that it is not anti-additive, *dudo* can obtain an [iNEG] feature during L1 acquisition.[18]

2.1.2.2 The Negative Polarity Item approach

Another approach takes n-words to be Negative Polarity Items (NPIs), which are licensed by a (possibly abstract) negation (cf. (Laka 1990; Giannakidou 1997; Giannakidou 2000)). However, these analyses, although much closer to the syntactic agreement approach as they both take n-words to be semantically non-negative, also face several problems.

The first problem is that the distribution of standard NPIs and n-words differs. N-words may only be licensed in syntactically local domains, whereas the licensing conditions for NPIs depends more on their semantic context. NPIs, as opposed to n-words, can be licensed across the clause boundary, as shown in (33) for Greek.

(33) I Ariadne *dhen* ipe oti idhe {**TIPOTA*/tipota}[19] Greek
The Ariadne NEG said that saw.3SG n-thing/anything(NPI)
'Ariadne didn't say she saw anything'

Since feature checking obeys syntactic locality constraints, this difference is immediately accounted for. It should be remarked though that n-words may be licensed across the clause boundary as shown in (32). This results from the fact that the verb in subordinate clauses has a subjunctive form and subjunctive clauses are generally much weaker with respect to locality effects an allow for all kinds of feature checking across the clause boundary (as has been demonstrated by Giorgi and Pianesi 1997, Quer 1998, and others).[20]

The second and fatal problem for Giannakidou 2000 to be discussed in this section concerns fragmentary answers, taken as evidence by Zanuttini in favour of the negative quantifier approach.[21] Watanabe 2004 argues against Giannakidou's 2002 analysis in terms of fragmentary answers. Since Giannakidou argues that n-words in Greek are semantically non-negative, she has to account for the fact that n-words in fragmentary answers yield a reading that includes a negation. She argues that this negation, expressed by *dhen*, is deleted under ellipsis. Hence, the assumption that n-words are semantically non-negative can be maintained. However, as Watanabe shows, this analysis violates the condition that ellipsis may only take place under semantic identity (cf. Merchant's 2001

[17] Example taken from Herburger (2001).
[18] One could ask why downward entailing elements that are not strictly negative may still get assigned an [iNEG] feature. In theory, this would enable the learning mechanism to assign [iNEG] to a large number of LIs, many of them being semantically non-negative. However, I argue that this is a relic of previous stages of the language. Spanish n-words developed from regular NPIs, which were allowed in such contexts. This analysis is supported by the fact that languages in which n-words have not developed from NPIs (several Slavic languages) do not allow such constructions.
[19] Example taken from Giannakidou 2000: 470. The emphasised *TIPOTA* is an n-word, and the unemphasised *tipota* is a plain NPI.
[20] Giannakidou 2000 takes n-words (in Greek) to be universal quantifiers and derives the locality effects from the locality effects of Quantifier Raising.
[21] Another argument often used against the approach that takes n-words to be indefinites/existentials is the fact that n-words may not be modified by *almost*. See however Penka 2007 who presents a number of arguments that invalidate this test.

notion of e-GIVENness). As the question does not contain a negation, it may not license ellipsis of the negative marker *dhen*.

Under the syntactic agreement analysis *dhen* is taken to be semantically non-negative (carrying [uNEG]), and thus the semantic identity condition is met again. The abstract negative operator then induces the negation in the answer. Note that in Non-strict NC languages the negative marker never follows an n-word, and therefore no negative marker can be deleted under ellipsis in the first place.

(34) a. Q: Ti ides? A: [*Op*¬ [*TIPOTA* [~~*dhen*[uNEG]~~ ~~ida~~]]] Greek
What saw.2SG? N-thing NEG saw.1SG
'What did you see?''Nothing!'

b. Q: ¿A quién viste? A: [*Op*¬ [A *nadie* [~~vió~~]]] Spanish
To what saw.2SG? To n-thing saw.1SG]
'What did you see?' 'Nothing!'

It follows that the syntactic agreement approach accounts correctly for NC, and solves many of the problems that the other approaches are struggling with. Thus, the NC examples above provide evidence for the existence of [uNEG] features, and therefore stronger motivation for the existence of uninterpretable formal features. In the following subsection I demonstrate that NC is not the only instance of doubling that should receive an account in terms of uninterpretable formal features.[22]

2.3 Cases of doubling: Modal Concord

If negative features are not always semantically interpretable, the expectation that follows is that doubling phenomena such as NC should be found amongst other functional categories, such as tense or modality, as well. In this subsection I demonstrate that this is indeed the case for modality. English exhibits Modal Concord (MC) as has been observed by Geurts and Huitink 2006, Huitink 2008. MC is a phenomenon where two modal expressions do not yield a cumulative reading, but yield only one modal operator at LF. This is shown in (35).

(35) a. You *may possibly* have read my little monograph upon the subject
'The speaker thinks that it is possible you read his little monograph'

b. Power carts *must mandatorily* be used on cart paths where provided
'It is obligatory that power carts be used on cart paths where provided'

As Geurts and Huitink correctly point out, not all MC readings can be entailed from cumulative readings. In the case of epistemic necessity, iterative readings entail concord readings. The *principle of veridicality* ensures that if an agent knows p, p is the case.

[22] A similar proposal that takes n-words and negative markers to be NPI-like is Manzini & Savoia (2005) and Manzini (2007). In this work it is argued that negative markers (clitics in their terms) and n-words are NPI's that are licensed by an abstract operator NEG. Further more they argue that '[a]s for […] NEG […] its presence is pragmatically implied by the presence of the negative polarity clitic' (Manzini (2007: 18)). Two remarks come to mind: (i) it cannot be *pragmatically* implemented, since that would suggest cancelability of the inclusion of NEG, contrary to fact; and (ii) this is indeed what Zeijlstra (2004) and the analysis in this paper claim: somehow negative elements must have a property that encodes that they need to be outscoped by a NEG operator. The claim of this paper is that *by definition* such a property is identical a feature [uNEG].

(36) $\Box p \rightarrow p$ Veridicality

If a proposition is of the form $\Box p$, the concord reading follows immediately. A similar thing applies to epistemic possibility. Given the principle of positive introspection (if an agent knows something, he knows that he knows it), iterative readings of modal possibility operators entail concord readings.

(37) $\Box p \rightarrow \Box\Box p$ ($\equiv \Diamond\Diamond p \rightarrow \Diamond p$) Positive introspection

However, no such principles hold for deontic logic. If something is obligatory, it is obviously not guaranteed that it is the case. In other words, veridicality does not hold in deontic logic. The same applies to deontic possibility. If something is obligatory, it is not obligatory that it is obligatory. Hence, the fact that Modal Concord is not restricted to epistemic modality ensures that the MC data prove the existence of uninterpretable material.

As such MC is reminiscent of NC, and is thus calling for an analysis along similar lines. However, there are at least two differences between MC and NC: first, MC seems not to be obligatory, contrary to NC; second, MC leads to some emphatic effect, whereas plain NC gives rise to a neutral reading. In this section I argue that despite appearances MC behaves on a par with NC and that if MC and NC are both considered being instances of syntactic agreement, these differences between NC and MC follow immediately.

I propose that modal adverbs (*probably*, *maybe*, *possibly*) are phonological realisations of modal operators, but that modal auxiliaries (*must*, *can*, *may*) are in fact markers of the presence of a modal operator (thus behaving in a sense like inflectional morphology). This amounts to saying that modal adverbs have interpretable modal features, whereas modal auxiliaries carry uninterpretable modal features. Furthermore I assume that a modal operator may also appear abstract as long as the presence of the abstract operator is marked by overt manifestations of uninterpretable features of the same kind (exactly as has been the case with abstract negative operators). This is what happens in cases of a single modal auxiliary: the auxiliary carries a particular uninterpretable modal feature, and establishes an Agree relation with the abstract modal operator. The feature specification on the modal auxiliary ensures that the modal operator is of the same modal type (epistemic/deontic; existential/universal).

(38) You may read
$[_{IP}$ You $[_{ModP}$ $Op_{[iMOD\text{-}DEON\text{-}\exists]}$ $may_{[uMOD\text{-}DEON\text{-}\exists]}$ $[_{VP}$ read$]]]$

In the case of a modal adverb and an auxiliary of the same modal type, an Agree relation can be established:

(39) a. You may possibly have read my little monograph upon the subject
$[_{IP}$ You $[_{ModP}$ $possibly_{[iMOD\text{-}EPIS\text{-}\exists]}$ $[_{Mod^\circ}$ $may_{[uMOD\text{-}EPIS\text{-}\exists]}]$ $[_{VP}$ …$]]]$

b. Power carts must mandatorily be used on cart paths where provided
$[_{IP}$ You $[_{ModP}$ $Op_{[iMOD\text{-}DEON\text{-}\forall]}$ $must_{[uMOD\text{-}DEON\text{-}\forall]}$ $[_{VP}$ …$]]]$

Only if two modal adverbs co-occur in the same sentence or a modal adverb of a distinct type than the modal auxiliary, a cumulative reading will be yielded since no agreement can be established. Note that this also holds in cases in which, due to intonational patterns, no

Agree relation between two modal elements can be established. This accounts for the fact that under a different intonation the sentences in (35) still allow a cumulative reading.

The idea that modal auxiliaries are semantically vacuous also explains their behaviour in negative sentences. Take sentence (40) in which negation outscopes the higher modal auxiliary:

(40) You cannot swim
¬ > ◊

If it is not the modal auxiliary *can* that is responsible for the introduction of the modal operator at LF, but an abstract operator, the semantics of (40) follow immediately once it is assumed that *can* must raise to a higher position than *not* for purely phono-syntactic reasons. *Can* must have been base-generated in a position below *not* where the abstract modal operator has been included as well in order to check *can*'s modal feature:

(41) $[_{IP}$ You $[can_i$-not$]$ $[_{ModP}$ Op_{MOD} t_i $[_{VP}$ swim$]]]$

Note that MC is not established between adverbs/functional elements and arguments, but only between adverbs and modal auxiliaries/affixes. It is known by the work of (Cinque 1999) that modal adverbs occupy high positions in the clausal hierarchy, at least dominating IP. This fact has been given an explanation by Ernst 2006 (but see (Nilsen 2003) for a critical discussion of this particular analysis) who argues that modals operate on propositions rather than events. This explains the first difference between MC and NC. Herburger 2001 and Zeijlstra 2004 explain the obligatory occurrence of a first negative element in an NC construction as a result of the fact that sentential negation requires the negative operator to outscope the existential quantifier that binds the (highest) event variable, as has been discussed above. Assuming that this variable is base-generated by the highest verb in the clause (v°) an additional negative marker signals that the entire vP is under the scope of negation. This analysis relates the obligatoriness of NC to the fact that arguments are base-generated vP in situ. Since modal adverbs are always base-generated outside vP, MC is not obligatory.

Under this analysis the possibility of modal repair, i.e. an instance of obligatory MC, is not excluded (see Shields 2008). Modal repair occurs when a second modal element is required in order to prevent the sentence from being ungrammatical. In English this happens after I-to-C movement. Modal auxiliaries in English must outscope the highest position of the finite verb in the clause. Normally this is I° and a modal adverb, such as 'probably' in (42), c-commands this position. If V_{fin} is in C°, however, this is no longer the case and a second modal auxiliary is required. Given that these auxiliaries themselves are semantically vacuous the reading of the sentence is not affected:

(42) a. Would Mary probably sing?
b. *Does Mary probably sing?

Finally, from the explanation that modal adverbs/auxiliaries do not have to participate in an MC relation, the emphatic effects from MC constructions directly follow. In this sense, their behaviour is (not surprisingly) identical to that of optional NC languages. In a language like Afrikaans, NC is optional and the NC sentences have emphatic effects, as shown in (43).

(43) Sy is *nooit* (*nie*) beskikbaar *nie* Afrikaans

She is never NEG available NEG
'She's never available'

Since the position of *nooit* marks the position of negation at LF, the first *nie* (*nie*$_1$) which is taken to be semantically non-negative, cf. Biberauer & Zeijlstra 2009, is not required to participate in the sentence, and does not change the semantics of the sentence once it is included. The emphatic effects can than be deduced from the Gricean maxim of manner ("be brief", cf. Grice 1975).

Both the fact that MC readings cannot follow from iterative readings and the strong resemblance between MC and NC (the differences between these two phenomena can be independently accounted for) provide more firm ground for the existence of uninterpretable features in natural language. The expectation that NC is a consequence of the existence of uninterpretable negative features is confirmed by the fact that similar behaviour is also found in other functional domains.

2.4 Concluding remarks

Thus far we have seen that both the data on negation and the data on modality strongly suggest the correctness of the hypothesis that natural language exhibits uninterpretable features. Obviously this hypothesis gains even more strength if it is shown that other instances of functional morphology in fact prove to be phonological realisations of uninterpretable formal features.

Without going into details, several analyses along these lines have been proposed. For instance, various scholars have argued on semantic grounds that past tense morphology is actually semantically vacuous and simply marks the presence of abstract operators (Dowty 1982, Heim 1994, Ogihara 1995, Abusch 1997, Kratzer 1998, von Stechow 2002). These proposals are based on two observations. The first observation is that the position from where the past tense operator takes scope differs from its surface position. The second observation is that tense may also reflect concord behaviour, a phenomenon known as Sequence Of Tense (SOT). Take the example in (44). The natural reading that this sentence obtains is one in which the moment of illness and the moment of thinking took place simultaneously. Following the line of reasoning presented above, it makes most sense to analyse sentence (44) as (45), where past tense morphology establishes an Agree relation with the abstract past tense operator.

(44) I thought Mary was sick English

(45) [Op$_{PAST[iPAST]}$ [I thought$_{[\sout{uPAST}]}$ [CP Mary was sick$_{[\sout{uPAST}]}$]]]

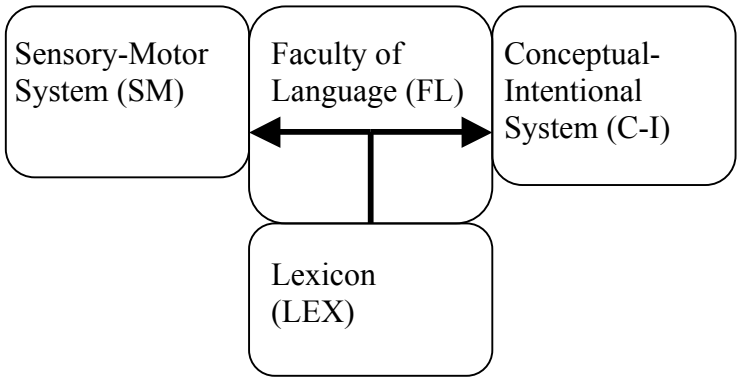
Obviously, many more doubling phenomena come to mind, such a number and person agreement (on verbal elements, *wh* morphology, aspectual morphology, etc. Crucial is however that the idea that uninterpretable material is available in natural language has received a much firmer ground than it has achieved thus far. Hence, I answer the first research question, *how can the existence of uninterpretable material be motivated*, by concluding that the doubling phenomena prove the existence of uninterpretable material. The questions as to why uninterpretable material must exist in the first place and to what extent uninterpretability is related to dislocation (application of Move/Agree) thus become of acute interest.

3. Economy and the architecture of grammar

In order to address the above-mentioned questions, one must first have a look at the way the architecture of grammar has been modelled and how this architecture has been motivated for in linguistic theory.

Following Chomsky's *Strongest Minimalist Thesis* (SMT) 'language is an optimal solution to interface conditions that the Faculty of Language (FL) must satisfy' (Chomsky 2005b: 3. This thesis, tracing back to the philosophical view that language enables human beings to express their thoughts, a view endorsed in the biolinguistic perspective, is implemented in the current perspective on the architecture in the following way: the faculty of language (FL), a mental organ is connected to both the systems that deal with the expression of a sentence and the meaning it conveys, as illustrated in (46) below:

(46)



In the figure in (46) the input for FL exists of a lexical numeration and the output (after separating at Spell-Out) is diverged either to the Sensory-Motor (SM) interface or the Conceptual-Intentional (C-I) interface. Consequently, since the output of FL is the input for the SM and C-I systems, the outputs of the derivation should be fully legible for each connected mental component. This amounts to saying that the two interpretational systems impose conditions on the structures that are met at the interface. Such conditions are for instance principles such as Full Interpretation (stating that each element of a derivation at the interface may not contain any uninterpretable material). Moreover, since FL is assumed to have no internal levels of interpretation, all other grammatical principles apply at either one of the interfaces. This also holds for economy conditions. The fact that movement only takes place if strictly necessary follows from Full Interpretation (move in order to delete uninterpretable material) and an economy condition that also holds at LF (only move if necessary), which is formulated in terms of Move-specific [EPP] features.

Against this background the SMT simply takes natural language to be the simplest possibility to obey all conditions that are imposed on FL by the interfaces. The idea that language is the simplest solution to fulfil these interface conditions leads to the assumption that language is in some way 'perfect.' However, although some conditions are really strong (violating Full Interpretation leads to ungrammaticality), other conditions are less strong. Economy conditions are best understood in the sense that, all other things being constant, comparison between two structures leads to the grammaticality of the more economical structure and ungrammaticality of the less economical one. But, there is nothing that guarantees 'that all other things are being equal.' Crucially, if there are a number of conditions that the SM system imposes on language and a number of conditions that the C-I system imposes, there is no reason to assume that these conditions are not in conflict. On the contrary, it is much more likely to assume that, since the two mental

components function autonomously, the two types of conditions are not always compatible. It could in fact very well be the case that if a particular interface condition imposed by the SM-system is maximally satisfied, some other interface condition, operating at the C-I interface, cannot be maximally satisfied anymore.

If several interface conditions are indeed in conflict with other conditions, one cannot say anymore that there is only one solution to optimally satisfy interface conditions. In fact it turns out that there are more, equally optimal, solutions to satisfy interface conditions, which every grammar can exploit to express some particular semantic property or operator. Hence, Chomsky's SMT needs to be amended in the following way:

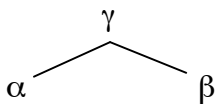
(47) *The Revised Strongest Minimalist Thesis (RSMT):*
Every grammar G exploits expressing strategies that form a maximally optimal solution to legibility conditions at the (different) interfaces.

3.1 Optimal design in the architecture of grammar

In this section I discuss which economy conditions applying at the two interfaces and what the consequences of these economy conditions are for syntactic structure. It will become clear that the semantic conditions (each lexical items should have some semantic content) and prosodic economy conditions (keep prosodic structure as small as possible) lead to a conflict, and that the only way of repair is the inclusion of additional functional structure.

Let us try to enter the mind of a purely semantically biased language engineer. From the semantic perspective the most important requirement on linguistic structure is that it allows for compositional interpretation. This means that for in (48) a particular interpretation of an element γ, $||\gamma||$ must follow from $||\alpha||$ and $||\beta||$ by means of somce mode of interpretation, e.g. Functional Application (as defined by Heim and Kratzer 1998 in (49)). Consequently, there is no reason to assume a different structure, let alone a structure that contains more (functional) material than α and β. Extra structure below γ is only motivated if the interpretation of γ does require so.

(48)



(49) FA: $||\gamma|| = ||\alpha(\beta)|| = ||\alpha||(||\beta||)$

However, it is a well-known fact about natural language that syntactic structure is not always identical to the easiest structure that compositionality might require. This is due to the fact that language, apart from semantic requirements, also needs to satisfy phonological requirements. Take a look at (48) again. Since α and β occupy different structural positions, they should be thought of as different Lexical Items, i.e. different morphological words. The structure is for instance reminiscent of a verb and its object argument. This is not the most economical structure from the perspective of the SM interface however. Let us compare the two structures in (50) and (51). The first corresponds to the structure in (48). The structure in (51) on the other hand is phonologically much more economical in terms of prosodic structure: (50) contains two words, whereas (51) contains only one Lexical Item that consists of a root and an affix. The amount of (necessary) prosodic structure is thus lower in (51) than in (50).

(50) $[LI_1 + LI_2]$

(51) $[_{LI2}$ Root-$AF_1]$

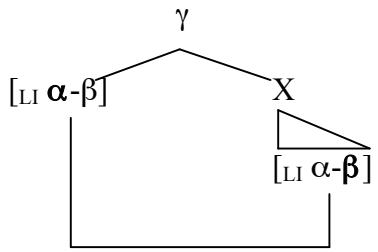
The problem with the structure in (51) however is that it cannot be interpreted as such. A corresponding structure, as given in (52), cannot be interpreted, since both α and β need to be interpreted in an independent position from which they can take scope. Hence (52) will crash at LF.

(52)

3.2 Dislocation

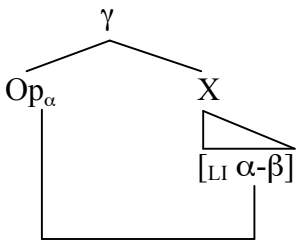
Apparently the SM-biased way to express multiple markers on one and the same structural position is doomed to fail. However, the fact that the basic syntactic operation Merge allows for Internal Merge (i.e. remerging a syntactic object) offers a solution. Suppose that an LI that encodes two semantic operators remerges. In that case nothing a priori forbids partial interpretation at LF: one part of the semantic information encoded by the LI is interpreted in one position; the other part in the other position. This is schematised in (53).

(53)



Another way of expressing two semantic operators (or properties) on one and the same node is by assuming that some part of the morphology on the LI is actually not semantically interpretable, but uninterpretable, thus marking the presence of an abstract operator. This strategy is schematised in (54)

(54)



Hence, in order to keep structures like (51) interpretable, the single word [α-β] needs to be matched to two structural positions. This is the moment where dislocation is introduced: either the complex element must be moved to a second position, such that in each position one semantic operator is interpreted, or the element carrying the affix marks the presence of an abstract operator by means of agreement. It will come as no surprise that the

structures in (53)-(54) are attested cross-linguistically. (53) is an instance of movement; (54) is an instance of agreement.

Following this line of reasoning, Move and Agree are syntactic operations whose existence can be motivated as a result of conflicting economy conditions that the sound and meaning systems impose on the faculty of language. Note that under this implementation Move is not a superfunction of Agree. Hence the old argumentation that Move is triggered by additional licensing requirements loses its ground. This directly answers the fourth research question. Move and Agree are independently triggered and therefore Move is not more complex than Agree.

Thus Move and Agree no longer have to be motivated in terms of deleting uninterpretable formal features in order to satisfy Full Interpretation. In the next section I further elaborate this idea by arguing that the existence of Move/Agree is syntax-externally motivated (i.e. not motivated to check features), but that the existence of Agree entails the existence of uninterpretable material.

4. Move, Agree and the necessity of uninterpretable features.

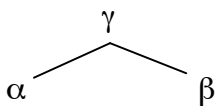
Two research questions have been addressed so far. The conclusion of section 2 is that the existence of uninterpretable material is confirmed by the large number of doubling phenomena that are attested in natural language; the conclusion of section 3 is that Move and Agree can be seen as equally economic marking strategies to link sound and meaning (i.e. to optimally satisfy conflicting economy conditions that are imposed by the C-I and SM system). The aim of this section is to connect the two phenomena and show that the perspective on Move/Agree presented above forces uninterpretable features into existence.

Now, let us see what the different marking strategies are to express the presence of a semantic operator Op_F. As concluded above, there are three different marking strategies. (i) Op_F itself is phonologically realised as an LI (being a morphological word) and merges with the constituent it operates on; (ii) Op_F is expressed on another meaningful LI and by Move one of the two copies is interpreted as Op_F at LF, (iii) Op_F is abstractly realised and its presence is marked by a marker on another LI that establishes an Agree relation with Op_F; the marker itself then does not contribute to the semantics of the sentence itself.

4.1 External Merge

It follows immediately that in a configuration as in (48), repeated as (55) below, no uninterpretable material is needed. Each semantic operator/property is introduced in a separate structural position by overt elements. Consequently no problems should rise for interpretation at LF and PF. Structures that are not based on Move/Agree, but only on external Merge, thus do not impose the existence of uninterpretable material. Therefore there is no need to assume postulate uninterpretable features in such configurations.

(55)

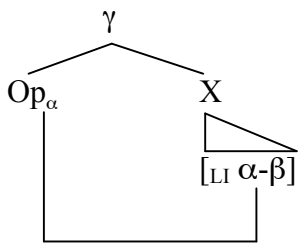


(56) FA: $||\gamma|| = ||\alpha(\beta)|| = ||\alpha||(||\beta||)$

4.2 Agree

Things are different however in cases of Move/Agree. I focus on Agree first. Agree establishes a marking relation between two elements that is imposed by lexical requirements of one of those two elements. In (57) the semantic contribution of α is not induced by the LI [α-β], but by Op_α in a different position. The existence of Op_α in its turn is marked (licensed) by the overt presence of [α-β].

(57)



Take for instance the expression of past tense. Following Ogihari 1995, von Stechow 2002 and others past tense morphology is not the phonological realisation of the past tense operator. Hence the LF representation of (58) is must be like (59).

(58) John killed Mary

(59) [John [Op_{PAST} [kill Mary]]]

This prediction is completely in line with the conclusions about Agree, which forbid that the predicate and the past tense operator are interpreted in one and the same node. Obviously, the question immediately rises how the presence of this Op_{PAST} is licensed. It must be licensed, since one should prevent that this abstract operator can be introduced without restriction. This problem is reminiscent of the problem concerning the licensing of the abstract negative operator (and the abstract modal operator), as discussed in section 2. In section 2, such an economy has been introduced in (15), repeated as (60).

(60) A phonologically empty negative operator may be assumed iff it prevents a derivation from crashing.

This licensing forms a serious problem concerning its implementation in a minimalist framework, to be more precise, a framework in which abstract operators can be freely introduced. The reason for this is that in principle nothing forbids the inclusion of an abstract operator in the numeration, leading to unattested constructions as (61).

(61) *Gianni *Op*¬ ha telefonato — Italian
Gianni has called
'Gianni didn't call'

This problem can however be solved by assuming that (60) is not a constraint working on language competence, but that it is applied to sentence parsing. A hearer needs a trigger to parse the presence of Op¬. If such a trigger is absent, there is no possibility to include Op¬ in the sentence. Note that such an account is much in line with Ackema and Neeleman's 2002 parsing account for the ban on rightward movement. Now (62) can be generalised to abstract operators of any kind:

(62) A phonologically empty operator Op_F may be assumed iff it prevents a derivation from crashing.

Note that (62) predicts that if a sentence like (58) is grammatical, and *–ed* is not the phonological realisation of Op_{PAST}, the sentence can only have a past tense reading (i.e. there is an tense operator present at LF), if the sentence without Op_{PAST} would be ungrammatical. It is *–ed* that requires the past tense operator (*John kills Mary* does not express past tense). Apparently, -ed has a grammatical property that (i) requires that it is connected with a past tense operator, and (ii) that it is semantically empty. Note that this is completely identical to saying that *–ed* has a feature that is semantically uninterpretable, but must be checked by a feature that is semantically interpretable. In other words, *-ed* must carry a feature [uPAST] that is checked against a feature [iPAST].

Hence, the operation Agree that allows language to spell out multiple markers of semantic operators/properties on a single structural node requires a feature checking mechanism. Without such a feature checking mechanism Agree could never have been possible in the first place. Hence uninterpretable material, including its checking requirements, exists by virtue of Agree. Moreover, note that this version of Agree also immediately accounts for the presence of Multiple Agree. Two markers with the same formal requirement can and by economy will be checked of by the same (abstract) operator carrying interpretable features.

4.3 Move

Now the question rises whether Move requires uninterpretable features as well. In principle nothing dictates this. If two semantic functions that are both spelled-out on the same LI, nothing prevents Move to apply partial reconstruction. This is for instance the case in the expression of Mood. An almost universal property of imperatives is that verbs with imperative morphology move to a sentence-initial position. This instance of movement simply follows from the fact that the imperative morphology can only be interpreted outside the part of the sentence that contributes to the propositional content of the illocution. This is shown in (63) for Dutch:

(63) Geef mij het boek Dutch
Give me the book
'Give me the book'

Here *geef* occupies C° and the operator that encodes the illocutionary force of an imperative takes scope from C°, whereas the verbal contents are interpreted in V° (see Han 2001, Zeijlstra 2006 who use the ban on negative imperatives as a piece of evidence for this conclusion). The derivation of (63) includes remerge of *geef*, yielding the following structure:

(64) [[C° geef] … [V° geef]]

Since *geef* contains two semantic functions, Op_{IMP} and the predicate GIVE', the two must take scope from different positions. Given the semantic constraints on the possible positions where Op_{IMP} can be interpreted and the ban on interpretation of two semantic functions in one position, the only LF representation that will not crash at LF is (65).

(65) [[C° Op_{IMP}] … [V° GIVE']]

Note that Move in this case has been triggered by semantic requirements for which no feature checking system is needed. Hence this kind of movement may be referred to as *foot-driven movement* as semantic requirements applying to the root position of the verb drive this instance of movement. Instances of foot-driven movement have previously been proposed by Platzack 1996, Koeneman 2000, Zwart 2004, Van Craenenbroeck 2006 on other grounds (though Koeneman's 2000 ideas on flexible syntax are very much in line with this approach) and it is thus a welcome result that this case of movement directly follows from the RSMT. In a way, this proposal forms a semantic motivation for pied-piping in the sense that it explains why other features must move along with the essential features that be moved: the latter ones are not formal features at all and syntax is thus blind to them.

This does not imply however that Move can always do without uninterpretable features. Note that nothing prevents Move to mark a higher instance of uninterpretable features. This becomes clear when discussing preverbal negation in Italian. As has been pointed out before, in order to express sentential negation, a negative operator must outscope the entire vP. This can in principle be done in two ways: either by merging a negative operator to vP, or by moving an element carrying [uNEG] to a position outside vP, so that it must be c-commanded by a negative operator. Both ways are attested in Italian: in (66) the negative operator *non* is merged to VP and checks the subjects [uNEG] feature; in (67) the subject moves to Spec,TP and the abstract operator $Op_{\neg}$ checks [uNEG]. In the latter case the movement of the subject to a position outside vP prevented $Op_{\neg}$ from being included vP in situ.

(66) [$Non_{[iNEG]}$ ha telefonato $nessuno_{[\sout{uNEG}]}$] Italian
Neg has called n-body
'Nobody called'

(67) $Op_{\neg[iNEG]}$ $nessuno_{[\sout{uNEG}]}$ ha telefonato
Neg has called n-body
'Nobody called'

Since Move may also function as a marker (not fundamentally different from inflectional morphology) in those cases dislocation of uninterpretable material is required as well. Note that this requirement follows from the fact that in the end, Agree is able to establish the necessary relation to $Op_{\neg}$. Hence, in principle Move does not require the existence of uninterpretable features, but since Agree drives their existence in the first place Move can also be applied as an instance of marking the presence of an abstract operator.

5. Conclusions

In the introduction I raised four research questions:

i. How can the existence of uninterpretable material be motivated?
ii. Why does natural language exhibit uninterpretable material in the first place?
iii. Why are uninterpretable formal features deleted under Agree?

iv. Why is Move triggered if the simpler operation Agree could establish a feature checking relation in the first place?

In this paper I have first argued that only doubling phenomena provide proper evidence to demonstrate the existence of uninterpretable material. On the basis of data exhibiting NC and MC I have concluded that uninterpretable material is indeed present in natural language.

Moreover I have argued that the current minimalist model of grammatical architecture already by itself creates the possibility of different marking strategies with respect to semantic functions. Multiple strategies are possible because some strategies are more semantically and others more phonologically oriented. In section 3, I argued that the more phonologically oriented marking strategies require movement and agreement. Hence, the existence of Move/Agree has received independent motivation.

Finally I have demonstrated that only Agree requires the existence of uninterpretable features. This observation explains why Agree imposes feature checking. Uninterpretable features result from Agree, not the other way round. Apart from that I have concluded that Move itself does not require the existence of uninterpretable features. Move can function without, yielding foot-driven movement. I have argued however that foot-driven movement is not the only instantiation of Move. Move may also replace LI's containing uninterpretable features. In those cases Move functions as an agreement marker.

To conclude, I have argued that a new minimalist view of the architecture of grammar, which takes language to be an optimal solution to *conflicting* interface constraints, predicts the existence of three different marking strategies to express semantic functions (External Merge, Internal Merge and Agree). Since Agree calls uninterpretable features into being, the existence of uninterpretable material in natural language thus has received independent motivation.

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