

If non-simultaneous spell-out exists, this is what it can explain¹

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x.1 Problem

In this paper I show how non-simultaneous spell-out can be employed as a derivational mechanism to explain two distinct yet very similar phenomena, total reconstruction and quantifier raising. Following Marušič and Žaucer (2006) and Marušič (2005, 2007, to appear), I assume that non-simultaneous spell-out is a derivational option. Armed with the possibility of non-simultaneous spell-out, the theory is shown to be able to derive total reconstruction as a case of spell-out to the LF interface occurring before the spell-out to the PF interface, and Quantifier raising as the opposite, i.e. a case of spell-out to the PF interface occurring before the spell-out to LF. Total reconstruction and quantifier raising thus turn out to actually be parallel, just flipped phenomena, which can be derived with the same mechanism. A common derivational mechanism had been proposed for the two phenomena before, but as I will show, the explanation using the copy theory of movement is not favored.

x.1.1 Total reconstruction (as the clearest case of reconstruction)

As is well known, examples like (1) are ambiguous. The indefinite subject in (1) can be interpreted either specifically or non-specifically, in the scope of *likely*. There need not be any particular Englishman in (1) that has the property of being likely to be arrested for hooliganism during the World Cup. It could be that it is just likely that someone from England will be arrested, since there are a lot of hooligans in England and they are often arrested during World Cups.

(1) An Englishman is likely to be arrested for hooliganism during the World Cup.

likely > ∃

The DP in (1) can be interpreted in the lower clause, in which it originates. But it does not surface in the embedded clause. Since the surface position of the DP in (1) is higher than the

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surface position of *likely*, some operation had to either move the DP up for pronunciation or move the DP down for interpretation. Both of these possibilities have been explored.

As pointed out by Sauerland and Elbourne (2002), this type of reconstruction, total reconstruction, is different from the better known and more widely discussed *binding* or *partial reconstruction*, as in (2) (sometimes also called “connectivity effects”).

(2) [Which article about himself_k]_i did Mary ask every student_k to read t_i?

In order for the reflexive to be properly bound by the universal quantifier, part of the fronted *wh*-constituent must reconstruct to its base position. As pointed out by Saito (1989), the reconstruction cannot affect the entire *wh*-constituent, or else the interpretation of (2) should be something like (3). This is clearly not the case, since (3) is a different question. The actual LF representation of the question in (2) is something like (4).

(3) Did Mary ask every student [which article about himself]_i to read t_i?

(4) Which_i did Mary ask every student_k to read [article about himself_k]_i

Regardless of the best way to analyze them, these cases are crucially different from total reconstruction, the phenomenon discussed here. In total reconstruction, it is the entire moved phrase that occupies a lower position at LF.

May (1985) derives total reconstruction using a lowering operation at LF, that is, after syntax has completed all upward movements. In cases like (1), the entire DP first raises over *likely* and then lowers to the clausal boundary where it takes scope, as shown in (5).

(5) a. [An Englishman]_i is likely to t_i be ... (in syntax proper)

└──────────────────┘

b. ___ is likely [an Englishman]_i to t_i be ... (at LF)

└──────────────────┘

Boeckx (2001) offers a different version of LF lowering. He claims that arguments are always interpreted in the same position in which they are assigned case, while the cases of indefinites being interpreted below the raising predicate can be explained as an LF process of (optional) insertion of a null LF expletive (*there*_{LF}). The expletive *there*_{LF} pushes the indefinites down for interpretation so that they undergo literal lowering. Quantifiers like

‘everyone’ cannot be associates of an expletive (**there is everyone in the room*), therefore an expletive cannot be inserted in a sentence with a raised quantifier, which is why quantifiers do not or cannot lower at LF (Boeckx 2001 claims that only indefinites reconstruct). Lowering is an operation happening after syntax that returns the syntactic derivation to a previous stage. Since it is an undoing operation, it is unwanted.

Chomsky (1993) proposes a different approach to reconstruction using the *copy theory of movement* (see also Hornstein 1995, Romero 1998, Fox 1999). Following the copy theory of movement, movement leaves a copy rather than a trace in every position the moved constituent moves through. When the derivation reaches the interfaces, one of the two copies of the non-trivial chain must be deleted. Reconstruction results when the two interfaces delete different copies. In the case of total reconstruction, the first-merged constituent gets deleted at the PF interface and interpreted at LF, while the remerged higher copy deletes at LF and gets interpreted at PF. On top of this being an undoing operation, it creates an additional problem. Heim & Kratzer (1998) claim that movement creates a λ -operator in addition to the copy at the top of the chain. If the topmost copy is deleted, then the λ -operator is left alone, which turns the sentence into a function.

To avoid an undoing operation like LF lowering or copy-deletion, Sauerland & Elbourne (2002) defend the proposal by Aoun & Benmamoun (1998) that total reconstruction comes as a result of PF movement. Aoun & Benmamoun show that in certain Clitic left-dislocated phrases in Lebanese Arabic, total reconstruction can only be explained if we resort to PF movement. That is, if the dislocated constituent moves in the PF component, we would predict that this movement would not affect its interpretation and that the dislocated constituent would not be interpreted in its surface position but rather in the position from where it PF-moved, which is the syntactic position where it was located at the time of spell-out to PF. Sauerland and Elbourne (2002) elaborate and make the stronger claim that total reconstruction is available only as a result of PF movement and that the only way to get the interpretation lower than pronunciation is by moving the constituent outside of syntax proper.

As Sauerland & Elbourne (2002) explain, the subject in (1) is part of the common syntactic derivation to the point of the embedded TP. They assume TP is a phase, so that at this point the lower portion of the structure is sealed off. Because TP is a phase, the subject is frozen in its position, and later sent to PF and LF. When the entire derivation is over and both clauses spelled-out, the subject moves higher in the PF component, in order to satisfy a PF interface condition. Since this is a movement happening only at the PF interface, it has no influence on the LF component and thus no influence on the interpretation of the subject. The

subject gets interpreted in the position where it was located at the point of spell-out, which is inside the embedded clause in the case of the examples like (1).

In order to derive the result they need, Sauerland & Elbourne (2002) have to argue that the need to have a filled SpecTP—the EPP—is actually a PF condition. By itself, this is an acceptable assumption (cf. van Craenenbroeck & den Dikken 2005), one I will endorse too, but it seems strange that it could be satisfied with PF movement. After all, the EPP feature has a specific syntactic position, so it seems strange that pure PF movement could target this specific syntactic position.

More importantly, Sauerland & Elbourne's analysis of (1) makes a wrong prediction. If at the point of TP the derivation reaches a phase and everything inside TP gets frozen in place or shipped to the interfaces, we predict that the DP that is later PF-moved to a higher position should not have any syntactic effect on the higher portion of the sentence, just like its higher position at the PF interface has no influence on the LF side of this derivation. Such a spelled-out DP should not participate in the subsequent syntactic derivation. In particular, the low-interpreted DP—with narrow scope interpretation—should not trigger verb agreement on T of the matrix clause, since its *phi*-features are already spelled out and have left the syntactic derivation in the lower phase. The features on the matrix T could only get default values (if any at all). But this is not what we find. The plural DP in (6) is subject to total reconstruction and at the same time agrees with the upper T.

- (6) a. Four Basques **are** likely to win all the jerseys. *likely* > *four*
b. Scissors **are** likely to be in the drawer. *likely* > \exists

To derive sentences in (6), agreement must happen at the PF interface, crucially after spell-out. But Sauerland & Elbourne crucially need agreement to happen in the stem derivation in order to explain facts like (7) from British English. As seen in (7), collective names can trigger plural agreement even without overt plural marking (supposedly with the semantic feature [Mereology: plural]). When they do trigger plural agreement in raising constructions, the subject cannot undergo total reconstruction so that the indefinite only receives the specific reading, (7b). This means that it was LF-interpreted in its surface position. The agreement on the verb is forced by [Mereology: plural], which as a semantic feature never spells-out to PF. Since it is a semantic feature, it could not have been sent to LF inside the lower TP phase,

otherwise there would be nothing to interpret in the matrix clause, and there would be no features to trigger agreement with the matrix T.

- (7) a. A northern team is likely to be in the final. $\exists > \textit{likely}, \textit{likely} > \exists$
b. A northern team are likely to be in the final. $\exists > \textit{likely}, *\textit{likely} > \exists$

Given this, a PF-moved DP should not be able to trigger agreement in the matrix clause. But as we see in (6), it does. Note that AGREE, which could in principle explain the facts in (6) and (8) (e.g. Chomsky 2000, 2001), cannot be applied. If AGREE is active in (6), it should also be active in (9), allowing plural verbal agreement in British English, which it doesn't. Similarly, it should allow reconstructed interpretation of the subject with plural agreement in (7b), but it doesn't.

- (8) a. There **is/are* likely to be 5 Basques among the top 10.
b. There **is/are* likely to be scissors in the drawer.
(9) * There are likely to be a northern team in the final.

Den Dikken (2001) gives a different analysis of collective names, or as he calls them, "plurilinguals". According to him, nouns like *team* or *committee* are not special because of the LF feature [Mereology: plural], but rather because they are part of a DP headed by an empty plural *pro*. Den Dikken proposes that (9) is out not because AGREE cannot apply but because pronouns cannot be associates of *there*. Note that even if we explain (9) without anything blocking AGREE, we are still left without an explanation for the lack of ambiguity in (7b).

So, Sauerland and Elbourne's (2002) account of total reconstruction does not appear to be completely correct. But since they do seem to be on the right track, I want to modify their proposal in the direction of an observation they make in passing. If we assume that spell-out can happen to a single interface (as already argued for by Marušič and Žaucer 2006, Marušič 2005 etc.), then we can easily explain total reconstruction as an instance of LF-only spell-out at the embedded TP phase. As argued extensively in Marušič (2005, 2007), non-finite TP has the typical properties of a phase at the LF interface but not at the PF interface. The obvious conclusion is that non-finite TP only spells-out its complement to the LF interface, while whatever was meant for the PF interface remains in the derivation. If the PF side of the embedded clause is still operational, it can also move higher in the structure, in particular, to

check the matrix EPP and to get case. The operation responsible for the plural agreement in (6) and (8) is thus indeed AGREE, but importantly, the features that establish AGREE are the PF features operating in syntax, in the not-yet-spelled-out, extended PF phase. The *phi*-features on the matrix T are checked by the PF related plural ([_{PF} Plural]) features of the DP. Regardless of the analysis of "plurilinguals" that we accept, these do not have any [_{PF} Plural] features but either an unpronounced plural pronoun or an [_{LF} Mereology: Plural] feature. So, since only PF-related features of the lower clause are visible for the derivation at the matrix clause, "plurilinguals" cannot trigger plural agreement in (9).

We will return to the actual derivation of the raising constructions in section 3.

x.1.2 Quantifier Raising (as the clearest case of covert movement)

Covert movement presents the standard phase theory with a serious challenge. If phase boundaries freeze all syntactic movements, nothing should escape out of a phase. If something does escape, such movement can only happen at the two interfaces, so that we could only be talking about purely LF (and PF) movements. Since covert movement is typically argued to be syntactic, we would not want to push it completely into LF. Chomsky (2005, 2008) cites Nissenbaum's (2000) solution to this "problem", which takes the difference between *covert* and *overt movement* to be a result of the different timing between spell-out and move. If movement to the edge applies prior to spell-out, movement is overt. If spell-out applies prior to movement to the edge, movement is covert. With the standard assumptions that spell-out is simultaneous and that spell-out creates uncrossable boundaries, there should not be any movement after spell-out, therefore, there should not be any covert movement. Nissenbaum (2000) assumes spell-out is not simultaneous to both interfaces, but rather that only phonological features get spelled-out to PF, while the others remain in the derivation on its way to LF. Since spell-out is said to apply cyclically to both PF and to LF (Chomsky 2001, 2004, Legate 2001, 2003), positing PF-only spell-out does not make much sense.

Cecchetto (2004), following Nissenbaum (2000), argues that a single LF computation is actually needed since the evaluation of Principle C, which happens at LF, takes into account the entire LF of a complex sentence, not just a phase. Long distance Principle C violation can be observed over as many phases as one can think, (10). Now, since Principle C does not seem to observe any locality conditions, one is tempted to put it completely outside of the syntax. Additionally, if we follow this kind of reasoning, then not even spell-out to PF should

be cyclic. Intonation, for example, is calculated over the entire utterance, regardless of the number of phases it consists of.

(10) * He_i said Jill thought Mary believed Ann heard Peter say that Rose once saw Jim_i.

If we abandon the position that spell-out applies cyclically to both interfaces, we lose the prime conceptual motivation for phases – saving on memory. LF and PF chunking of a sentence into phases thus still seems conceptually appealing.

The other influential proposal takes covert movement to be a side effect of the copy theory of movement. The so-called Phonological theory of covert movement was proposed by Bobaljik (1995) and Pesetsky (1998) (see also Fox & Nissenbaum 1999). This analysis takes covert movement to be essentially the same as overt movement in that it is just regular copying and remerging of the elements from inside the structure. The difference between covert and overt movement is made at the interfaces. At the LF interface, the lower copy deletes or is assigned the semantics of a variable and the upper copy gets fully interpreted, while at the PF interface, the upper copy deletes and the lower one gets pronounced. This proposal makes the two phenomena mentioned in the beginning of the paper—total reconstruction and quantifier raising—look essentially the same. The two phenomena are treated as two sides of the same coin. This is obviously a welcome result, but since this is basically the same proposal as the analysis offered for total reconstruction by the copy theory of movement, it also shares the problems of that proposal, and it can thus be rejected using the same objections. Deletion of a copy is an unwanted undoing operation, which should ideally be avoided. Additionally, it is not clear what principles determine when to delete which copy; this gets particularly problematic in large complicated sentences, where determining which copy is higher/lower and which copy should be deleted is far from trivial.

Adopting the existence of non-simultaneous spell-out, I propose that covert movement is invisible at the surface only because what moves up has already been spelled-out to PF at some earlier step in the derivation. Since every syntactic object is a composition of formal, semantic and phonological features, the element in question will—even when already without the spelled-out phonological features—still consist of formal and semantic features that can participate in the derivation. Obviously, we need a particular phasal composition in elements that undergo covert movement. As I will show in section 4, the kind of phasal composition that we need to derive quantifier raising is exactly the kind of phasal composition that we find if we look at the DP.

x.2 Non-simultaneous spell-out

Building on the Minimalist Program and the Phase theory (Chomsky 2001, 2004, 2005, 2008, Uriagereka 1999 etc.), a phase is a complete stage in the derivation, with its own numeration, applications of the operation MERGE, and its own spell-out. Syntactic objects can move out of the phase only by moving to the phase edge, where they remain visible for operations in the next higher phases.

According to Chomsky (2001, 2004, 2005, 2008), there are two strong phases: ν P, which marks the completion of the argument structure, and CP, which marks the completion of the propositional structure. Uriagereka & Martin (1999), Grohmann (2000), and Sauerland & Elbourne (2002) proposed that TP is also a phase. Reasons to treat TP as a phase are the following. TP has the EPP feature, which is sometimes also called the edge feature since it has no other role but to allow elements from inside the phase to raise up to the edge of the phase, where they remain visible for further computation. The TP is the projection of agreement, it assigns nominative case, which makes it parallel to the ν P, which assigns the other structural case—accusative case. TP further maps to a proposition, which is most clearly seen with modals. For reasons of space, I will not go into the discussion of the phasal properties of TP. A detailed discussion is available in Marušič (2005, 2007, to appear). One thing has to be added, though: just like finite TP, non-finite TP also maps to a proposition. Seen from LF, both finite and non-finite TP are both clearly phasal. Here I am assuming that TP is a phase at the LF interface, a conclusion reached in Marušič (2007, to appear).

When the phase is completed, it is frozen and shipped to the two interfaces. The shipment is said to happen simultaneously to both interfaces (Chomsky 2004, 2005, 2008, Legate 2003, 2004). (Or at least, this is how the derivation usually proceeds.)

The structure is sent to the two interfaces in units. We would expect that these units of spell-out remain units also at the two interfaces. This appears to be the most natural way units at the two interfaces are created. By saying that units at the interfaces are always a reflex of phases, we reduce the computational mechanism at the interfaces.

Phases are propositional elements, and thus some units of information (Chomsky 2001, Marušič 2005). On the PF side, phases are reflected as phonological units. They have some level of phonetic independence (Chomsky 2001, 2005, Marvin 2002, Marušič 2001) and can correspond to prosodic words, prosodic phrases, intonational phrases etc. These are also units on which sentential stress is computed (Legate 2001, 2003, Matushansky 2003, cf. also Cinque 1993, Truckenbrodt 1999, Wagner 2003).

possibility but rejected in Matushansky (2003). But the kind of non-simultaneous spell-out they proposed is different from the one discussed here.

Megerdoomian (2003), comparing Armenian and Japanese causatives, claims that spell-out to LF is universal and applies at the strong phases identified by Chomsky (2001 etc.), while PF spell-out is subject to parametric variation among languages and is thus the prime reason why what appears as a single word in one language can be realized with multiple words in another. In the case of Japanese and Armenian causatives, the difference is that in Japanese both types of causatives are realized as morphemes attached to the verb, whereas in Eastern Armenian only one causative construction adds a morpheme to the verb, while the other is realized as an independent word. Since LF spell-out is universal, both languages have, semantically speaking, the same two kinds of causatives; this is also clear from Megerdoomian's syntactic tests, on which each member of the pair in one language behaves in parallel with one member of the pair in the other language. Megerdoomian explains the difference between the two languages as a result of the fact that in Armenian one of the two causative constructions has an additional PF phase, with the result that one of the two causatives is composed of two different phonological units. Since Japanese does not have this extra PF phase, both causatives in Japanese are morphemes that form a single word together with the verb. Megerdoomian concludes that PF spell-out is subject to parametric variation between languages.

A different view on non-simultaneous spell-out is advanced by Felser (2004). Looking at a *wh*-copy construction—*wh*-questions with multiple *wh*-words at every CP between the clause from which the *wh*-word raises and the fronted *wh*-position—she claims that it is the PF spell-out that applies universally and automatically to partial phrase markers which form relatively independent phonological or processing units. LF spell-out, on the other hand, is restricted to candidates that are convergent. In other words, Felser's proposal is just the opposite of Megerdoomian's. For Felser, certain phases can spell-out only to the PF interface, but there are no phases spelling-out only to LF.

According to the view I am defending here, the spell-out of a phase can be restricted to either interface. In a way, this is an integration of the two proposals by Megerdoomian (2003) and Felser (2004), making the two interfaces parallel with respect to syntax.³

³ In view of the fact that the two interfaces are not completely parallel, it is not so obvious that this is a desired position. LF seems to be pretty much universal for all natural languages, while this quite clearly does not hold for PF. This should suggest LF is (more) central to the language faculty than PF. For the most part, languages differ between each other only in their PF (with sign languages presenting a completely different problem).

x.3 Total reconstruction

The two syntactic approaches to total reconstruction involve initial overt movement followed by an optional undoing operation, either lowering or deletion of the remerged element. To avoid the undoing operation, Sauerland & Elbourne (2002) defend a proposal by Aoun & Benmamoun (1998) that total reconstruction comes as a result of PF movement. As was shown earlier, their proposal predicts that when it totally reconstructs, a fronted indefinite should not have any syntactic effect on the matrix clause, since it was spelled-out to the two interfaces already inside the embedded clause. But reconstructed indefinites do participate in the syntactic derivation of the matrix clause. As we shall see, if we accept non-simultaneous spell-out, the relevant facts presented in section 1 can easily be explained.

Before we go into the actual proposal, let us have a look at some properties of the raising constructions, since it is not so obvious that they involve total reconstruction at all. Compare (13) and (14). As noted by Lasnik (1998), the two readings in a typical example argued to involve total reconstruction are not really distinguishable, as is the case in (13). But if we change the raising predicate and make the two readings distinguishable, the sentence only allows the non-reconstructed reading. According to (14), it is not the case that the likelihood for every coin to land heads is 3%; it is rather the case that for each coin, its individual likelihood to land heads is 3%.

- (13) *Every coin is likely to land heads.* $\forall > \textit{likely}, \textit{likely} > \forall$
(14) *Every coin is 3% likely to land heads.* (Lasnik 1998:93)
 \neq it is 3% likely that every coin will land heads

Since (14) clearly shows that there is no reconstruction and since the two readings in (13) are not distinguishable, the only reasonable conclusion is that there is no reconstruction in either of the two examples. But this is not the entire story. Bobaljik and Wurmbrand (1999) note that it is not really clear that the modified *likely* predicates behave like the plain *likely* predicates, since it is not really clear even in the case of indefinites that they reconstruct below the modified *likely* predicates. So for example, in context with three coins, (15) does not necessarily have the reconstructed interpretation of the subject, while at the same time, in a context with only two coins, (16) does have the reconstructed interpretation. Bobaljik and Wurmbrand (1999) do not draw any conclusion from this, but suggest that “n%-likely” and “likely” might not be syntactically equivalent (Bobaljik and Wurmbrand 1999, p. 13).

Starting from Lasnik and Saito (1992), who suggested that for every raising verb or adjective there is also a homophonous control verb or adjective, we could suspect that the potential difference between the two types of *likely* predicates lies precisely in the fact that those predicates that allow reconstruction are clearly raising predicates, while those that do not allow any reconstruction behave more like control predicates.

- (15) One coin is 38% likely to land heads.
- i. One of the coins is weirdly weighted in favor of tails.
 - ii. ?# It is 38% likely that only one coin will turn up heads.
- (16) One coin is likely to land heads.
- ii. ✓ It is likely that only one coin will turn up heads.

Regardless of the difference between the two types of predicates, the fact is that unlike the universal quantifier, indefinites do seem to reconstruct. This is also the conclusion of Bobaljik and Wurmbrand (1999, p. 22). Similarly, Boeckx (2001) claims that only indefinites reconstruct in raising constructions. For this reason, I will be looking only at indefinites in raising constructions.

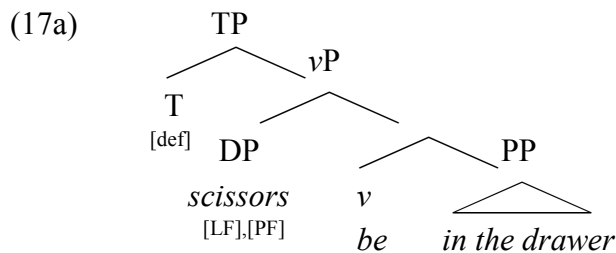
x.3.1 A different approach to PF movement

If we accept that phases can spell-out features of the constructed syntactic structure to PF or LF alone, we can derive PF movement as a special case of syntactic movement. The difference between this kind of special movement and the regular syntactic movement is in the object that moves, since in one case, it is a complete lexical item, and in the other, a lexical item lacking part of its features, namely all the LF-related features.

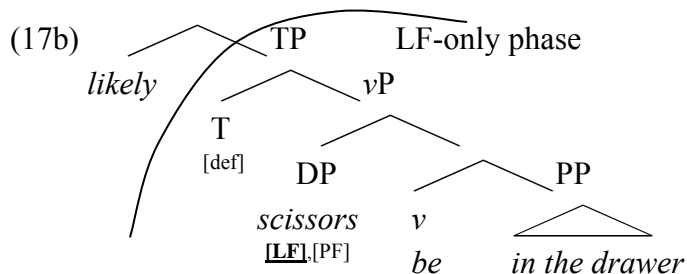
When the derivation of a raising construction reaches the embedded TP projection, a “part” of the structure gets frozen, and later (at the next higher phase) only this “part” gets spelled out. As explained earlier, I am assuming that non-finite TP is a non-standard phase boundary (cf. Marušič 2005, 2007, to appear). Semantically, non-finite complements are propositions, but phonologically, they show no independence, as extensively argued for in Marušič (2007). Non-finite TP thus appears to be a spell-out unit only for LF. It is an instance of a non-simultaneous phase spelling out its complement only to the LF interface. After LF-only spell-out, the derivation is left with the “part” that would be sent to PF if non-finite T was a complete phase and the unchecked formal features. Accepting this kind of approach,

we retain all the movements in syntax proper. In a way, this is a syntactic way of doing PF movement, since it is an instance of movement that only affects the PF interface.

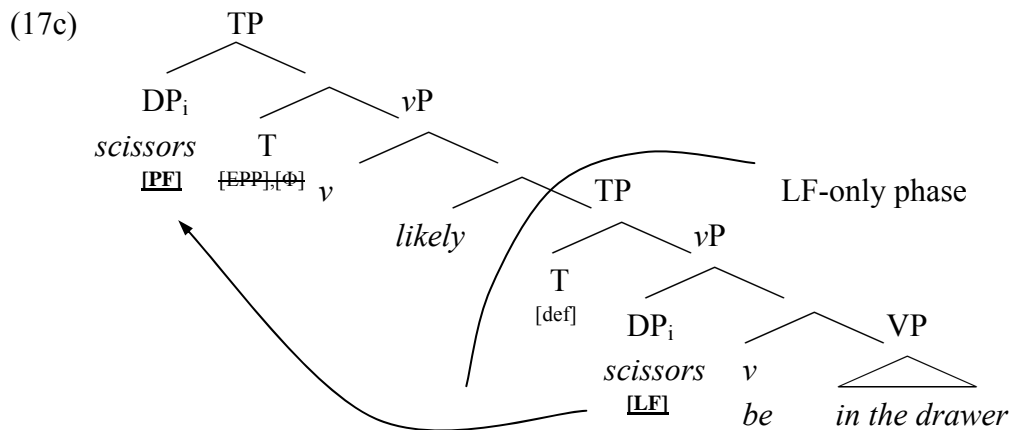
The lower clause is derived in the usual way by stem derivation all the way to the TP. Assuming that EPP is a PF condition (cf. van Craenenbroeck & den Dikken 2005) and thus related to PF phases, the embedded non-finite T has no EPP. This means the lower subject does not raise to specTP, as shown in (17a).



When *likely* is merged into the structure, a new phase begins, (17b). At this point, the LF-related features ($[_{LF} x]$) of the complement of *likely*, including the $[_{LF}]$ features of the lower subject in the Spec of the lower vP phase, are sent to the interpretative component and become completely inaccessible. Since *likely* only induces an LF phase, all the PF related features ($[_{PF} x]$) are left untouched.



At the level of the matrix TP, the subject's "PF part" (lacking the semantic features $[_{LF} x]$) can move to SpecTP to check the matrix EPP and the *phi* features of the upper T. The phonological features of the moved subject include $[_{PF} \text{Plural}]$, so that agreement between the subject and the matrix T is not surprising.



When the derivation reaches the root CP, the derivation is completed and the entire sentence spelled-out to both interfaces. Since the subject's PF- and LF-related features were split into two positions, the subject *scissors* is pronounced in the upper subject position and interpreted in the lower subject position. In this way, it is easy to understand why we can interpret (18a) as (18b).

- (18) a. Scissors are likely to be in the drawer.
 b. It is likely that scissors are in the drawer.

The fact that agreement is triggered both by "plurals", whose plurality is not realized phonologically, and by purely phonological features like [_{PF} Plural] (these features are part of pluralia tantum nouns) suggests that agreement cannot happen in only one part of the derivation (either only in PF or only in LF). Agreement is a syntactic phenomenon and occurs during the derivation.

(18a) is actually ambiguous. The indefinite can take either narrow or wide scope with respect to the predicate *likely*. I take indefinite noun phrases to be structurally ambiguous between true indefinites and quantifiers. Since quantifiers do not reconstruct in such cases, the other reading is easily explained. The way we derive the exclusively wide scope reading of the universal quantifier in (13-14) is also the way the wide scope reading of the indefinite is derived. I discuss this at the end of the next section.

x.4. Quantifier Raising

Quantifier raising applies to (strong) quantifiers, which are a subgroup of DPs. It seems reasonable to expect that QR exists because of the specifics of the DP structure. The main

idea is that quantifiers lack a phase that would send their structure to LF, but that the projection that is not an LF phase does send their structure to PF.

I am taking the top projection of a nominal phrase to be KP (Bittner & Hale 1996). KP/case phrase can very reasonably be assumed to be a PF phase; after all, case is a PF condition. Since case is uninterpretable at LF, it seems unintuitive to claim that at the same time, it is also the LF phase; as just noted, case is a condition at the PF interface. We can try to see how such a structure would behave. There will be no differences after such a nominal phrase merges into the clausal structure, but at the next phase, the internal structure of this nominal phrase will become partially invisible. In particular, only the LF features of the complement of K will be visible and only these will be able to participate in the subsequent stages of the derivation. The proposed structure of the nominal phrase is given in (19).

$$\begin{array}{l}
 (19) \qquad \qquad \qquad \text{PF \& LF phase} \\
 \qquad \qquad \qquad \text{[}_{\text{KP}} \text{ K [}_{\text{QP}} \text{ Q [}_{\text{NP}} \text{ N]]} \text{]]} \\
 \qquad \qquad \qquad \text{PF-only phase}
 \end{array}$$

The lower NP phase of (19) is not controversial (nor is it really important for the present discussion). It has been argued for by Svenonius (2004), and one can easily find more arguments for it, such as the fact that at LF, quantifiers are separable from their restriction (cf. Ruys 1997). This kind of phasal composition is suggested also by Matushansky (2003). She uses a number of tests to check the phasehood of the nominal phrase and concludes that PF and LF diagnostics produce contradictory results: while LF diagnostics show that DP is not a phase, PF diagnostics show that it is.

The view that the highest projection of the noun phrase is a PF phase is quite intuitive. Noun phrases are phonetically independent, they form a prosodic phrase, and participate in the non-clearly syntactic movement operations. Matushansky (2003) gives examples of clefting, pseudo-clefting, predicate fronting, and *though*-constructions. In all of which, DPs can easily participate.

Being an LF phase is typically equated with forming a proposition. Nominal phrases are not propositions (they are not of the semantic type $\langle t \rangle$). Quantifier and its NP-restriction does not form a natural semantic constituent. The semantic unit includes both the restriction (NP) and the scope (the rest of the clause) of the quantifier. Therefore, unless one assumes the DP structure of Larson (1991), where the scope of the quantifier is a *pro* in the SpecDP, the nominal phrase cannot be propositional. If it is not a propositional element, it is not an LF

phase. Further arguments against seeing the nominal phrase as an LF phase are discussed in Marušič (2005, to appear). Following Sauerland (2005), I show there that the nominal phrase is not a scope island for QR in inverse scope linking constructions, as in (20).

(20) *Tom read* [_{QNP_m} *one book by* [_{QNP_e} *every linguist*]].

Sauerland (2005) develops a test using inverse scope linking DPs with an intensional verb. Since indefinites are very useful for testing narrow scope with respect to an intensional predicate and plurals to test wide scope, the inverse scope linking construction we want to use has a plural nominal as the complement of an indefinite. As is shown in (21), the interpretation with the embedded nominal scoping over the intensional predicate and the non-embedded nominal scoping under the intensional predicate is available, (21d). This interpretation, which is the salient reading in a context where Mary writes in a personal add that she is looking for a Catalan or a Basque man to marry, clearly shows that DP cannot be a scope island (example (21) from Sauerland 2005, p. 306, ex. (8)).

- (21) a. Mary wanted to marry someone from these two countries.
 b. 'For these two countries, there's someone that Mary wanted to marry.'
 (two > someone > want)
 c. 'Mary's desire: for these two countries, marry someone from that country.'
 (want > two > someone)
 d. 'For these two countries, Mary had the desire to marry someone from that country.'
 (two > want > someone)

An additional argument can be given against DP's scope island status. If the contained quantified nominal phrase (QP_E) can only scope at the edge of the containing quantified nominal phrase (QP_M), then we have strong predictions in cases where there are three quantified nominal phrases stacked in a single DP. In particular, the most embedded QNP should not scope over the main QNP when the main QNP scopes over the middle QNP, as schematized in (22).

- (22) a. [_{QP_m} Q [_{NP} ... [_{QP_{e/m}} Q [_{NP} ... [_{QP_e} Q [_{NP} ...]]]]]]]
 b. *QP_e > QP_m > QP_{e/m}

But in a situation where Bill is a building manager and takes care of several buildings, the interpretation of the quantified nominal phrases in their base order in (23) refers to no key. The most salient reading in this situation is the reading where the most embedded QP_E takes scope over the main QP_M , with the meaning paraphrased in (23b).

- (23) a. Bill got a key for all doors in all his buildings.
b. Bill got a master key that opens every door for each house.

The DP is therefore not a scope island; at least some quantifiers can take scope higher and outside of the DP. This by itself does not necessarily mean that quantifiers cannot take scope at the DP edge, and that the DP is not an LF phase, but nonetheless, this is what Sauerland (2005) suggests, thereby making the claim regarding possible scope positions stronger. If the DP or KP is indeed not an LF phase, then we get just the kind of composition we were looking for in order to derive QR. The top projection is a PF phase, blocking any movement of any PF-related features from inside the DP. At the same time, the same projection is not an LF phase, which means that the internal part of the DP is LF-visible at the later stages of the derivation and can move higher, if a [+quant] feature that marks scope in the clause attracts it.

I am assuming that scope is marked in the clausal structure with the presence of a [+Quant] feature in the TP (or any other LF-phase projection, except the CP). Such a feature is parallel to the [+WH] feature marking *wh*-scope in the CP. This feature attracts the [+Q] feature of the quantifier, resulting in the LF vs. PF split of the internal part of the nominal phrase (with KP being a PF phase, movement of the PF part of the internal structure of the KP is blocked).⁴

x.4.1 Quantifier Raising in raising constructions

DPs need case, which they get from the two strong phases, TP and vP . Case is a condition on the PF interface. The two strong phases have an EPP to check. The (visible) EPP is a PF interface condition and is as such bound to PF phases. Extending the split between PF and LF, I propose an LF equivalent of the EPP, which is checked by the raised quantifiers. Just as

⁴ Presumably, it is the [+Q] feature of the quantifier that makes the difference between quantified noun phrases and other nominal phrases. The other option would be to say that referential expressions (and indefinites), that is, nominal phrases not undergoing quantifier phrases, are both LF and PF phases. Arsenijević (2007) argues that phases are referential, which suggests that nominal phrases—except, obviously, quantified nominal phrases—are phases (also for the LF interface). I do not take position regarding these two options.

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