On the mechanics of Spell-Out

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7.1 Introduction and overview

This paper considers evidence from various Slavic languages bearing on the mechanics of Spell-Out. Spell-Out is typically described as a ‘rule’ (cf. e.g., Hornstein et al. 2005: 46–7) which applies to a syntactic representation, separating structure relevant for phonetic interpretation from structure relevant for semantic interpretation and sending that information off to the Phonetic Form (PF) and Logical Form (LF) interfaces, respectively. Concentrating on the PF-side, this paper shows that, once one begins to probe how Spell-Out actually works, one quickly discovers that Spell-Out in fact masks a confusing array of interacting processes needed to convert the abstract hierarchical arrangement of feature bundles we take to be syntax into the linearized sequence of articulatory instructions we take to be phonetics. Within minimalism’s highly derivational architecture, Spell-Out processes run the gamut from those which are primarily syntactic in nature, and presumably apply very early in the mapping from syntax to PF, to those which are primarily phonological in nature, and presumably apply very late. The paper argues that Spell-Out subsumes a complex of operations, including at least deletion, linearization, and prosodification, and examines how these three processes interact. My primary window into the specific derivational steps which serve to map syntactic structures into those manipulable by the morphology and/or phonology will be South Slavic clitics, whose special properties lie at the nexus of syntax, morphology, and phonology.

Much which has traditionally been regarded as part of the syntax proper can be seen as a response to PF demands, decisions imposed on syntactic structures by the need for pronunciation. This new role for PF is manifested in several ways. For one thing, the syntax creates structure through the concatenation operation of ‘merge’, but leaves unspecified the linear order of the concatenated elements. In the spirit of Bobaljik (2002), Erteschik-Shir
(2005), and much other recent work, syntactic representations are seen as only containing hierarchical information. PF considerations thus become fundamental in determining word order. Linearization in this view is a property imposed on language by virtue of the temporal exigencies of articulation, an essential aspect of ‘Spell-Out’. It will be argued that linearization must be done ‘online’ (i.e., cyclically, via ‘Multiple Spell-Out’) and that it reapply at different points in the derivation, making use of different kinds of information. I will claim that initial linearization exploits c-command along the lines of Kayne’s (1994) ‘Linear Correspondence Axiom’ (LCA), but that later relinearization exploits prosodic properties of specific lexical items. Ontologically prior to linearization, it seems to me, should however be the decision of what in fact needs to be linearized. For example, if, as has become standard since Chomsky (1995), movement is analyzed as remerger of a copy of the moving constituent, then it seems reasonable to imagine that the determination of which copy is ultimately going to be pronounced should be left unspecified by the syntax. That is, copy selection can be regarded as a property imposed not by the syntax per se but rather by the needs of the morphological and phonological components with which syntax interfaces.

The paper is organized as follows. Section 7.2 reviews several ideas in the literature about copy pronunciation. I will conclude that decisions about copy pronunciation must, like linearization, be made derivationally, although the interactions are complex: copy deletion can depend on linear adjacency but linearization requires a prior decision about which copy is being pronounced, ellipsis sometimes depends on specific morphology, prosody requires morphological material to host it but prosodic considerations might also impact on choice of copy, and so forth. Section 7.3 examines linearization. It is shown that the positioning of the Bulgarian interrogative clitic li requires linearization to apply cyclically. Section 7.4 then examines different kinds of ellipsis. It will be argued that that there are (at least) two kinds of PF ellipsis, an early one that saves certain derivations by deleting structure containing offending features and a much later one that ignores syntactic constituency altogether.1 Finally, section 7.5 considers how pieces of the derivation that have been sent separately to Spell-Out are reassembled. It is suggested that this is done directly within the lexical ‘subarrays’ defined by each of the phase heads in the Numeration: subarrays are built derivationally, such that the product of merging all the members of one subarray in effect becomes (through Spell-Out)

1 See also Merchant (2001, 2007) for discussion of types of ellipsis.
a lexical item, which can then literally serve as a member of another subarray within the same Numeration.

### 7.2 Aspects of copy pronunciation

I now turn to some aspects of copy pronunciation that any adequate model of the syntax–PF interface ought to accommodate. I begin by reviewing two fairly well-established accounts of lower copy pronunciation.

#### 7.2.1 Delayed clitic placement

The first phenomenon is ‘delayed clitic placement’: lower copies of clitics are pronounced just in case the highest copy is not prosodically viable. Consider second-position clitics in Bosnian/Croatian/Serbian (henceforth, BCS), which arguably move, in an iterated head-to-head fashion, to the highest head position in the clause. These elements are enclitic, which means that they require a hosting prosodic word to their left. The highest copy is ordinarily pronounced, but if there is no available host, then the next highest copy is sent to PF. Consequently, whenever BCS clitics are left by the syntax at the beginning of their Intonational phrase (I-phrase), we encounter them in lower than second position. For example, as opposed to (1a) with overt subject *ja ‘I’, in null subject variant (1b) the highest copy of the enclitics *sam ti* has no potential prosodic host to its left. This causes the next copy down to be pronounced:

\[
(1) \quad \begin{align*}
\text{(a) } & \text{#[[Ja]$_{aux}$ sam ti] obečala sam ti (BCS)} \\
& \text{I aux.isg you.dat promised aux.isg you.dat igračku#.} \\
& \text{toy.acc} \\
& \text{‘I promised you a toy.’} \\
\text{(b) } & \text{pro sam ti #[[Obečala]$_{aux}$ sam ti] igračku#.} \\
& \text{‘(I) promised you a toy.’}
\end{align*}
\]

Similarly, in the minimal pair in (2) the delayed clitic placement effect arises if the topicalized constituent *tvome prijatelju ‘your friend’* happens to be

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2 I put this idea forward in Franks (1998, 2000) and it has since been adopted more broadly; cf., e.g., Bošković 2001.

3 This paper only considers the role of prosodic boundaries in inducing pronunciation of a lower copy, but Lambova (2004) argues that potential intonation clash (resulting from the attempt to impose both topic and focus intonations on the same material) can have a similar effect.

4 Here and elsewhere, pronounced copies are in boldface and non-pronounced ones are in outline font. Prosodic words are indicated by a subscripted ‘o’ and I-phrase boundaries are demarcated with ‘#’.
pronounced as a separate I-phrase, as indicated in (2a), but not otherwise, as in (2b):

(2) a. #Tvome [prijatelju]_{o} # $su \quad [(\text{prodali})_{o} \text{ su}] \quad \text{(BCS)}
   \text{your.dat \ friend.dat \ aux.3pl \ gave \ aux.3pl}
   \text{book.acc}
   ‘To your friend, they sold the book.’

   b. #Tvome prijatelju \text{ su prodali} \text{ su knjigu}.

In (2a), since the 3rd plural auxiliary clitic $su$ cannot find prosodic support when immediately preceded by an intonational break, the lower copy must be pronounced instead. This system correctly predicts that, when there is no way for the highest copy of the clitics to avoid being initial in its I-phrase, then the lower copy must be pronounced. Thus, since parentheticals are necessarily flanked by I-phrase boundaries, these induce obligatory pronunciation of lower copies. Compare (3) with (1a), where tvoja mama ‘your mother’ is an appositive:

(3) #Ja#, #tvoja [mama]_{o} #, #sam \text{ ti} \quad [(\text{obećala})_{o} \text{ sam}] \quad \text{(BCS)}
   \text{I \ your \ mother \ aux.1sg \ you.dat \ promised \ aux.1sg}
   \text{ti} \quad \text{toy.acc}
   ‘I, your mother, promised you a toy.’

Further evidence in support of this kind of account of BCS is based on closely related Slovenian. In this language, the clitics are not necessarily dependent on a prosodic word to their left to be pronounced; cf. Franks and King (2000: 31–48) or Bosković (2001: 151–68). Hence, in the Slovenian translation of (3), cited by Golden and Milojević Sheppard (2000), the highest copy of the clitics can be retained. This is shown in (4).

(4) Jaz#, #tvoja mama#, [sem \text{ ti} [obljubila]_{o}] \text{ sem } \text{ ti igračko}. (Slovenian)
   ‘I, your mother, promised you a toy.’

Since it is possible to pronounce the highest copy of sem ti in Slovenian (4), this copy rather than the lower one must be the one which is ultimately shipped off for Spell-Out.

It is tempting to think of these facts in Optimality Theoretic terms: Spell-Out seeks to target the highest copy but compromises when that copy lacks prosodic viability. Moreover, while these desiderata prevail in BCS, Slovenian brooks no such compromise, pronouncing the highest copy regardless. One
might argue that the clitics in BCS are subject to a prohibition against being initial in their I-phrase. This is in fact a standard optimality approach to clitics, as presented for example in Legendre (2003), who exploits the idea of a competition between Edgemost and NonInitial constraints.\(^5\) Under such a view, these clitics in BCS prefer being non-initial over being edgemost, whereas their Slovenian counterparts have the opposite preference. Note however that this conception of the facts characterizes clitic properties purely in terms of linear order. It does not treat them as syntactic entities within a hierarchical structure, but instead as ‘phrasal morphology’, as articulated in Anderson (2005 and elsewhere). However, this purely PF linear account loses all of the many structural aspects of clitic placement (cf., e.g., Bošković (2004b) for a summary of reasons why South Slavic clitics should be analyzed as independent syntactic entities). Indeed, the mere fact that it is the left rather than right edge which is targeted (that is, Edgemost \((X, \text{Left})\) and NonInitial) becomes an accident rather than a principled consequence of the assumption that clitics move in the syntax (since movement is upwards and leftwards).

An alternative perspective, which I develop in Franks (2000), is that syntax is generative but optimality-like considerations police the interfaces. The clitics move in the syntax, but the syntax leaves unspecified which copy is pronounced. It is up to Spell-Out to resolve this, selecting from what the syntax offers the optimal PF instantiation. Spell-Out thus picks the highest prosodically viable copy. In this way, the syntax provides the correct structure, but the phonology filters out the illicit copies. Prosodic considerations are irrelevant to the syntax, but in the mapping to PF these play a critical role. In such a PF-filtering system, the syntax ‘proposes’ and the phonology ‘disposes.’ Under this view, rather than ‘ranking’ an I-phrase non-initiality constraint lower in Slovenian than in BCS, there would simply be no reason to posit a prohibition against I-phrase initiality in Slovenian at all. This prohibition, moreover, is just a property of specific lexical items; it is not part of the syntax per se of the languages to which these items belong. That is, different lexical items can be subject to different prosodic requirements, and PF seeks to meet those requirements in spelling out what has been generated by the syntax.

### 7.2.2 Avoiding homophonous sequences

Prosodic requirements are in fact not the only kind imposed on Spell-Out. A second phenomenon that invokes lower pronunciation of copies to consider

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\(^5\) Legendre (2003) states that Edgemost \((X, \text{Left})\) = E(X) means ‘a feature \([X]\) is left-aligned with the edge of a projection of the head \([X]\) is associated with’ and NonInitial \((X)\) means ‘\([X]\) is not realized in Intonational phrase-initial position.’
involves multiple wh-fronting. As observed in Billings and Rudin (1996), there is a PF constraint against consecutive homophonous wh-phrases in multiple wh-fronting languages such as Bulgarian. Given this prohibition, in a multiple wh-question in Bulgarian, although ordinarily the highest copy is pronounced, when the two wh-words are identical, it is the lower copy of the second one which must be pronounced. Consider the minimal pair in (5) and (6):

(5) a. Koj kakvo kupi? (Bulgarian)
    who what bought
    ‘Who bought what?’
    b. *Koj kupi kakvo?

(6) a. Kakvo obuslavja kakvo?
    ‘What conditions what?’
    b. *Kakvo kakvo obuslavja?

Since pronunciation of the higher copy is blocked, (6) looks roughly like (7) in PF:

(7) Kakvo kakvo obuslavja [kakvo obuslavja kakvo]?

This gives the order in (6a) rather than (6b).

Notice that, according to this account, (6a) crucially involves overt wh-movement, despite appearances to the contrary. Bošković (2001, 2002b, 2004b) adduces some striking evidence from another multiple wh-fronting language, Romanian, that this is indeed correct. In Romanian there is a similar PF constraint, as shown in (8) with a structure as in (9).

(8) a. Ce precede ce? (Romanian)
    ‘What precedes what?’
    b. *Ce ce precede?

(9) Ce, ce, precede [ce, precede ce]??

Interestingly, Romanian (8a) behaves as if the direct object ce had indeed moved in the syntax. Bošković points out that it can license a parasitic gap, a fact which indicates overt wh-movement:

(10) Ce ce precede ce fără să influențeze pg? (Romanian)
    ‘What precedes what without influencing’?

* The constraint is part of a larger family of familiar PF constraints against sequences of homophonous elements, such as the double -ing filter in English, the double infinitive filter in Italian, the prohibition against sequences of identical clitics in many Slavic and Romance languages, or the ban on homophonous sequences of articles in ancient Greek.
This discovery, which is compelling enough to have entered the canon of textbooks such as Hornstein, Nunes, and Grohmann (2005), provides novel empirical support for the kind of model in which lower copy pronunciation is purely a PF matter.

Returning to Slavic, consider some further evidence for the strong PF adjacency nature of this constraint. First, as shown in BCS (11a), from Bošković (2002b), the intervening adverb neprestano ‘constantly’ obviates the effect:

(11) a. Šta neprestano šta uslovljava šta?
   ‘What constantly conditions what?’
   (BCS)

   b. ?Šta neprestano šta uslovljava šta?

As (11b) reiterates, pronunciation of a lower copy is only possible where required. These facts are also highlighted by the ungrammaticality of the order /C3 /kogo kogo 'to whom whom' in Bulgarian (12):

(12) a. Koj na kogo kogo e pokazal? (Bg)
   who to whom whom aux.3sg pointed-out
   ‘Who pointed out who to whom?’

   b. Koj na kogo e pokazal kogo?

   c. Koj na koj kogo e pokazal?

In (12a), the first kogo is part of the dative phrase na kogo 'to whom', whereas the second kogo is accusative. To avoid adjacent occurrences of kogo, a lower copy of the second kogo is pronounced, as in (12b). Interestingly, as noted in Billings and Rudin (1996), replacing na kogo by the colloquial form na koj, as in (12c), resolves the homophony, so that the dative > accusative sequence once again becomes felicitous.

7.2.3 On Spell-Out

What do facts such as these suggest about Spell-Out? For one thing, since linear adjacency is crucial in deciding which copy of the wh-word to pronounce, linearization should precede copy deletion (linearization > copy deletion). Also, since prosodic information is needed to determine that the highest copy of the clitics cannot be pronounced, (at least some) prosodic phrasing must precede copy deletion as well (prosodification > copy deletion). Finally, it makes little sense to impose prosodic structure until linear order has been established among the elements being prosodified (linearization > prosodification).

On the other hand, Moro (2000) and others argue that copy deletion is needed to render c-command unambiguously asymmetric, as required in
order to implement the Linear Correspondence Axiom. Copy deletion must therefore be a prerequisite to linearization, if the LCA has anything to do with determining linear order. Consequently, copy deletion must also precede linearization (copy deletion > linearization), since otherwise the grammar would not know which copy to linearize. An obvious solution to this ordering paradox is cyclicity of application of the relevant processes. Under minimalism, with no unique S-Structure level to serve as the input to PF, Spell-Out can apply multiple times. The relevant information is thus sent to the articulatory interface iteratively in the course of the derivation. In Chomsky’s system, the chunks of structure that are sent to Spell-Out piecemeal are the complements of ‘phase’ heads, e.g., C₀ or v₀, which define privileged domains. Assuming, then, some version of Multiple Spell-Out, one can understand these processes to operate in a bottom-up fashion, perhaps as in (13):

(13) copy deletion > linearization > prosodification

Notice, however, that the ordering of these processes is extrinsically determined, since the structure cannot be linearized until multiple copies have been resolved, nor can it be prosodified until linear order is determined, and copies cannot be deleted until adjacency to a preceding prosodic impasse or phonologically identical form has been established. The characterization in (13) thus raises serious questions and may be problematic for a strictly phase-based approach. For one thing, it seems likely that the infelicitous adjacencies that force copy deletion can be local in the sense of involving only a single phase. This suggests that deletion can apply at any time, i.e., both before and after prosodification and/or linearization. On the other hand, as explored in section 7.3, there are clear and much needed effects of making Spell-Out decisions derivationally. Perhaps, then, a better solution would exploit the system proposed in Franks (2000) and suggested above, whereby interface conditions are regarded as constraints rather than rules per se. This would preserve the derivational nature of the mapping embodied in Multiple Spell-Out but allow the particular ‘processes’ in (13) to interact more flexibly at each phase. Under this view, it would make no sense to order them, since they are not really processes applying to transform one representation into another, but rather criteria for the comparison of candidates generated by the syntax. Spell-Out would then mean that selection of copy, imposition of linear order, and appropriate prosodic structure are all evaluated simultaneously, with

7 Chomsky (1995: 337) has also suggested that the ‘LCA is an operation that applies after morphology,’ so that the fusing of two heads into one lexical item (as, for example, under cliticization) might offer a way of circumventing the LCA applied independently to its subparts.

8 On the lowest cycle, of course, copy deletion will be vacuous if remerge has not applied.
convergence on the maximally efficient choice. However, unlike in standard completely non-derivational Optimality Theory, in some cases no viable choice may exist, resulting in ineffability. This leads to an alternative conception, namely that these processes are ‘anywhere rules’, in the sense that there is no intrinsic ordering among them, but they still apply in a cyclic fashion, to progressively larger Spell-Out domains.

Another puzzle is that, for the clitics, when the highest copy cannot be pronounced for PF reasons it is the next highest prosodically viable copy that is retained, whereas with wh-phrases only copies in the original clause can be pronounced. Consider for example Bulgarian (14).\footnote{Bošković (2002b) cites (14) as follows, but all Bulgarian speakers I have asked find kakvo ‘what’ before cˇe ‘that’ absolutely impossible and before the verb obuslavja ‘conditions’ very awkward:}

(14) Kakvo (*kakvo) misli (*kakvo) Ivan (*kakvo) cˇe (??kakvo) (Bg)
what what thinks what Ivan what that what obuslavja (kakvo)?
conditions what
‘What does Ivan think conditions what?’

The highest copy of kakvo is, as before, blocked by adjacency to the preceding homophonous kakvo, but it is not obvious why any of the intermediate copies should not be viable.\footnote{I address the PF and LF status of wh-phrases in intermediate SpecCP in Franks (2006a), suggesting some technical solutions to this classic problem. See also Bošković (2007).} Presumably, though, they are not, because otherwise the next highest copy would have to be the one pronounced, just as with the clitics. This suggests that sometimes the entire structure needs to be evaluated simultaneously. It will be argued in section 7.4 that PF ellipsis might require this (although presumably for very different reasons).

7.2.4 Getting clitics higher

I take clitics to be exhaustive instantiations of formal features (henceforth, FF), devoid of all but purely grammatical features. In this sense, clitics can be regarded as the Spell-Out of functional heads. One view of second-position clitics is that they move to the highest head position in some appropriate
functional domain; it is this movement which is the source of the Edgemost (X, LEFT) effect. If so, a reasonable question is ‘How do they get there?’ A reasonable answer—given that verbs are canonical hosts for special clitics—is that they somehow piggyback on the verb.

A compelling reason for the verb to move up through its extended projection is that its FF need to match those of all associated functional heads. In principle, it is just the verb’s FF which need to move. In a verb-second language, such as German, the semantic features of the particular verb are pied-piped, whereas in other languages there is just FF movement. There are various technical scenarios one could imagine to make this all work (cf. Franks 2000), but the basic claim is that the FF of the verb are copied up the tree in a stepwise fashion, with successive FF adjunctions, so that at the end there is a copy, situated high, of the verb’s FF plus those of all the clitics. Now for the problem this raises: How can we take advantage of the insight that the verb provides a syntactic ‘host’ for the clitics even when the clitics are not actually pronounced adjacent to the verb? In Slavic languages like Bulgarian and Macedonian most clitics are positioned with respect to the verb, but in second-position languages like Bosnian/Croatian/Serbian and Slovenian the surface position of the verb is irrelevant. Consider for example the following variants:

(15) a. Sestra ih rado poklanja školskoj knjižnici. (Croatian)
    sister.nom them.acc gladly gives school.dat library.dat
    ‘Sister gladly gives them to the school library.’

b. Sestra ih školskoj knjižnici rado poklanja.

c. Školskoj knjižnici ih rado poklanja sestra.

d. Rado ih sestra poklanja školskoj knjižnici.

The key lies in moving the verb overtly in some way that does not require it to be pronounced in its target position. The verb moves to second position, taking the clitics along with it, but for some reason the clitics are realized in that position while the verb is realized lower down. What exactly differentiates the clitics from the verb? My answer is that clitics are pure FF bundles whereas the verb contains substantive semantic features as well. Thus, if only FF are copied, and if there is a desideratum that the highest copy that can be sent to Spell-Out must be, then the clitics are going to be pronounced high but the

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11 Pied-piping is presumably what the diacritic feature ‘strong’ means—an instruction to PF to pronounce an element in that position.
verb cannot be. The verb is, instead, pronounced in the highest position to which a copy of its semantic features has been pied-piped.\(^\text{12}\)

The scenario of pronouncing elements that are exhaustively FF bundles higher than their fully lexical counterparts is in fact widespread. A hallmark of clitics themselves is that they typically appear higher than full Noun Phrases (NPs). The reason is simple: although FF movement applies equally to clitics and lexical NPs, this ‘scatters’ the various features of lexical NPs (unless their semantic features are pied-piped along with the FF) but leaves clitics, as pure FF bundles, whole and intact.\(^\text{13}\)

### 7.3 Aspects of linearization

At this point I offer some specific proposals about linearization, taking linear order to be introduced only on the PF-side as part of the Spell-Out process.

#### 7.3.1 Clitics and linearization

Because pronunciation of verbs and clitics is divorced for second-position clitics as in (15), we cannot tell what the order between them and the verb really is. But when we look at verb-adjacent clitics, as are typical in Bulgarian and Macedonian, we find that the clitics precede the verb if they can. Within a clause, such clitics ordinarily appear immediately before the verb, regardless of how much material precedes them, as in Bulgarian (16):

\[
(16) \text{Včera v gradinata Mila sigurno mu dade (Bg)} \\
\text{yesterday in garden.def Mila surely him.dat gave} \\
\text{knigite. books.def} \\
\text{‘Yesterday, in the garden, Mila surely gave him the books.’}
\]

\(^{12}\) This view of movement is akin to that put forward in Zwart (1997), for whom overt movement involves both FF and semantic features (his ‘Lexico-Categorial’), whereas movement traditionally analyzed as ‘covert’ is in fact overt but only involves FF. Although the idea is hardly new that second positions for clitics and verbs are intimately related—stemming as it does from Wackernagel (1892) and recently exploited in non-derivational frameworks such as Anderson (2005)—the reason why clitics are pronounced higher than the verb finds a conceptually well-grounded explanation only in the context of a model which treats FF as the driving force behind movement.

\(^{13}\) Roberts’s (1998) account of why English auxiliaries raise to \(T\) whereas main verbs do not expresses the same kind of idea—and indeed, he comments that ‘another obvious place to look . . . is the area of clitics’. For Roberts too, FF movement is ‘always and only overt’; strong features in addition cause the entire category to be pied-piped. Taking verb features in English to be weak, lexical verbs are as expected pronounced \textit{in situ}. Auxiliaries, however, only have FF, so that when ‘Move F moves all features of the element it moves . . . checking the weak feature of the V node causes the entire auxiliary to move’ (Roberts 1998: 119).
The exception is what in the Romance linguistics tradition is known as the ‘Tobler-Mussafia’ effect, according to which, if the clitics would end up in absolute initial position, they must then follow the verb instead, as in (17):

\[(17)\]  
\[\text{Dade mu} \text{ knigite včera.} \quad \text{(Bg)}\]  
gave him.DEF books.DEF yesterday  
‘She/he/you gave him the books yesterday.’  
(Mu dade knigite včera.)  

These Bulgarian clitics are subject to a PF prohibition against being initial; cf. Franks (2006b, 2008). However, the domain of this non-initiality restriction is not the I-phrase, as is claimed for second-position clitics, but rather something larger. I proposed that the relevant prosodic domain is Nespor and Vogel’s (1986 [2008]) ‘Utterance’, indicated by \('u'\). This can be seen in (18), where the clitics \(mi\ go\) are oblivious to the I-phrase boundary necessarily introduced by the parenthetical \(\text{edna moja prijatelka}‘\ a friend of mine’:  

\[(18)\]  
\[y \# \text{Mila} \# \text{edna moja prijatelka} \# [mi go [dade]_o] \# y \quad \text{(Bg)}\]  
\[y \quad \text{Mila one my friend me.DAT it.ACC gave}\]  
‘Mila, a friend of mine, gave it to me.’  

In sum, since the generalization is that the clitics are preverbal unless this would leave them in absolute initial position within the clause, linearization first makes them preverbal, but then this ordering is adjusted as needed. Further indication that linearization should abstract away from the Tobler-Mussafia effect is the fact that Macedonian, although syntactically very similar to Bulgarian, does not display this PF restriction: its clitics can be initial in the Utterance. Hence the Macedonian judgments are the opposite from Bulgarian here: the starred order in (17) is perfectly good in Macedonian, no Tobler-Mussafia effects obtain. I would thus argue that the correct way to understand (17) is to derive the Tobler-Mussafia effect on the PF-side of the grammar: the syntax produces an output in which the clitics precede the verb and this order is adjusted on the PF-side to comply with the prohibition in Bulgarian (but not Macedonian) against Utterance initial clitics.

To handle this I endorse an approach, due originally to Bošković (2002a), that is compatible with the LCA. As discussed in Kayne (1994), the LCA has the effect of left-adjunction: when a head \(A\) moves to another head \(B\), it adjoins to \(B\)’s left, producing ‘[[A + B]…A]’. Taking this to be a principle of linearization means, however, that the clitics must move to adjoin to the verb, and not vice versa, since, everything else being equal, the clitics precede the
verb. Taking furthermore the clitics to be instantiations of functional heads above the verb, this means that the verb moves past the clitics, thereby providing a target to which the clitics can then adjoin (and linearize to the left, as per the LCA). In Bošković’s system the syntax provides something like (19) for the clitic-verb order in (18). First, dade moves past go, as in (19a). Next, go adjoins to dade, as in (19b). Then, mi is merged and the ‘go + dade’ complex later moves past that, as in (19c). Finally, mi adjoins to ‘go + dade’ producing the order in (19d), with copies pronounced as indicated.

\[
(19) \begin{align*}
\text{a. } & \; [\text{[dade] go} \ldots \text{dade} \ldots ] \Rightarrow \\
\text{b. } & \; [\text{[go + dade] go} \ldots \text{dade} \ldots ] \Rightarrow \\
\text{c. } & \; [\text{[go + dade] [mi [\text{[go + dade] go} \ldots \text{dade} \ldots ]]} ] \Rightarrow \\
\text{d. } & \; [\text{[mi + [go + dade]] [mi [[\text{[go + dade] go} \ldots \text{dade} \ldots ]]} ] \\
\end{align*}
\]

In sum, once the verb dade ‘gave’ has moved past the clitic go, go can adjoin to it. Then once the ‘go + dade’ complex head moves past the clitic mi, mi can adjoin to that. The result is iterated left-adjunction, with clitics preceding the verb.

7.3.2 Some guiding principles
If the syntax per se makes no statements whatsoever about linear order, how are hierarchical syntactic structures ultimately mapped into flat ones?

7.3.2.1 Making use of the linear correspondence axiom This happens, I believe, cyclically and in several different steps. Linearization is an ongoing process—not the compilation of a set of immutable statements about precedence—and linear order can be manipulated by resubjecting syntactic material to it as needed. In all likelihood, however, the first and most potent linearization principle is the LCA, Kayne’s widely accepted idea that asymmetric c-command maps into precedence. This applies cyclically, online, with the effect that heads precede their complements and adjunction is linearized to the left. Under this view, as just described, the Slavic special clitics precede their host. This is because these are syntactically distinct functional heads, reflecting paradigmatic features of case, tense, and agreement. They thus move in the syntax (or, more technically, their formal

\[14\] The caveat ‘everything else being equal’ means unless linearization to precede the verb would violate some other PF requirement, such as non-initiality. Also, the effects of left-adjunction are not visible in languages like BCS and Slovenian, where the clitics and verb need not be pronounced contiguously. Thus, Macedonian is the best indicator of what is really going on, since it involves minimal confounding effects.

\[15\] Thus, contra the system of Fox and Pesetsky (2005), I explicitly reject ‘order preservation’.
features are copied). LCA-induced precedence is the straightforward consequence of this movement.

7.3.2.2 *Invoking prosodic considerations* In many of the Slavic languages there is, however, one simple clitic that displays very different behavior. This is the particle *li*, the syntax and semantics of which has received considerable attention in recent years; cf. e.g. Franks and King (2000: 349–57), Rudnickaya (2000), Bošković (2001: 197–253), or Franks (2006b). This lexical item is always unequivocally enclitic and has Yes/No interrogative and contrastive focus functions of various types in languages such as Russian, BCS, Czech, Macedonian, and Bulgarian. Here I concentrate on *li* in Bulgarian, which exhibits some of the more spectacular linearization effects.

The clitic *li* instantiates Yes/No polarity and focus features in a high head position, which for present purposes can be taken to be $C^0$. As a clitic, *li* projects no prosodic structure itself and, as an enclitic, *li* is always pronounced at the right edge of an adjacent host prosodic word. When preceded by a possible host, *li* is linearized to that host’s right. In Bulgarian (20), for example, *v tozi grad* ‘to this city’ moves in the syntax to the specifier of the Complementizer Phrase (SpecCP), directly in front of *li* in $C^0$. This then encliticizes to *grad* ‘city’ (and the auxiliary clitic *si*, since it is not Utterance initial, remains in front of and eventually procliticizes to *xodil* ‘went’).

(20) $[V\ [tozi][grad]\ li\ [si\ [xodil]]]$  
    in this city Q aux.2sg went

‘Was it to this city that you went?’

Very often, however, SpecCP is empty so that there is nothing higher than *li*. When this happens, *li* must be linearized at the right edge of the prosodic word to its right.\(^{16}\) Thus, *li* differs from the special clitics (which precede the verb if at all possible) in that if often follows the verb. In (21a) the conjunction *i* ‘and’, although not a prosodic word or viable host by itself, is sufficient to render the clitics *mu gi* not Utterance initial; in (21b) the future proclitic *sˇte* does this; and in (21c) the proclitic sentential negation element *ne* does.\(^{17}\)

\(^{16}\) This phenomenon is generally known as ‘prosodic inversion’. For discussion, see Bošković (2001: 11–36), who offers a summary of reasons for not adopting prosodic inversion as a movement rule applying in PF and Franks (2006b), where I develop the approach to *li* placement not as literal PF-movement but rather as an artifact of linearization.

\(^{17}\) Note that in standard Bulgarian *ne* is post-stressing, so that the dative clitic *mu* in (21c) actually bears stress and hosts *ne*.
(21) a. [I mu gi DAde] včera. (Bg)  
and him.DAT them.ACC gave yesterday  
‘And she/he/you gave them to him yesterday.’

b. [Ste mu gi predadES]  
will him.DAT them.ACC hand-over.2SG  
‘You will hand them over to him.’

c. [Ne MU] [DAde] knigite.  
eg neg him.DAT gave books.DEF  
‘She/he/you didn’t give him the books.’

Under the exact same conditions, however, li necessarily follows the verb:

(22) a. [[I [DAde] li] knigite včera na Ivan?  
and gave Q books.DEF yesterday to Ivan  
‘And did she/he/you give the books to Ivan yesterday?’

b. [[Ste predadES] li] knigite na Ivan?  
will hand-over.2SG Q books.DEF to Ivan  
‘Will you hand the books over to Ivan?’

c. [[Ne DAde] li] knigite na Ivan?  
eg neg gave Q books.DEF to Ivan  
‘Didn’t she/he/you give the books to Ivan?’

That is because, unlike the special clitics, which as we have seen move to the verb, li is merged higher, above the verbal complex. Its enclitic nature then causes it to be linearized after the adjacent prosodic word, which, in (22), is (i) dade, ste predades, and ne dade.18

With post-stressing ne, li appears between the clitic mu and the verb, as in (23). While this is what one expects if ne mu in (21c) is indeed an independent prosodic word, it is interesting that li separates mu from dade, since under Bosković’s analysis presented above these constitute a complex head in the syntax:

(23) [[Ne MU] li] [DAde] knigite.  
eg neg him.DAT Q gave books.DEF  
‘Didn’t she/he/you give him the books?’

Even more striking, however is what happens if there is a second special clitic, such as accusative gi ‘them’. As seen in (24a), gi is most naturally proclitic on the verb following it, with ne mu independently a viable prosodic word.

18 As revealed by (30d) below, li must be linearized to follow dade ‘gave’ earlier than the conjunction i is merged, above CP.
Consequently, merging interrogative C⁰ li above the clause in (24a) causes it still to be prosodified after adjacent ne mu, except that now li appears between the two pronominal clitics. This is shown in (24b):

\[(24) \quad \text{a. } [ [ \text{Ne MU}_0 ] \text{ [gi [DAde]}_0 ] \text{ [Ana]}_w, } \]
\[\quad \text{neg him.dat them.acc gave Ana} \]
\[\quad \text{‘Ana didn’t give them to him.’} \]
\[\text{b. } [ [ \text{Ne MU}_0 ] \text{ li } [ \text{gi [DAde]}_0 ] \text{ [Ana]}_w? } \]
\[\quad \text{neg him.dat Q them.acc gave Ana} \]
\[\quad \text{‘Didn’t Ana give them to him?’} \]

In short, li—which the syntax leaves in C⁰, i.e., higher than and asymmetrically c-commanding IP/TP, so that, everything else being equal, it would be initially linearized by the LCA to precede—is prosodically adjoined to the right edge of the adjacent minimal prosodic word, which in (24b) is ne mu. Schematically, this is shown in (25):

\[(25) \quad \text{a. } [ \text{ne MU}_0 ] [ \text{gi [DAde]}_0 ] \ldots (\text{merger of li}) \Rightarrow \]
\[\text{b. } [ [ \text{ne MU}_0 ] \text{ li } [ \text{gi [DAde]}_0 ] \ldots \]

Assuming Multiple Spell-Out, LCA-driven linearization produces the order in (25a), which is prosodified as indicated. Next, li is merged in C⁰. If SpecCP is filled, as in (20), li can be linearized to satisfy both the LCA and its prosodic requirement of seeking support to its left. However, if nothing is in SpecCP, li as an enclitic cannot be initial in its prosodic word, hence must be prosodified at the right edge of its minimal host, i.e., ne mu, as in (25b).\(^{19}\)

7.3.3 An argument for cyclic linearization

This section presents an argument for why the linearization process must be cyclic.

Recall the Tobler-Mussafia effect, which in Bulgarian (but not very similar Macedonian) adjusts clitics left in Utterance-initial position. Taking as always asymmetric c-command to map into precedence, compare the initial Spell-Out orders in (26):

\[(26) \quad \text{a. } \text{Si } \text{mu } \text{gi pokazvala. (aux.2sg him.dat them.acc shown.fem * in Bulgarian)} \]
\[\quad \text{‘You have shown them to him.’} \]

Splitting of mu+gi by li is particularly striking since nothing else can ever interrupt such a sequence of two pronominal clitics. As discussed in Franks (2005, 2006b, 2008), Bulgarian tolerates some intervention by various aspectual adverbials and destressed emotive particles, but these can never split the pronominal subcluster; only li can do this.
b. I si mu gi pokazvala. (✓ in Macedonian and aux.2sg him.DAT them.ACC shown.FEM and Bulgarian) ‘And you have shown them to him.’

Sentence (26a) reflects a stage before an order consistent with the Tobler-Mussafia effect has been imposed, hence it is good in Macedonian but not in Bulgarian. In (26b), on the other hand, the presence of i means that no Tobler-Mussafia relinearization is needed in either language. In other words, once Utterance-level prosodic structure is imposed, the clitics in (26a) but not those in (26b) end up being initial. Hence, in (26a)—but not in (26b) because i ‘and’ there prevents the clitic group from being Utterance-initial—the clitic group si mu gi must be relinearized in Bulgarian (but not Macedonian). This is shown in (27):


This process erases the precedence relation between the clitic group and its adjacent prosodic word and resubmits it to linearization, redefining precedence in a way consistent with the Utterance non-initiality restriction.

Given this, one might ask how li linearization, which is sensitive to the prosodic word, interacts with Tobler-Mussafia linearization, which is sensitive to the Utterance. The interrogative version of Bulgarian (26a) eventually emerges as in (28):

(28) Pokazvala li si mu gi?
   shown.FEM Q aux.2sg him.DAT them.ACC
   ‘Have you shown them to him?’

20 ‘The fact that atonic i ‘and’ is sufficient to render these clitics in Bulgarian no longer Utterance-initial is significant, because it means that they are in fact not ‘enclitic’, in the standard technical sense of looking for a prosodic host only to their left. Interestingly, i does not similarly save I-phrase-initial clitics in BCS. Thus, starting with i in BCS (ib) would not cause the higher copy of the clitics to be pronounced:

(i) a. I obec’ala sam ti igračku.
   ‘And (I) promised you a toy.’

b. I sam ti obec’ala igračku.

This implies that merely invoking a constraint such as NONINITIAL is inadequate; directionality of prosodic support must also be stipulated. I am not sure how to implement this, but clearly the problem in (ib) is that i projects no prosodic structure of its own, hence i is unable to host sam ti. (Possibly the clitics in (i) are linearized to the right of obec’ala ‘promised’ before merger of i, just as in (30d) below, where ‘Utterance-initial’ is determined at the CP level; alternatively, a lower copy of them is pronounced or they might undergo relinearization themselves.) Bošković’s (2004b: 42) characterization that these BCS ‘clitics must encliticize to a constituent that is right-adjacent to an I-phrase boundary’ does correctly rule out (ib), but is to my mind unwieldy in requiring reference to the edge property of its host and misses the insight that these elements are prosodically enclitic.
How is the word order in (28) derived? I propose a derivational scenario which roughly proceeds through the steps sketched out in (29):

(29)  
(a) \[[\text{si mu gi}]_{CG} \text{[pokazvala]}\] (merger of li) ⇒ 
(b) \[[[[\text{si mu gi}]_{CG} \text{[pokazvala]}_{0u}] \text{li}] \text{(Spell-Out as Utterance)} ⇒ 
(c) \text{v}\#([[[\text{si mu gi}]_{CG} \text{[pokazvala]}_{0u}] \text{li}]\# \text{v} \ (√ \text{in Macedonian;} \n\ast \text{in Bulgarian}) \rightarrow 
\text{d) v}\#([[[\text{pokazvala}]_{0u} \text{li}] [\text{si mu gi}]_{CG}]\# \text{v} \quad (\text{Bulgarian only})

All heads are first linearized to the left, following the LCA, as in (29a). However, unlike in the case of (26), the special clitics are not considered Utterance-initial until after the CP li has been merged and is itself linearized to its host’s right, as shown in (29b). The entire CP is then sent to Spell-Out and prosodified as an Utterance, indicated in (29c). At this point—if these are Bulgarian clitics—the clitic group violates the prosodic prohibition against Utterance-initiality. Hence its linearization with respect to its host is erased and reevaluated to follow pokazvala li, with the effect in (29d). It is this kind of ‘double right wrap’ derivation that gives rise to the appearance of li splitting the verbal participle pokazvala ‘shown’ from the clitics si mu gi in Bulgarian (28b). Macedonian, on the other hand, lacks the Utterance-initial constraint, so step (29d) is never invoked and the final output remains as in (29c).

What happens when the conjunction i ‘and’ is thrown into the mix? Recall that this element is sufficient to render the special clitics not Utterance-initial, although it is not itself tonic and so cannot host enclitics, such as li (or any of the BCS clitics). Interestingly, although i saves the clitics in (26b), it fails to do so when added to (28). When ‘protected’ by li, addition of i has no ameliorating effect whatsoever. The relevant Bulgarian paradigm is summarized in (30):

(30)  
(a) Pokazvala si mu gi.  
‘You have shown them to him.’ 
(b) I si mu gi pokazvala.  
‘And you have shown them to him.’ 
(c) Pokazvala li si mu gi?  
‘Have you shown them to him?’ 
(d) I pokazvala li si mu gi?  
‘And have you shown them to him?’ 

21 I have reported this observation in a number of places, most accessibly Franks and Bošković (2001).
Sentence (30d) is the crucial one, demonstrating the need for cyclic linearization. It reveals that the determination that the clitics are Utterance-initial—hence the resolution of this problem that gives rise to the Tobler-Mussafia effect in Bulgarian—must precede merger of the conjunction i above the interrogative C0 head li. But this is exactly what we should expect if i here is a higher head, outside of CP. The CP phase is sent to Spell-Out, it is necessarily prosodified as an Utterance, and linearization must be reevaluated to respect the clitics’ non-initiality requirement. By the time i is merged, above CP, it is too late to render the clitics non-initial. The result is (30d), which is just (30c) with i tacked in front; unlike in (30b), in which i crucially counts, i in (30d) is irrelevant.

Note a crucial assumption: in the derivation of (30b) the string si mu gi pokazvala cannot be prosodified as an Utterance, it must wait until i has been merged, otherwise the wrong order would obtain. In the derivation of (30d), on the other hand, waiting is impossible: li defines a CP and this must be prosodified as an Utterance. In Franks and Bošković (2001), we took this Tobler-Mussafia paradigm as evidence for Chomsky’s phase theory, in which CP is a phase but its complement, IP/TP, is not. However, in Chomsky’s system it is actually the complement to a phase head that is sent to Spell-Out, not the phase itself. Clearly, this does not work for the Bulgarian data, which require that CP be an Utterance and InXection Phrase/Tense Phrase (IP/TP) not be one: if li, as the head of the CP phase, were not included in the material shipped off to Spell-Out, then Tobler-Mussafia would of course apply.22

One should finally ask why li does not have the same effect as i, rendering si mu gi non-initial. The answer is that it never does count as initial, since, when CP is sent to Spell-Out, li in (30c) and (30d) is linearized at the right edge of si mu gi pokazvala.23 Because there is no literal prosodic inversion, li never actually precedes the special clitics. Thus, si mu go pokazvala li is sent to Spell-Out prosodified as an Utterance, which then undergoes Tobler-Mussafia as in Bulgarian (29d) but not in Macedonian (29c).

7.4 Aspects of ellipsis

This section considers those aspects of ellipsis which a successful model of the Spell-Out process should accommodate. The questions addressed here concern

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22 Chomsky’s reason for sending the complement of the phase head to Spell-Out was to keep the specifier of the phase syntactically active; in section 7.5 below, I suggest a model which achieves this and in which it only makes sense for phases themselves to be sent to Spell-Out.

23 Of course, if SpecCP is occupied, as in (20), li has a host to its left and, when CP is sent to Spell-Out, no Tobler-Mussafia is necessitated.
what kinds of constituents can be targeted and where ellipsis can occur in the process of mapping syntactic representations into ultimately phonetic ones.

7.4.1 Ellipsis and resolution of PF offense
The most familiar type of ellipsis specifically targets syntactic constituents to remain unpronounced. Indeed, ellipsis is generally taken as a textbook standard for diagnosing constituency. Since it must apply to representations which preserve syntactic constituency, such ellipsis presumably applies very early in the Spell-Out process. Another argument leading to this conclusion can be made on the basis of the observation that ellipsis can actually save certain derivations by deleting structure containing syntactic features that would, had they not been deleted, offend PF; see among others Lasnik (1999) or Merchant (2001). Lasnik, for example, has argued widely and persuasively that direct objects even in English undergo object shift, but that the verb also undergoes short movement to a head position preceding the shifted object. This is shown in (31), using the system for representing copies adopted earlier:

(31) You will believe Bob [VP believe Bob].

This allows Lasnik (1999) to treat pseudogapping as VP-ellipsis. In his structure (32), Bob moves to a Specifier position outside VP, but the verb believe does not. Hence, the object is preserved under pseudogapping but the verb is elided along with the Verb Phrase (VP) containing it:

(32) You might not believe me but you will Bob.i [VP believe t].

A similar problem is posed by matrix sluicing, analyzed by Lasnik as IP-ellipsis, as in his (33):

(33) A: Mary will see someone.
B: Who i [IP Mary will see t]?

Lasnik (1999) then asks the question of why the verb fails to raise in (32) or why I-to-C movement of will fails in (33). Lasnik’s crucial insight is that ellipsis somehow serves to save the derivation. He considers various ways of implementing this failure to move just in case ellipsis is going to occur, depending on how feature strength is construed. The last and most appealing formalization offered in Lasnik (1999) exploits formal feature movement and appeals to the idea that ellipsis provides an additional way of circumventing the PF crash that is caused by leaving a strong feature visible to PF (unchecked and unerased). Movement, leading to checking, can eliminate the offending strong feature, but ellipsis can also do that—provided it does not move. In
this way, ellipsis saves (32) and (33). But this kind of ellipsis must be early in the Spell-Out process, since it crucially targets syntactic constituents complete with their feature specifications.

7.4.2 Ellipsis and focus
The role of functional sentence perspective in determining surface word order is well studied in the Slavic tradition. This section shows how word-order effects motivated by functional sentence perspective considerations can be achieved through the PF-side deletion of designated material rather than through literal PF-movement.

7.4.2.1 Free word order  The idea that focus can lead to PF-side movement has been recently applied to Russian scrambling by Erteschik-Shir and Strahov (2004). An alternative PF-filtering approach exploits copy deletion. Consider how functional sentence perspective desiderata might feed copy deletion. Sentences can be partitioned into Theme (Topic) and Rheme (Comment), with the focus the most prominent part of the Rheme. In Slavic ‘free’-word-order languages, I propose, this partition is usually accomplished by mapping vP into the Rheme. This means that the first pronounced element within vP demarcates the beginning of the Rheme. Compare the neutral word orders in Russian (34) and (35), where ‘T|R’ indicates the division into Theme and Rheme and ‘T=Ø|R’ means the sentence is entirely rhematic:

(34) a. A: What did Vanya do?
   B: Vanja T|R prišel. (Russian)
   ‘Vanya arrived.’

   b. [TP Vanja <RH | bem [VP prišel [VP prišel Vanja]]>]

   c. A: What happened?
   B: T=Ø|R Prišel Vanja.
   ‘Vanya arrived.’

   d. [TP Vanja <RH | bem [VP prišel [VP prišel Vanja]]>]

(35) a. A: What did Vanya do?
   B: Vanja T|R uemer.
   ‘Vanya died.’

   b. [TP Vanja <RH | bem [VP Vanja uemer [VP uemer]]>]

24 See also Stjepanović’s (2007) analysis of free word order in BCS.
c. A: What happened?
B: \( T = \emptyset \) \( \text{Ø} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) \( \text{ʃ} \) `Vanya died.'

d. \([ TP \text{Vanja} \text{< Rheme } [vP \text{Vanja} \text{umer} [VP \text{umer}]] > ]\)

First consider unaccusative (34), with the subject \text{Vanja} generated as a complement to the verb \text{prisˇel} `arrived'. In sentence (34a), divided into Theme and Rheme, the higher copy of \text{Vanja} in SpecTP is pronounced, as shown in (34b), but in wholly rhematic (34c) the lower copy of \text{Vanja} must be pronounced. The Verb–Subject word order thus derives from the structure in (34d). With unergative (35), on the other hand, the Subject–Verb order emerges even in the `out-of-the-blue' wholly rhematic sentence (35c). This is arguably because \text{Vanja} here is an external argument, hence there is no copy of \text{Vanja} within VP. The subject is instead introduced in SpecvP position, as indicated in (35d), where it ends up being pronounced even when included in the Rheme.

7.4.2.2 String discontinuities Although this kind of ellipsis involves deletion of entire copies, there is also evidence for `scattered' deletion of pieces of copies, the clearest examples of which are focus-driven. Consider for example, Bulgarian (20), repeated in (36), where the question could be about going to \text{THIS CITY} or to \text{THIS CITY}:

\[
(36) \quad V \text{ tozi } [[\text{grad}]_\alpha \text{ li}] [\text{[si } [\text{xodil}]_\omega ]]? \quad \text{(Bg)}
\]
\[
\text{in this city } \quad \text{Q aux.2sg went}
\]
\[
\text{`Was it to this city that you went?'}
\]

It is however also possible just to place the focus on \text{tozi} `this', as in (37):

\[
(37) \quad [[V \text{ tozi}]_\alpha \text{ li] grad } [\text{[si } [\text{xodil}]_\omega ]]? \quad \text{(37)}
\]
\[
\text{`Was it to this city that you went?'}
\]

How is this splitting achieved? In Franks (2006b) I argue that (37) requires copies of \( v \text{ tozi grad} `to this city' \) immediately above and below \( \text{li} \), with splitting forced by the property of \( \text{li} \) as demarcating the focus. This is schematized in (38):

\[
(38) \quad [\text{CP} [V [\text{tozi grad}]] \text{ li } [\text{[w [\text{tozi grad}]] si xodil}]]? \quad [ + \text{Foc}]\]
\]

A similar example splitting a \text{wh}–phrase is given in (39):

\[
(39) \quad \text{a. Koja li kniga šte mi podariš?!} \quad \text{(Bg)}
\]
\[
\text{which Q book will me.dat give.2sg}
\]
\[
\text{`Which(ever) book will you give me?!'}
\]

25 For clarity, I use strikethrough for the ellipsis and underline the pronounced pieces of the split.
b. \[ CP \,[ Koja \,[ kniga] \], li \,[ [koja \, kniga] \, sti mi podariš] ]?
\[ + Foc \]

These splits are striking because Bulgarian, as a DP language, does not otherwise permit left-branch extraction out of NPs. Instead, the generalization is that no non-focus material can follow the element with the focus feature in SpecCP. In this way, li induces scattered deletion and superficial splitting.\footnote{This phenomenon is I believe different from the kind of li splitting displayed by Russian, since, as discussed by Rudnickaya (2000) among others, in Russian splitting is more or less obligatory: the

7.4.2.3 Just linear strings  A different and far more superficial type of ellipsis does not appear to recognize syntactic constituency at all. The relevant data, having to do with focus-driven ellipsis, are from colloquial Croatian and sometimes lead to dramatic surface splits. The basic problem is that splitting can leave non-constituents on both sides of the splitter, thereby precluding any of the various available purely syntactic approaches to discontinuity. Consider BCS (40):

(40) \( U\, izuzetno\, sam\, veliku\, sobu\, ušao. \) (BCS)

in exceptionally aux.1sg large room entered

'It was into an exceptionally large room that I entered.'

As before, this splitting can be effected through ellipsis of string-adjacent material, as in (41):

(41) \[ PP \,[ U\,[ NP \,[ AP \, izuzetno \, veliku\, sobu] ]\, sam\,[ PP \,[ U\,[ NP \,[ AP \, izuzetno \, veliku\, sobu] ]\, ušao \ldots \]

The operative principle, as just observed for focus li, is that there can be no material within the fronted phrase that is to the right of the element bearing the \[ + Foc \] feature. All material following the \[ + Foc \] element is therefore elided, regardless of its syntactic constituency. This results in the pronunciation of the next highest copy of that material, as shown schematically in (42).
Crucially, in this system material on neither side of the [+Foc] element is required to be a constituent; instead, all that matters is that the deleted material within XP be contiguous.\(^{27}\)

For some Croatian speakers,\(^{28}\) this mechanism gives rise to a striking range of possibilities, where the word immediately in front of future auxiliary clitic \(\acute{c}u\) is the likely focus:\(^{29}\)

\[(43)\]

\begin{itemize}
  \item a. Svakog \(\acute{c}u\) lijepog dana putovati vlakom svojoj (Croatian)
  \begin{itemize}
    \item every fut.1sg nice day travel train self’s
    \end{itemize}
  \begin{itemize}
    \item kućí.
    \end{itemize}
  \begin{itemize}
    \item ‘EVERY nice day I will go to my house by train.’ or
    \begin{itemize}
      \item ‘Every nice day I will go to my house by train.’
    \end{itemize}
  \end{itemize}

  \item b. Svakog lijepog \(\acute{c}u\) dana putovati vlakom svojoj kućí.
  \begin{itemize}
    \item ‘EVERY nice day I will go to my house by train.’
  \end{itemize}

  \item c. Svakog lijepog dana \(\acute{c}u\) putovati vlakom svojoj kućí.
  \begin{itemize}
    \item ‘Every nice DAY I will go to my house by train.’ or
    \begin{itemize}
      \item ‘Every nice day I will go to my house by train.’
    \end{itemize}
  \end{itemize}

  \item d. Svakog lijepog dana putovat \(\acute{c}u\) vlakom svojoj kućí.
  \begin{itemize}
    \item ‘Every nice day I will go to my house by train.’
  \end{itemize}

  \item e. Svakog lijepog dana putovati vlakom \(\acute{c}u\) svojoj kućí.
  \begin{itemize}
    \item ‘Every nice day I will go to my house by TRAIN.’
  \end{itemize}

  \item f. Svakog lijepog dana putovati vlakom svojoj \(\acute{c}u\) kućí.
  \begin{itemize}
    \item ‘Every nice day I will go to my house by train.’
  \end{itemize}
\end{itemize}

It is not easy to know how to derive such unlikely strings. Particularly problematic are (43e) and (43f), in which the clitic is lower than immediately after the verb, since this is otherwise impossible. Given the analysis of clitics as functional heads, there cannot even be a copy of future

Russian version of (37) requires splitting—\(v \acute{e}t\ot li gorod\) and not \(v \acute{e}t\ot gorod li\)—regardless of which part of the PP is focused. The reason, I believe, is because in Russian there is simply no copy above \(li\) for scattered ellipsis to exploit, hence the only option ever for Russian \(li\) is to be pronounced at the right edge of the prosodic word to its right.

\(^{27}\) Non-clitics can also intervene, a possibility which gives rise to more complex structures involving scattered deletion of pieces of scrambled phrases. Similar facts have been described for Russian (Pereltsvaig 2007) and Ukrainian (Féry this volume; Féry et al. 2007).

\(^{28}\) Peti-Stantić (2007) offers these examples in examining whether spoken Croatian really adheres to second position for clitics; cf. also Franks (2007).

\(^{29}\) The order in (43c), and also (43a) in literary registers, can be neutral as well, since these can be derived through the standard clitic placement rule in addition to focus-driven ellipsis.

\(^{30}\) This order can also be neutral, but only if there is a prosodic break after \(svakog lijepog dana\).
clitic ču that low. These data hence reveal that what is pronounced in front of the clitics in colloquial Croatian must actually be higher. I therefore conclude that the splits in (43) derive from a syntactic structure as in (44):

(44) [Svakog dana putovati vlakom svojoj kući] ču [svakog dana putovati vlakom svojoj kući].

Essentially, there is a copy of the entire clause both above and below ču; ellipsis along the lines of (41)/(42) then applies to produce the various possibilities in (43), depending upon the locus of focus in the fronted phrase.

7.4.2.4 Prepositional phrase splits and lexical non-distinctness PP-internal splitting in Croatian provides another interesting illustration of the same general principles. Consider the split in (45b):

(45) a. Od jučer ga prodaje za velike novce. (Croatian) 'Since yesterday (s)he’s selling it for big bucks.'
   b. Od jučer prodaje za velike ga novce.
   c. 'Od jučer prodaje za ga velike novce.

This split, judgments again due to University of Zagreb Professor Anita Peti-Stantić, is quite unexpected under familiar models of clitic placement. However, if the entire clause is fronted past ga, (45b) can be derived as in (46):

(46) [Od jučer prodaje za velike novce] ga [od jučer prodaje za velike novce]

As before, all material in the fronted phrase that follows the actual focused element is elided. In this way, apparent PP splits can be derived without moving non-constituents, providing an alternative to the kind of PF-side movement argued for in, e.g., Erteschik-Shir and Strahov (2004).

What then about (45c), in which the clitic cannot go immediately after the preposition? While it is possible that this is merely a reflection of the difficulty in focusing za ‘for’, there seems to be more to the story. The Slavic splitting data reveal a general PF requirement that a preposition needs to be directly followed by some piece of its complement; compare the grammatical split in (40). If so, (45c) can be rejected out of PF considerations. Some support for this conclusion is to be found in the interesting fact that accidental properties of the particular lexical item can sometimes rescue splittings: when such splittings involve a preposition that has an intransitive (i.e., adverbial) variant, then the splitting is not in fact filtered out by PF. Two such Janus-faced
prepositions in BCS are genitive governing *ispred* ‘in front of’ and *pored* ‘alongside’, as in (47) and (48):

(47) a. *Ispred ga je ulaza* docˇekala policija.  
    in-front-of him.acc aux3sg entrance.gen waited police  
    ‘The police were waiting for him in front of the entrance.’

b. *Pored je tog čovjeka sjela.*  
    alongside aux3sg that.gen man.gen sat  
    ‘She sat alongside that man.’

(48) a. *On je sjedio ispred/pored.*  
    he aux3sg sat in-front/alongside  
    ‘He was sitting in front/alongside.’

b. *Ispred/Pored je sjedio.*  
    ‘(He) was sitting in front/alongside.’

However, prepositions such as *prema* ‘towards’ that do not admit intransitive usage, as shown in (49a), invariably block this kind of splitting. Compare (49b) with (47b):

(49) a. "Išao je *prema.*  
    went aux3sg towards  
    [Intended: ‘He was going towards.’]

b. "Prema je tom čovjeku došao.  
    towards aux3sg that.dat man.dat came  
    [cf. √Prema tom čovjeku je došao. or √Prema tom je čovjeku došao.]  
    ‘He was coming towards that person.’

Both deletions in (50) are valid operations, for example if *pored* or *prema* were contrastively focused, but the sequence *prema je* in (50b) is subsequently filtered out as deviant whereas *pored* *je* in (50a) is not:

(50) a. √[Pored tog čovjeka] *je* [pored tog čovjeka] . . .


The reason (50a) survives is because, once the lexical item *pored* has been inserted, the adverbial and prepositional variants are non-distinct, hence *pored* can function as a genitive assigning preposition for morphosyntactic case-checking purposes but as an intransitive adverbial for PF purposes. We thus expect that the kind of splitting in (45c) should be marginally possible with a preposition like *ispred* and indeed, according to A. Peti-Stantić (p. c.), it is: *Policija dočekala ispred ga je ulaza ( . . . a ne pored) ‘The police were waiting for him IN FRONT of the entrance ( . . . and not alongside)’.*
In sum, although prepositions need some piece of their complement to follow them, the existence of an intransitive variant somehow allows such prepositions to dodge this requirement. It is as if PF cannot tell whether any particular instance of *pored* ‘alongside’ has a case-assigning feature or not, nor can it remember that, before ellipsis in (50a), the case-governing variant had been invoked to make *tog čovjeka* ‘that man’ genitive. This indicates that case valuation, however implemented, necessarily precedes the sort of focus-driven ellipsis at work here. This makes it very different from the more familiar type of ellipsis. Traditional ellipsis is the failure to send syntactic structure to Spell-Out, hence it is constrained by constituency and, as we saw in Lasnik’s (32) and (33), applies early enough to delete features that must be checked and erased before PF (i.e., strong ones). The kind of ellipsis that allows (47) to slip through, on the other hand, can occur only after lexical insertion under non-distinctness has taken place.

An informal survey of BCS prepositions shows that they fall into two classes along precisely these lines: splittability is enabled by potential intransitivity. This correlation supports the superficiality of this kind of ellipsis, but raises the far from trivial question of how to exploit the correlation. The general structure of the solution however is clear: at one point in the derivation a lexical item satisfies some requirement and then, at a later point, when a contradictory requirement is imposed on it, that item can also satisfy the second requirement. This is because of non-distinctness: lexical insertion requires that the form selected from the lexicon for Spell-Out of some morphosyntactic feature set be featurally non-distinct and lexical syncretism is expressed in the lexicon in terms of non-distinctness (i.e., underspecification) of features.

The general phenomenon of syncretic morphological forms managing to satisfy the contradictory requirements of two different structures is widespread. Here are three relevant constructions, albeit quite different from the PP-split phenomenon just discussed. In the across-the-board *wh*-movement construction in Russian (51), the feminine relative pronoun *kotoroj* ‘which’ is syncretic instrumental and dative, whereas the masculine forms *kotorym*/*kotoromu* are distinct:

(51) devuška, kotoroj [ja byl uvlečen \(t_{\text{INST}}\) i (Russian) girl which.\textsc{inst/dat} I was carried-away and často daval \(t_{\text{DAT}}\) dengi] often gave money
‘the girl who I was carried away with and often gave money to . . .’
[cf. mal’čik, ”kotorym”/”kotoromu” ‘(the) boy ”who.\textsc{inst}”/”who.\textsc{dat}”’]
In German free relatives, as in (52), inanimate was is syncretic nominative and accusative, whereas the animate forms wer and wen are distinct:

(52) Ich werde was da steht mitbringen. (German)
I will what.NOM/ACC there stands with-bring
‘I will bring along what is standing there.’
[cf. Ich werde ??wer/*wen da steht mitbringen. ‘I will ???who.NOM/
*who.ACC…’]

In Hungarian, which distinguishes verb conjugations for definite and indefinite direct objects, coordination of objects of different types creates a problem for lexical insertion, but syncretism evades it. As shown in (53), the past-tense first singular láttam ‘saw’ is syncretic definite and indefinite conjugation, whereas the present-tense first singular forms látom/látok are distinct:

(53) Láttam a két szép kutyát és egy
saw.1sg-def/indef the two beautiful dogs and one
csunya cicát. (Hungarian)
ugly cat
‘I saw the two beautiful dogs and one ugly cat.’
[cf. *Látom /*Látok…(I) *see.1sg-def/*see.1sg-indef…’]

In each of these, the various structures are created in the syntax and evaluated from two independent perspectives. When one phase is spelled out, an item is selected for lexical insertion, and that item remains active and available for feature checking when a different phase is spelled out. If the particular morphological form did not happen to be syncretic, then there would be no appropriate lexical item available and the conflict would result in ineffability. In the course of Spell-Out to PF, however, the syncretism of particular morphological entries allows those feature conflicts to survive.

7.5 A technical speculation about multiple Spell-Out

I want finally to offer a theoretical digression, speculating about the mechanics of phase theory and specifically addressing the following question: How are pieces of the derivation which have been separately sent to Spell-Out later reassembled? My approach to this question builds on Chomsky’s (2001b) notion of lexical ‘subarrays.’ Chomsky observed that, in order for economy considerations such as ‘merge over move’ to be effective, only convergent
derivations starting from the same Numeration can be compared. However, to avoid competition involving lexical items from distinct functional complexes within a single sentence, Chomsky needed to adopt subarrays. These are autonomous sets of lexical resources defined by each of the phase heads in the Numeration. However, the problem of how these subarrays are reassembled for the purposes of spelling out the entire sentence was left unresolved. My solution is to build subarrays derivationally, such that the product of merging all the members of one subarray into a phase in effect becomes (through Spell-Out) a lexical item which can then serve as a member of another subarray within the same Numeration. Merge collapses the subarray into a spelled-out unit, which is then literally added into the subarray associated with some other phase head. This is how the various clausal and nominal arguments can be derivationally assembled and deployed in the same phase.

This formalization of Multiple Spell-Out implies that the output of each phase, if it is to merge successfully as an argument, must remain active by preserving some unvalued feature. Moreover, in order to be visible to some higher probe, that unvalued feature must be at the top (=left edge) of the phase, analogous to the accessible outermost layer of a morphological word. From this perspective, when an element with an unvalued feature moves (i.e., a copy remerges) at the top of its phase, this enables the phase to function as an active lexical item within some other subarray. In Franks (2006a) I call this ‘agnostic’ movement: by moving and saving itself, the element also preserves the phase to which it belongs. The result is a system in which everything inside of a sentence, as the pieces are shipped off to Spell-Out, becomes a word, so that even the sentence itself is ultimately just one big word. We now see why it is phases rather than phase-head complements which are sent to Spell-Out: a spelled out CP or Determiner Phrase (DP), if it is to be an argument, will have some unvalued feature(s) at its left edge. Edge visibility is an intrinsic property of words. The CP or DP can thus be inserted into the subarray defined by some other phase head, of which it then functions as an argument.

7.6 Conclusion

In this paper I have deployed Slavic facts to identify a variety of likely PF effects on the output of syntax, considering how factors such as linear order, prosodic structure, and copy deletion might interact. It was proposed that these cooperate to mediate the mapping from hierarchical syntactic

31 See also Uriagereka (1999).
representations to linearized PF ones. While initial linearization was argued to be LCA-inspired, attention was drawn also to subsequent processes which can reevaluate precedence relations for prosodic reasons. Examples were the realization of simple enclitics like *li* and the relinearization of Bulgarian special clitics to conform to the Tobler-Mussafia non-initiality requirement. Different kinds of ellipsis—defined in general as PF non-expression of syntactically fully structured material, rather than LF copying into syntactically vacuous phrases—were also examined. It was argued that, beyond copy deletion and silent phrases, there are late ellipsis processes which ignore the internal constituency of the units targeted. Lastly, a derivational model of Multiple Spell-Out was adopted, applying cyclically to larger and larger chunks of structure, and a particular view was suggested of how independently spelled-out phases are combined.

This paper has admittedly been in many ways programmatic. The potential relevance of data to the workings of Spell-Out was noted, but the derivational details and the resolution of various conceptual alternatives was left for future research. We are left, in addition, with the complicated but promising exercise of reexamining the various proposals made in sections 7.2–7.4 from the ‘derivational subarray’ perspective laid out in section 7.5.

I conclude by reiterating a theme which inspired the workshop from which the papers in this volume are drawn: the division of labor between syntax and PF. The analyses presented in this paper, I believe, help to demonstrate that the burden has now decidedly shifted towards PF: linearization, copy selection, ellipsis, and possibly even movement are defined in the effort to pronounce. Of course, all this may just amount to saying PF is a lot more abstract than we thought.