Dynamic Spell–Out as Interface Optimization*

Spell–Out, although traditionally described as a “rule” stripping off from a syntactic representation structure relevant for phonetic interpretation from structure relevant for semantic interpretation and sending that information off to the appropriate PF or LF interface component, in fact subsumes a complex array of interacting processes. These processes must take the abstract hierarchical arrangement of feature bundles we take to be syntax into a linearized sequence of articulatory instructions we take to be phonetics. This paper explores the mechanics of Spell–Out on the PF side, bringing to bear diverse Slavic language data. Within the highly derivational minimalist architecture these mechanisms 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. My goal in this paper is to provide an overview of the kinds of processes arguably subsumed under the Spell–out rubric and then to see if a clearer picture of the overall system might emerge. I will argue that the chief concern of Spell–Out is the optimization of PF, and that optimization proceeds in a derivational fashion.

Minimalist reasoning dictates that we submit to scrutiny the generally accepted arsenal of analytic devices available under the standard GB model. One important consequence of this scrutiny is the careful reevaluation of the division of labor between syntax and PF. In general, it now appears that 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 shifting of the burden to PF is manifested in several ways. First, the syntax creates structure through the concatenation operation of “Merge”, but leaves unspecified the linear order of the concatenated elements. That is, in the spirit of Bobaljik (2002), Nunes (2004), and much other recent work, syntactic representations only express hierarchical information. PF considerations are thus 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 “on-line” and that it applies multiply in the course of the derivation, making use of diverse kinds of information. In the strongly

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derivation of approach I adopt, linearization is construed as dynamic rather than static. I agree with Cedric Boeckx, who contends that “none of the conceptual motivations for phases is compelling” and consider his proposal that we should adopt (quasi)-uniform Spell-Out paths, as well as an alternative that takes Spell-Out domains to be prosodic units instead. I then show some advantages of a highly iterative derivation in optimizing Spell-Out. This optimization, however, does not posit single access to a set of ranked constraints, as in traditional Optimality Theoretic models. Instead, Spell-Out involves the continual filtering of structures through a mesh of PF-side constraints. In this vein, assuming the Linear Correspondence Axiom (LCA) of Kayne (1994), initial linearization exploits asymmetric c-command, but linearization later in the mapping to PF can exploit prosodic properties of specific lexical items. Other Spell-Out effects concern decisions such as copy pronunciation, lexification, prosodification, and ellipsis, all of which I contend are dynamic in character.

The paper proceeds as follows. The first section reviews several ideas in the literature about copy pronunciation and concludes that decisions about copy pronunciation must, like linearization, be made derivationally. The interactions are however 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. The next section examines pronunciation of lower copies with wh-movement and argues against successive cyclic movement in favor of chain formation at the end of the derivation. The third section with positioning and linearizing clitics in the South Slavic languages, demonstrating the essential roles play both by prosody and the LCA. Section four subjects linearization to more careful scrutiny, and it is shown that the positioning of the Bulgarian interrogative clitic li requires linearization to apply cyclically. Section five examines different kinds of ellipsis, and argues 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 late one that ignores syntactic constituency altogether. It also considers the curious role of morphological syncretism in letting otherwise infelicitous constructions “slip by” as well as how choice of allomorph can depend on very superficial phonological factors.

1 Interestingly, the same general claim has been recently argued for in López (2009), on the basis of a completely different set of data. He convincingly accounts for rightward dislocation (in Spanish and Catalan) in terms of the LCA as a “soft” constraint, violable in order to satisfy prosodic requirements. Like me, López advocates the view that “prosodification and linearization are simultaneous operations”.

2 The selection of a particular lexical item with underspecified morphosyntactic features in one Spell-Out domain affects acceptability when that item is shared with another domain.
The last section elaborates on the system of Spell–Out and considers alternative approaches to cyclicity that are not phase-based. An attempt is made to reconcile optimality theoretic and derivational generative approaches by imposing constraints to optimize PF desiderata on the output of each Spell-Out domain, and it is shown how the Tobler-Mussafia effect can be handled in this light. More generally, I argue that the rejection of punctuated resolves puzzles about the ordering of the various Spell–Out processes and trivializes distinctions between OT and derivational conceptions of Spell–Out.

1 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 with reviewing two fairly well-established accounts of lower copy pronunciation in the literature.

1.1 Delayed clitic placement

The first phenomenon can be called “delayed clitic placement”. The basic idea, which I put forward years ago (cf. e.g. Franks 1998/2010, 2000) and has since been adopted by Bošković (2001a) and many others, is that lower copies of clitics are pronounced just in case the highest copy is not prosodically viable. Consider second position (2P) clitics in Bosnian/Croatian/Serbian (BCS), which move to the highest head position in the clause. These are enclitic, meaning that they require a prosodic word host to their left; I suggest that we take this to be a prohibition against being initial in their Intonational phrase (I-phrase). Interestingly, whenever BCS clitics are left by the syntax at the beginning of their I-phrase, we encounter them in lower than second position. In the minimal pair in (1) this effect arises only if the fronted constituent tvome prijatelju ‘your friend’ is treated as a (topicalized) separate I-phrase, as in (1b):

(1) a. #Tvome prijatelju  su  prodali  knjigu.#
    your.DAT friend.DAT aux.3PL gave aux.3PL book.ACC
    ‘It was to your friend that they sold the book.’

   b. #Tvome [prijatelju]o #  [[prodali]o  su]  knjigu.#
    #To your friend, they sold the book.’

Since the 3\textsuperscript{rd} plural auxiliary clitic su in (1b) cannot find prosodic support when preceded by an intonational break, the next lower copy down is pronounced. This approach correctly predicts this behavior precisely when there is no way

\footnote{Note that here and elsewhere pronounced copies are in boldface, non-pronounced ones are struck through and in outline font. Prosodic words are indicated by a subscripted “o” and I-phrase boundaries are demarcated with “#”.

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for the highest copy of the clitics to avoid being initial in its I-phrase. Similarly, since parentheticals are necessarily flanked by I-phrase boundaries, these induce obligatory pronunciation of lower copies, as in BCS (2b), where \textit{tvoja mama} ‘your mother’ is an appositive:

(2) a. #[[Ja\textsubscript{\texta} sam \textsubscript{\texta} ti]] obe\v{c}ala \textsubscript{\textc} \textsubscript{\textg} igra\v{c}ku#.
   \begin{tabular}{l}
   I \text{aux.1SG you.DAT promised aux.1SG you.DAT toy.ACC} \\
   ‘I promised you a toy.’
   \end{tabular}

   b. #Ja#, #tvoja [mama]\textsubscript{\texta} #, #\textsubscript{\textc} \textsubscript{\textg} [[obe\v{c}ala]\textsubscript{\textc} sam \textsubscript{\textg} ti] \textsubscript{\textc} \textsubscript{\textg} igra\v{c}ku#.
   ‘I, your mother, promised you a toy.’

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”.

Evidence in support of this kind of account is based on closely related Slovenian (Slvn). In this language, the clitics are not necessarily dependent on a prosodic word to their left to be pronounced (i.e., they are not subject to a prohibition against being initial in their I-phrase); cf. Franks and King (2000: 31–48) or Bo\v{s}kovi\v{c} (2001: 151–168). Hence, in the Slvn translation of (2b), cited by Golden and Milojevi\v{c} Sheppard (2000), it is the highest copy of the clitics which is retained. This is shown in (3).

(3) Jaz#, #tvoja mama#, [\textsubscript{\textc} \textsubscript{\textg} \textsubscript{\texti} \textsubscript{\texto} \textsubscript{\textj} \textsubscript{\textl} sem \textsubscript{\textl} [obljubila]\textsubscript{\textl} ] \textsubscript{\textc} \textsubscript{\textg} \textsubscript{\texti} \textsubscript{\texto} \textsubscript{\textj} \textsubscript{\textl} igra\v{c}ko.
   \begin{tabular}{l}
   ‘I, your mother, promised you a toy.’
   \end{tabular}

Since it is possible to pronounce the highest copy of \textit{sem ti} in Slovenian (3), this copy rather than the lower one must be the one which is ultimately shipped off to Spell–Out.

It is tempting to think of these facts in Optimality Theoretic (OT) terms. “Enclitic” here is a lexical property which means the item is subject to something like (4):

(4) \text{NONINITIAL(I-PHRASE)}

Spell–Out seeks to target the highest copy but compromises when that copy lacks prosodic viability. And, as we have seen, this desideratum prevails in BCS, but Slovenian brooks no such compromise, pronouncing the highest copy regardless. The idea expressed in (4) reflects the standard OT approach to clitics, as presented for example in Legendre (2003). She exploits the idea of a competition between \text{EDGEMOST} and \text{NONINITIAL} constraints, stating that \text{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 \[\text{\textsc{noninitial}}(X)\] means “\([X]\) is not realized in Intonational phrase-initial position”. Under such a view, these clitics in BCS prefer being non-initial over being edgemeost, whereas their Slovenian counterparts have the opposite preference.

Unfortunately, the OT 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 for example in Anderson (2005 and elsewhere). Such a purely PF linear account discards the many structural aspects of clitic placement that have been widely discussed in the literature.\(^4\) Indeed, under the standard OT morphological account the mere fact that it is the left rather than right edge which is targeted (that is, Edgemost (\(X, \text{\textsc{left}}\)) and Non\textsc{initial}) becomes an accident rather than a principled consequence of the assumption that clitics move in the syntax. Movement, on the other hand, always extends the tree, which means it will always be upwards, hence, insofar as the LCA pertains, leftwards.

An alternative perspective, developed in Franks (2000), is that syntax is fundamentally generative but optimality-like considerations police the interfaces. 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 keeping with the violable (i.e soft) constraint in (5) and assuming the general principle (i.e undominated or hard constraint) articulated in (6). It is the interaction of (5) and (6) which forces the higher copy of the clitics to be pronounced in Slvn (3) but the lower copy in BCS (2b).

(5) **PRONOUNCE HIGHEST**: Lower identical copies are silent.

(6) **PROSODIC SUPPORT**: Everything pronounced must be prosodically parsed

In this way, the syntax provides the correct structure, but the phonology filters out illicit copies. Prosodic considerations are irrelevant to the syntax, but in the mapping to PF these play a critical role. Under this view, rather than “ranking” an I–phrase non-initiality constraint lower in Slvn than in BCS, there would simply be no reason to invoke a prohibition against I–phrase initiality in Slvn 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 as efficient as possible in spelling out what has been generated by the syntax.

\(^4\) I refer the reader to Bošković (2004) for a short summary of reasons why South Slavic clitics should be analyzed as hierarchically arranged independent syntactic entities.
1.2 Avoiding homophonous sequences

A second phenomenon that invokes lower pronunciation of copies to consider involves multiple *wh*–fronting (MWF). As observed in Billings and Rudin (1996), there is a PF constraint against consecutive homophonous *wh*–words in MWF languages such as Bulgarian (Bg), stated roughly as follows:⁵

(7) **AVOID HOMOPHONOUS SEQUENCES**

Given this desideratum, in a multiple *wh*–question in Bg, 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 (8) and (9):

(8) a. Koj kakvo kupi?
   who what bought
   ‘Who bought what?’

(9) a. Kakvo obuslavja kakvo?
   ‘What conditions what?’

Since pronunciation of the higher copy is blocked, (9) looks roughly like (10) in PF:⁶

(10) **Kakvo *kakve* obuslavja [kakve obuslavja *kakvo]*? (Bg)

This gives the ordering in (9a) rather than (9b).

Evidence for the strong PF adjacency nature of this constraint is shown by BCS (11a), from Bošković (2002b). Here, the intervening adverb *neprestano* ‘constantly’ obviates the effect:

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

   b. ?*Šta neprestano šta uslovjava šta?

As (11b) reiterates, pronunciation of the lower copy is only possible where required.

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⁵ The constraint is part of a larger family of familiar PF constraints against sequences of homophonous elements; I discuss the one dispreferring two sequences of *je* in BCS later on.

⁶ I assume there is also V–movement, so that the higher copy of the verb *obuslavja* ‘conditions’ is pronounced.
These facts are also highlighted by the ungrammaticality of the order *na kogo kogo ‘to whom whom’ in Bg (12).

(12) a. *Koj na kogo kogo e pokazal?  
    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). However, as Billings and Rudin (1996) note, when na kogo is replaced by the colloquial form na koj, as in (12c), this disrupts the homophony, so that both AVOID HOMOPHONOUS SEQUENCES and PRONOUNCE HIGHEST can be satisfied. The dative > accusative sequence becomes once again felicitous, with the relevant structures given in (13) and (14).

(13) a. Koj na kogo kogo e pokazal kogo?  
    b. *Koj na kogo kogo e pokazal kogo?

(14) a. Koj na koj kogo e pokazal kogo?  
    b. *Koj na koj kogo e pokazal kogo?

Ungrammatical (14b) again demonstrates that the lower copy cannot be pronounced unless motivated by the need to satisfy a higher constraint. It is also worth noting that there are two valid outputs, (13a) and (14a), depending on how the indirect object is expressed (na kogo or na koj). Copy deletion can thus be dependent on lexical access, in this case choice of the adjacent allomorph.

1.3 Intermediate summary

What do facts such as these suggest about Spell–Out? For one thing, it seems to me that, since linear adjacency and morphological identity are crucial in deciding which copy of the wh–word to pronounce, linearization and choice of lexical item to insert should precede copy deletion. Also, since prosodic information is needed to determine which copy of the clitics to pronounce, (at least some) prosodic phrasing must precede copy deletion as well. And it surely makes no sense to impose prosodic structure until linear order has been established either. So, very crudely, the facts so far suggest the following ordering of Spell–Out processes:
(15) lexical insertion > linearization > prosodification > copy deletion

On the other hand, one might expect copy deletion to precede linearization, since otherwise the grammar would not know which copy to linearize. Moreover, it has been argued by Moro (2000), Nunes (2004), and others that copy deletion serves to render c-command unambiguously asymmetric, something that is required if Kayne’s LCA has anything to do with determining linear order. Indeed, in Franks (2010), I concluded on the basis of the same data that copy deletion should come first rather than last, just that it would be vacuous before any movement/remerge, roughly as in (15’).

(15’) copy deletion > lexical insertion > linearization > prosodification

It now however seems to me that the question of how to order these various aspects of Spell–Out is probably moot, in that they must be taken into consideration all more or less at once; cf. also López (2009) for the interaction of the LCA and prosody. In fact, 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 (15) thus raises serious questions and may be problematic for a strictly phase–based approach. Moreover, infelicitous adjacencies that force copy deletion can be local in the sense of involving only a single phase. On the one hand, this suggests that deletion can apply at any time, i.e., both before and after prosodification and/or linearization, and that the traditional phase is not the appropriate unit. On the other hand, as I will try to show below, there are clear and much needed effects of making Spell–Out decisions derivationally.

Perhaps, then, a better solution would be, as suggested above, to regard interface conditions as constraints rather than rules per se. However, we would need to apply them iteratively in order to preserve the derivational nature of the mapping embodied in MSO. Under this view, it makes 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 morphological instantiation, selection of copy, imposition of linear order, and appropriate prosodic structure are all evaluated simultaneously, with convergence on the maximally efficient choice. At the end of this paper I return to this idea and suggest that, properly construed, there may not be any substantive difference between an OT and generative way of implementing these insights.
2 A puzzle

The characterization in (15) of what happens when begs other questions. For example, does the entire structure need to be evaluated at once or can an MSO system work, in which chunks of structure are manipulated piecemeal?

For clitics, when the highest copy cannot be pronounced for PF reasons it is the next highest prosodically viable copy that must be retained; blind pronunciation of the lowest (“tail”) copy is never an option. This suggests a cyclic algorithm for copy evaluation and, I will claim, for clitic linearization. 7

For wh–phrases, on the other hand, it is the lowest copy that is the by far preferred alternative. Bošković (2002b) cites the judgments for Bg in (16a), although speakers I have consulted find kakvo ‘what’ before če ‘that’ impossible and before the verb obuslavja ‘conditions’ degraded (16b).

(16) a. Kakvo (*kakvo) misli (*kakvo) Ivan (%kakvo) če (kakvo) obuslavja (kakvo)?
   ‘What does Ivan think conditions what?’
   b. Kakvo (*kakvo) misli (*kakvo) Ivan (*kakvo) če (?kakvo) obuslavja (kakvo)?

In Romanian, the judgments on comparable structures are also as in (16a)—hypothetical intermediate landing sites simply cannot be pronounced, only the tail can. 8 How should we interpret these facts?

Note that the wh feature driving the movement is at the top of the tree, as is the sequence of homophonous elements which determines that the tail wins. I see no way of implementing this unless the intermediate sites are not taken as involving literal (re)merge of a copy at all. This conclusion in fact seems inescapable, given that it is the tail which must be pronounced when putative successive-cyclic wh–movement fails in English, as in (17):

(17) [CP Who [TP → thinks [CP {?what?} that [TP Mary bought what]]]]?

If what moves to the intermediate SpecCP, regardless of how this movement is motivated, and if MSO is assumed, then how can the lowest copy be activated just in case the top landing site (being occupied by who) is unavailable? This is a

7 In Franks and Herring (2010) as well as in Franks (in progress) I explore instead a single top-down algorithm for the mapping from syntax to PF.
8 A curious puzzle I address in Franks (in progress) is why, in varieties of German which allow pronunciation of wh–words in intermediate positions, this is never possible for the tail:

(i) [CP Wen denkst du [CP wen sie meint [CP wen Harald (*wen) liebt]]]
   ‘Who do you think that she believes that Harald loves?’
classic problem, considered *inter alia* by myself in Franks (2006a) as well as Chomsky (2001), Bošković (2007), Boeckx (2008 and other work). Everything points to the conclusion that the intermediate copy of *what* in (17) is really not there at all. Thus it cannot be bound or license parasitic gaps, as shown by (18a) and (18b), respectively.

(18)  
   a. *Who said that Mary thinks {? which pictures of herself?} that Bill likes which pictures of herself?*  
   b. *Who said that you claimed {? which painting?} that you loved which painting [in order to get me to look at pg]?*

The fact of the matter is that LF movement invariably behaves like no movement, which is why the higher unpronounced copies are inside curly brackets flanked by question marks. The problem here is how does a bottom-up system know that overt movement is not going to succeed and that LF movement will eventually be required? In contrast, real, overt, successive-cyclic movement *does* have empirical effects which target the intermediate landing site. Compare for example (19) to (18):

(19)  
   a. [*CP Which pictures of herself does [TP Mary [VP think [CP which pictures of herself (that) [TP Bill [VP likes which pictures of herself]}}}]]]?  
   b. *Which painting does Mary think [CP which painting that [TP you claimed that you love which painting] [in order to get me to look at pg]]?*

In (19a) the intermediate copy of *herself* is bound by *Mary*, in (19b) the intermediate copy of *which painting* licences the parasitic gap.

Another illustration of the absence of expected intermediate PF effects under hypothetical LF *wh*–movement can be constructed on the basis of “*V-Preposing*” inversion in Spanish (20), based on Torrego (1984):

(20)  
   a. [*CP Qué pensaba Juan [CP qué le había dicho Pedro [CP qué había publicado qué la revista]]]?  
      ‘What did Juan think that Pedro had told him that the journal had published?’  
   b. [*CP Quién pensaba [CP {qué?} que Pedro dijo [CP {qué?} que Juan había publicado qué]]]?  
      ‘Who thinks that Pedro said that Juan published what?’

In (20b) the *wh*–phrase *qué* ‘what’ cannot occupy the matrix SpecCP because it is filled by *quien* ‘who’. Concomitantly, the inversion which arises with overt
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movement in (20a) is also missing. As before, not only is the tail pronounced, but all intermediate effects also disappear:

One solution that makes sense to me takes advantage of Takahashi’s (1994) “Form Chain” approach. According to this account, it is not until the attracting head has been merged and provides a target—a [+wh] C in these instances—that a chain is formed to create the intermediate sites. These are introduced in accordance with the Minimal Link Condition, replicating the effects of successive cyclic movement, but in one fell swoop and without the look-ahead problem. The advantages to a system such as Takahashi’s have been argued for in various works by Boeckx and Bošković, *inter alia*. For present purposes, the crucial point is that this may provide a way of distinguishing lower copy pronunciation of clitics (where the next one down wins) from lower copy pronunciation of *wh*-phrases (where one in the most embedded clause wins) by distinguishing clitic movement from *wh*–movement. The latter goes across phases and is driven by a a [+wh] feature in the highest C^0^. The former is typically phase internal and does not seem to be feature driven at all. Moreover, much evidence shows that clitics need not end up in a consistent position, hence it is hard to imagine their movement as any sort of instantiation of Attract. 9

3 Clitics as Formal Feature Bundles

I take clitics to be pure instantiations of Formal Features (FF). That is, they are devoid of all lexical content features. In this sense, clitics can be regarded as the Spell–Outs of functional heads. For example, *sam* in BCS (2) is just “1st singular verbal agreement” and *ti* is just “2nd singular dative case”. One persistent view of 2P clitics, as in BCS and Slvn, is that they move to the highest head position in some appropriate functional domain. The obvious question is then “How do they get there?” and a reasonable answer—given that verbs are canonical hosts for special clitics 10—is that they somehow piggy-back on the verb. Since I have attempted to flesh this out in previous work, my intention here is simply to sketch out the general idea of how this piggy-backing might work. 11

3.1 How to get clitics higher?

A compelling reason for the verb to move up through its extended projection is that its FF need in some way to match those of all associated functional heads.

9 I put these issues aside in this paper, returning to them in Franks (in progress), which explores a multiattachment solution to top-down chain formation.

10 Adopting Zwicky’s terminology, “special” clitics are those reflecting paradigmatic functional categories such as case, tense, or agreement.

11 I also avoid specifics about which functional heads the various clitics might instantiate or the kind of cartography involved.
Of course, it is just the formal features of V (rather than the entire V) which need to move. So 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. Putting aside the various technical scenarios one could imagine to make this all work (cf. Franks 2000), my basic claim is that the FF of the verb are copied up the tree and that this happens in a stepwise fashion, with successive head adjunctions, so that at the end the verb’s FF plus those of all the clitics are situated on the highest head. The question this then raises is how to exploit the insight that the verb provides a syntactic “host” for the clitics even when the clitics are not actually pronounced adjacent to the verb.

Consider for example the BCS Croatian variants in (21):

(21) a. Sestra ih rado poklanja školskoj knjižnici.
   ‘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. In essence, although the verb must move to 2P and take the clitics along with it, the clitics need to be realized in that position while the verb is realized lower down. The question is thus: 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 as in (5) that the highest copy that can be spelled out must be, then the clitics are going to pronounced high but the verb cannot be. The verb is, instead, pronounced, in the highest position to which a copy of its semantic features have been pied-piped. Although the idea is hardly new that 2P for verbs and clitics is 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

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12 Pied-piping is presumably what the diacritic feature “strong” means, following the insight in e.g. Groat and O’Neil (1996) or Richards (1997) that “strong” amounts to nothing more than an instruction to PF to pronounce an element in that position.

13 In languages like Bg and Macedonian (Mac) most clitics are positioned with respect to verb, but in 2P languages, such as BCS and Slvn, the surface position of the verb is irrelevant.

14 This view of movement is very much akin to that put forward in Zwart (1997), for whom overt movement involves both FF and semantic features (which he calls “Lexico-Categorial”), whereas movement traditionally analyzed as “covert” is in fact overt but only involves FF.
conceptually well grounded explanation only in the context of a model which formally distinguishes clitics from verbs.

In fact, the scenario of pronouncing elements that are exhaustively FF bundles higher than their fully lexical counterparts is widespread. A hallmark of clitics themselves is that they typically appear higher than full noun phrases. The reason is simple: although FF movement applies equally to clitics and lexical NPs, (in the absence of pied-piping) this “scatters” the various features of lexical NPs but leaves clitics, as pure FF bundles, whole and intact. Roberts’s (1998) account of why English auxiliaries raise to $T^\circ$ 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 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 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).

3.2 Clitics and linearization

This section endorses an approach to clitic movement, due originally to Bošković (2002a), that is compatible with Kayne’s LCA.

3.2.1 On why “clitic + verb” order is more basic

Because pronunciation of verbs and clitics is as we have seen divorced for 2P clitics as in (21), one cannot tell what the order between them and the verb really is. However, when one considers verb-adjacent clitics, as are typical in Bg and Mac, one finds that the clitics always 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 Bg (22).

(22)  

a. Ti minulata godina si mu gi pokazvala. 
   you last year aux.2SG him.DAT them.ACC shown.FEM  
   ‘You have shown them to him last year.’

b. Včera v gradinata Mila sigurno mu dade knigite. 
   yesterday in garden.DEF Mila surely him.DAT gave books.DEF  
   ‘Yesterday, in the garden, Milasurely gave him the books.’

The exception is what in the Romance linguistics tradition is known as the “Tobler–Mussafia” (TM) effect, according to which, if the clitics would end up in absolute initial position, they must then follow the verb instead:
These Bg clitics are subject to a PF prohibition against being initial. However, the domain of this non-initiality restriction, although prosodic, is not the I-phrase, as it is for 2P clitics, but rather the relevant domain is Nespor and Vogel’s (1986) “Utterance”. That is, the Bg clitics are subject to (24), as opposed to the BCS ones subject to (4):

(24) NONINITIAL(Utterance)

The relevance of this larger prosodic domain is further demonstrated by (25), with Utterance boundaries indicated by “υ”.

(25) a. υ #I si mu gi [pokazvala]ω # υ
‘And you have shown them to him.’

b. υ #Mila##edna moja prijatelka# #[mi go [dade]ω ]# υ
Mila one my friend me.DAT him.ACC gave
‘Mila, a friend of mine, gave it to me.’

The conjunction i, although not a prosodic word or viable host by itself, is sufficient to render si mu gi non-initial in (25a), and in (25b) the clitics mi go are oblivious to the intonational phrase boundary necessarily introduced by the parenthetical edna moja prijatelka ‘a friend of mine’; neither of these would of course be good in BCS. In sum, since the generalization is that the clitics are pre-verbal unless this would leave them in absolute initial position within the clause, I contend that linearization first makes them preverbal and then this ordering is adjusted as needed. Further indication that linearization should abstract away from the TM effect is the fact that Mac clitics, although syntactically very similar to Bg, do not display the PF restriction in (24): its clitics can be initial in the Utterance. Mac is thus the best indicator of what is really going on between the clitics and the verb, since it involves minimal confounding effects. And indeed, a comparison of Mac (26) with Bg (23) shows that the word order facts here are the opposite:

(26) a. Si mu gi. pokazvala.
aux.2SG him.DAT them.ACC shown.FEM
‘You have shown them to him.’
I would thus argue that a promising way of understanding Bg (23) is to derive TM on the PF–side of the grammar. I will return to the specific derivation below: my point here is simply that the syntax would produce an output in which the clitics precede the verb and that this order would be adjusted on the PF–side to comply with the prohibition in Bg—but not Mac—against Utterance initial clitics.

3.2.2. Bošković’s system for deriving “clitic + verb”

Kayne’s LCA has the effect of left-adjunction: when a head A moves to another head B, it adjoins to B’s left, producing the schema in (27).

(27) \[[ A + B ] ... A \]

Taking the LCA 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. If, however, the clitics instantiate functional heads above the verb, such as Tense or Agreement, this implies that the verb must move 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 (28) for the clitic-verb order mi go dade in (25b). First, dade moves past go, as in (28a). Next, go adjoins to dade, as in (28b). Then, mi is merged and the “go + dade” complex later moves past that, as in (28c). Finally, mi adjoins to “go + dade” producing the order in (28d), with copies pronounced as indicated.

(28) a. \[[[dade] go ... dade ...] \] ⇒
b. \[[[go + dade] go ... dade ...]] \] ⇒
c. \[[[go + dade] [mi [[[go + dade ] go] ... dade ...]]] \] ⇒
d. \[[[mi + [go + dade ]][mi [[[go + dade ] go] ... dade ...]]]] \] ⇒

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 itself adjoin to that. The result is iterated left adjunction, with all the clitics preceding the verb.
4. Further aspects of linearization

The syntax per se makes no statements whatsoever about linear order, which is only introduced on the PF-side as part of the Spell–Out process. So the question at hand is: How are hierarchical syntactic structures ultimately mapped into flat ones? I now explore some of the mechanics of this process, focusing on Bg clitics. I will argue that linearization is iterative and that, contra the system espoused for example by Fox and Pesetsky (2005), there is no “order preservation” . Rather, linearization is an on-going process—not the compilation of a set of immutable statements about precedence—and linear order can be manipulated by resubjecting lexical material to it as needed. As stated, however, the first and most potent linearization principle is the LCA, Kayne’s claim that asymmetric c-command maps into precedence. This applies cyclically, on-line, with the effect that heads precede their complements and adjunction is linearized to the left. Under this view, as just outlined, the Slavic special clitics precede their hosts.

4.1 Invoking prosodic considerations

In many of the Slavic languages, however, there is one simple clitic that displays very different behavior. This is the lexical item *li*, which as described in Franks (2006b) and references therein, is always unequivocally enclitic and has interrogative and focus functions of various types in languages such as Russian, BCS, Czech, Mac and Bg. Here I concentrate on Bg, which exhibits some of the more spectacular linearization effects.

The clitic *li* instantiates Yes/No and focus features in the highest head position in the tree, which for the sake of discussion will 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.\(^{15}\) In terms of non-initiality, this means that, as a lexical property, *li* cannot be the initial in its prosodic word. The relevant constraint is stated in (29).

\[(29) \text{NONINITIAL(PROSODIC WORD)}\]

If preceded by a possible host, such as *grad* in Bg (30), which is part of the phrase in SpecCP $\nu$ tozi *grad*, then *li* is linearized at the right edge of that host:

\[(30) [V \text{ tozi}_{\nu} [[\text{grad}_{\nu} \text{ li \ si [xodil]_{\nu}}])]? \]

in this city Q aux.2SG went

‘Was it to this city that you went?’

\(^{15}\) I take this to mean the domain of NONINITIAL for *li* is the prosodic word.
Sometimes, however, SpecCP is empty so that there is nothing higher than $li$. When this happens, $li$ is linearized at the right edge of the prosodic word to its right. Thus, $li$ differs from the special clitics in Bg in following the verb. Recall that these latter precede the verb if at all possible: in (31a) the conjunction $i$ ‘and’ renders the clitics $mu$ $gi$ non-initial, in (31b) the future proclitic $šte$, does, and in (31c) the sentential negation element $ne$ does:\footnote{Note that in standard Bg $ne$ is post-stressing, so the dative clitic $mu$ in (31c) is actually stressed (word stress is indicated by upper case).}

\begin{enumerate}
\item [(31)] a. $\llbracket I\mu gi\rrbracket_{0}$ $DAde$ $včera$. and him.$DAT$ them.$ACC$ gave yesterday
\quad ‘And she/he/you gave them to him yesterday.’
\item b. $\llbracket Šte\mu gi\rrbracket_{0}$ $predaDEŠ$. will him.$DAT$ them.$ACC$ hand-over.$2SG$
\quad ‘You will hand them over to him.’
\item c. $\llbracket Ne\MU\rrbracket_{0}$ $[DAde]_{0}$ knigite.
\quad neg him.$DAT$ gave books.$DEF$
\quad ‘She/he/you didn’t give him the books.’
\end{enumerate}

We see in (32), however, that under the exact same conditions $li$ necessarily follows the verb:

\begin{enumerate}
\item [(32)] a. $\llbracket [I\rrbracket_{0}\llbracket DAde\rrbracket_{0}\llbracket li\rrbracket ]$ knigite $včera$ na Ivan?
\quad and gave $Q$ books.$DEF$ yesterday to Ivan
\quad ‘And did she/he/you give the books to Ivan yesterday?’
\item b. $\llbracket Šte\llbracket predaDEŠ\rrbracket_{0}\llbracket li\rrbracket ]$ knigite $na$ Ivan?
\quad will hand-over.$2SG$ $Q$ books.$DEF$ to Ivan
\quad ‘Will you hand the books over to Ivan?’
\item c. $\llbracket [Ne\rrbracket_{0}\llbracket DAde\rrbracket_{0}\llbracket li\rrbracket ]$ knigite $na$ Ivan?
\quad neg gave $Q$ books.$DEF$ to Ivan
\quad ‘Didn’t she/he/you give the books to Ivan?’
\end{enumerate}

That is because $li$’s enclitic nature causes it to be linearized after the adjacent prosodic word, which, in (32), is $i$ $dade$, $šte$ $predadeš$, and $ne$ $dade$.

With post-stressing $ne$, $li$ appears between the clitic and the verb, as in (33), which is exactly what one expects if $ne$ $mu$ in (31c) is indeed an independent prosodic word:

\begin{enumerate}
\item [(33)] $\llbracket [Ne\rrbracket_{0}\llbracket MU\rrbracket_{0}\llbracket li\rrbracket ]$ $[DAde]_{0}$ knigite.
\quad neg him.$DAT$ $Q$ gave books.$DEF$
\quad ‘Didn’t she/he/you give him the books?’
\end{enumerate}
Such examples, where *li* fails to respect the LCA, show that this is not a hard and fast principle of linearization. Rather, as López (2009) also concludes, the LCS is soft constraint:

(34) LCA: C-COMMAND LINEARIZES AS PRECEDENCE

The linearization of *li* can override (34) in order to satisfy PROSODIC SUPPORT in (6), in keeping with the lexical properties of *li*.

Even more interesting is the question of what happens if there is second special clitic, such as accusative *gi* ‘them’. As seen in (35a), *gi* is most naturally proclitic on the verb following it, with *ne mu* independently a viable prosodic word. Consequently, *li* is still prosodified after adjacent *ne mu*, except that now *li* appears *between* the two pronominal clitics. This is shown in (35b):

(35) a. [[Ne **MU**_0 [vi **[DAde]_0 ]] [Ana]_0 ] (merger of *li*) ⇒
   neg  him.DAT  them.ACC gave  Ana
   ‘Ana didn’t give them to him.’
   b. [[Ne **MU**_0  **li**] [vi **[DAde]_0 ]] [Ana]_0 ?
   neg  him.DAT  Q  them.ACC gave  Ana
   ‘Didn’t Ana give them to him?’

LCA-driven linearization first produces the order in (35a), which is prosodified as indicated. Next, *li* is merged in C⁰. If SpecCP is filled, as in (30), *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* is linearized as prosodically adjoined to the right edge of the adjacent minimal prosodic word, which in (35b) is *ne mu*. This is the best example of prosodically conditioned linearization that I know of.

Splitting of *mu + gi* by *li* in (34b) is particularly striking since nothing else can ever interrupt such a sequence of two pronominal clitics. This is not generally true of the clitic + verb cluster in Bg, which as I have discussed in Franks (2005, 2006b), tolerates some intervention by various tonic aspectual adverbials, such as *vse ošte* ‘still’ in (36) or *veče* ‘already’ in (37), or destressed emotive particles like *už* in (38).

(36) a. Ti ne **SI**  **mu**  go  *vse ošte*  dal.
   you neg  aux.2sg  him.DAT  him.ACC  still  gave
   ‘You still have not given it to him.’
   b. ?Ti **SI**  *vse ošte**  **mu**  go  dal.
   c. *Ti **SI**  **mu**  *vse ošte**  go  dal.
Dynamic Spell–Out as Interface Optimization

(37) a. Az sâm ti ja veče dala.
   I aux.1SG you.DAT it.ACC already gave
   ‘I already gave it to you.’
   b. Az sâm veče ti dala.
   c. *Az sâm ti veče ja dala.

(38) a. Az sâm ti go už dala.
   I aux.1SG you.DAT it.ACC already gave
   ‘I have maybe already given it to you.’
   b. Az sâm už ti go dala.
   c. *Az sâm ti už go dala.

Judgments about adverb interpolation are somewhat uncertain, since, although produced by the syntax, they require appropriate prosodification, which in turn requires appropriate discourse context. So, given this prosodic filtering effect, something like (37b) implies a particular context and intonation; particle splitting, as in (38b), is more natural. But the point about adverb interpolation is that the pronominal subcluster cannot ever be split. Except by li.

4.2 On the cyclicity of linearization

I now show why the linearization process must be iterative. While this is hardly a heretical view, what has I think gone underappreciated is the degree to which linear order is labile.

Recall the TM effect, which in Bg adjusts clitics left by the syntax in initial position, as in (22) versus (24). More accurately, of course, the syntax does not leave them with any order, since all that the syntax expresses is hierarchical relations. But taking asymmetric c-command to map into precedence, Bg (22a) and (24a) would have the initial Spell–Out orders in (39).

(39) a. Si mu gi pokazvala.
   aux.2SG him.DAT them.ACC shown.FEM
   b. I si mu gi pokazvala.
   and aux.2SG him.DAT them.ACC shown.FEM
   ‘And you have shown them to him.’

Once prosodic structure is imposed, the clitics in (39a) but not those in (39b) end up being initial in their Utterance, hence in Bg the Clitic Group si mu gi, demarcated “CG”, must be relinearized, as in (40):

17 Note that the representations in (39) are before TM, so that (39a) is acceptable in Mac but not in Bg; (39b) on the other hand does not lead to TM, so it is acceptable in both.
18 At this point I adopt Nespor and Vogel’s CG domain, but later suggest an account without it.
I understand this process as one which erases the precedence relation between the clitic group and its adjacent prosodic word and redefines it in a way that is consistent with the non-initiality constraint pertaining to the Utterance level of prosodic organization.

One might wonder why I bother first to linearize the clitics in front of the verb and subsequently to relinearize them to follow the verb. This is probably my most radical claim, since it implies a strongly derivational model. It also raises the important question of when initial linearization takes place, a question to which I will return shortly. In any event, given these facts, one should ask how linearization, which is sensitive to the prosodic word, interacts with TM linearization, which is sensitive to the Utterance. My claim is that the interrogative version of Bg (39a)/(40a) begins, after LCA linearization, as in (41a) but eventually emerges as in (41b):

(41) a. li si mu gi pokazvala Q aux.2SG him.DAT them.ACC shown.FEM
b. Pokazvala li si mu gi?
   ‘Have you shown them to him?’

How is the order in (41b) derived? I propose a derivational scenario which roughly proceeds through the steps sketched out in (42):

(42) a. [[si mu gi]CG [pokazvala]o] (merger of li) ⇒
b. [[[si mu gi]CG [pokazvala]o] li] (Spell–Out as Utterance) ⇒
c. v #[[[si mu gi]CG [pokazvala]o] li ]# v (TM) ⇒
d. v #[[[pokazvala]o li ] [si mu gi]CG ]# v

The idea, as before, is that all heads are first linearized to the left, following the LCA, but, unlike in the simple case of (39a), the special clitics cannot be considered Utterance initial until after li has been merged in C0 and is itself linearized, as in (42b). The entire CP is then sent to Spell–Out and prosodified as an Utterance, indicated in (42c). At this point 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 (42d). 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.

Once again, (42c) is the final version in Mac, but in Bg TM applies to produce (42d).
It is worth observing that addition of the conjunction *i* ‘and’ has no effect on these word order facts, something that is expected only if CP must be prosodified as an utterance. The reason *i* is of interest is that this element is sufficient to render the special clitics not Utterance initial, as shown by (39b), but is not itself tonic and so cannot host prosodic enclitics, such as *li*. What I have noticed and reported in number of places, most accessibly Franks and Bošković (2001), is that, although *i* saves the clitics in (39), it fails to in (41). Apparently, by the time *li* is sent to Spell–Out it is too late. That is, the determination that the clitics are Utterance initial and the resolution of this problem that gives rise to the TM effect must precede merger of the conjunction *i* above the interrogative *li*. This is however exactly what one would expect if *i* is a higher head, necessarily outside of CP. That is, CP is sent to Spell–Out, it is prosodified as an Utterance, linearization is reevaluated to respect the clitics’ non-initiality requirement, and by the time *i* is merged the clitics have already been relinearized so that they follow *li*. The result, in short, is (43), which is just (41b) plus *i*.

(43)  I pokazvala *li si mu gi*?
    ‘And have you shown them to him?’

When *li* is present, *i* is irrelevant to linearization.

There are several crucial assumptions implicit in my account of these data that can tell us a lot about the timing of Spell–Out. In the derivation of (39b) 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 (43), on the other hand, waiting is impossible: *li* defines a CP and this must be prosodified as an Utterance. To accomplish this I assume Selkirk’s (to appear) “Match Theory”, which exploits canonical correspondences in mapping syntactic phrasing into prosodic phrasing (as opposed to more traditional edge or alignment based approaches). Her system is given in (44):

(44)  Selkirk’s Match Theory
    a. **Match Clause**: Syntactic clause $\Rightarrow$ Intonational phrase ($\iota$)
    b. **Match Phrase**: Syntactic phrase (XP) $\Rightarrow$ Phonological Phrase ($\phi$)
    c. **Match Word**: Syntactic word $\Rightarrow$ Prosodic Word ($\omega$)

One source of possible confusion is that I have adopted Nespor and Vogel’s terminology, following most others who discuss Slavic clitics, so that what I have called an Utterance is Selkirk’s I-phrase and what I have called an I-phrase is her Phonological Phrase. The basic idea is however the same: a clause, here a CP, maps into a large unit of prosodic organization, a word maps into a small
one, and a phrase is in between. My point is simply this: a CP is spelled out as an Utterance, which means that whatever is in SpecCP necessarily counts, hence if anything has moved to SpecCP, li is able to satisfy the LCA in (30). But anything outside of CP, such as the i in (43), is not considered. Hence the li facts, taken together, require spelling out of CP.

5. Aspects of ellipsis

This section discusses several aspects of ellipsis that a successful model of the Spell–Out process should accommodate.

5.1 Ellipsis and resolution of PF offense

There is a vast literature on ellipsis of diverse types. I follow Merchant (2001) among others in taking ellipsis to be PF deletion than LF copy. One implementation is to mark a recoverable constituent for “flat” intonation and then delete it in the mapping to PF. This is tantamount to non-pronunciation of a syntactic constituent, i.e., mapping to silence in PF. Standard ellipsis must be fairly early in the Spell–Out process, since it crucially targets syntactic constituents. Indeed, ellipsis is generally taken as a textbook standard for diagnosing constituency.

In this context, the capacity for ellipsis to rescue derivations syntactically illicit structures is of particular interest; cf. especially Merchant (2001) for copious examples and discussion. To illustrate, Lasnik (1999) considers why V fails to raise when there is pseudogapping (VP-ellipsis), as in (45a), and why I-to–C movement fails when there is matrix sluicing (IP-ellipsis), as in (45b).

(44)  a. You might not believe me but you will {\textit{believe}} Bob, {\textit{VP believe t_i}}
    b. A: Mary will see someone.
   B: Who, {\textit{will}} {\textit{IP Mary will see t_i}}?

---

20 A more careful account might be couched in Ito and Mester’s new “prosodic adjunction” model.
21 In Franks and Bošković (2001), we took this TM paradigm as evidence for Chomsky’s (2001) “phase” theory. However, in Chomsky’s system, where CP is a phase but its complement IP is not, 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 Bg data, which require CP itself to be spelled out. Moreover, all other post-LCA linearization facts refer to prosodic rather than syntactic domains. Since linearization is essentially a PF matter, this is as expected.
Lasnik’s insight is that ellipsis can save these derivations by deleting structure containing offending features.\textsuperscript{22} The puzzle is that, in order for ellipsis to have a salutary effect, the offending feature should be \textit{within} the elided constituent and the violation it creates is not evaluated until \textit{PF}. In the end, Lasnik comes up with a complicated solution that exploits FF movement and appeals to the idea that ellipsis and pied-piping movement both provide ways of circumventing PF crash caused by a strong feature on the target. Regardless of the specifics of his analysis, it seems to me that the general idea could easily apply to PF clitic violations as well.

Consider a well-known (if controversial) paradigm that seems to militate against a syntactic account of clitic cluster formation. It is based on the BCS ellipsis data in (46), discovered by Stjepanović (1998a, 1998b) and also discussed in Bošković (2001a), Franks (1998/2010), Richards (1997) and Progovac (2000):

\begin{align*}
\text{(46) a. Ona} & \text{ } \text{mu} \text{ } \text{ga} \text{ } \text{je} \text{ } \text{dala}, \text{ } \text{a} \text{ } \text{i} \text{ } \text{ja} \text{ } \text{sam} \text{ } \text{mu} \text{ } \text{ga} \text{ } \text{[dala].} \\
& \text{she} \text{ } \text{him.DAT} \text{ } \text{it.ACC} \text{ } \text{aux.3SG gave and also} \\
& \text{I} \text{ } \text{aux.1SG} \text{ } \text{him.DAT} \text{ } \text{it.ACC gave} \\
& \text{‘She have it to him, and I did, too.’} \\
\text{b. Ona} & \text{ } \text{mu} \text{ } \text{ga} \text{ } \text{je} \text{ } \text{dala}, \text{ } \text{a} \text{ } \text{i} \text{ } \text{ja} \text{ } \text{sam} \text{ } \text{mu} \text{ } \text{ga} \text{ } \text{[ga dala].} \\
\text{c. Ona} & \text{ } \text{mu} \text{ } \text{ga} \text{ } \text{je} \text{ } \text{dala}, \text{ } \text{a} \text{ } \text{i} \text{ } \text{ja} \text{ } \text{sam} \text{ } \text{[mu ga dala].} \\
\text{d. ?*Ona} & \text{ } \text{mu} \text{ } \text{ga} \text{ } \text{je} \text{ } \text{dala}, \text{ } \text{a} \text{ } \text{i} \text{ } \text{ja} \text{ } \text{sam} \text{ } \text{[mu] ga} \text{ } \text{[dala].}
\end{align*}

If ellipsis here always targets a phrase—for the sake of concreteness assume AgrIOP dominates AgrOP which in turn dominates AuxP—then Stjepanović’s paradigm implies AuxP-ellipsis in (46a), AgrOP-ellipsis in (46b), and AgrIOP-ellipsis in (46c). The ungrammatical (46d), on the other hand, could only be obtained by deleting the AgrIO dative head \textit{mu} independently of AuxP-ellipsis. On the one hand, these facts provide additional support for my contention that, wherever they end up, clitics are introduced as separate functional heads. On the other hand, they also raise a problem for any strictly syntactic approach to clitic placement: ellipsis must target the phrase containing the clitic \textit{before} the clitic continues its upwards move. This strikes me as exactly like Lasnik’s problem with verb and auxiliary movement, so that it should have the same kind of solution, one in which ellipsis trumps movement.

\textsuperscript{22} Lasnik (1999) offers various ways of implementing this failure of \textit{believe} or \textit{will} to move just in case ellipsis of VP or IP will occur, depending on how strength is construed. The details do not concern us here.
5.2 Ellipsis and prosodic incompatibilities

Turning now to a different sort of prosodic motivation for ellipsis, I briefly mention the possibility that the ellipsis sometimes can serve to resolve prosodic paradoxes. In her dissertation on Bg, for example, Lambova (2004) makes considerable use of intonation clash, which is encountered if one tries to impose both topic and focus intonations on the same material. She argues that fronted topic and focus both freely adjoin to a discourse-related “ΔP” projection, but that intonation clash filters out the order in which focus precedes topic, schematically as in (47).

(47)  a. TOPIC > FOCUS: no intonation clash
       b. *FOCUS > TOPIC: intonation clash!

Lambova also argues that if pronunciation of a lower copy can avoid the potential clash, then that lower copy is pronounced. One of her examples is reproduced in (48):

(48)  a. Tortata koj kâde šte porâča?
       cake.DEF who where will order
       ‘The cake, who will order where?’
       b. [SpecCP [C^0 [C^0 tortata [SpecΔP [koj [kâde]]] [Δ^0 [IP šte porâča ...]]]]]

If so, as with the AVOID HOMOPHONOUS SEQUENCES facts discussed above, this is another place where PF considerations prevent the highest copy of a wh-phrase from being pronounced. Once again, prosodification needs to feed copy deletion; moreover, the prosodic clash can surely only be identified after initial LCA-driven linearization.

5.3 Ellipsis and focus

I have recently encountered a different, far more superficial type of ellipsis that does not recognize syntactic constituency. The relevant data are from colloquial Croatian and have to do with focus-driven ellipsis in that language. Although traditional 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. For example, alongside Bg (30), repeated in (49a), one can also have (49b).

(49)  a. [V tozi_o]o [[grad]o li] [si [xodil]o]?
       in this city Q aux.2sg went
       ‘Was it to this city that you went?’
b. [[V tozi\textsubscript{i} \texttt{li}] grad [si [xodil]\textsubscript{i}]]?
‘Was it to \textit{THIS} city that you went?’

The difference is that in (49a) the focus is on \textit{CITY}, but in (49b) the focus is on \textit{THIS}. I would argue that (49b) requires there to be copies of \textit{v tozi grad} immediately above and below \textit{li}, which is in \texttt{C\textsubscript{0}} and which forces the discontinuous deletion because \textit{li} demarcates the focus. The basic idea is that non-focus material cannot follow the focused element in the fronted phrase. This is schematized in (50), making use of Lambova’s \texttt{ΔP} phrase structure system:

\begin{align}
\text{(50)} & \quad [\text{CP} \quad [V \quad [\texttt{tozi grad}] \quad \text{li} \quad [\texttt{ΔP} \quad [\texttt{koja kniga} \quad \text{šte mi podariš}]]\quad [\text{+Foc}]])
\end{align}

A similarly example splitting a \textit{wh–}phrase is given in Bg (51a), with deletions as in (51b):

\begin{align}
\text{(51)} & \quad \text{a. Koja } \text{li kniga šte mi podariš?!} & \text{b. [CP [Koja [kniga]] li [ΔP [koja kniga] šte mi podariš]]?}
\end{align}

These splits are striking because Bg, as a DP language,\textsuperscript{23} does not otherwise permit Left-Branch Extraction (LBE). Consequently this split cannot be derived through movement of \textit{koja}. However, because no non-focus material can follow the locus of the focus feature in SpecCP, \textit{li} induces scattered deletion hence superficial splitting. It is worth noting that this phenomenon is different from the kind of \textit{li} splitting displayed by Russian, since as discussed by Rudnickaya (2000) among others, in Russian splitting is more or less obligatory, even with traditional fortresses as in (52):

\begin{align}
\text{(52)} & \quad \text{a. ?Anna li i Petr priežžajut vo vtornik?} & \quad \text{b. *Anna i Petr li priežžajut vo vtornik?}
\end{align}

Similarly, the Russian version of (49) \textit{requires} splitting regardless of which part of the PP is focused; only (53b) is good:

\begin{align}
\text{(53)} & \quad \text{a. *V ètot gorod li ty ezdil?} & \quad \text{b. V ètot li gorod ty ezdil?}
\end{align}

\textsuperscript{23}For Bg as a DP language and the associated impossibility of LBE see Bošković (2005).
The reason for this is that in Russian there is simply no copy above li for scattered deletion to exploit, hence the only option ever viable for Russian li is to be pronounced at the right edge of the prosodic word to its right.24

I now turn to an even more superficial type of scattered ellipsis, leading to sometimes dramatic surface splits, which apparently operates in colloquial varieties of Croatian. The judgments are due to University of Zagreb Professor Anita Peti-Stantić; here I just point out some of the highlights, since the facts are also reported in Franks (2010). The basic problem is that, for Peti-Stantić, splitting can leave non-constituents on both sides of the splitter. Consider Croatian (54) with the splitting as before effected through ellipsis of string adjacent material, as indicated in (55):

(54) U izuzetno sam veliku sobu ušao.
    in exceptionally aux.1SG large room entered
       ‘It was into an EXCEPTIONALLY large room that I entered.’

(55) [PP U [NP [AP izuzetno veliku] sobu]] [sam
[+Foc]
[PP u [NP [AP izuzetno veliku] sobu]] [ušao ...]

The operative principle is once again 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 deleted, resulting in pronunciation of the next highest copy of that material. Crucially, in this system material on neither side of the [+Foc] element is required to be a constituent; instead, all that matters is linear adjacency. Note also that for Peti-Stantić non-clitics can also intervene, a possibility which gives rise to more complex structures than in (55).

Now for the dramatic part. Peti-Stantić (2007), in examining whether spoken Croatian really adheres to second position for clitics, offers the examples in (56), in which the clitic ču follows whatever word is focused:

(56) a. Svakog ču lijepog dana putovati vlakom svojoj kući.
    every fut.1SG nice day travel train self’s house.
       ‘Every nice day I will go to my house by train.’
    b. Svakog lijepog ču dana putovati vlakom svojoj kući.
    c. Svakog lijepog dana ču putovati vlakom svojoj kući.
    d. Svakog lijepog dana putovat ču vlakom svojoj kući.
    e. Svakog lijepog dana putovati vlakom ču svojoj kući.
    f. Svakog lijepog dana putovati vlakom svojoj ču kući.

24 This fact correlates with the general lack of superiority effects for Russian wh–phrases.
Particularly problematic to derive are (56e, f), in which the clitic is lower than immediately after the verb, since this is generally impossible. Crucially, there cannot even be a copy of future clitic ču that low in (56e) or (56f). These data thus reveal that what is pronounced in front of the clitics in colloquial Croatian must actually be higher. I therefore conclude that they must derive from a syntactic structure as in (57):

(57) [Svakog dana putovati vlakom svojoj kućī] ču [svakog dana putovati vlakom svojoj kućī].

Essentially, there is a copy of the entire clause both above and below ču; ellipsis then applies to produce the various possibilities in (56), depending upon where the focus is.

PP-internal splitting provides another interesting illustration of the same general principles. Consider the split in (58b), again provided by Peti-Stantić:

(58) a. Od jučer ga prodaje za velike novce.
   from yesterday him.ACC sells for large money
   ‘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.

Although (58b) is quite unexpected under familiar models of clitic placement, if the entire clause is fronted past ga, it can be derived as in (59):

(59) [Od jučer prodaje za velike novce] ga
    [+Foc]
    [od jučer prodaje za velike novce].

Consider now (58c), in which the clitic cannot go immediately after the preposition. The proper formulation of the largely universal cohesion between preposition and complement is a widely researched topic, about which I have nothing to contribute. However, if I am correct that whatever is going on here is a matter of PF–side deletion, one wonders why syntax should be relevant at all. And indeed, it seems as though on some level (58c) must be rejected out of PF considerations. Some support for this conclusion can be found in the interesting fact that accidental properties of the particular lexical item can sometimes rescue splittings. Specifically, 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 prepositions in BCS are genitive governing ispred ‘in front of’ and pored ‘alongside’:
(60) a. Ispred ga je ulaza dočekala policija.
   in-front-of him.ACC aux.3SG entrance.GEN waited police
   ‘The police were waiting for him in front of the entrance.’

   b. Pored je tog čovjeka sjela.
   alongside aux.3SG that. GEN man.GEN sat
   ‘She sat alongside that man.’

(61) a. On je sjedio ispred/pored.
   he aux.3SG 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’ which do not admit intransitive usage, invariably block this kind of splitting. Compare (62b) with (60b):

(62) a. *Išao je prema.
   went aux.3SG towards
   Intended: ‘He was going towards.’

   b. *Prema je tom čovjeku došao.
   towards aux.3SG that.DAT man.DAT came
   Intended: ‘He was coming towards that person.’
   [cf. ✓Prema tom čovjeku je došao. ✓Prema tom je čovjeku došao.]

Both scattered deletions in (63) are valid operations, for example if pored or prema were contrastively focused, but the sequence prema je in (63b) is subsequently filtered out as deviant whereas pored je in (63a) is not:

(63) a. ✓[Pored tog čovjeka] je [pored tog čovjeka] ...
   b. *[Prema tom čovjeku] je [prema tom čovjeku] ...

The reason (63a) survives is because, from the perspective of the lexical item pored, 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. The kind of splitting in (58c) is thus expected to elude the PF filter with a preposition like ispred and indeed, according to A. Peti-Stantić (p. c.), (64) is much better than (58c):

(64) Policija dočekala ispred ga je ulaza
   police waited in-front-of him.ACC aux.3SG entrance.GEN
   (... and not alongside)
   (... 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 (63a), the case governing variant had been invoked to make *tog čovjeka* ‘that man’ genitive.

6 Superficial lexical choice

In the phenomenon just discussed, syncretism is crucial. 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 I believe a consequence 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.

6.1 More accidental syncretism effects

Language is replete with examples of syncretic morphological forms which manage to satisfy the contradictory requirements of two different structures. This section presents three relevant constructions, albeit quite different from the PP-split phenomenon just discussed.

In the across-the-board (ATB) *wh–movement* construction in Russian (65), the feminine relative pronoun *kotoroj* ‘which’ is syncretic instrumental and dative, whereas the masculine forms *kotorym/kotoromu* are distinct:

\[(65)\] *devuška, kotoroj [ja byl uvelčen \(t_{\text{INST}}\) i girl (with/to) which.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.INST/**who.DAT ...’]
In Franks (1995), I assimilated examples like (65) to the parasitic gap construction, which displays the same syncretism effect, and argued that a null operator was involved. The features of the null operator were determined by those of overt *kotoroj*, which for instrumental and dative are non-distinct.

In German free relatives, as in (66), inanimate *was* is syncretic nominative and accusative, whereas the animate forms *wer* and *wen* are distinct:

(66) Ich werde was da steht mitbringen.
I will what.NOM/ACC there stands with-bring
‘I will bring along what is standing there.’
[cf. Ich werde ??*wer/*wen ... ‘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 (67), the past tense first singular *láttam* ‘saw’ is syncretic definite and indefinite conjugation, whereas the present tense first singular forms *látom*/*látok* are morphologically distinct:

(67) Láttam a két szép kutyát és egy csunya cicát.
saw.1SG-DEF/INDEF the two beautiful dogs and one 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 the syncretism of particular lexical items allows those forms to be evaluated in two different ways from two different perspectives. If the particular morphological form does not happen to be syncretic, then there is no appropriate lexical item available and the conflict results in ineffability. But if there is a form that can do double duty, Spell–Out remains oblivious to the syntactic feature conflicts.

6.2 Matching and clitic drop

Gračanin-Yüksek (2009) observes that accusative pronominal clitics can be dropped in *što*-relative clauses in BCS just in case the *form* of the nominal head of the relative clause is appropriate to the gap in the relative clause. This means that a nominative noun can license an accusative gap so long as its form is syncretic with the accusative. Some of her examples are given in (68)–(70):

(68) a. Čovjek [što sam ga/*∅ vidio] opljačkao je banku.
man.NOM that aux.1SG him.ACC saw robbed aux.3SG bank
‘The man that I saw has robbed a bank.’
b. Upoznao sam čovjeka [što ga/∅ je Jan doveo met aux.1SG man.ACC that him.ACC aux.3SG Jan brought na zabavu].
on party
‘I met the man that Jan brought to the party.’
child.neut.NOM/(ACC) that aux.1SG him.ACC seen has long hair
‘The child that I saw has long hair.’

(69) a. Želja [što sam je/*∅ osjetio] bila je jaka.
desire.FEM.NOM that aux.1SG her.ACC felt been aux.3SG strong
‘The desire that I felt was strong.’
b. Ljubav [što sam je/∅ osjetio] bila je jaka.
love.FEM.NOM/(ACC) that aux.1SG her.ACC felt been aux.3SG strong
‘The love that I felt was strong.’

What is going on here? While it is not particularly unexpected that matrix accusative čovjeka should be able license an accusative gap in (68b), the fact that matrix nominative dijete in (68c) also can is surprising. The reason is because nominative dijete is featurally non-distinct from the accusative, so somehow it is able to functions as accusative in the embedded clause—despite the fact that it is actually nominative. The constrast between distinctly nominative želja and syncretic ljubav in (69) is similar.

In Franks (1995), I suggested a movement account when there is a gap and base generation when there is a clitic (i.e., regarding the clitic as a resumptive pronoun). Although Gračanin-Yüksek makes the same set of assumptions, I suggest here that the clitic can also arise through movement and that only for some speakers does it have a resumptive quality. Hence Gračanin-Yüksek’s (70), which involves an adjunct island, is ungrammatical with a gap and acceptable only for some speakers with a clitic:

(70) Vidio sam čovjeka [što Sanja plače [jer %ga/*∅ mrzi]].
seen aux.1SG man.ACC that Sanja.nom cries because him.ACC hates
‘I saw the man that Sanja cries because she hates (him).’

It is clear that the origin of the clitic relates to the fact that the relativizer što does not mark case. Regardless of how this connection is implemented, the point remains that the same phenomenon is taking place here as with ATB and parasitic gap constructions: a null operator moves to SpecCP in the relative clause and its morphological case features are matched against those of its antecedent. This is illustrated in (71) for (68c):
(71) Dijete [∅ [ što sam t∅ vidio] ima dugu kosu.

child.NOM-ACC Øacc that aux.1SG seen has long hair

‘The child that I saw has long hair.’

If the case features of the null operator are compatible with that of the nominal head of the relative clause, here dijete, it is licit. If not, the case marked relative pronoun koji must be used.

6.3 Homophony and allomorph selection in Croatian

I now turn to a demonstration of the superficiality of the factors impacting on allomorph selection. A famous alternation in the BCS clitic system is between the standard 3sg feminine accusative pronoun je and its variant ju. Here I rely partly on data presented in Witcombe (2009), and note also that my informants for these data were Croatian speakers.

The most familiar situation in which ju supplants accusative je is when it precedes the 3sg singular auxiliary, also je, as in (72).

(72) Konobar mi ju/*je je dao.

waiter me.DAT her.ACC aux.3SG gave

‘The waiter gave it to me.’

This is clearly an instance of constraint against homophonous sequences in (7), although it pertains to allomorph selection rather than copy deletion. Much less well known is the fact that ju is selected over je when it precedes a word beginning in je-, as in (73), or when it follows a word ending in -je, as in (74).


already her.ACC eat.1SG gave aux.1SG her.ACC Jelena.DAT

‘I am already eating it.’ ‘I gave it to Jelena.’

(74) Pije ju/*je

drinks it.ACC

‘S/he is drinking it.’

Unlike accusative je, 3sg singular auxiliary je has no special allomorph to exploit. Instead, it deletes after another clitic ending in -e, obligatorily after reflexive se but only optionally after 1st person me or 2nd person te:

(75) a. Predstavila mu se (*je).

introduced him.DAT REFL aux.3SG

‘She introduced herself to him.’
b. Vidio me (je). saw me.ACC aux.3SG
‘He saw me.’
c. Pozvao te (je). called you.ACC aux.3SG
‘He invited you.’

There is variation among speakers, dialects, and styles; such vicissitudes of allomorph selection show it to be a relatively superficial process, an interplay among competing desiderata. Witcombe (2009) in fact develops an OT account of these sorts of phenomena.

7 More speculations about Spell–Out

The facts of Spell–Out discussed in this paper indicate to my mind that we need a model in which (i) contradictory factors compete (OT-like competition in Spell–Out), but structures are built derivationally (cyclicity of Spell–Out), and (iii) (at least some) decisions are local (uniformity of Spell–Out paths). These tentative conclusions are listed in (75):

(75) a. Contradictory factors compete. (OT-like competition in Spell–Out)
   b. Structures are built derivationally. (cyclicity of Spell–Out)
   c. (At least some) decisions are local. (uniformity of Spell–Out paths).

In this final substantive section I elaborate on these conclusions and examine associated conceptual considerations. I speculate on alternative approaches to cyclicity and explore the role of prosodification in Spell–Out.

7.1 Spell–Out as PF optimalization: uniform paths or prosodic domains?

Recall, first, that we encountered problems in deciding in which order to apply Spell–Out processes such as selection of lexical item, its linearization, decisions about copy deletion and prosodification, and so forth. My solution was to see these factors as competing desiderata, along OT-like lines. However, to the extent that Spell–Out is iterative, these desiderata have the effect of processes rather than constraints. And while the standard embodiment of iterativity is cyclicity, I have adduced evidence that the path to PF is not necessarily punctuated along traditional cyclic nodes lines. Rather, linearization needs to be able to take place repeatedly within the same phase, for example, each time a clitic adjoins to its host. Boeckx (2008) refers to the standard model, in which

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25 Note also that Slvn, unlike BCS, does not drop je.
cyclic phasal domains are sent to PF, as “punctuated” Spell–Out paths, and to alternatives in which every phrase is a Spell–Out domain as involving a “(quasi)-uniform” Spell–Out path. Boeckx (2008: 52) concludes that “Chomsky’s characterization of C and v as phases does not receive independent support from interface diagnostics, and boils down to a stipulation.” While I agree with this general conclusion, it is not obvious to me that a uniform approach is the best solution once traditional phases have been rejected.

Spelling out every phrase does provide a way of making sense of (75). One interesting consequence is that cyclic consideration of constraints, as in such derivational OT phonology work as Rubach (2004) or Kiparsky (2000), becomes indistinguishable from pure generative approaches as the cycles become closer and closer in size. That is, the smaller Spell–Out domains are, the tighter they are nested hence the less distinguishable contraints become from processes. Optimality theoretic and derivational generative approaches might therefore be reconciled by sending every phrase produced by the syntax to Spell–Out. OT-like constraints would be iteratively imposed, optimizing PF desiderata as each phrase is constructed. In such a model, as the paths approach uniformity, ordering puzzles disappear and distinctions between OT and derivational conceptions trivialize.

There is however a provocative alternative that produces cyclic effects but does not rely on syntactic units per se. A curious fact about the effects discussed in this paper is that they pertain to prosodic domains of different sizes. If prosodic rather than syntactic structuring is what is actually relevant to Spell–Out domains, then perhaps all ostensible cyclic effects could be recast in these terms. This sort of approach makes sense to my mind, since Spell–Out is really a PF rather than syntactic matter.

Note that under Boeckx’s version the relevant unit must be a phrase, which is what is meant by “quasi”-uniform; a perfectly uniform Spell–Out path would apply after every application of merge. But clearly li must wait until CP is completed, since it needs to violate the LCA only once it is has been determined that there is no prosodic word to host it in SpecCP. Crucially, Spell–Out could not be allowed to apply at the bar-level, otherwise examples such as (49) would not be derivable. Similarly under the prosodic domain story, the fact that enclitic li is not prosodically supported can only be determined after no viable host merges in SpecCP. Not that, even though li is a syntactic word, as a clitic Selkirk’s (44c) fails to apply to it, so that it is only prosodified at the next prosodic level up, by which time it will already be clear whether or not there is a host to its left. Either way, it is worth noting that iterative OT addresses one of the common objections to standard OT: the problem of ineffability. The problem is this: If there is always a highest ranked candidate—no matter how low—then

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26 I explore such an account in Franks (in progress).
how can a derivation ever crash? But in an iterative system, even if there always is an the optimal candidate, that candidate may end up being useless as input to the next derivational step and the derivation stops. Similarly, on the PF and LF sides, if the winning Spell–Out candidate is something that cannot be seen, i.e., that is illegible to PF or LF, then this too results in ineffability.

7.2 Tobler-Mussafia linearization revisited

This section offers a quick demonstration of what this might mean for TM linearization. Recall the account presented in section 4.2, with the derivation in (42), repeated in (77), of the Bg sentence in (76):

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

(77) a. [[si mu gi]CG [pokazvala]o] (merger of li) ⇒
b. [[[si mu gi]CG [pokazvala]o] li] (Spell–Out as Utterance) ⇒
c. v [[[[si mu gi]CG [pokazvala]o] li]# v (TM) ⇒
d. v [[[[pokazvala]o li] [si mu gi]CG]# v

I had to restructure the clitics to form a “clitic group” consisting of the cluster si mu gi and then relinearize them, in order to go from (77c) to (77d) in accordance with NONINITIAL(UtTERANCE). The reason for the restructuring was that, under Bošković’s system of successive clitic adjunction, the most straightforward internal order before merger of li would be as shown in (78).

(78) [si [mu [gi [pokazvala]]]]

Now, what if the clitics were not subjected to restructuring, but rather the mapping to Spell–Out was optimized in an iterative fashion for each element successively? The result, interestingly enough, is the same, as shown in (79):

(79) a. [si [mu [gi [pokazvala]]]] ⇒
b. [[[si mu [gi [pokazvala]]] li]] ⇒
c. [[[mu [gi [pokazvala]]] li] si] ⇒
d. [[[[gi [pokazvala]] li] si] mu] ⇒

(79a) is just (78), reflecting the successive LCA-compatible linearization of each clitic adjunction. In (79b) li has been added and linearized to the right of the prosodic word si mu gi pokazvala, in conformity with its enclitic status,
which outranks the LCA. This is the final linearization in Mac. In Bg, on the other hand, *si now violates NONINITIAL(UTTERANCE), so it is linearized at the right edge of *mu gi pokazvala li, as in (79c). At this point, however, *mu violates NONINITIAL(UTTERANCE), so it is linearized at the right edge of gi pokazvala li si, as in (79d). But now gi violates NONINITIAL(UTTERANCE), so it is linearized at the right edge of pokazvala li si mu. This produces the final output, with the correct Bg order of pokazvala li si mu gi, in (79e).

7.3 Clitic constraints revisited

In the system just described, when each prosodic unit (or phrase, if the appropriate domain turns out to be syntactic) is sent to Spell–Out, it continually runs the gauntlet of constraints until it is truly optimal. This requires some reevaluation of the constraints introduced earlier. In particular, the question of how the BCS special clitics differ from *li needs to be examined more carefully. Whereas the traditional approach to 2P clitics is that they are positioned second in their I-phrase, as reflected in my use of NONINITIAL(I-PHRASE) in (4), this cannot actually be correct. The problem is that the BCS version in (80b) of Bg (25a), repeated as (80a), is not possible, despite the fact that *si mu ih is indeed non-initial in its I-phrase:

(80)  
a. I *si mu gi pokazvala.  
   ‘And aux.2SG him.DAT them.ACC showed.  
   ‘And you showed them to him.’  
b. *I si mu ih pokazala. [correct BCS order: I pokazala si mu ih.]

I therefore conclude that the operative constraint here actually pertains to the prosodic word, just like with *li (in all Slavic languages in which it is found).

(81)  
NONINITIAL(PROSODIC WORD)

The prosodic difference between the special clitics in BCS and Bg is thus that the domain of non-initiality has expanded to the Utterance in the latter language; in Mac (and Slvn) it is disregarded altogether. However, if (81) pertains both to the special clitics (in BCS) and to *li, then an alternative account

27 At the very least, additional clitic parameters would need to be assumed, such as the traditional three parameter system of Klavans (1985), updated in Anderson (1995) and also adopted by Bošković (2001a: 82).
28 It must be the Utterance rather than I-phrase because of examples such as Bg (25b).
29 Of course, the other important difference has to do with clitic placement. The simplest account would be that in 2P languages the verb is pronounced low whereas in the verb-adjacent clitic languages it is pronounced high, hence adjacent to the clitics.
of any differences between these two kinds of items is necessitated. I believe that the answer is straightforward: the special clitics, being paradigmatic and introduced lower in the tree, move, whereas li does not. In short, there are no lower copies of li that can be pronounced when (81) is in danger of being violated.\(^{30}\) This implies that PRONOUNCE HIGHEST is ranked below NONINITIAL(PROSODIC WORD), so that lower copies are accessed if possible. This explains the absence of prosodic inversion in BCS.\(^{31}\)

The I-phrase nonetheless still plays an important role in prosodification in these languages. The reason is that clitics remain unprosodified until they are contained within a prosodic domain sent to Spell–Out. Hence, it is only when an I-phrase containing a clitic is prosodified that the clitic is evaluated with respect to NONINITIAL(PROSODIC WORD). It is at that point that the special clitics (in BCS) and li (in all the languages) need to be adjoined to an adjacent prosodic word. Here I am assuming the “Strict Layer Hypothesis” of Selkirk (1984) and Nespor and Vogel (1986), which states that “speech is organized into a set of prosodic domains that form a hierarchy of containment, with each non-terminal constituent made up of a sequence of constituents at the next level down” (Ito and Mester, in press). Hence, parsing of I-phrases into prosodic words must be exhaustive.\(^{32}\)

8 Conclusion

By way of summary, I began by arguing for a syntax which eschews phase-induced successive cyclic movement and considered when hypothetical intermediate wh–phrase sites are pronounceable or interpretable. I advocated Takahashi’s (1994) proposal that “an element does not move until its final landing site has been introduced into the tree, and attraction takes place” (Boeckx 2008: 68), so that chains are formed only subsequent to movement. I then identified a variety of likely PF effects on the output of syntax and considered how factors such as linearization, lexicalization, prosodification, and deletion might interact. I argued that these are probably best understood as

\(^{30}\) A small caveat: it is likely that, in some languages, li can be introduced as the head of a FocusPhrase (Lambova’s ΔP) just below CP and raise to C. See Franks 2006b) for consideration of this possibility.

\(^{31}\) The issue remains of why—taking the arguments in Bošković (2001b) to be compelling—BCS li is never reprosodified at the right edge of the prosodic word to is right in order to respect NONINITIAL(PROSODIC WORD). My guess is that the situation simply never arises because li is merged as a Focus head in this language (see fn. 30), hence there is always prospective host material to its left, in SpecFocusP.

\(^{32}\) Unfortunately, BCS (80b) remains problematic. Although I would prefer to avoid a “directionality of prosodic adjunction” parameter (cf. fn. 27), it may well be that a lexical enclitic/proclitic distinction is unescapable. If BCS clitics require support to their left, then the sequence i si mu ih will straightforwardly violate the hard constraint PROSODIC SUPPORT.
competing constraints, interacting to select an optimal realization. I then argued for a highly derivational model of Spell–Out, applying from the bottom up to larger and larger units. However, I suggested that these units may not be traditional phases, but rather increasingly exhaustive prosodic domains. I also suggested that every Spell–Out domain is optimized and that this optimization itself iterates until it cannot be further improved upon. Most of the data were meant to show how small scale tinkering could happen on a local level. I also discussed situations in which one piece of a syntactic structure needed to made reference to another piece, and showed that it was oblivious to the internal syntax of that other piece, relying instead on the actual choice of lexical item.

Returning to my point of departure—the division of labor between syntax and PF—it seems is that the burden has shifted decidedly over to PF. This PF rich reconception of the grammar, although it makes syntax simpler, is going to make the PF–side a lot more complex. Solving the puzzles of PF-driven Spell–Out presents a challenge I plan to address in future work, and urge readers to do the same.

References


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