

**On the Mechanics of Spell-Out**  
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**0. 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” 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 PF and 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 it 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 a 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 tool for shedding light on the specific derivational steps which serve to map syntactic structures into those manipulable by the morphology and/or phonology will be 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 contain only hierarchical information” and PF considerations are 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” (cyclically, via “Multiple Spell-Out”) and that it reapplies at different points in the derivation, thus making use of different kinds of information (initial linearization exploits c-command along “Linear Correspondence Axiom” lines, later relinearization exploits prosodic properties of specific lexical items). I postpone examination of linearization to section 2, since ontologically prior, it seems to me, should be the decision of what in fact needs to be linearized. For example, if the discontinuities created through

movement are technically treated as remerger of a copy of the moving constituent, then one might 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 by the needs of the morphological and phonological components. Section 1 reviews several ideas in the literature about copy pronunciation. I will conclude that decisions about copy pronunciation must also be made derivationally, although the interactions are complex, since, for example, 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 3 then examines different kinds of ellipsis. It will be argued 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.<sup>1</sup> Finally, section 4 considers how pieces of the derivation that have been sent separately to Spell–Out are reassembled. It is proposed 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 becomes (through Spell–Out) in effect a lexical item, which can then literally serve as a member of another subarray within the same Numeration.

**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 by reviewing two fairly well-established accounts of lower copy pronunciation.

**1.1 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.<sup>2</sup> Consider second position clitics in Bosnian/Croatian Serbian/ (BCS), which arguably move to the highest head position in the clause. They are enclitic, which means that they require a prosodic word host to their left. We can think of this as a prohibition against being initial in their Intonational phrase. Thus, whenever BCS clitics are left by the syntax at the beginning of their I-phrase, we encounter them in lower than second position.<sup>3</sup> In the minimal pair in (1) this effect arises if the topicalized

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<sup>1</sup> See also Merchant (2007) for discussion of types of ellipsis.

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

<sup>3</sup> 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.

constituent *tvome prijatelju* ‘your friend’ is treated as a separate I-phrase, as indicated in (1a), but not otherwise, as in (1b):<sup>4</sup>

- (1) a. #Tvome [prijatelju]<sub>ω</sub> # #su [[prodali]<sub>ω</sub> **su**] knjigu.# (BCS)  
           your.DAT friend.DAT       aux.3PL   gave       aux.3PL book.ACC  
           ‘To your friend, they sold the book.’  
       b. #Tvome prijatelju **su** prodali su knjigu.#

Since the 3rd plural auxiliary clitic *su* cannot find prosodic support when preceded by an intonational break, the lower copy must be pronounced in (1a). 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, as in (2b), where *tvoja mama* ‘your mother’ is an appositive:

- (2) a. #[[Ja]<sub>ω</sub> **sam**   **ti**] obećala sam ti igračku#. (BCS)  
           I       aux.1SG you.DAT promised   aux.1SG you.DAT toy.ACC  
           ‘I promised you a toy.’  
       b. #Ja#, #tvoja [mama]<sub>ω</sub> #, #sam ti [[obećala]<sub>ω</sub> **sam ti**] igračku#.  
           ‘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.”<sup>5</sup>

**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*-phrases in MWF languages such as Bulgarian.<sup>6</sup> Given this prohibition, in a multiple *wh*-question in Bg, although ordinarily the

<sup>4</sup> Here and elsewhere pronounced copies are in boldface, non-pronounced ones in outline font. Prosodic words are indicated by a subscripted “ $\omega$ ” and I-phrase boundaries are demarcated with “#”.

<sup>5</sup> Evidence in support of this kind of account 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 (i.e., they are not subject to a prohibition against being initial in their I-phrase); cf. Franks and King (2000: 31–48) or Bošković (2001: 151–168). Hence, in the Slvn translation of (2), cited by Golden and Milojević Sheppard (2000), it is the highest copy of the clitics which is retained:

(i) #Jaz#, #tvoja mama#, # [**sem ti** [obljubila]<sub>ω</sub>] sem ti igračko#. (Slvn)  
       ‘I, your mother, promised you a toy.’

<sup>6</sup> 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

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 (3) and (4).

- (3) a. Koj kakvo kupi? (Bg)  
       who what bought  
       ‘Who bought what?’  
       b. \*Koj kupi kakvo?
- (4) a. Kakvo obuslavja kakvo?  
       ‘What conditions what?’  
       b. \*Kakvo kakvo obuslavja?

Since pronunciation of the higher copy is blocked, (4) looks roughly like (5) in PF:

(5) **Kakvo kakvo obuslavja** [kakvo obuslavja **kakvo**]?

This gives the order in (4a) rather than (4b).<sup>7</sup>

**1.3 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. 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. On the other hand, as argued by Moro (2000) among others, copy deletion serves to render c-command unambiguously asymmetric, which is required if Kayne’s Linear Correspondence Axiom (LCA) has anything to do with determining linear order.<sup>8</sup> Consequently, copy deletion must also

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.

<sup>7</sup> Additional evidence for the strong PF adjacency nature of this constraint can be seen in Bošković’s observation that the intervening adverb *neprestano* ‘constantly’ obviates the effect:

- (i) a. Šta neprestano **šta** uslovljava **šta**? (BCS)  
       ‘What constantly conditions what?’  
       b. ?\*Šta neprestano **šta** uslovljava **šta**?

These facts are also highlighted by Billings and Rudin’s 1996 observation that Bg (ii-b) is needed to resolve (ii-a), but colloquial (ii-c), with no homophony, is perfect.

- (ii) a. \*Koj na kogo kogo e pokazal? (Bg)  
       who to whom whom aux.3SG pointed-out  
       ‘Who pointed who out to whom?’  
       b. Koj na kogo e pokazal kogo?  
       c. Koj na koj kogo e pokazal?

<sup>8</sup> 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

*precede* linearization, since otherwise the grammar would not know which copy to linearize.

Assuming Multiple Spell-Out (MSO), one can understand the order of processes to operate in a bottom-up fashion roughly as in (6):

(6) copy deletion > linearization > prosodification

This ordering is extrinsically determined, since one cannot linearize until multiple copies have been resolved and one cannot prosodify until linear order is determined.<sup>9</sup> The characterization in (6) however raises serious questions. For one thing, the fact that local prosodic structure impacts on copy deletion seems to be problematic for a strictly phase-based approach, suggesting that deletion can apply at any time, i.e., both before *and* after prosodification (within a single phase). There is also evidence that sometimes the entire structure needs to be evaluated simultaneously. One 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.<sup>10</sup> One general solution, which I proposed in Franks (2000), might be to regard interface conditions as in (6) to be constraints rather than rules *per se*. This would preserve the derivational nature of the mapping embodied in MSO but allow various processes to interact more flexibly at each phase.

**1.4 Getting clitics higher.** I take clitics to be exhaustive instantiations of formal features (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. If so, a reasonable question is “How do they get there?”, and a reasonable answer—given that verbs are canonical hosts for special clitics—is that they somehow piggy-back on the verb.

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. 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.<sup>11</sup> There are

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<sup>9</sup> On the lowest cycle, of course, copy deletion is vacuous.

<sup>10</sup> Bošković (2002b) cites the following judgments for Bg, but all Bg speakers I have asked find *kakvo* ‘what’ before *če* ‘that’ absolutely impossible and before the verb *obuslavja* ‘conditions’ very awkward:

(i) Kakvo (\*kakvo) misli (\*kakvo) Ivan (%kakvo) če (kakvo) obuslavja (kakvo)? (Bg)  
 ‘What does Ivan think conditions what?’

<sup>11</sup> Pied-piping is presumably what the diacritic feature “strong” means, following Richards’s 1997 insight that “strong” amounts to an instruction to PF to pronounce an element in that position.

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 Bg most clitics are positioned with respect to verb, but in second position languages like BCS the surface position of the verb is irrelevant. Consider for example the following variants:

- (7) 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 and takes the clitics along with it, but then 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 spelled out must be, then the clitics are going to be pronounced high but the verb cannot be. The verb is, instead, pronounced in the highest position to which a copy of its semantic features has been pied-piped.<sup>12</sup>

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 NPs. The reason is simple: although FF movement applies equally to clitics

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<sup>12</sup> 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 position for clitics and verbs 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 conceptually well grounded explanation only in the context of a model which treats FF as the driving force behind movement.

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.<sup>13</sup>

**2. Aspects of linearization.** One should probably not take all this too literally if what is being copied are FF and if linear order is only introduced on the PF-side as part of the Spell-Out process. So at this point I offer some specific proposals about linearization.

**2.1 Clitics and linearization.** Because pronunciation of verbs and clitics is divorced for second position clitics as in (7), 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 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 (8).

- (8) Včera v gradinata Mila sigurno **mu** dade knigite. (Bg)  
 yesterday in garden.DEF Mila surely him.DAT gave books.DEF  
 ‘Yesterday, in the garden, Mila surely gave him the books.’

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 (9).

- (9) Dade **mu** knigite včera. (Bg)  
 gave him.DAT books.DEF yesterday  
 ‘She/he/you gave him the books yesterday.’  
 (\***Mu** dade knigite včera.)

These Bg 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 it is for second position clitics, but rather the relevant prosodic domain is Nespor and Vogel’s (1986) “Utterance”, indicated by “v”. This can be seen in (10), where the clitics *mi go* are oblivious to the I-phrase boundary necessarily introduced by the parenthetical *edna moja prijatelka* ‘a friend of mine’:

- (10) v #Mila# #edna moja prijatelka# #[**mi** **go** [dade]<sub>ω</sub>]# v (Bg)  
 Mila one my friend me.DAT him. ACC gave  
 ‘Mila, a friend of mine, gave it to me.’

<sup>13</sup> Roberts’ (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 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).

In sum, since the generalization is that the clitics are pre-verbal unless this would leave them in absolute initial position within the clause, linearization initially makes them preverbal, but then this ordering is adjusted as needed. Further indication that linearization should abstract away from the TM effect is the fact that Mac, although syntactically very similar to Bg, does not display this PF restriction: its clitics can be initial in the Utterance. Hence the Mac judgments are the opposite from Bg here: the starred order in (9) is perfectly good, no TM effects obtain. I would thus argue that the correct way to understand (9) is to derive TM 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 Bg (but not Mac!) against Utterance initial clitics.

To handle this I endorse an approach, due originally to Bošković 2002, that is compatible with the LCA. As discussed in Kayne 1994, the LCA has the effect of left-adjunction. Taking this to be a principle of linearization means, however, that the clitics must adjoin to the verb, and not vice versa, since, everything else being equal, they precede it. 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 (11) for the clitic-verb order in (10):

(11) [mi + [go + dade ] [ mi [ go + dade ] go ] ... dade ...]

Once the verb *dade* 'gave' has moved past the clitic *go*, *go* can adjoin to it. Then once the *go* + *dade* group moves past the clitic *mi*, *mi* can adjoin to that.

**2.2 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?

**2.2.1 Making use of the Linear Correspondence Axiom.** This happens, I believe, cyclically and in several different steps. 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.<sup>14</sup> In all likelihood, however, the first and most potent linearization principle is the LCA, the 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 described, the Slavic special clitics precede their host. That is

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<sup>14</sup> Thus, contra the system of Fox and Pesetsky (2005), I explicitly reject “order preservation.”

because these are paradigmatic, reflecting features of case, tense, and agreement, and move in the syntax. LCA-induced precedence is the straightforward consequence of this movement.

**2.2.2 Invoking prosodic considerations.** In many of the Slavic languages there is, however, one simple clitic that displays very different behavior. This is the 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 I take 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. In terms of non-initiality, this means that *li* cannot be the initial in its prosodic word. When preceded by a possible host, *li* is linearized to that host's right:

- (12) [Vtozi]<sub>ω</sub> [[grad]<sub>ω</sub> **li**] [si [xodil]<sub>ω</sub> ]? (Bg)  
 in this city Q aux.2SG went  
 'Was it to this city that you went?'

Very often, however, there is nothing higher than *li*. When this happens, *li* is linearized at the right edge of the prosodic word to its right. Thus, not only can (12) have the variant in (13), *li* differs from the special clitics (which precede the verb if at all possible) in following the verb: in (14a) the conjunction *i* 'and', although not a prosodic word or viable host by itself, is sufficient to render the clitics *mu gi* non-initial; in (14b) the future proclitic *šte* does this; and in (14c) the sentential negation element *ne* does.<sup>15</sup>

- (13) [[V tozi]<sub>ω</sub> **li**] grad [si [xodil]<sub>ω</sub> ]? (Bg)  
 'Was it to THIS city that you went?'

- (14) a. [I **mu** **gi** DAde]<sub>ω</sub> včera. (Bg)  
 and him.DAT them.ACC gave yesterday  
 'And she/he/you gave them to him yesterday.'
- b. [Šte **mu** **gi** predaDEŠ]<sub>ω</sub>.  
 will him.DAT them.ACC hand-over.2SG  
 'You will hand them over to him.'
- c. [Ne **MU**]<sub>ω</sub> [DAde]<sub>ω</sub> knjigite.  
 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:

<sup>15</sup> Note that in standard Bg *ne* is post-stressing, so the dative clitic *mu* in (14c) actually bears stress.

- (15) a. [[I DAde]<sub>ω</sub> 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. [[Šte predaDEŠ]<sub>ω</sub> li] knigite na Ivan?  
will hand-over.2SG Q books.DEF to Ivan  
'Will you hand the books over to Ivan?'
- c. [[Ne DAde]<sub>ω</sub> li] knigite na Ivan?  
neg gave Q books.DEF to Ivan  
'Didn't she/he/you give the books to Ivan?'

That is because its enclitic nature causes it to be linearized *after* the adjacent prosodic word, which, in (15), is *i dade*, *šte predadeš*, and *ne dade*.

With post-stressing *ne*, *li* appears between the clitic and the verb, as in (16), which is what one expects if *ne mu* in (14c) is indeed an independent prosodic word:

- (16) [[Ne MU]<sub>ω</sub> li] [DAde]<sub>ω</sub> knigite.  
neg him.DAT Q gave books.DEF  
'Didn't she/he/you give him the books?'

More interesting is the question of what happens if there is a second special clitic, such as accusative *gi* 'them'. As seen in (17a), *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, as shown in (17b):

- (17) a. [[Ne MU]<sub>ω</sub> [gi [DAde]<sub>ω</sub>] [Ana]<sub>ω</sub>.  
neg him.DAT them.ACC gave Ana  
'Ana didn't give them to him.'
- b. [[Ne MU]<sub>ω</sub> li] [gi [DAde]<sub>ω</sub>] [Ana]<sub>ω</sub>?  
neg him.DAT Q them.ACC gave Ana  
'Didn't Ana give them to him?'

In short, *li*—which the syntax leaves in C<sup>0</sup>, i.e., higher than and asymmetrically c-commanding everything else and thus initially linearized by the LCA to precede—is prosodically adjoined to the right edge of the adjacent minimal prosodic word, which in (17b) is *ne mu*. Schematically, this is shown in (18):

- (18) a. [ne [mu [gi [dade]]]] OR [ne [[mu gi] [dade]]]  
b. li [ne MU]<sub>ω</sub> gi [DAde]<sub>ω</sub> ] ...  
c. [[ne MU]<sub>ω</sub> li] gi [DAde]<sub>ω</sub> ...

Assuming MSO, LCA-driven linearization produces the order in (18a). Prosodic structure is then imposed, *li* is later merged in C<sup>0</sup> and, again by the LCA, this is initially sent to Spell-Out with the

the linear order in (18b). 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*.<sup>16</sup>

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

Recall the TM effect, which in Bg (but not very similar Mac!) adjusts clitics left in initial position. Taking asymmetric c-command to map into precedence, compare the initial Spell-Out orders in (19):

(19) a. **Si mu gi** pokazvala. [NB: before TM, so good in Mac but bad in Bg]  
 aux.2SG him.DAT them.ACC shown.FEM  
 ‘You have shown them to him.’

b. I **si mu gi** pokazvala. [NB: no TM needed, so good in both]  
 and aux.2SG him.DAT them.ACC shown.FEM  
 ‘And you have shown them to him.’

Once Utterance level prosodic structure is imposed, the clitics in (19a) but not those in (19b) end up being initial, hence in Bg the clitic group *si mu gi* must be relinearized, as in (20a):

(20) a.  $v \# [[\mathbf{si\ mu\ gi}]_{CG} [\text{pokazvala}]_{\omega}] \# v \Rightarrow v \# [[\text{pokazvala}]_{\omega} [\mathbf{si\ mu\ gi}]_{CG}] \# v$   
 b.  $v \# i [\mathbf{si\ mu\ gi}]_{CG} [\text{pokazvala}]_{\omega} \# v$

This process erases the precedence relation between the clitic group and its adjacent prosodic word and redefines it in a way consistent with the Utterance non-initiality constraint.

Given this, one should ask how *li* linearization, which is sensitive to the prosodic word, interacts with TM linearization, which is sensitive to the Utterance. The interrogative version of Bg (19a) begins, after LCA linearization, as in (21a), but eventually emerges as in (21b):

(21) 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 (21b) derived? I propose a derivational scenario which roughly proceeds through the steps sketched out in (22):

(22) a.  $\mathbf{li} [[\mathbf{si\ mu\ gi}]_{CG} [\text{pokazvala}]_{\omega}] \Rightarrow [[[\mathbf{si\ mu\ gi}]_{CG} [\text{pokazvala}]_{\omega}] \mathbf{li}]$   
 b.  $[[[\mathbf{si\ mu\ gi}]_{CG} [\text{pokazvala}]_{\omega}] \mathbf{li}] \Rightarrow v \# [[[\mathbf{si\ mu\ gi}]_{CG} [\text{pokazvala}]_{\omega}] \mathbf{li}] \# v$  (Mac)

<sup>16</sup> 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), Bg tolerates some intervention by various tonic aspectual adverbials and distressed emotive particles, but these can never split the pronominal subcluster; only *li* can do this.

c.  $v \# [ [ [ \text{si mu gi} ]_{CG} [ \text{pokazvala} ]_{\omega} ] \text{ li} ] \# v \Rightarrow v \# [ [ [ \text{pokazvala} ]_{\omega} \text{ li} ] [ \text{si mu gi} ]_{CG} ] \# v$  (Bg)

All heads are first linearized to the left, following the LCA, but, unlike in the simple case of (19a), the special clitics are not considered Utterance initial until after *li* has been merged and is itself linearized, as in (22a). Subsequently, only once the entire CP clause is sent to Spell–Out as an Utterance, does the clitic group violate the prosodic prohibition against Utterance initiality. Hence its linearization with respect to its host is erased and reevaluated to follow *pokazvala li*. It is this kind of “double right wrap” derivation that gives rise to the appearance of *li* splitting in (21b). Mac however lacks the Utterance initial constraint, so step (22c) is never invoked and the final output remains as in (22b).

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, but is not itself tonic and so cannot host prosodic enclitics, such as *li* (or any of the BCS clitics). Interestingly, although *i* saves the clitics in (19), it fails to in (21).<sup>17</sup> Compare (23) with (19b):

(23) I pokazvala **li si mu gi**?

‘And have you shown them to him?’

The determination that the clitics are Utterance initial and the resolution of this problem that gives rise to the TM effect must thus *precede* merger of the conjunction *i* above the interrogative *li*. But this is exactly what we would expect if *i* is a higher head, necessarily outside of CP. The CP phase 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 it is too late. The result is (23), which is just (21b) plus *i*; unlike (19b), *i* here is irrelevant.

Note a crucial assumption: in the derivation of (19b) 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 (23), 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 TM 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 Bg data, which require that CP be an Utterance and IP/TP not be (since if  $C^0$  *li*, as the phase head, were *not* shipped off to Spell–Out, then TM should apply; its absence in example (12) shows clearly that the relevant domain must be CP).

<sup>17</sup> I have reported this observation in a number of places, most accessibly Franks and Bošković (2001).

Chomsky's reason for sending the *complement* to the phase head to Spell-Out was to keep the Specifier of the phase syntactically active; at the end of the paper I will suggest a model which achieves this and in which it only makes sense for phases themselves to be sent to Spell-Out.

**3. Aspects of ellipsis.** This section considers aspects of ellipsis that a successful model of the Spell-Out process should accommodate.

**3.1 Ellipsis and resolution of PF offense.** I take ellipsis to be a PF rather than LF matter, where a recoverable constituent is marked for “flat” intonation and is then deleted in the mapping to PF.

Lasnik (1999) and Merchant (2001), *inter alia*, have observed that ellipsis can save certain derivations by deleting structure containing offending features. Lasnik, for example, considers why V fails to raise when there is pseudogapping (VP-ellipsis), as in (24a), and why T-to-C movement fails when there is matrix sluicing (IP-ellipsis), as in (24b):

(24) a. You might not believe me but you will Bob<sub>i</sub> [<sub>VP</sub> believe ~~*t<sub>i</sub>*~~]

b. A: Mary will see someone.

B: Who<sub>i</sub> [<sub>IP</sub> Mary will see ~~*t<sub>i</sub>*~~]?

There are various ways of implementing this failure to move just in case ellipsis will occur, depending on how strength is construed, although the look-ahead problem looms. The last and most appealing solution offered in Lasnik (1999) 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. Details aside, this kind of 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.

**3.2 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 comparable effects can be achieved through PF-side deletion.

**3.2.1 Word order.** The idea that focus motivates PF-side movement has been recently applied to Russian scrambling by Erteschik-Shir and Strahov (2004). An alternative PF-filtering approach exploits copy deletion.<sup>18</sup> Consider how functional sentence perspective considerations might feed copy deletion in Russian (25) versus (26):

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<sup>18</sup> See also Stjepanović's (2007) analysis of free word order in BCS.

- (25) a. A: What did Vanya do?  
 B: Vanja prišel. (Russian)  
 ‘Vanya arrived.’  
 b. [TP **Vanja** <RHEME [vP **prišel** [vP prišel Vanja]]>]  
 c. A: What happened?  
 B: Prišel Vanja.  
 ‘Vanya arrived.’  
 d. [TP Vanja <RHEME [vP **prišel** [vP prišel **Vanja**]]>]
- (26) a. A: What did Vanya do?  
 B: Vanja umer.  
 ‘Vanya died.’  
 b. [TP **Vanja** <RHEME [vP Vanja **umer** [vP umer]]>]  
 c. A: What happened?  
 B: Vanja umer.  
 ‘Vanya died.’  
 d. [TP Vanja <RHEME [vP **Vanja umer** [vP umer]]>]

With unaccusative (25), the higher copies are pronounced in a standard THEME–RHEME sentence (25a/b), but in wholly rhematic (25c/d) the lower copy of *Vanja* must be pronounced since it is the focus, hence the VS word order. With unergative (26), on the other hand, the SV order emerges even in an out-of-the-blue sentence. This is arguably because *Vanja* here is an external argument, hence there is no copy of *Vanja* within VP.

**3.2.2 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, the choice between Bg (12) and (13), repeated in (27).

- (27) a. V tozi [[grad]<sub>ω</sub> **li**] [**si** [xodil]<sub>ω</sub>]? (Bg)  
 in this city Q aux.2SG went  
 ‘Was it to this city that you went?’  
 b. [[V tozi]<sub>ω</sub> **li**] grad [**si** [xodil]<sub>ω</sub>]?  
 ‘Was it to THIS city that you went?’

In (27a) the question could be about going to *this CITY* or *THIS CITY*, but in (27b) focus is on *THIS*. In Franks (2006b) I argue that (27b) requires copies of *v tozi grad* ‘to this city’ immediately above and

below *li*, with splitting forced by the property of *li* as demarcating the focus. This is schematized in (28):<sup>19</sup>

(28) [<sub>CP</sub> [<sub>V</sub> [tozi grad]] **li** [[<sub>v</sub> [tozi grad]] **si** xodil]]?  
 [+Foc]

A similar example splitting a *wh*-phrase is given in (29):

(29) a. Koja **li** knjiga **šte mi** podariš?! (Bg)  
 which Q book will me.DAT give.2SG  
 ‘Which(ever) book will you give me?!’

b. [<sub>CP</sub> [Koja [~~knjiga~~]] **li** [[~~koja knjiga~~] **šte mi** podariš]]?  
 [+Foc]

These splits are striking because Bg, 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.<sup>20</sup>

**3.2.3 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; this precludes any of the various syntactic approaches to discontinuity. Consider BCS (30):

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

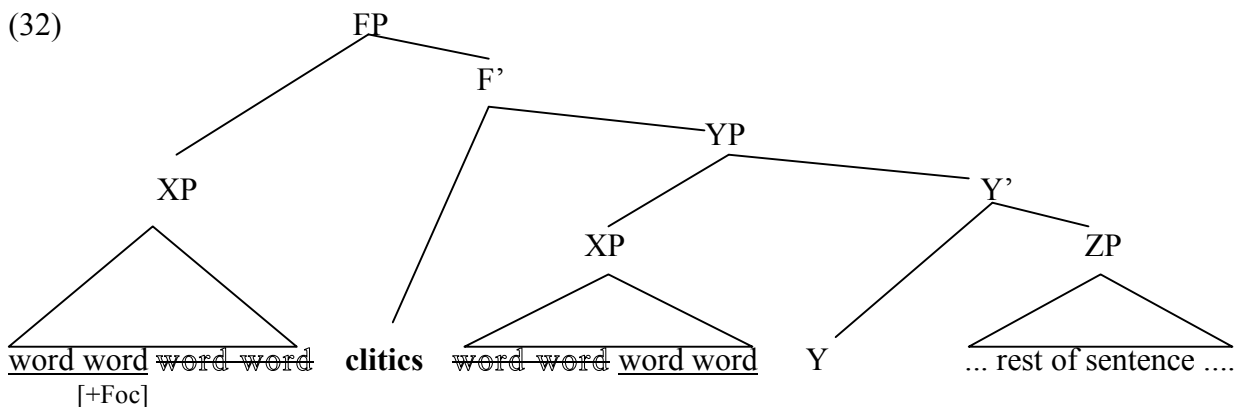
As before, this splitting can be effected through ellipsis of string adjacent material, as in (31).

(31) [<sub>PP</sub> U [<sub>NP</sub> [<sub>AP</sub> izuzetno ~~veliku~~] sobu]] [**sam** [<sub>PP</sub> ~~U~~ [<sub>NP</sub> [<sub>AP</sub> ~~izuzetno~~ veliku] sobu]]] [ušao ...  
 [+Foc]

The operative principle 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 deleted, resulting in pronunciation of the next highest copy of that material, as shown schematically in (32).

<sup>19</sup> For ease of identification, I use strikethrough for the ellipsis and underline the pronounced pieces of the split.

<sup>20</sup> It is worth noting that this phenomenon is 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 Russian version of (27) requires splitting—*v ètot li gorod* and not *\*v ètot gorod li*—regardless 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 prosodic word to its right.



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.<sup>21</sup>

For some Croatian speakers, this mechanism gives rise to a striking range of possibilities:<sup>22</sup>

- (33) a. Svakog **ću** lijepog dana putovati vlakom svojoj kući. (Croatian)  
 every fut.1SG nice day travel train self's house.  
 'Every nice day I will go to my house by train.'
- b. Svakog lijepog **ću** dana putovati vlakom svojoj kući.
- c. Svakog lijepog dana **ću** putovati vlakom svojoj kući.
- d. Svakog lijepog dana putovat **ću** vlakom svojoj kući.
- e. Svakog lijepog dana putovati vlakom **ću** svojoj kući.
- f. Svakog lijepog dana putovati vlakom svojoj **ću** kući.

It is not easy to know how to derive such unlikely strings. Particularly problematic are (33e, f), in which the clitic is lower than immediately after the verb, since this is otherwise impossible.<sup>23</sup> Given the analysis of clitics as functional heads, there cannot even be a copy of future clitic *ću* that low in (33e) or (33f). 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 (33) must derive from a syntactic structure as in (34):

- (34) [Svakog dana putovati vlakom svojoj kući] **ću** [svakog dana putovati vlakom svojoj kući].

<sup>21</sup> 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).

<sup>22</sup> Peti-Stantić (2007) offers these examples in examining whether spoken Croatian really adheres to second position for clitics; cf. also Franks (2007).

<sup>23</sup> Note that this is even true of English weak pronouns: *John threw out the books/John threw 'em out* but *John threw the books out/\*John threw out 'em*.

Essentially, there is a copy of the entire clause both above and below *ću*; ellipsis along the lines of (31)/(32) then applies to produce the various possibilities in (33), depending upon where in the fronted phrase the focus is.

**3.2.3 PP-splits.** PP-internal splitting provides another interesting illustration of the same general principles. Consider the split in (35b):

- (35) a. Od jučer **ga** prodaje za velike novce.  
 from yesterday it.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.

This split, the judgment 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*, (35b) can be derived as in (36):

- (36) [Od jučer prodaje za velike novce] **ga** [~~od jučer prodaje za velike novce~~]  
 [+Foc]

What then about (35c), in which the clitic cannot go immediately after the preposition?<sup>24</sup> If 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 (35c) must be rejected out of PF considerations. The reason is that 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 (37) and (38):

- (37) 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.’
- (38) 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.’

<sup>24</sup> The source of the largely universal cohesion between preposition and complement is beyond the scope of this paper.

However, prepositions such as *prema* ‘towards’ that do not admit intransitive usage, as shown in (39a), invariably block this kind of splitting, as in (39b):

- (39) 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  
 [cf. ✓Prema tom čovjeku je došao. OR ✓Prema tom je čovjeku došao.]  
 ‘He was coming towards that person.’

If I am correct, both deletions in (40) are valid PF operations, say if *pored/prema* is contrastively focused, but subsequently the sequence *prema je* in (40b) is filtered out as deviant whereas *pored je* in (40a) is not:

- (40) a. ✓[Pored tog čovjeka] **je** [~~pored tog čovjeka~~] ...  
 b. \*[Prema tom čovjeku] **je** [~~prema tom čovjeku~~] ...

In general, my survey of prepositions shows that they fall into two classes along precisely these lines: splittability is enabled by potential (although not actual!) intransitivity. This correlation supports the superficiality of this kind of ellipsis, but raises the far from trivial question of how to exploit the correlation.

Although prepositions apparently need some piece of their complement to follow them, the existence of an intransitive variant somehow allows prepositions that do not meet this requirement to slip through the system. 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 (40a), 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 (making it different from the more familiar type of ellipsis constrained by constituency). But the contrast between (40a) and (40b) also implies that the information of presence of lexical syncretism is still available at the point where the output of ellipsis is evaluated.<sup>25</sup>

<sup>25</sup> The phenomenon of ambiguous morphological forms managing to escape PF filters that would otherwise lead to degraded status is fairly widespread. Taking syncretism to be expressed in terms of lexical non-distinctness (underspecification), three relevant phenomena are *wh*-ATB, as in Russian (i); free relatives, as in German (ii); and coordination, as in Hungarian (iii):

(i) devuška, kotoroj [ja byl uvlečen  $t_{INST}$  i često daval  $t_{DAT}$  dengi]  
 girl who.INST/DAT I was carried-away and 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 ...’]

**4. Summary and speculations.** I have identified a variety of likely PF effects on the output of syntax and considered how factors such as linear order, prosodic structure, and copy deletion might interact. I argued for a derivational model of Spell–Out, which applies cyclically, to larger and larger chunks of structure. I drew attention also to processes subsequent to cyclic LCA-inspired initial linearization which can reevaluate precedence relations for prosodic reasons. Examples were the realization of simple enclitics like *li* and the relinearization of Bg special clitics to conform to the TM non-initiality requirement. I have also tried to argue that, beyond copy deletion, there are late ellipsis processes which ignore the internal constituency of the units targeted.

I want, lastly, to identify two major questions about Spell–Out. The first is: Are copies distinct syntactic entities or merely pointers to a single memory address? The second is: How are pieces of the derivation that have been separately sent to Spell–Out reassembled?

I find the “multiattachment” idea, that so-called movement chains are just sets of pointers to a single item outside the tree itself, very appealing. Of course, it is then up to any advocate of what Herring (2007) refers to as “Call-by-reference Syntax” to reanalyze all analyses that in any way treat copies as distinct. Additionally, it cannot be as simple a matter as pointing to an element in the Numeration, since phrases also move. Of course, we need separate work spaces anyway, to build up phrases that merge as such, so, instead of thinking that it is these treelets that are copied when they (Re)merge, the pointer would have to call up the address of a phrase assembled in some workspace outside of the Numeration.<sup>26</sup>

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- (ii) 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 da steht mitbringen... ‘I will who.NOM/who.ACC ...’]
- (iii) 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 ...’]

Russian feminine *kotoroj* in (i) is syncretic instrumental and dative whereas the masculine forms are unique; German inanimate *was* in (ii) is syncretic nominative and accusative whereas the animate forms are unique; Hungarian past tense first singular *láttam* in (iii) is syncretic definite and indefinite conjugation whereas the present tense first singular forms are unique. The various structures are created in the syntax and valued in two different ways from the perspective of two independent probes. On the PF–side, however, the syncretism of particular morphological entries allows those feature conflicts to survive.

<sup>26</sup> So, for example, imagine that a  $\nu$ P phase has been constructed. Its “merger” with I is just a pointer to the address of that completed  $\nu$ P. This same  $\nu$ P can then have other occurrences, for

This system is however a bit unwieldy, with heads called up directly from the Numeration and phrases (at least those merged in Specifier position) called up from outside of it. A cleaner solution can be devised which builds on Chomsky's 2001 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, he needed to adopt subarrays. These are sets of lexical resources defined by each of the phase heads in the Numeration. This leaves unresolved the problem of how these subarrays can be reassembled for the purposes of Spelling-Out the entire sentence. My solution is to build subarrays derivationally, such that the product of merging all the members of one subarray becomes (through Spell-Out) in effect a lexical item which can 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. Thus, by the time any phrase is (Re)merged, its memory is part of the Numeration.

This formalization of MSO 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 reemerges 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 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. It can thus be inserted into the subarray defined by some other phase head, of which it then functions as an argument.

We are left, unfortunately, with the complicated exercise of reexamining the various proposals made in this paper from the "derivational subarray" perspective. How, for example, does it relate to

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example, it can merge as a topic or it can merge with another I as part of a coordinate structure. This way, under  $vP$  topicalization, it is the higher occurrence of the pointer to  $vP$  which succeeds, and similarly under  $vP$  ellipsis. Interestingly, it seems that the possibility for  $vP$  topicalization and  $vP$  ellipsis goes hand in hand: BCS allows both whereas Bg allows neither.

linearization? Iterative processes like successive-cyclic *wh*-movement suggest that unvalued features are going to need always to remain at the left edge: as each phase gets Spelled-Out, it gets inserted into an open slot of a new subarray. But the details of implementation are elusive, since PF resolutions involving “failed” *wh*-movement (i.e., *wh*-in-situ, as in fn. 10) can only be determined at the end of the derivation.<sup>27</sup>

Turning finally to the division of labor between syntax and PF, it seems that the burden has now decidedly shifted to PF: linearization, copy/pointer selection, 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.

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<sup>27</sup> Possibly a multiattachment “pointer” system can resolve this, but it still implies that information needs to be preserved even after Spell-Out; that is, unvalued features at the edge of a word/phase are pointers and, as such, they keep active all other pointers to the same address; one cannot finish linearizing until the multiattachment is resolved.

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