Revisiting the Nuclear Stress Rule and its Exceptions[*]

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1 Introduction

◆ What determines the distribution of phrasal stress?

◆ More specifically, what is the input to the phrasal stress (PS) assignment operation?

▸ Everyone: output of syntax

▸ Traditional assumption: linear string

(1) C&H's Nuclear Stress Rule (NSR for English; Chomsky and Halle 1968):
The rightmost primarily-stressed vowel in a domain receives the highest stress

▸ Implication of this analysis: Linearization precedes PS assignment

■ Is this true?

◆ **TWO BIG QUESTIONS**:

▸ Big Question: What is the **shape of the input** to PS assignment?

■ A one-dimensional string?

■ A multi-dimensional hierarchy?

▸ Bigger Question: What is the **proper formulation** of the PS assignment operation?

■ Which position in the input is the relevant one?

◆ **DATA TO INVESTIGATE**:

▸ Certain elements have been said to instantiate exceptions to the PS assignment operation

▸ When and why these items are exceptional offers insight to the questions

◆ **PREVIEWS OF THE ANSWERS**:

▸ **The input is hierarchical structure from a chunk of the syntactic derivation**

■ Without PF-uninterpretable features

▸ The PS assignment operation assigns stress at Spell-Out..

■ (Zubizarreta 1998, Legate 2003, Kahnemuyipour 2004, Adger 2007, Kratzer and Selkirk 2007)

▸ ... based on depth of embedding...

■ (Cinque 1993, Zubizarreta 1998, Kahnemuyipour 2004, Kratzer and Selkirk 2007)

■ In particular, the most embedded element (in English)

▸ Apparent exceptions to (or failures of) past analyses indicate a **need to revisit the structural input**

■ Any exceptions to this process must not reference PF-uninterpretable features

◆ **BIG CONCLUSIONS**:

▸ **Putative exceptions from the work on phrasal stress are not exceptional at all**

◇ In fact, they are highly valuable for what they can tell a theoretician / hearer / learner

▸ **Instead of using syntactic models to test PS assignment operations, we can use PS data to test syntactic models**

■ Linear-order and PS positions are observable phenomena which can be similarly used to decide between models

2 Putative Exceptions

◆ Syntax plays a critical role in PS assignment, as noted in Chomsky and Halle 1968 (SPE):

▸ "Once the speaker has selected a sentence with a particular syntactic structure and <u>certain lexical items (largely or completely unmarked for stress, as we shall see)</u>, the choice of stress contour is not a matter subject to further independent decision"   (*ibid* p.25)

■ Syntax determines linear order and linear order determines PS, so syntax determines PS... with a caveat.

◆ The underlined portion of the quote suggests that lexical properties can cause exceptions

▸ In this vein, there is a common, **long-standing assumption in the literature: lexical/ interpretive properties can cause exceptions to PS assignment**

■ Mentioned explicitly in Bresnan 1971 and apparently assumed elsewhere

■ Even if SPE's NSR is not employed (e.g. Zubizarreta 1998, Kahnemuyipour 2009, a.o.)

2.1 Range of Data

◆ I investigate four types of putative exceptions:[1]

▸ Reflexive anaphors, verb particles, given material, and indefinites

▸ Below are some examples of each of these types
(In all examples, PS is marked with <u>*underlined italics*</u> and an accent on the stressed syllable)

(2)   a.   Hazel glued <u>*Kén*</u> to herself.   [reflexive anaphors]

      b.   (After Sue came home…) Walter turned my <u>*rádio*</u> on.   [verb particles]

      c.   (Chicken was cheap today, so…) Bill <u>*áte*</u> chicken.   [given material]

      d.   We will <u>*cóok*</u> something.   [indefinites]

◆ Under most (all?) existing analyses, (2a–d) would have to be interpreted as exceptions to PS assignment

2.2   Problems with an Exception-Based Approach

◆ Alternative: These are not exceptions, and in fact conform to normal PS assignment

  ▸ In fact, **there are <u>theoretical</u> and <u>empirical</u> problems to the 'exceptional' approach**

◆ First of all, this idea presents **complications for acquisition**

  ▸ Prosodic signal reflects some aspects of the syntactic structure that it externalizes, so it can be taken as evidence for uncovering the abstract and hidden syntactic structure

    ■ ("prosodic bootstrapping", Pinker 1984, Morgan and Demuth 1996, Christophe et al. 2003, Höhle 2009, among many others)

  ▸ **The child must decide if a pattern is an exception or a cue for abstract structure** – how to make this decision?

    ■ e.g., is (3) informative about syntax, or an exception?

    (3)   Gerp blick <u>*snárf*</u> zoop.

    ■ On its own, this problem is perhaps not insurmountable, but it is at least suggestive

◆ A second theoretical issue relates **what is possible in our model**

  ▸ Standard generative models do not allow the relevant information to reach phonology, to cause exceptions

  ▸ Discourse features (e.g., givenness, indefinites), lexical category[2] (e.g., verb particle), anaphoricity (e.g., reflexive pronoun) do not reach phonology

    ■ Because such features { are not present / must be deleted } before phonology

◆ Finally, and most critically, the claim that such features yield exceptionality **fails empirically**

  ▸ **"Exceptional" phrases aren't always exceptional** – compare (2) with (4)

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[2]Lexical category has been claimed to be PF interpretable (e.g, Smith 2011), and so has the lexical/functional distinction (e.g., Šurkalović 2015). However, as we will see in (4), even if these features were visible to PS assignment, a statement like 'do not assign PS to verb particles' would make the wrong prediction.

(4)   a.   Hazel glued Ken to <u>*himsélf*</u>.   [reflexive anaphors]

      b.   (After Sue bought me a radio…) Walter turned my radio <u>*ón*</u>.   [verb particles]

      c.   (Chicken was cheap today, so…) Bill ate beans and <u>*chícken*</u>.   [given material]

      d.   We will cook <u>*some fóod*</u>.   [indefinites]

> **THE EMPIRICAL PROBLEM**
>
> What determines whether constituent can be "exceptional"?

▸ For approaches with "exceptions", **this kind of variable behavior is not straightforwardly unexpected**

  ■ *OPTION 1:* we need more intricate systems that define what is/isn't exceptional

    ◇ A model of violable phonological constraints, in the vein of OT Prince and Smolensky 1993?

     ▷ In principle: yes

     ▷ We will see: apparently exceptional PS, and exceptions to exceptions, are defined in rigid *syntactic* terms

  ■ *OPTION 2:* we need a different approach to these "exceptions"

◆ We will attack both components of what has caused them to be claimed to be exceptional

(5)   **Definition**: *Exceptional*
A PS pattern *p* is exceptional just in case *p* is not predicted as the output of

    i.   the phrasal stress rule

    ii.   the input that the rule operate on

▸ Addressing (i): There is single simple phrasal stress assignment rule operation in the vein of Cinque 1993

▸ Addressing (ii): The inputs are hierarchical structures sent to PF by Spell-Out

> **CONCLUSIONS TO BE MADE**
>
> ◆ This model with the appropriate PS rule and syntactic inputs
>
> ▸ **Reaffirms the previously "exceptional" prosodic patterns as predicted outputs**
>
> ▸ **Provides support for particular syntactic analyses, in theoretically contentious contexts**
>
> ▸ **Simplifies the interfaces and learning problem**
>
> ▸ **Conforms to modern generative approaches to what information is accessible at the interfaces**

3   A Phrasal Stress Assignment Rule

- ◆ Contemporary theories of phrasal stress generally agree that **syntactic hierarchy (and not linearization) is the input to PS assignment**

  - ‣ Specifically, depth of embedding is what matters

    - ▪ (Cinque 1993, Zubizarreta 1998, Kratzer and Selkirk 2007, Kahnemuyipour 2009, a.o.)

  - ‣ We define depth of embedding as follows[3]

  - (6)   <u>Depth of Embedding</u>:
    A syntactic object, X, is more deeply embedded than some other syntactic object, Y, provided that no copy of X c-commands all copies of Y

    - ▪ This basically means that a constituent is most embedded if it doesn't c-command (all the copies of) some other constituent

- ◆ PS assignment, as with any PF operation, does not apply to entire sentence-structures at once

  - ‣ Instead, it operates on Spell-Out Domains (e.g. Legate 2003, Adger 2007)

  - ‣ Multiple Spell-Out architecture predicts this

    - ▪ Cycles of PS will emerge from this (cf. Bresnan 1971, Adger 2007)

- ◆ This gives the following definition for the PS assignment operation:[4]

 - (7)   <u>Depth-Based Phrasal Stress Rule</u> (English):
    The most deeply embedded constituent in a Spell-Out Domain receives the phrasal stress.

    - ‣ This PS assignment rule often yields the same output as the often-descriptively-true NSR in (1)

      - ▪ In English, most-deeply-embedded often coincides with the rightmost, but not always

- ◆ Given this definition, **some movements feed/bleed the PS assignment rule and some don't** (cf. Legate 2003)

  - ‣ If movement applies to X <u>within</u> a Spell-Out Domain, the PS assignment operation will see both copies of X

    - ▪ Potentially rendering the moved item less embedded than something else, as (8)

  - ‣ In (8), both copies of X are sent to Spell-Out with both copies of Y

(8)
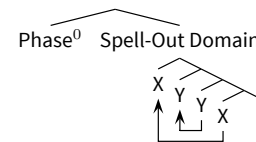
- ▪ **Y is deemed most embedded**, per (6)

  - ◇ Even though there is a copy of X lower than a copy of Y; some copy of X c-commands all copies of Y

- ‣ However, if movement targets a position outside of a Spell-Out Domain, the moving item will stop in the phase edge

  - ▪ In this way, the Spell-Out Domain will not contain the head of this movement chain

    - ◇ And to the PS assignment operation, it will appear as though this movement has not occurred

- ‣ In the following case, only one copy of X is sent to Spell-Out with Y

(9)
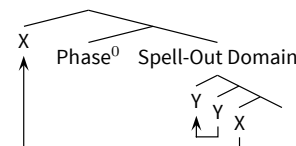
- ▪ **X is deemed most embedded**, per (6)

  - ◇ Spell-Out doesn't see that there is a copy of X that c-commands (every copy of) Y[5]

- ▪ As such, if the moved item was most-embedded before this movement, the PS assignment operation will still treat it as such

- ‣ Movements that take place **within a Spell-Out Domain may feed/bleed the PS assignment rule**, but movements that take place **out of a Spell-Out Domain preserve previously assigned PS**

  - ▪ Largely the same conclusions are reached in Bresnan 1971, in different formal terms

  - ▪ (i.e. transformations applied after the cycle will preserve any PS assigned within that cycle; transformations applied withing the cycle can influence it)

- ◆ **Prosody Can Signal:**

  - ‣ The fact that a movement has taken place, and

  - ‣ When in the structure that movement takes place

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[3]See Appendix E for a slightly (but importantly) refined version of this definition.

[4]It is not necessary that this PS assignment rule be universal, though it does have cross-linguistic support; see Cinque 1993. Instead, perhaps it is parameterized, with some languages marking phrasal stress on *most* embedded elements, and others marking phrasal stress on *least* embedded elements (Kandybowicz, p.c.).

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[5]X may surface in the position of the higher copy. If the higher copy surfaces, the lower copy will be deleted at a higher occurrence of Spell-Out – this is how a copy theory of movement defines movement through the phase edge (see e.g. Nunes 2004). Additionally, whether or not the copy of X that gets declared most embedded gets deleted at PF later on is irrelevant: if one member of the chain receives a PF specification like [+F], all members of the chain do (such a position is defended in Selkirk 1995, Ahn 2012b and McPherson 2014).

4   Resolving Putative Exception

◆ In this section, we will go through some of the structures of (2) and (4)

  ‣ Seeing how the PS assignment rule in (7) derives apparent exceptions

  ‣ For time, we will focus on reflexive anaphors and particle verbs

  ‣ (Given material and indefinites are discussed in the appendix)

4.1   Reflexive Anaphors

◆ Let start with reflexive anaphors

  ‣ Recall the minimal pair below:

  (2a)   Hazel glued _Kén_ to herself.

  (4a)   Hazel glued Ken to _himsélf_.

◆ To understand the prediction of (7), we must understand the structure of ditransitives like the ones in (2a) and (4a)

  ‣ A range of observations support a structure in which the direct object (like _Ken_) typically c-commands the indirect object (like _himself_):

  (10)   a.   Hazel glued no one to anything.   [NPI licensing]
          b.   *Hazel glued anyone to nothing.

  (11)   a.   Hazel glued no man$_1$ to his$_1$ chair.   [Pronominal Binding]
          b.   *Hazel glued his$_1$ chair to no man$_1$.

  (12)   a.   Hazel glued Frank$_1$ to his$_1$ chair.   [Condition C]
   b.   *Hazel glued him$_1$ to Frank$_1$'s chair

    ■ The direct object c-commands the indirect object, and not vice-versa

  ‣ The PS assignment rule in (7) would not seem to make a different prediction than the linearization-based NSR

    ■ The anaphors _herself_/_himself_ ought to be most embedded, as the indirect objects of (2a)/(4a)

    (2a′)   Hazel glued [_Kén_ [to herself]].

    (4a′)   Hazel glued [Ken [to _himsélf_]].

◆ What determines _herself_ to be an ineligible candidate for PS while _himself_ is eligible?

  ‣ The structures must be different

◆ Cross-linguistically **local subject-bound reflexive anaphors** are shown to undergo movement

  ‣ To a position outside of vP and within the Spell Out Domain (Ahn 2012a, 2015a, _forthcoming_; see similar ideas in Labelle 2008, Sportiche 2010, Lechner 2012)

    ■ Driven by semantic and syntactic motivations

  ‣ If subject-bound reflexives move within the Spell-Out Domain, and PS is calculated upon Spell-Out Domains, **subject-bound reflexives will not be considered the most deeply embedded constituent for the PS assignment rule**

    ■ This movement bleeds the PS assignment rule — recall (8)

  ‣ The derivation of (2a) thus proceeds as below:[6][7]

  (13)
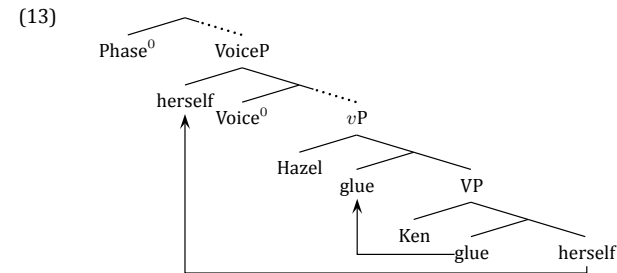
    ■ _herself_ is bound by the subject and thus moves, leaving _Ken_ as the most embedded

    ■ _Ken_, and not _herself_, is correctly predicted to bear PS

  ‣ When bound by a non-subject, the movement doesn't take place:

  (14)
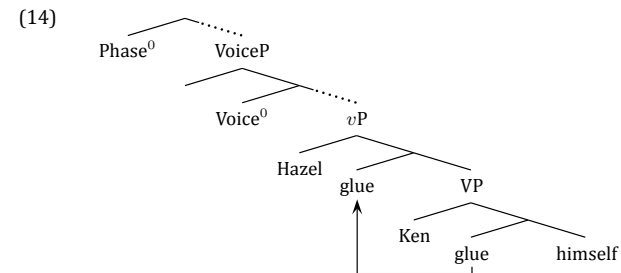
    ■ _himself_ is bound by the object _Ken_ and doesn't move, staying as most-embedded

    ■ _himself_ does bear PS, in contrast to (13), as predicted

  ‣ This anaphor movement is "covert" in that it does not affect linear word order

    ■ It **must not** be LF movement (if such a thing even exists)

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[6]The structure is more complex than given here, and the labels used is not crucial for this theory. Thus, to clarify: the labels vP and VP are used for their common usage as the stretch of structure in which arguments of the predicate are introduced. In addition, I make no claim about the nature of v/V complex in (13); head movement of _glue_ is shown for simplicity.

[7]Questions may arise about the preposition _to_ and why it is absent from the derivations above. Essentially, it enters the derivation higher in the structure. It is not the case that PS 'avoid' stress, but rather they are typically not candidates from stress because they are merged rather high in the derivation (e.g., Sportiche 2005, Kayne 2005).

◇ If movement is what affects PS assignment (done at PF), givenness movement could not take place at LF — see (24)

◇ (Two candidates for such 'covert' movements are: spell-out of a lower copy (Fox and Nissenbaum 1999), and plain-old string-vacuous movement (Kayne 1998))

◆ **Important:** strong evidence against alternative formulations of the phrasal stress rule

▸ In particular, **against PS rules in which phrasal stress goes to the highest XP**[8]

■ e.g., Kahnemuyipour 2004 and Kratzer and Selkirk 2007

▸ The anaphor in (14) must be more embedded than the binder (Recall (10)–(12))

◆ How do we know PS is mediated by syntactic movement?

▸ Syntactic islands categorically affect PS distribution

(15) a.   Hazel glued Ken [$_{island}$ to the wall and to *hersélf*].   [Coordinate Structure Island]

b.   Hazel glued Ken [$_{island}$ to the wall and to *himsélf*].

(16) a.   Hazel glued Ken to [$_{island}$ someone like *hersélf*].   [NP Adjunct Island]

b.   Hazel glued Ken to [$_{island}$ someone like *himsélf*].

■ See Ahn 2015a for more details, including lots of acoustic data from corpora

◆ To recap:

▸ If the lexical property of being an anaphor made anaphors invisible to the PS operation, the difference between (2a) and (4a) is not predicted

▸ What does is reflexive movement along with our theory of PS, (7)

4.2   Particle Verbs

◆ As a second empirical domain, consider verb particles

▸ Recall the minimal pair below:

(2b)   Walter turned my *rádio* on.

(4b)   After Sue bought me a radio, Walter turned [my radio]$_{given}$ *ón*.

◆ The syntax of particle verbs is heavily debated

▸ Guéron 1987, Hoekstra 1988, Johnson 1991, Neeleman 1994, den Dikken 1995, Kayne 2000, Ramchand and Svenonius 2002, among many, many, many others

▸ Looking at the distribution of PS, some of these analyses can be ruled out

◆ Consider scenarios in which nothing is given (looking at both V-Obj-Prt and V-Prt-Obj orders)

▸ In the both possible word orders, the object bears PS

(17) Q: What's that noise?   [V Obj Prt]

A1:   Walter turned my *rádio* on.

A2:   #Walter my radio *ón*.

(18) Q: What's that noise?   [V Prt Obj]

A1:   Walter turned on my *rádio*.

A2:   #Walter turned *ón* my radio.

■ This means **the object is more embedded than the particle at Spell-Out**, in both word orders

◆ The phrasal stress properties are *not* specific to the particle verb *turn on* (in which the particle clearly contrasts with *off*)

▸ The same patterns arise with *zip up* (cf. *zip down*) and *throw away* (cf. *throw towards*):[9]

(19) Q: Why are they staring at me?

A1:   Zip your *pánts* up.   [V Obj Prt]

A2:   Zip up your *pánts*.   [V Prt Obj]

(20) Q: Why are you mad at yourself?

A1:   I threw my *móney* away.   [V Obj Prt]

A2:   I threw away my *móney*.   [V Prt Obj]

◆ What is perhaps striking is that the PS facts are constant *across both word orders*

▸ In addition, in the absence of an object, particles bear PS:

(21)   (Context: the radio is on the fritz, and the speaker is addressing the radio while banging the side of it)

a.   Turn *ón*!

b.   #*Túrn* on!

■ **Particles, when they avoid stress, must not be because they are particles**

◆ Linear-based PS operations are especially ill-suited for this data

▸ Instead, at spell out, the hierarchical relations are the same across word orders – and those relations derive

▸ **Phase > Verb > Particle > Object**

■ And the word order differences between the two could arise either through movements later in the derivation, through other principles of which copy gets pronounced

■ At Spell-Out, *radio* is seen as most embedded

◆ The findings from PS only sketch out constraints on what kinds of structures for particle verbs are possible
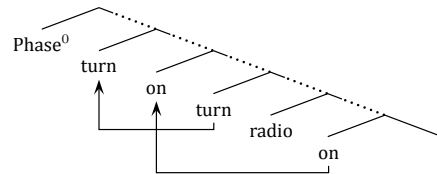
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[8]At least for English. See footnote 4.

[9]Thanks to David Pesetsky for this suggestion.

▸ If a small clause analysis of particles is pursued (Hoekstra 1988, Kayne 2000, Ramchand and Svenonius 2002, etc.)...

  ▪ ...it **must be** in conjunction with some kind of particle fronting (cf. den Dikken 1995, Koopman and Szabolcsi 2000, for Scandinavian/Dutch/Hungarian)
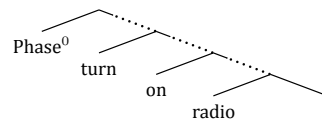
(22)

  ◇ The [V Obj Prt] order could be derived in various ways, including spelling out lower copies, or additional movements (which would need further motivation)

▸ Alternatively, particle constructions are not small clauses[10]

  ▪ And the object originates lower than the particle (e.g., Johnson 1991, den Dikken 1995)

(23)

  ◇ The [V Obj Prt] order could be derived by an object-shift type operation as in Johnson's analysis, but such movement **must be** movement across phases

◆ To recap:

  ▸ If the (non-phonological) lexical property of being a particle (or other functional head) derived (2b), the PS in (4b) would not be predicted

  ▸ What does is the height of particles and objects in the structure, and our theory of PS in (7)

5   Conclusions

5.1   The Phrasal Stress Assignment Operation

◆ Big Question: What is the **shape of the input** to PS assignment?

  ▸ **Syntactic hierarchy** (not one-dimensional linear order)

  ▸ A sub-portion of the derivation (a Spell-Out Domain)

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[10]Contra Marantz 2009, Marantz (p.c.) believes this to be so because of apparent differentials with regard to *re*-prefixation, where small clauses exhibit restrictions that particle verbs exhibit less.

◆ Bigger Question: What is the **proper formulation** of the PS assignment operation?

  ▸ **Most deeply embedded**

  ▸ Necessarily *most*-deeply, because of object-bound reflexives

◆ Specific formulation:

(6)   <u>Depth of Embedding</u>:
A syntactic object, X, is more deeply embedded than some other syntactic object, Y, provided that no copy of X c-commands all copies of Y

(7)   <u>Syntactic Depth Nuclear Stress Rule</u> (English):
The most deeply embedded constituent in a Spell-Out Domain receives the phrasal stress.

  ▸ Additionally, this approach to PS maintains earlier generalizations that **movements that take place after the first Spell Out will preserve earlier PS assignment**

  ▪ As originally noted by Bresnan 1971

  ▪ For example WH-movement (Bresnan 1971), object shift (Cinque 1993), and NP fronting around adjectives (Adger 2007) must all happen across phase boundaries because they preserve an earlier-assigned PS

◆ Bolinger 1972 (and similar works following) provides criticisms against any deterministic PS rule

  ▸ Bolinger: PS is placed based on discourse information – not syntax

  ▸ This is not a problem if **syntax encodes discourse information** (Rizzi 1997, Jayaseelan 2001, Belletti 2004)

  ▸ (See Appendix B showing how this applies to discourse givenness)

◆ In particular, syntactic hierarchy alone accounts for the necessary patterns

  ▸ No need for syntactic/lexical/discourse features, per se, to be available for PS assignment

  ▸ Corroborating a lot of syntactic independent evidence about these constructions' derivations

5.2   Applications/Implications of this Work

◆ **Putative exceptions** from the work on phrasal stress **are not exceptional at all**

  ▸ Their apparent exceptionality is syntactically controlled

◆ Instead of using syntactic models to test PS assignment operations, **we can use PS data to test syntactic models**

  ▸ Linear-order and PS positions are both observable phenomena which can be used in similar (but separate) ways to decide between models

◆ **Linearization and Phrasal Stress are divorced**

  ▸ In particular, if we adopt a lower-copy spell-out approach to covert movement

  ▸ (See Ahn 2015a:§3.5)

◆ Children acquiring language can use **prosodic evidence as a reliable cue** for syntactic structure

  ▸ Facilitating acquisition, instead of complicating it

  ▸ **Syntacticians need to pay close attention to prosodic data**

   ▪ PS is thus a diagnostic for syntactic hierarchy and timing of movements

   ▪ Similar for other phonological properties, e.g., prosodic boundaries

  ▸ **Phonologists need to pay close attention to syntactic derivations**

   ▪ Phonological operations may apply to smaller domains, based on Spell-Out

   ▪ Operations that appear sensitive to linear order may not be

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Appendix

A   Architecture of the Interfaces

◆ Minimalist architecture defines syntax, semantics (LF), and phonology (PF) as modular

  ▸ The interfaces between them are only able to **pass certain kinds of information in certain directions** (e.g. Chomsky 1995, Collins and Stabler 2016)

  ▸ The (narrow) syntax generates input to LF and PF, at cyclic domains (Spell-Out Domains) throughout the course of the derivation, that are the complement of phasal heads (e.g. Uriagereka 1999, Chomsky 2001, Chomsky 2008)
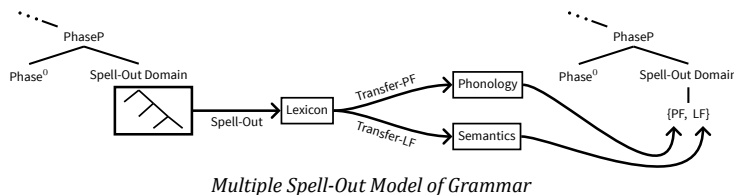
Multiple Spell-Out Model of Grammar

     ◇ (cf. Collins and Stabler 2016) and Ahn and McPherson *in prep*)

    ■ This architecture is cyclic

      ◇ Creating opportunities for cyclic operations at all levels of grammar, without stipulating cycles in any particular component

  ▸ In this model, there is no PF-LF interface – except for the narrow syntax

  (24)   <u>Condition on LF and PF Operations</u>
       No operations at Phonology depend on Semantic operations/properties.

    ■ Any phenomenon that has both PF and LF effects **must be rooted in the syntax**

  ▸ Additionally, not all portions of the syntactic representation get passed on to (both of) the interfaces

    ■ Lexical items get inserted after syntax, by Vocabulary Insertion

      ◇ A postsyntactic operation that associates syntactic structures with phonological and semantic content from the lexicon (e.g. Halle and Marantz 1993)

    ■ Features without semantic/phonological interpretation must be deleted ("checked") before being sent to the respective interfaces

      ◇ Deletion happens just before Transfer, because Vocabulary Insertion is sensitive to such features,[11] but LF/PF cannot receive them (Full Interpretation)

---

[11]Traditionally, Vocabulary Insertion (VI) does not feed semantics, and happens on the path from syntax to phonology. It seems to be that lexical items feed semantics, on the basis of implicatures triggered by particular lexical items and on the basis of idiomatic interpretation of certain collections of lexical items. However, nothing crucially relies on this: it could be that VI only occurs on the path from syntax to phonology, and uninterpretable features could be deleted slightly earlier than VI.

    ■ Only syntactic hierarchy, lexical items and interpretable features are sent to Semantics/Phonology – and not anything else

  (25)   <u>Condition on Features and PF Operations</u>
       No operations at Phonology depend on uninterpretable features.

    ■ Any PF effects that appear to be the result of formal syntactic features must not be

      ◇ e.g., Case and syntactic labels do not reach Phonology[12]

B   Given Material

◆ Givenness has claimed to yield PS "exceptions"

  ▸ Recall the minimal pair below:

  (2c)   (Chicken was cheap today, so…) Bill <u>áte</u> chicken.

  (4c)   (Chicken was cheap today, so…) Bill ate beans and <u>chícken</u>.

◆ Generalization: features like givenness may affect PS placement

  ▸ Common analysis: information structure features may affect PS, without any change in the syntactic representation

    ■ e.g. as an interpretable feature sent to both PF and LF

  (26) a.   <u>Generalization on Given Material</u> (Bresnan 1971)
       …by some means or other, [discourse-]anaphoric […] elements are not assigned primary stress…

      b.   <u>Metrically Invisible Given Material</u> (Zubizarreta 1998)
       [Discourse-]Anaphoric constituents are metrically invisible for the NSR in English and German.

      c.   <u>Destress Given</u> (Féry and Samek-Lodovici 2006)
       A given [G-marked] phrase is prosodically nonprominent.

  ▸ Prediction: all given things will bear this feature, and since this feature determines PS assignment, all given things should behave uniformly with regard to PS assignment

    ■ We have seen this analysis is not supported, given data like (4c)

    ■ In (4c), *chicken* is equally discourse-given as *chicken* in (2c)[13]

      ◇ The linguistic context is identical

      ◇ Despite this, *chicken* doesn't bear phrasal stress in (2c), but does in (4c)

---

[12]Though see footnote 2.

[13]One might conjecture that the reason *chicken* bears phrasal stress in '*beans and chicken*', in (4c), is because it is interpreted as a single discourse-new entity. While it may be true that '*beans and chicken*' is a singular discourse-new entity, it is *not* an atomic entity without internal structure. This internal (syntactic and prosodic) structure provides multiple candidates for bearing phrasal stress. When it comes to placing phrasal stress within '*beans and chicken*', the approaches in (26) make an incorrect prediction; namely that phrasal stress ought not fall on '*chicken*' (as it is still discourse-given), predicting the infelicitous '*beans ánd chicken*' or '*béans and chicken*' – not on the discourse-given '*chicken*'.

- Instead, pursuing the correct syntax for structures with given material as Wagner (2006), **given material actually moves**, as much as is grammatically possible[14]

  - ‣ This is motivated in part for semantic reasons

  - ‣ And movement may impact location of PS

- Thus *chicken* in (2c) moves, but it does not move in (4c) because movement is impossible

  - ‣ This givenness movement is "covert" in that it does not affect linear word order

    - ▪ (Wagner does not go into details, but leaving open what kind of movement/copy-resolution process derives the linear order)

  - ‣ Let's call the target of movement for given material "GivenP"

    - ▪ GivenP **must be located within** the lowest Spell-Out Domain

    - ▪ Since given material moves within the Spell-Out Domain, and PS is calculated upon Spell-Out Domains, **given material will not be considered the most deeply embedded constituent for the PS assignment rule** — see (8)

    - ▪ The derivation of (2c) thus proceeds as below:[15]

  (2c′)
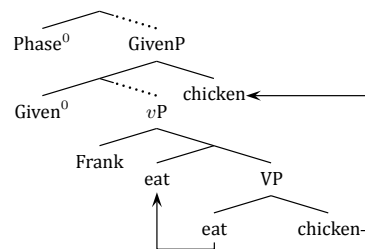
    - ◇ Following (7), *chicken* does not receive PS because it is not most embedded in (27)

    - ◇ (all copies of *eat* are more embedded than the higher copy of *chicken*)

  - ‣ Since movement of *chicken* is impossible in (27), due to (island effects), it stays the most embedded

    - ▪ And it receives PS, **despite being discourse-given**

  (4c′)   [$_{PhaseP}$ [$_{GivenP}$ [$_{vP}$ Frank eat [$_{island}$ beans and chicken]] __]]

B.1   Given + V-Prt

- Now we will turn our attention to scenarios in which the object is given

  - ‣ Again, in both word orders, the PS falls on the same constituent: the particle – and not the verb or object – bears PS

---

(27)   [V Obj Prt]

    Q: What happened to my radio?

    A1:   Walter turned [my radio]$_{given}$ *ón*.

    A2:   #Walter turned [my *rádio*]$_{given}$ on.

    A3:   #Walter *túrned* [my radio]$_{given}$ on.

(28)   [V Prt Obj]

    Q: What happened to my radio?

    A1:   Walter turned *ón* [my radio]$_{given}$.

    A2:   #Walter turned on [my *rádio*]$_{given}$.

    A3:   #Walter *túrned* on [my radio]$_{given}$.

(29)   Q: Why are they staring at my pants?

    A1:   Zip *úp* [your pants]$_{given}$.   [V Prt Obj, Discourse Given Obj]

    A2:   Zip [your pants]$_{given}$ *úp*.   [V Obj Prt, Discourse Given Obj]

(30)   Q: Where's your money?

    A1:   I threw [my money]$_{given}$ *awáy*.   [V Obj Prt, Discourse Given Obj]
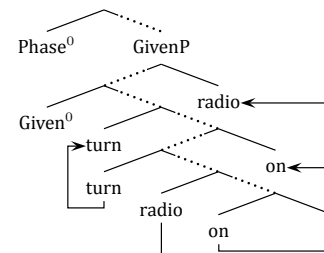
    A2:   √?I threw *awáy* [my money]$_{given}$.   [V Obj Prt, Discourse Given Obj]

- ‣ This means **the particle is more embedded than the verb and given material at Spell-Out**, in both word orders

- ‣ If *radio* undergoes movement to GivenP, as in (4b):

  (31)

  - ▪ The particle is most embedded at Spell-Out, as the result of givenness movement

C   Indefinites and N→D

- Indefinites have also claimed to be exceptional

  - ‣ Recall the minimal pair below:

    (2d)   We will *cóok* something.

    (4d)   We will cook some *fóod*.

- English N→D movement moves a subset of nouns[16] (*one*, *thing*, *body*, *time*...) from their base position, targeting a position higher than all nominal adjuncts

  - ‣ The fact that there is N→D movement in this domain is motivated by syntax

---

[14]This "as much as is grammatically possible" restriction is intriguing. When movement is impossible, the givenness seems to 'come for free'. This is reminiscent of Preminger 2011. For further discussion, see discussion in Ahn 2015a.

[15]I make no claim that the moving element moves to a spec-final position – this is only shown for exposition.

[16]Without any complements, adjuncts or number features.

(32)　a.　[$_{DP}$ some thing [$_{NP}$ red ~~thing~~]]　　　　　　　　　　[N→D]

　　　b.　[$_{DP}$ some [$_{NP}$ red object]]　　　　　　　　　　　　　　[no N→D]

▸ Note that when N→D movement takes place, the N does not bear PS[17]

(33)　What did Liz do?

　　　a.　She *cóoked* something.

　　　b.　She cooked some *food*

　　　c.　#She cooked *sómething*.

　　■ This is not the case that *something* is unstressed because they are not 'newsworthy' (as in Bolinger 1972)

　　　◇ Wagner 2006 shows that newsworthy-ness is not an adequate analysis: it is not clear that *some food* is more newsworthy than *something*, since you can only cook food

◆ So let us consider the syntax, as that is what we have seen to affect PS

　▸ It is standard to assume that *change something* (involving N→D movement) and *change some laws* have the following structures:

(34)　　　　　　　　　　　　　　　(35)
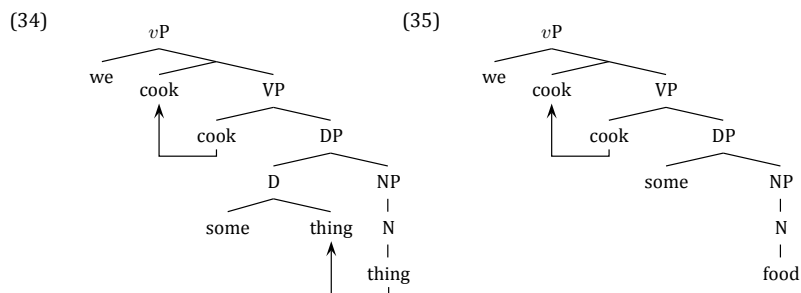
　　■ But this does not explain why *change* bears PS in the former, but *laws* bears PS in the latter[18]

　▸ Sportiche 2005 proposes an alternate structure of DPs, in which the deep structure of *change some law* is as (36)

(36)　　[$_{DP}$ some [$_{vP}$ cook [$_{NP}$ food]]]

　　■ One Sportiche's basic arguments in favor of (36):

　　　◇ Locality of Selection only allows a head X to select something within its XP

◇ Vs may place selectional restrictions on Ns but *never* place restrictions on Ds[19]

◇ A standard structure like (35) where V and DP are sisters makes the wrong predictions

■ Instead, NPs (and not DPs) are merged as arguments of the predicate

　◇ Then later in the derivation the NP forms a derived constituent with the D, via movement of nominal material up to near D

▸ However, the two *somes* in *change something* and *change some laws* are not the same D – they have different selectional restrictions

　■ The N→D *some* can only attract (certain) bare Ns in the singular

　■ The *some* that doesn't trigger N→D movement can form a constituent with either plural or singular Ns

▸ It is thus possible that the two Ds occur in different positions

　■ (For a discussion of different types of Ds being associated with different loci on the clausal spine, see Hallman 2004)

▸ Given the PS differences between the two, the N→D Ds must be within the Spell-Out Domain, and the non-N→D D must be outside of it:

(37)
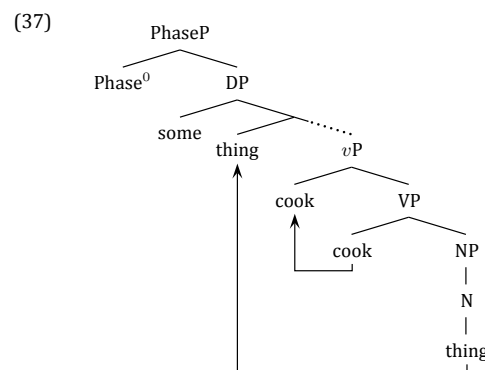
(38)　　[$_{DP}$ some [$_{PhaseP}$ [$_{vP}$ cook [$_{NP}$ food]]]]

　■ Less theory-specific, just in case the phenomenon of "N→D movement" takes place...

　　◇ ...**(a copy of) the N (e.g. *thing* in *something*) will be higher than (all copies of) the V**

　　◇ (Perhaps it is movement to Num^0, which is also outside the verbal domain in this approach. See Ahn 2015b.)

---

[17]In fact, there is the segmentally homophonous: *She greets every (single) one*, in which *one* <u>does</u> bear PS. The N *one* does not undergo N→D in such a case.

[18]In fact, it is not clear what our PS assignment rule would predict when there is symmetrical c-command, as in (34). One possibility is that it looks for other copies for which there is no symmetrical c-command – however, this would falsely predict that *thing* should bear PS in (34). Alternatively, it could be that such structures should never reach the interfaces – see Moro 2000 and Chomsky 2013, among others.

[19]Nor on Num^0 – any apparent number effects are about semantic selection for semantically plural entities, that are not necessarily syntactically plural. Cf. *I gathered my collection*.

▸ By having Ds outside of the VP, with different Ds in different positions (as independently argued), we now understand which indefinites bear PS and which do not[20]

◆ Under this approach, N→D movement causes the moved N to avoid stress

  ▸ N→D strands any nominal adjuncts, resulting in them becoming post-nominal, following the movement

(39)   We will cook something _sálty_.

```
                PhaseP
               /      \
          Phase⁰       DP
                      /   \
                   some    ......
                     thing      vP
                               /  \
                            cook    VP
                            ↑      /  \
                            cook    NP
                                   /  \
                               salty   NP
                                       |
                                       N
                                       |
                                     thing
```
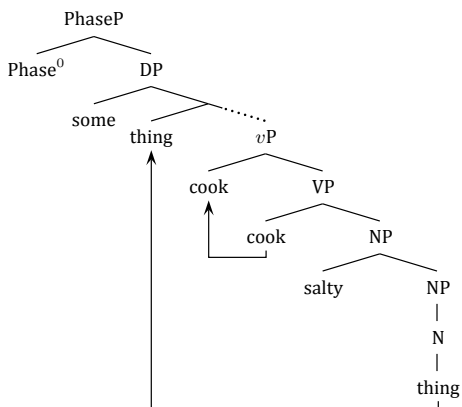
    ■ After this movement, the (lowest) stranded adjunct will be most embedded (compare _unfair_ and _change_ in (39))

    ■ This structure correctly predicts that it will bear PS, as in (39)

    ■ (This means N→D movement is movement of a smaller constituent than movement to D in cases like _change some unfair laws_.)

◆ Additionally, this approach predicts that the PS behavior of indefinites like _something_ is not the result of being indefinite / not newsworthy

  ▸ This PS avoidance also happens in other places where N→D happens[22]

---

(40)   What's Hazel's job?
     a.   She _gréets_ everyone.
     b.   She greets every _guést_.
     c.   [#] She greets _éveryone_.

◆ To recap:

  ▸ If an indefinite pronoun's interpretive property of being "not newsworthy" makes it invisible to the PS operation, the difference between (2d) and (4d) is not predicted

    ■ Nor is the behavior of _everyone_ in (40)

  ▸ What does is N→D movement targeting a position outside of VP, along with our theory of PS, (7)

D   Hierarchy of the Clausal Spine

◆ Taken together, investigating the four empirical domains of (2), we can establish the hierarchy within the lowest clausal Spell-Out Domain, sketched in (41)

(41)   Phase > $\left\{\begin{array}{c}\text{given material} \\ \text{subject-bound reflexives} \\ \text{N→D Ds}\end{array}\right\}$ > Verb > Particles > Objects

◆ Below, more data are given that more completely argue for this hierarchy

◆ In all examples, the subject is given information, but all else is new information, allowing PS assignment rule to apply to the predicate.

(42)   Phase > Given > Verb
     Q: Q: Hazel raises _fárm animals_. What does Bill do?
     A1:   He _sláughters_ farm animals.
     A2:   [#] He slaughters _fárm animals_.

(43)   Phase > Reflexive > Verb
     Q: What did Hazel do when she thought she was dreaming?
     A1:   She _slápped_ herself.
     A2:   [#] She slapped _hersélf_.

---

[20] Also, by this logic, it might be appropriate for other 'weak' Ns such as _stuff_ or _shit_ (as in, _She did stuff/shit_ to also undergo N→D movement, albeit to a silent mass D – one that occurs with bare mass Ns. This is supported by the fact that _stuff_ and _shit_ in these types of cases are near synonyms for _something_. (Beware: there is a _shit_ that doesn't undergo N→D movement, which is a near synonym of _nothing_ – _About physics, I know shít_ means "I know nothing" but _About physics, I knów shit_ means "I know stuff". Note that _nothing_ bears PS in places where _every/some/anything_ do not, indicating that nothing has a different syntax – one with may involve movement out of the Spell-Out Domain to near Neg⁰; see Kayne 1998.) However, these mass N→D Ns differ syntactically, in that, if there is an adjective modifier, it will be prenominal. At the same time, these Ns only avoid PS when there is no adjective – note the similarities in these patterns: _saw someone t\'all_ and _did stupid shít_. At this point, the similarities/differences are not fully understood. [21]

[22] However, it might be that not all N→D movement seems to be the same. Consider the following data:

---

i.   What will happen if the contract is broken?
     a.   [I'd _gét_ something]$_F$
     b.   [#][I'd get _sómething_]$_F$
     c.   [#][I'd _gét_ nothing]$_F$
     d.   [I'd get _nóthing_]$_F$
     e.   [?][I'd _gét_ everything]$_F$
     f.   [I'd get _éverything_]$_F$

This could be because of differences between types of 'determiners', with different ones merged in different locations (see Hallman 2004, Kayne 1998, and Alrenga and Kennedy 2014, suggesting that _no_ is in a position that is likely higher than _some_ in (37)). More investigation is needed, especially with regard to interpretation. Alternatively, maybe the differences in PS above has to do with what is naturally focused by the context (i.e. the F-marking in the examples above are not what is being judged).

(44) Phase > N→D > Verb
  Q: What did Bill do at the party?
  A1:   He _kícked_ someone.
  A2:   #He kicked _sómeone_.

(45) Reflexive > Verb > Particle
  Q: What did John do after prison?
  A1:   He cleaned himself _úp_.
  A2:   #He _cléaned_ himself up.

(46) Given > Verb > Particle
  Q: What did Bill do after Hazel bought him a radio?
  A1:   Bill turned the radio _ón_.
  A2:   #Bill turned the _rádio_ on.

(47) N→D > Verb > Particle
  Q: What's that noise?
  A1:   Bill turned something _ón_.
  A2:   #Bill turned _sómething_ on.

(48) Verb > Particle > Complements
  Q: What's that noise?
  A1:   Bill turned the _rádio_ on.
  A2:   #Bill turned the radio _ón_.

D.1 More Hierarchy: Prepositions

- Prepositions are merged higher than the position that the verb reaches in the Spell-Out Domain
  - This is why PS is not assigned to the Ps, even when they appear to the right of the V at the surface

  (49) Preposition > Verb
    Q: What did Bill do at the party?
    A1:   He _tálked_ about himself.
    A2:   #He talked _ábout_ himself.

  - Likely it is outside of the phase, above the non-N→D Ds
- See Kayne 2002 for arguments that Ps are merged outside the VP

D.2 More Hierarchy: Pronouns

- Pronouns (re-)merge higher than the V and within the Spell-Out Domain
  - For this reason, a given pronoun will avoid phrasal stress

(50) Phase > Pronoun > Verb
  Q: What did Bill do at the party?
  A1:   He _húgged_ me.
  A2:   #He hugged _mé_.

- Wagner argues that pronouns behave as exceptional because they are given (when they avoid stress)[23]
  - This seems right: when the referent of a pronoun is _not given_ (as in the case of deictic pronouns), the pronoun _does bear_ phrasal stress:

  (51) Q: What did John do today?
    A1:   John went _thére_. _(pointing at a picture of the Eiffel Tower)_
    A2:   #John _wént_ there. _(pointing at a picture of the Eiffel Tower)_

- Alternatively, it could be that pronouns external merge in a position higher than the position that the verb reaches in the Spell Out Domain
  - Thus they would avoid stress by never being in an object position (like some analyses of clitics)
  - For this analysis, deictic pronouns as in (51) must merge in a different location, lower than the verb
- Either way, at Spell Out, a non-deictic pronoun is in a position higher than the verb

D.3 Summary

(52) Prepositions(?) > Phase > { given material / subject-bound reflexives / N→D Ds / non-deictic pronouns } > Verb > Particles > Objects

E Depth of Embedding and Problems with Movement and Specifiers

- What happens when the syntactic object that moves within the Spell Out Domain contains more than one terminal? Consider (53):

  (53) John printed the directions _hóme_.
    - In (53), _home_ is the complement of directions – bearing PS, as expected
  - Now, let us consider a context in which _directions home_ is given

---

[23]It is also possible that pronouns are exceptional is because they are Ds, which are merged in a position (but cf. Cardinaletti and Starke 1999, arguing that English style pronouns are not Ds).

(54)   (John went online to find directions home. Than…) John *prínted* the directions home.

▸ The derivation for (54) should be as:

(55)
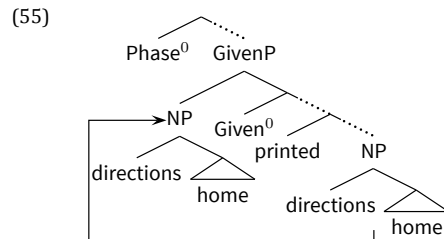
     ▪ Our original definition of depth, (6), correctly predicts *directions home* doesn't bear PS, given (55)

     ▪ But how do we know whether *home* is more or less embedded than *printed*?

       ◇ It's not the case that all copies of *home* c-command all copies of *printed*, so doesn't that mean *home* is more embedded?

◆ At the same time, **our original definition is not sufficiently complex to determine the PS in similar scenarios**

   ▸ Our original definition of depth does not make a clear prediction about the PS when a specifier is more structurally complex than its sister

   ▸ Let us consider an example of this, (56), and its structure at Spell-Out, (57):

(56)   I saw funny clowns *dánce*

(57)
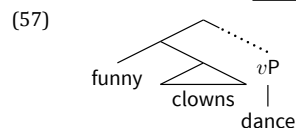
     ▪ In the tree above, our original depth of embedding definition would allow both *clowns* and *dance* to be considered most embedded, since there is no c-command between the two

     ▪ Intuitively, there is a sense in which *dance* is more embedded

   ▸ Our intuitions come from the idea that there is a spine to the tree, and when considering candidates for depth of embedding we compare elements that merge on the spine

     ▪ The mechanism for determining depth of embedding searches down the path of complementation (the spine)

       ◇ It considers the nodes that are directly merged on the spine

     ▪ **It does not look into specifiers' structure**

▸ **The PS assignment rule considers non-complements to be atomic units, without any structural depth**

     ▪ Things that (re-)merge in non-complement positions behave structurally as atoms

       ◇ See Cinque 1993 and Uriagereka 1999 (a similar but different idea is explored in Hornstein 2010)

       ◇ Cinque 1993 (paraphrased): when a non-complement merges with the path of complementation, that non-complement is only visible as a structural atom. "This implies that no matter how complex the specifier of CP, AgrP, and DP, it will never win over a complement, or, in the absence of [a complement], over the head." (*ibid.*)

     ▪ Specifiers behave as though they have been previously sent to Spell-Out

       ◇ Specifiers have their own PS assigned internally, before merging on the spine

         ▹ Consider an example non-complement, "XP": the PS for XP gets assigned within XP, according to what is most deeply embedded in XP

         ▹ (XP may also end up being assigned the PS for a larger Spell-Out Domain containing it, as well)

       ◇ Uriagereka 1999 follows the same logic in the domain of linearization – $ is an example of a non-complement's root node:

         ▹ "…elements dominated by $ precede whatever $ precedes. […] this is a direct consequence of the fact that [the non-complement $] **has been spelled-out separately […] in a different derivational cascade**." (emphasis mine)

▸ This leads us to a finalized conceptualization of Depth of Embedding[24]

(58)   **Depth of Embedding** (final revision):
     a.   A syntactic object, X, is more deeply embedded than some other syntactic object, Y, provided that no copy of X c-commands all copies of Y.
     b.   The internal structure of non-complements is not accessible when calculating depth for a given domain.

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[24]More radically, the internal structure of non-complements is *never* accessible; non-structural operations might have access to internal elements of non-complements – see Hornstein 2010's conceptualization of Copy.