

DM, Spell-out, Phonological Representations, and the
PF-Interface
Masaryk University
March 4-April 15
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§1 Introduction to the issues, Introduction to DM (March 4)

In this lecture we will look briefly at cyclic phonological effects and discuss what the goals of a theory of the morphosyntax-phonology interface should be, and how they might best be achieved. We will then focus on an overview of Distributed Morphology and its core principles, as a lead-up to a discussion of cyclicity in the second lecture. The main source of information for this overview will be Embick (2015)'s *The Morpheme: A theoretical introduction*.

§1.1 Cyclic Phonology and the Structure of the Grammar

- The focus of this lecture series is on cyclic phonological computation, and on how different proposed solution to this computation impact our theories of grammar generally. By grammar here I mean the morphosyntax, the phonology, and the semantics, although we will mainly ignore the latter save for some discussion of compositional vs. idiomatic meaning.

The main point of all of this is that our theories of morphosyntax have an impact on our theories of phonology and vice versa.

- So, what kind of data are we looking at?

- (1)
- a. párent
 - b. paréntal
 - c. párenting
 - d. párenthood

- The question triggered by data like those in (1) is what influences the shift in stress in (1b), but blocks a shift in stress in (1c,d)?

There are three possible options for an explanation here.

(A) The distinction is lexical. The position of stress in (1a-d) is memorized. This implies that the phonology of structurally complex objects is stored, or that the examples here are not morphologically complex.

(B) The distinction is morphosyntactic. There is a crucial difference in morphosyntactic structure between (1b) and (1c,d) that explains the different stress patterns.

(C) The distinction is phonological. There is a phonological property of the affix in (1b) that distinguishes it in a relevant way from the affixes in (1c,d) and explains the different positions in stress.

Another possibility is that it is a combination of (B) and (C) that leads to the distinction ((A) could also combine with the other proposals if some forms are lexicalized and others are not).

- The analysis of the above will assume Full Decomposition. Full Decomposition is defined as follows in Embick (2015:17):

(2) Full Decomposition: No complex objects are stored in memory; i.e., every complex object must be derived by the grammar.

"The particular sense of complex that is at issue in (9) is important. In principle, complex could mean either "consisting of more than one primitive", or it could mean something like "a single primitive with some internal structure". It is the former sense that is crucial here: primitives—which in this theory are morphemes in memory—may be internally complex, in that they may be composed of multiple features. What is ruled out by (9) is storage in memory of a representation that consists of more than one morpheme."

- Now, in this particular room full of Nanosyntacticians, may disagree that Full Decomposition should be restricted in this way, allowing for feature bundles to be single morphosyntactic pieces. And they might disagree that complex objects cannot be stored as multi-morphemic lexical items. But, I think we can all agree on the principle of Full Decomposition and assume lexicalization as a last resort solution.

***N.B.** that lexicalization has been proposed to coincide with Full Decomposition and be subject to restrictions on processing. See Bermúdez-Otero's (2013) discussion of *transportation* vs. *importation*.

- The question of what exactly is going on in (1) and derivations like (1) has been the subject of much work since the 1950's. It has received new attention in the last decade in light of the predictions of the frameworks of Distributed Morphology and Phases.

- In order to understand why, we must first lay out our theoretical assumptions. Today we will look at DM. Next week we will look at cyclicity/Phases.
- After we have defined some morphosyntactic assumptions, we will look at how these relate to the phonological patterns important to analysing cyclic phonological domains. And will complicate (1) with data like those in (3):

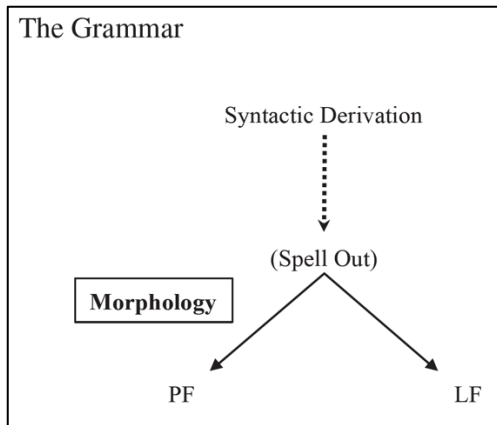
- (3) a. paréntalize
b. parèntalizátion

- A note on dumping one's garbage in other people's yards. Assuming that we have yards implies a commitment to modularity. We will take this as the default position here.
 - Syntacticians will sometimes dump problems that they cannot solve in the phonologist's yard.
 - ex. *long vowel at right edge of NP
 - Phonologists will sometimes dump problems that they cannot solve in the syntactician's yard.
 - ex. There are extra heads in the syntax that simplify the phonological account, but do nothing for the syntax.
- The goal of a fully modular theory of the grammar is to define the boundaries of each yard, and to stay within it. Hopefully that will lead to further insightful analyses.
- Realizational theories, such as DM and Nanosyntax, further the modular viewpoint in some ways (and perhaps not others) in that they derive the behaviour of (morpho)phonological forms from the properties of the morphosyntactic computational system.

§1.2 Distributed Morphology

§1.2.1 The architecture and the 'distribution' of lexica

(4) The Architecture of Distributed Morphology



(Embick 2015: 4)

- Feature Types: Sound and Meaning
 - a. Phonological Features: Features from the universal inventory of phonological features; e.g. $[\pm\text{voice}]$, $[\pm\text{labial}]$, etc.
 - b. Synsem Features: Features from the universal inventory of syntacticosemantic features; e.g. $[\text{past}]$ ('past'), $[\text{def}]$ ('definite'), $[\text{pl}]$ ('plural'), etc.

(Embick 2015: 6)

(more later on morphological features)

- Two Types of Syntactic Terminals
 - a. Functional Morphemes: These are, by definition, composed of synsem features such as $[\pm\text{past}]$, or

$[\pm\text{pl}]$, or $[\pm\text{def}]$. A further hypothesis is that they do not possess phonological features as part of their basic representation (see below).

- b. Roots: These make up the open class or "lexical" vocabulary. They include items such as $\sqrt{\text{CAT}}$, $\sqrt{\text{OX}}$, or $\sqrt{\text{SIT}}$. Roots do not contain or possess synsem features; a working hypothesis is that in the default case, they have an underlying phonological representation.

(Embick 2015: 7)

- Why make this distinction between whether morphemes are specified with phonological features or not?
 - Allomorphy
 - Syncretism
- *Allomorphy (Non-Roots)*

(5)

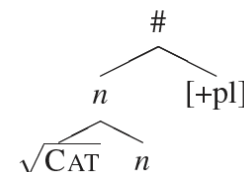
Vocabulary Item

$$\underbrace{[\alpha\beta\gamma]}_{\text{synsem features}} \leftrightarrow \underbrace{/X/}_{(\text{phonological}) \text{ exponent}}$$

(Embick 2015: 9)

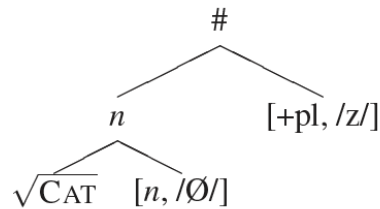
(6) a.

Structure for *cats*, before Insertion



b.

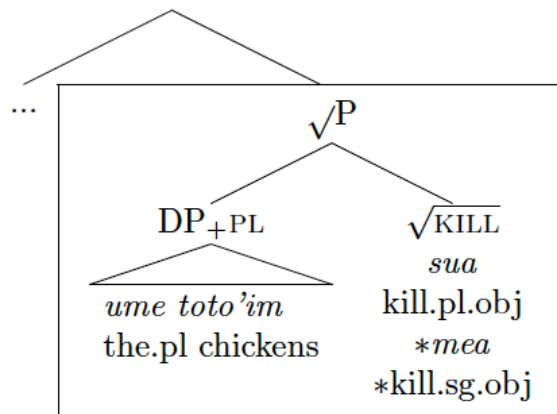
Structure for *cats*, after Insertion



(Embick 2015: 10)

- This is not agreed upon by all researchers who work within DM. On roots and argument structure/suppletion see (among others) Bobaljik and Harley (2013) on Hiaki suppletion.

(7)



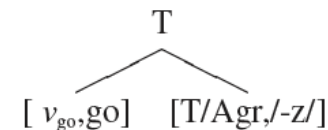
- Embick believes that roots may be underspecified or not, and if so, underspecification gets us root allomorphy. But, he says that underspecification/VI is mostly there to account for syncretism, and roots don't display syncretism, so it's not really important. I think some people in this room might

disagree with that, but Embick leaves the door open for contextual allomorphy/syncretism of roots.

- Allomorphy of 'functional' heads that appear to be roots
- Roots are a special kind of acategorial morpheme, according to Embick (they need structure to be interpreted) but words don't have to have a root. Light verbs, and other function words (e.g. pronouns) do not need to be built around a root.
- The classic view of DM is that these 'light' functional items are not roots and their mis-analysis as roots is what has led to the conclusion that some roots display allomorphy.

(8)

(31) *goes*



P.56

- We will come back to this, as some people have also proposed that derivational morphemes (normally considered to have categorial/functional features) are roots.
- What is important here is that the syntactic environment determines the phonological form of certain morphemes, and therefore allomorphy gives evidence that some (if not all) morphemes are bereft of phonological form in the syntax.
- Not often discussed in DM is the evidence from the opposite direction: Phonological features never impact the syntactic derivation (Scheer 2010 and references therein).

- *Syncretism*

- Illustration of Syncretism (P.25)

(9) Latin laudāre ‘praise’; Spanish hablar ‘speak’):

p/n	Latin	Latin American Spanish
1s	laud-ō	habl-o
2s	laudā-s	habla-s
3s	lauda-t	habla-Ø
1p	laudā-mus	habla-mos
2p	laudā-tis	habla- n
3p	lauda-nt	habla- n

Vocabulary Insertion provides a systematic (that is to say, non-accidental) analysis of syncretism.

Underspecification:

- [+1,-2,+pl] → -mos
- [+1,-2,-pl] → -o
- [-1,+2,-pl] → -s
- [-1,-2,-pl] → -Ø
- [-1,+pl] → -n

(27)

"If there were no Vocabulary Insertion operation, and functional morphemes were represented with their phonological form inherently, the Spanish pattern could not be analyzed as a systematic effect. Rather, the grammar of Spanish would contain two distinct functional morphemes [-1,+2,+pl,/n/] and [-1,-2,+pl,/n/] whose phonological form just happens to be the same. This latter analysis, which treats the identity in form as accidental homophony, is not capable of stating the important generalization

that (featurally) similar meanings are realized with the same morphology in language after language." (27-28)

(10) The distribution of lexica/"Notions of Lexical

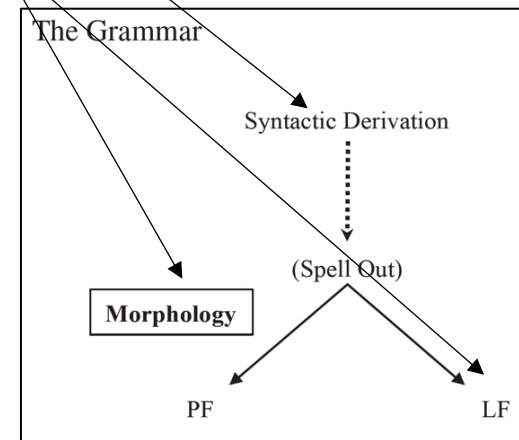
- a. The idea that the lexicon is a generative system in which words (as opposed to syntactic objects) are derived.
- b. The idea that basic elements (morphemes) must be listed, because they are underived.
- c. The idea that the unpredictable behavior of complex objects must be listed."

(14)

(11) The three lists of DM: The 'Distributed' factor

- a. the list of Syntactic Terminals
- b. the Vocabulary.
- c. the Encyclopedia.

(17)



§1.2.2 More on Functional morphemes and Roots

§1.2.2.1 Functional morphemes

- *Bundling*
- Functional morphemes are bundles of features. The feature set is universal, but the inventory applied within each language is a subset (like in inventories of phonological features).
- Languages differ in whether certain features are bundled together or not, but this is constrained (not all combinations of features are possible, e.g. {past, inalienable}).
 - Note that this falls out of a theory of general syntactic structure/selectional restrictions (as in Nanosyntax) but requires an extra theory of feature hierarchies/relationships in DM.
 - Buuuut, an extra theory of morpheme internal structure has a parallel in phonology too, at the segmental level (although work like Pöchtrager's makes the phonological hierarchy look more like the syntax).
- Examples of different kinds of bundling

(12) English *we* vs.

(4) Mandarin Chinese Pronominals (Corbett 2000)

p/n	form
1s	wǒ
2s	nǐ
3s	tā
1p	wǒ-men
2p	nǐ-men
3p	tā-men

- On the subject of bundling:
 - Are these differences due to bundling?
 - Are they both bundled and then Mandarin split?
 - Are they both split and then English bundled?
- Or is it all just VI? Can VI span nodes in a syntactic structure? In classic DM (Embick) spanning is disallowed. VI only targets terminal nodes/bundles).
- *The inventory of features*
- Do languages employ different (subsets of universal) features?

(13) SG/PL languages vs. SG/PL/DU languages

English I/we vs. Greek

(5) *nīkē* 'victory', Nominative Case

singular	nīkē
dual	nīkā
plural	nīkai

- English only needs one feature to account for the surface morphemes, but Greek needs two.
- Unless of course English has the same morpho-syntactic distinction, but just has no overt Vocabulary Items to distinguish it.

(34)

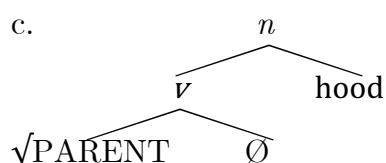
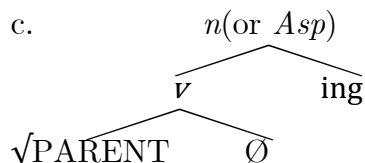
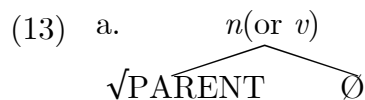
§1.2.2.1 Roots

- *Categorization of Roots*

Roots are category free. They are categorized by category-defining heads. These are derivational heads, that are often overt in other languages (languages with theme vowels, root-and-pattern languages). In English they can be null or pronounced, but the assumption is that the syntax is cross-linguistically stable. Important to what we will discuss is that these category-defining heads have been proposed to define cyclic interpretation.

Consider (1) again, in (12).

- (12) a. párent
 b. paréntal
 c. párenting
 d. párenthood



- Spanning/non-terminal spell-out vs zero heads? Does it make a difference? Maybe? Let's discuss.
- The current view of phases is that it is only their complement that is sent to (full) PF interpretation (the 'full' will be discussed next week). The null head is proposed to not be fully

interpreted, and so can be influenced allomorphically (and phonologically) by an adjacent, higher phase head. A spanning account would, without further modification, imply that in (13c,d) the outer n heads should be inside the same cycle as the root. This is not the case.

- Samuels (2009): [Level 2 morphemes]...”undergo vocabulary insertion on different cycles and thus cannot undergo fusion. This explains an observation attributed to David Perlmutter to the effect that there are no portmanteaux derivational affixes; see Embick (2010) for discussion.” (P. 91 of PDF)
- But, there are proposed to be portmanteau that cross cycles and include two phase heads. A classic example of this is the French P+D patterns. If this is allomorphy, then there should be no reason that category-defining heads should not be portmanteau.

- (14) a. de la \rightarrow de la ‘of the(f)’
 b. de le \rightarrow du / $_C$, de l' $_V$ ‘of the(m)’
 c. le \rightarrow le / $_C$ ‘the(m)’

- Here, like I stated at the beginning of this handout, there are multiple possible solutions to the above issue.
 - Lexical/allomorphy: Either *du* is a portmanteau, or *du* spells out the P or the D head and the other is null.
 - Syntactic: There is some exceptional syntactic reason that these two heads should see each other, where *de* is permitted to overwrite *le*
 - Phonological: *de le* \rightarrow *du* is not allomorphy.
- Note that there are further ‘portmanteau’ patterns in Quebecois French that could support or confirm a hypothesis (Alexander-Renaud, Léveillé & Saucier, current undergraduate project at UQAM)

(15) These alternations are optional)

- a. sur la → [sa:] ‘on the(f)’
- b. sur les → [se:] ‘on the(pl)’
- c. sur un → [sœ:] ‘on a(m)’

- These and other P+D alternations point to a larger phenomenon.
- [l] in French (like [l] synchronically in Portuguese) historically alternates with a vowel [o] in certain coda positions.

(16) cheval → chevals → chev[o] (chevaux) ‘horse~horses’

- This is exactly the kind of alternation that is of interest to us when building theories of the interface. If de le → du is a morphological operation, then we need to modify our theory of the morphology; if it is phonological, then we do not.
- Why not? Phonology is also subject to cyclic effects. Are the domains for morphological and phonological accessibility/locality different?
 - No and yes.
- *Yes : Cyclic Containment* (Arad 2003, Bermúdez-Otero 2018)

- (17) a. áffix (n) ‘an affix’
b. affix (v) ‘to attach’
c. áffix (v) ‘to attach an affix’

(18) accòmodátion (vs àbracadábra)

(19) Root-derived vs Word-derived items (Arad 2003)

a.

- | | | | | |
|----|------|-------|--------|--|
| a. | √yld | CiCoC | yilod | ‘newborn’ |
| b. | | CcuCa | yeluda | ‘birth rate’ |
| c. | | CCeCa | leda | ‘childbirth’; initial root consonant y drops: *yleda |
| d. | | CaCiC | yalid | ‘a native’ |
| e. | | CeCeC | yeled | ‘child’ |

b.

- | | | | |
|----|--------------------|------------|---|
| a. | √yld + CeCeC | yeled | n, ‘child, boy’ ³ |
| b. | yeled + ut | yaldut | n, ‘childhood’ |
| c. | yeled + ut + I | yalduti | adj., ‘childish, pertaining to childhood’ |
| d. | yeled + ut + i+ ut | yaldutiyut | n, ‘childishness’ |
| e. | yeled + on | yaldon | n, ‘little child’ |
| f. | yeled + a | yalda | n, ‘girl’ |
| g. | yeled + hitCaCCeC | hityaled | v, ‘act like a child, be childish’ |

- Note that outer affixes do not have access to the root (yld), but only to the output of the first cycle.
- *No: autosegmental representations (additive, copying), infixation* (Embick 2014, Newell 2017)

- (20) a. fan**fuckint**ástico
b. **rigoddamn**dículous

c.f.

- (21) a. That’s fucking fantastic!
b. You’re being goddamn ridiculous.

(Newell 2017:37)

- (22) -ìmoj ‘eat’; e-k-**imùj**-e ‘way of eating’
-cìl-i-cìl ‘scratch’; e-**cil-ì-cil**-e ‘way of scratching’

(Embick 2014:7(pdf))

§1.3 Conclusions for today

- The morphosyntactic structure/derivation influences cycles of phonological interpretation.
- The cycles of interpretation appear to be the same, but active morphological and phonological operations (e.g. allomorphy vs harmony) appear to be different.
- This has implications for our theories of morphosyntax and phonology.
- The research I will present in the following weeks (mostly mine, but others also for context) explores how an elaborated theory of phonology and the phonology-syntax interface can lead to a simplified, modular theory of grammar.

References

- Arad**, Maya. 2003. Locality constraints on the interpretation of roots: The case of Hebrew denominal verbs. *Natural Language & Linguistic Theory*, 21(4), pp. 737–779.
- Bermúdez-Otero**, Ricardo. 2018. Stratal phonology. In *The Routledge handbook of phonological theory* (pp. 100-134).
- Routledge**. **Bermúdez-Otero**, Ricardo. (2013). The stem-level syndrome. Speaker Series of the University of Pennsylvania Linguistics Department, Philadelphia, 11.
- Embick**, David., 2015. *The morpheme: A theoretical introduction* (Vol. 31). Walter de Gruyter GmbH & Co KG.
- Embick**, David. 2014. Phase cycles, φ -cycles, and phonological (in) activity. In Bendjaballah, S., Faust, N., Lahrouchi, M. and Lampitelli, N. eds., *The form of structure, the structure of forms: essays in honor of Jean Lowenstamm*. John Benjamins Publishing Company. pp.271-286.
- Newell**, Heather. 2017. Nested phase interpretation and the PIC.

In ed. Heather Newell, Máire Noonan, Glyne Piggott, & Lisa Demena Travis (Eds.) *The structure of words at the interfaces*, pp.20-40. Oxford University Press.

Scheer, T., 2010. *A guide to morphosyntax-phonology interface theories: how extra-phonological information is treated in phonology since Trubetzkoy's Grenzsignale*. Walter de Gruyter.