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Distributed Morphology and the syntax–morphology interface

We've seen seen a number of Distributed Morphology analyses in this course so far (including analyses of theme vowels, nominalization, and compounding. In looking at those analyses, we focused on structural concerns – how does the syntactic structure give rise to morphological structure. Today, we focus more on the background assumptions of Distributed Morphology and the novel operations it proposes.

1   Overview

- Bobaljik (2015) summarizes the assumptions of Distributed Morphology (DM).

  This paper has been published as Bobaljik 2017. For other summaries, see Embick and Noyer 2007 and Harley and Noyer 1999.

  – The founding work on DM is considered to be Halle and Marantz 1993, but the theory has changed a lot in the years.

  – This recent summary offers a nice overview of the current state of the art.

  – The focus here is on the various operations DM makes available beyond those that are thought to be provided by standard Miminalist syntax.

  And it is worth noting that DM usually takes Minimalist syntax as its starting point.

- Core tenants of DM:

  (1) *Syntax-all-the-way-down*:
  There is no meaningful distinction between words and morphological elements *at the level of syntax*. (Some) word formation is accomplished in the narrow syntax.

  In other words, the syntax manipulates morphemes.

  (2) *Late Insertion*:
  There is no phonological content in the syntactic derivation. Phonological material is inserted or realized *after* syntax has occurred.

  Phonological material is inserted *very* late in the derivation, well after SS/Spell Out.

- This leads to the following general picture of the grammar:

  i. Syntax (in part) builds 'words' (or, more properly, the elements that phonological material will be inserted into).

  ii. Several post-syntactic operations can further manipulate the output of the syntax (*i.e.*, after SS/Spell-Out) rectifying certain mismatches between the syntax and morphological form.

  iii. Phonological material is inserted into syntactic terminals (*i.e.*, X^o nodes) after syntax.

- Neither (1) nor (2) is unique to DM. Most of the action in DM deals with the post-syntactic morphological operations.

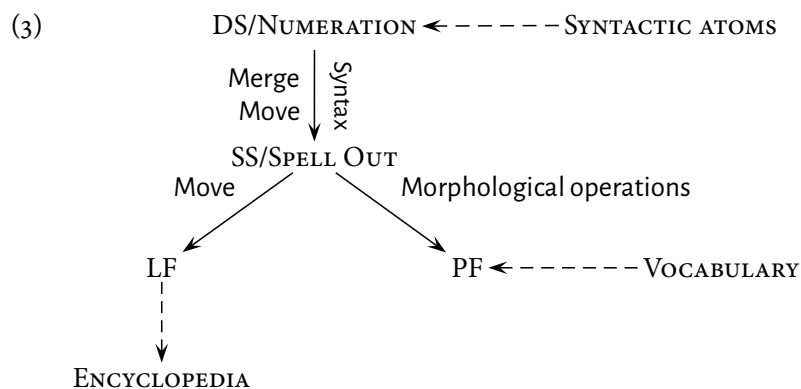 For example, Nanosyntax makes very similar assumptions.

  – Today we'll start by looking at the basis for (1) and (2).

  – After that, we'll go through a survey of the operations proposed by DM.

2 The model of grammar assumed by DM

- DM often assumes a typical GB/Minimalist Y-model of grammar.

  - The syntax is responsible for building structures and moving things around.
  - After the syntactic derivation, the structures are sent to LF where they are evaluated for meaning, and to PF where they are pronounced.

It can be used with single output models, however; see Bobaljik 2002.

- The revisions made to a standard Y-model (3) are minimal, but not insignificant.

  - The core parts of the Y-model remain the same.
  - The most notable change is the assumption that there are morphological operations on the PF branch, after SS/Spell Out.
  - There is also an addition of three lists that replace the traditional lexicon.

See our original discussion of the Y-model from the Overview of Morphology ⬚ (pp. 10ff).

(3) DS/Numeration ⬅ − − − − − Syntactic atoms

    Merge | Syntax
    Move   ↓

    SS/Spell Out

   Move   Morphological operations

  LF   PF ⬅ − − − − − Vocabulary

  Encyclopedia

This is a heavily simplified version of the model found in Harley and Noyer 1999. Compare Fábregas and Scalise 2012: 138.

- The lists in this model do a lot of work:

  - The traditional lexicon is replaced with a list of SYNTACTIC ATOMS, which are roots or groupings (or BUNDLES) of syntactic/semantic features that an individual language has.
  - The VOCABULARY is the list of phonological forms that various bundles can take. Vocabulary Items are added *after* the syntactic derivation.
  - The ENCYCLOPEDIA is a list of combinations of atoms and their possible meanings are.

There is no traditional lexicon in this theory. The typical functions of the lexicon are spread throughout these three lists.

3 Syntactic structure in words

- The concept of syntax-all-the-way-down is based in Constructionist theories that propose words are made up of smaller units assembled by the syntax.

  - Not only do words have structure, this structure is created by the syntax.

- Bobaljik discusses several cases that make it look like even words that appear morphologically simplex can in fact have structure.

  - The repetitive–restitutive ambiguity in causatives
  - Irregulary inflection in zero-derived forms.

He also talks about allomorphy in comparatives and superlatives. I'll talk a bit about that if there's time.

3.1 Causatives

- It is widely assumed there must be at least two syntactic levels in the verb phrase.

    – We have labeled these levels VoiceP and vP.

- One observation supporting this is an apparent ambiguity with the adverb *again*:
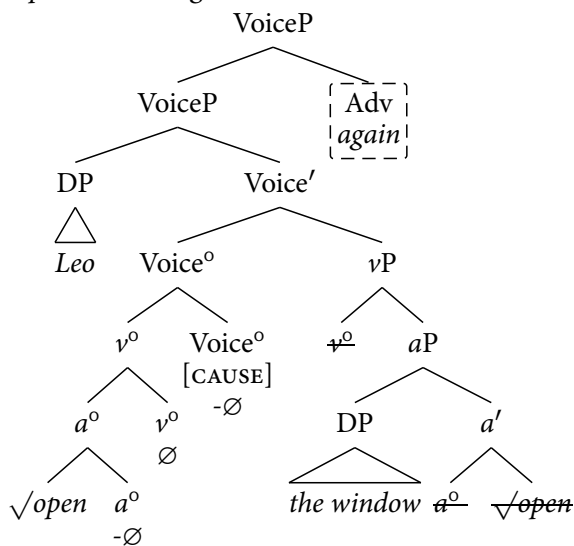
    (4)   Leo opened the window again.

        a.   The window had been open before. Somebody closed it, and now, for
              the first time, Leo opened it.
        b.   Leo had opened the window at least once before. Somebody closed it
              after this point and again Leo opened it.

<div style="float:right">We discussed this briefly during the lecture on Derivational morphology ⊞.</div>

- The standard way of understanding this ambiguity is to propose that there are
  two places in the syntax for *again* to adjoin.

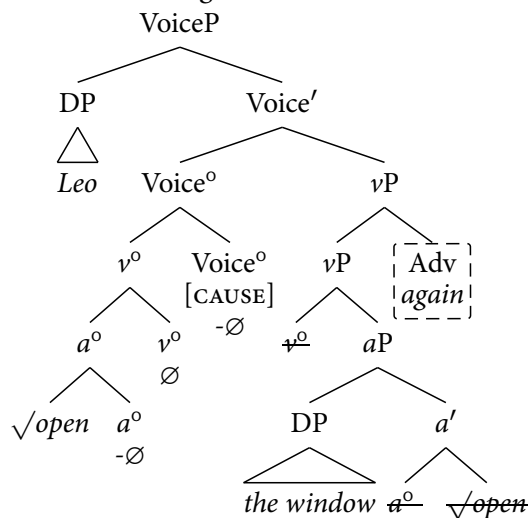<div style="float:right">See von Stechow 1996.</div>

    – The verb *open* just means something like 'become open'. Adjoining *again*
      to VP means simply 'become open again.'
    – A second head in the syntax means something like 'cause' (probably a little
      v^o head). Adjoining to vP means that the causing is happening again.

(5)   a.   *Repetitive reading*:   b.   *Restitutive reading*:

```
        VoiceP                                              VoiceP
       /      \                                            /      \
   VoiceP    [Adv                                        DP      Voice'
   /    \     again]                                    /\      /      \
  DP   Voice'                                         Leo    Voice°     vP
  /\   /     \                                              /      \    /    \
Leo Voice°    vP                                          v°    Voice°  vP   [Adv
    /    \    /  \                                        /\   [CAUSE]  / \   again]
   v°  Voice° v°  aP                                     a°  v°   -Ø   v°  aP
   /\  [CAUSE]   /  \                                   /\   Ø         /    \
  a°  v°  -Ø   DP    a'                              √open a°        DP     a'
  /\  Ø        /\    / \                                   -Ø        /\     / \
√open a°  the window a° √open                                the window a° √open
     -Ø
```

- For this to work, the verb *open* needs to have subparts to its meaning – a subpart
  that means 'x become open' and a part that means 'cause x to become open'.

- In this sense, the meaningful subparts of the verb are *distributed* over heads in
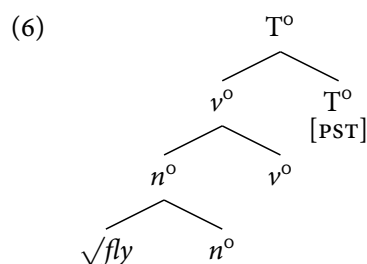 the tree. There is no one (simplex) head that contains the meaning of the verb.

3.2   Locality

- The other case Bobaljik looks at are issues of locality.

  - Here, the concern is how individual terminals in a complex head are allowed to interact with one another.
  - This raises questions of structural and linear adjacency between the terminals in a complex head.

- Bobaljik discusses the well discussed case of *flied out*.

  - *To fly out* is a baseball term meaning 'to hit a fly ball'.
  - Crucially, the past tense is not (usually) 'flew out' (see below).

- The reason for this, it is claimed, is that the verb is derived from the term *fly ball*.

  - A *fly* by itself can refer to a fly ball, so it seems to be a noun.
  - The verb is derived from this noun.

(6)

$$
\begin{array}{c}
\text{T}^\text{o} \\
\diagdown \\
v^\text{o} \quad \text{T}^\text{o} \\
\text{[PST]} \\
n^\text{o} \quad v^\text{o} \\
\sqrt{fly} \quad n^\text{o}
\end{array}
$$

- The assumption here is that there are too many categorizing heads between the root and T^o for T^o to trigger the irregular form of the verb *fly*.

  - In other words, the n^o head interferes the ability of T^o to trigger the irregular form of the (non-denominal) verb *fly*.

- Without word-internal structure, it isn't obvious how to cash this out.

  - In a lexicalist approach, we could just list this as a separate verb with different morphological rules or a different paradigm.
  - But that doesn't really give us an explanation for why the rules are different. Sticking it in the lexicon just takes a pass on the question.

- There are many other case of this: *Mickey Mouses* (*Mickey Mice), *Sony Walkmans* (?*Sony Walkmen*), *sabretooths* (*sabreteeth).

4   Vocabulary insertion

- The other significant assumption in DM is late insertion, which is implemented in DM as the Vocabulary Insertion operation.

- On most conceptions, this happens fairly late in the derivation, after most other morphological operations.

See Embick 2010 for a broad theory of locality in DM.

The form *flew out*, in the relevant sense, does seem to exist too, though. See the Language Log post ⧉ on *flied out*.

The following tree is just my interpretation of Bobaljik's (21c), page 11.

The irregular form is the result of a READJUSTMENT RULE; see Section 5.5.

This is, specifically, an argument against theories of morphology that simply group features together in a word without any structure to those features.

4.1 Morphemes under DM

- Before we can talk about how Vocabulary Insertion works, though, we need to discuss what a morpheme is in DM.

- The broad assumption is that every syntactic terminal is a morpheme (Harley 2009). They divide into two types.

  i. Roots are category-neutral terminals. They make up open class or "lexical" vocabulary and do not have any syntactic or semantic features.

  ii. Functional morphemes are collections of syntactic and semantic features (*e.g.* [pst], [pl]…).

Definitions based on Embick 2015: 7

- Many (if not all) morphemes lack phonological features.

  – There is discussion in the literature about whether roots have underlying phonological features.

  – I will assume today that they don't. It won't make a big difference for us.

Embick (2015), who we discuss next week, assumes that roots do contain underlying phonological material.

- Since they lack phonological features, there must be a morphological operation that *realizes* the morpheme, allowing them to be pronounced at PF.

  – This means that the syntactic and semantic properties of a morpheme are formally distinct from the phonological form it takes.

  – Fábregas and Scalise (2012: 160) refer to this as the separation hypothesis.

- The operation that realizes morphemes is Vocabulary Insertion.

  – Vocabulary Insertion is responsible for inserting appropriate phonological material in syntactic terminals.

- The elements determine what gets inserted are known as Vocabulary Items.

  – These are pairings of syntactic/semantic features and phonological material, referred to as exponents.

  – Each of these exponents serves as input to the phonology.

A lot of work in DM refers both to Vocabulary Insertion and Vocabulary Item with the initialism 'Stands either for Vocabulary Item or Vocabulary Insertion, depending on context. (VI)'. I'll try to avoid that in the handout, but I might say it from time to time.

- Vocabulary Insertion refers to the list of Vocabulary Items and uses these to select the correct phonological exponent to insert into each syntactic terminal.

- Vocabulary Insertion happens very late in the morphosyntactic derivation.

  – This allows expression of a morpheme to be determined by the morphological and phonological context in which it appears.

  – As the name suggests, Vocabulary Insertion is a particular implementation of Late Insertion, the idea that phonological material is inserted after the syntactic and morphological derivation.

4.2 Vocabulary Items

- Vocabulary items usually have a form like the following:

(7)   FEATURES ↔ PHONOLOGY / CONTEXT OF INSERTION

- For a simple case, consider English plurals:

(8) *English plurals*:
   a. Num° [PL]   ↔   /-ɛn/ / {√*child*, √*ox*, …} __
   b. Num° [PL]   ↔   ∅   / {√*fish*, √*foot*, √*moose*, …} __
   c. Num° [PL]   ↔   /-z/

   Based on Embick and Noyer 2007.

   – Vocabulary Items look a lot like phonological rules from Chomsky and Halle 1968 and its predecessors.

   – It is worth noting, though, that these are meant to be underlying or phonemic representations. This is not a replacement for phonology.

- This is a start; however, we want to make sure the system does not generate forms like **childs* or **foots*.

   – Nothing in the rules themselves make it so that /-z/ can't be inserted after, say, √*foot*.

   – The suffix /-z/ is the least specified. We want it to be treated as an elsewhere case.

   – In other words, we want the the Vocabulary Items that are more contextually specified to be inserted before the less specified ones can be.

4.3 The Subset Principle and competition

- In most work in DM, it is assumed that Vocabulary Insertion is governed by the SUBSET PRINCIPLE. This is stated in several ways; a representative example:

(9) *Subset Principle*:
   The phonological exponent of a Vocabulary Item is inserted into a position if the item matches all or a subset of the features specified in that position. Insertion does not take place if the Vocabulary Item contains features not present in the morpheme. Where several Vocabulary Items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.

   Embick and Noyer 2007: 298, (7)

- Bobaljik distills this down into two smaller rules.

   See especially footnote 6, page 5, for discussion.

(10) a. *Rules Apply*:
         A rule applies wherever its structural description is met.
      b. *Elsewhere Condition*:
         Where ore than one mutually exclusive rule may apply, (only) the most highly specified rule applies.

- This is meant to deal with cases of potential competition between items.

- Consider again the English plural cases above. What happens in the following example?

(11)

Num°

n^o　Num°
　　　[PL]

$\sqrt{ox}$　n^o

For now, assume that n^o is invisible if it doesn't receive a pronunciation; see Embick (2010).
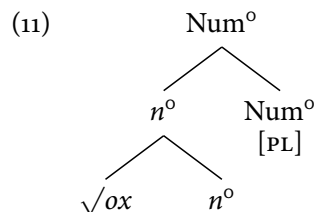
  – Rule (10a) demands some Vocabulary Item be inserted in the Num° terminal, since the Vocabulary Items in (8) have structural descriptions matching the feature.
  – Both /-ɛn/ and /-z/ could be inserted in Num° in this example. Rule (10b) tells us that /-ɛn/ should be inserted, since it is more specified that /-z/.

- The effect, then, is that /-z/ serves essentially as the elsewhere case.

  – Rule (10b) imposes an order on the vocabulary items so that the most specified ones are used first if possible.
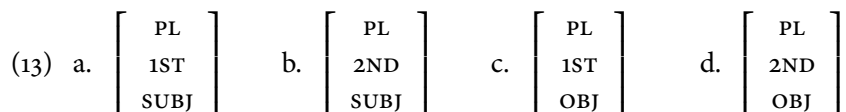
4.4　Underspecification

- A feature of Vocabulary Items is that they can be underspecified, allowing a rule to apply in multiple environments.

- Embick and Noyer (2007) give the simple example of Person/Number prefixes in the Athabascan language Hupa.

(12)　*Hupa prefixes*:

		Subj	Obj
Sg	1st	w-	wɨ-
	2nd	n-	nɨ-
Pl	1st	dɨ-	noh-
	2nd	oh-	noh-

- They focus specifically on the plural prefixes, since here /noh-/ is used regardless of whether it refers to 1st or 2nd person entity.

The singular prefixes look like they might be a bit more complicated.

- Presumably, however, there will be four different plural feature bundles, since there are four possible combinations of number and Case here.

(13)　a. $\begin{bmatrix} \text{PL} \\ \text{1ST} \\ \text{SUBJ} \end{bmatrix}$　b. $\begin{bmatrix} \text{PL} \\ \text{2ND} \\ \text{SUBJ} \end{bmatrix}$　c. $\begin{bmatrix} \text{PL} \\ \text{1ST} \\ \text{OBJ} \end{bmatrix}$　d. $\begin{bmatrix} \text{PL} \\ \text{2ND} \\ \text{OBJ} \end{bmatrix}$

- Since there are only three exponents, Embick and Noyer (2007) propose that there are only three Vocabulary Items:

(14) *Hupa Vocabulary Items*:
  a. [PL, 1ST, SUBJ] ↔ di-
  b. [PL, 2ND, SUBJ] ↔ oh-
  c. [PL, OBJ]   ↔ noh-

- These are not contextually specified in any way, so we can only look at the features on each Vocabulary Item.

- Given the Subset Principle/Elsewhere Condition, /noh-/ will be inserted in a node bearing, *e.g.*, [PL, 2, OBJ].

  - The Vocabulary Items in (14a) and (14b) are fully specified to match the bundles in (13a) and (13b).
  - However, (14c) is underspecified. It is only specified for number and case, not person.
  - Importantly, the features it does have match a subset of features in both (13c) and (13d).

- Since (14c) is the most specified Vocabulary Item that can apply to (13c) and (13d), it is inserted in these terminals.

5 Operations in DM

- DM is perhaps most famous for proposing a number of postsyntactic operations that manipulate the output of the syntactic computation.

  - A critical idea behind this is that these are things that the narrow syntax cannot or should not do.
  - Bobaljik discusses several of these; I've included a few others that are frequently discussed in the literature.

Here 'narrow syntax' refers to any syntactic operation occurring before Spell Out.

5.1 Regrouping operations

- There are several of these, many of which are discussed throughout the paper.

5.1.1 *Merger*

- MERGER originates in work by Marantz (1984). Bobaljik (2015: 3) gives the following definition:

(15) *Morphological Merger*:
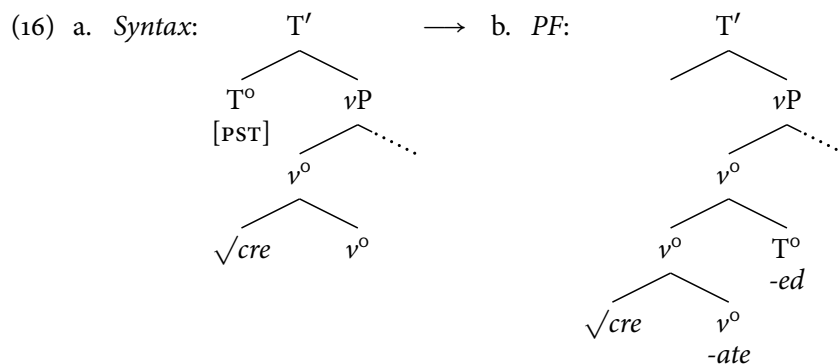A syntactic complementation relation: [X° YP]
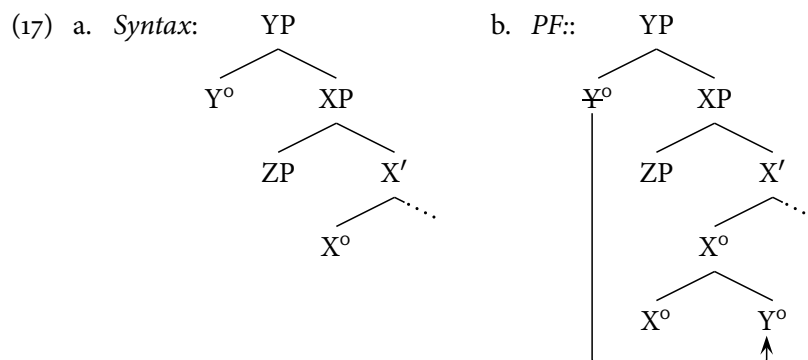may be realized in the morphology as an affixation relation:
X affixed to Y, the head of YP: [[Y] X] or [X [Y]]

- This is usually used in the service of understanding English tense affixation, based on the analysis of Chomsky (1957).

    – As is well-known, English appears to lack V°-to-T° movement, but the tense affix still appears on the verb.

    – The assumption is that Morphological merger allows T° to be pronounced on the verb after SS/Spell Out:

(16) a. *Syntax:* T′ $\longrightarrow$ b. *PF:* T′

$$
\begin{array}{ccc}
& T' & \\
& \diagup\diagdown & \\
T° & & vP \\
[\textsc{pst}] & & \diagup\diagdown \cdots \\
& v° & \\
& \diagup\diagdown & \\
\sqrt{cre} & & v°
\end{array}
\qquad
\begin{array}{cc}
& T' \\
& \diagup\diagdown \\
& vP \\
& \diagup\diagdown\cdots \\
& v° \\
& \diagup\diagdown \\
v° & T° \\
\diagup\diagdown & \text{-ed} \\
\sqrt{cre}\quad v° & \\
\text{-ate} &
\end{array}
$$

- A particular implementation of Merger is Lowering, an operation proposed by Embick and Noyer (2001).

(17) a. *Syntax:* YP   b. *PF::* YP

$$
\begin{array}{ccc}
& YP & \\
& \diagup\diagdown & \\
Y° & & XP \\
& & \diagup\diagdown \\
ZP & & X' \\
& & \diagup\diagdown\cdots \\
& X° &
\end{array}
\qquad
\begin{array}{ccc}
& YP & \\
& \diagup\diagdown & \\
\cancel{Y°} & & XP \\
& & \diagup\diagdown \\
ZP & & X' \\
& & \diagup\diagdown\cdots \\
& X° & \\
& \diagup\diagdown & \\
X° & & Y°
\end{array}
$$

- In essence, rather than letting two adjacent things be Spelled Out together, the higher head lowers on to the next one.

5.1.2 Cliticization

- Clitics and cliticization are not well defined in this paper.

    – The word 'clitic' often refers to an element that is phonologically dependent on something nearby (*e.g.*, the *-'ll* in *we'll.*).

    – It can also refer to an X° element that combines with a phrase rather than another head (*e.g.*, *-'s*).

    – Sometimes it refers to an element (usually phonologically small) that appears in the same position in some syntactic domain, but that position isn't a canonical syntactic position (*e.g.*, the definite article in Bulgarian):

The word *clitic* gets thrown around a lot. When you see this word, approach the analysis with caution.

(18) *Second-position definite article in Bulgarian* (Embick and Noyer 2001):

|			
a.	kniga-ta	b.	xubava-ta kniga
	book-DEF		nice-DEF book
	'the book'		'the nice book'

- Bobaljik (2015: 3) defines cliticization as occurring where 'syntactic constituency and morphophonological constituency are imperfectly aligned, with a hopping effect', similar to Merger.

- Bobaljik gives the example of the Latin conjunction =*que*, which (usually) appears cliticized to the first syntactic element of the right conjunct.

  - We know that the syntax of conjunction typically puts the conjunction between the two elements it conjoins (19a).

  - The fact that the conjunction appears inside of one of the conjuncts (between the adjective and the noun) tells us it must have moved (19b).

(19)   boni pueri bonae=que puellae
        good boys good=and girls
        'good boys and good girls'

    a. *Syntax*:

    b. *PF*:
       [[boni pueri] _____ [bonae=que puellae]]
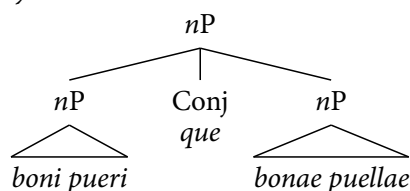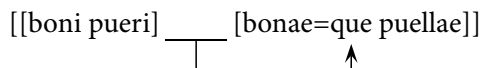
- Embick and Noyer (2001: 575–576) argue that cliticization of =*que* is sensitive to linear order as well as some aspects of structure.

  - This means that this sort of cliticization cannot be syntactic in nature, since syntactic structure does not encode linear order.

  - Moreover, the resulting string violates our normal assumptions about constituency; there's no way to linearize *que* between *bonae* 'good' and *puellae* 'girl'.

- However, it is not clear to me that all cases of supposed cliticization are necessarily morpho-phonological in nature.

  - Some cases may well involve syntactic movement of phonologically weak elements.

  - As Bobaljik notes, the distinction between clitics and affixes is not clear in in morphology as a field.

Side notes:

Tellingly, Embick and Noyer (2001) analyze definite articles in Bulgarian as a case of Lowering.

Where as affixes are usually written with hyphens (*e.g., -ize* or *re-*), clitics are written with '='.

Embick and Noyer (2001) propose that this is derived by a process called *Local Dislocation*, which is distinct from Merger/Lowering (see below).

See Zwicky and Pullum 1983 for a well-known attempt to tease them apart.

5.1.3 Rebracketing?

- Bobaljik (2015: 14) also briefly mentions REBRACKETING.

  – Rebracketing occurs when the morphological bracketing does not align with the underlying syntactic constituency.

  – This modifies the groupings but not the linear order.

(20)   [[X Y] Z] → [[X] Y Z]

- This matters mostly for issues having to do with locality.

  – For instance an operation triggered by X might only affect Y if they are immediate sisters.

  – Rebracketing can move Y out of the appropriate domain.

> I looked around and did not find any straightforward examples.

5.2 Fusion

- FUSION takes two distinct nodes and combines them so that a single Vocabulary Item may be inserted into them.

- Bobaljik discusses the case of comparatives, like *worse*.

  – This is presumably formed from (the equivalent of) *more + bad*.

- The problem is that Vocabulary Items can only apply to a single terminal node.

  – Merger can make something like **badder* by making Deg° a suffix on A°.

  – A single exponent like *worse*, however, has to be inserted into a single node.

- To get something like *worse*, two nodes are fused into a single node. This allows a single Vocabulary Item to apply to it.

5.3 Impoverishment

- IMPOVERISHMENT is an operation that deletes features.

- This is a fairly powerful operation that is sometimes used instead of underspecification to explain cases of SYNCRETISM (where two elements are morphophonologically identical).

- There are several motivations for using it.

  – If two features are never appear together *anywhere* in the grammar (as in the Russian case on pages 8–9), then it makes sense to say there is a general rule deleting one feature rather than underspecifying every VI that could be inserted into a node that might contain them.

  – Sometimes, as Bobaljik (2015) hints in the German case on page 16, it is possible to tell whether two phonologically identical forms have distinct underlying features. If they are distinct, then impoverishment is not in use.

> This is hard, I suspect.
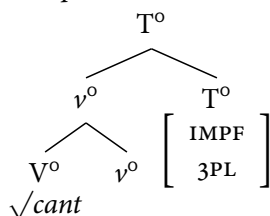
5.4 Epenthesis/Fission

- FISSION is used to insert a terminal node when a morpheme corresponds to more than one Vocabulary Item.

- Very often in DM, Fission is used for inserting agreement morphology, under the assumption that syntax does not have Agr° heads (Chomsky 1995).

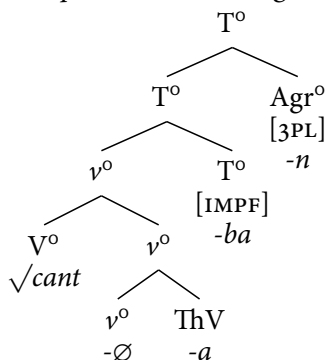I discussed this briefly in the lecture on Inflectional Morphology ⍈.

See Embick and Noyer 2007 and Oltra-Massuet and Arregi 2005.

(21) *Agreement insertion in Spanish*:

    a. *The Spanish verb at SS/SO*:

$$
\begin{array}{c}
\text{T}^{\text{o}} \\
\diagdown \\
v^{\text{o}} \quad\quad \text{T}^{\text{o}} \\
\diagup\diagdown \quad\quad \begin{bmatrix} \text{IMPF} \\ \text{3PL} \end{bmatrix} \\
\text{V}^{\text{o}} \quad v^{\text{o}} \\
\sqrt{cant}
\end{array}
$$

    b. *The Spanish verb with Agr node*:

$$
\begin{array}{c}
\text{T}^{\text{o}} \\
\diagup\diagdown \\
\text{T}^{\text{o}} \quad\quad \text{Agr}^{\text{o}} \\
\quad\quad [\text{3PL}] \\
\quad\quad -n \\
v^{\text{o}} \quad \text{T}^{\text{o}} \\
\quad\quad [\text{IMPF}] \\
\quad\quad -ba \\
\text{V}^{\text{o}} \quad v^{\text{o}} \\
\sqrt{cant} \\
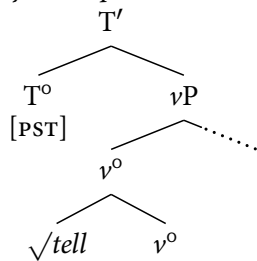v^{\text{o}} \quad \text{ThV} \\
-\varnothing \quad -a
\end{array}
$$

- As we've seen, it is possible to use DISSOCIATED MORPHEMES to epenthesize theme vowels into the structure.

  - Recall that there is no evidence theme vowels or agreement nodes are active in syntax.
  - The idea is that they can be added after syntax.
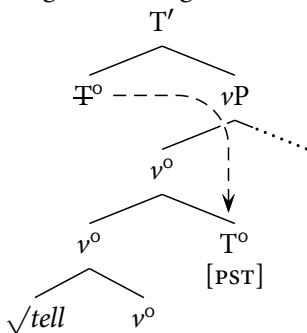
5.5 Readjustment

- One thing Bobaljik mentions several times is READJUSTMENT RULES.

  - These are rules that change the form of phonological material after Vocabulary Insertion but before PF.
  - They must apply after Vocabulary Insertion since they affect the phonological form of exponents.

- He mentions, for instance, the verb *tell*.

  - In the past tense, *tell* has an irregular form *told* [towld] (and not *telled [tɛld]).
  - By hypothesis, English has a Readjustment Rule that changes the phonological form of the root from /tɛl/ to /tol/.
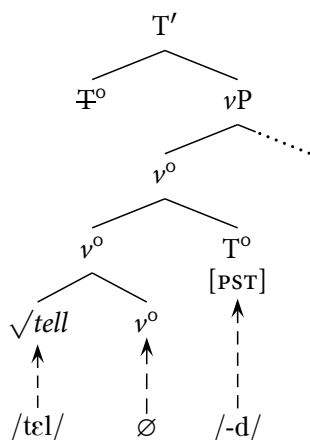
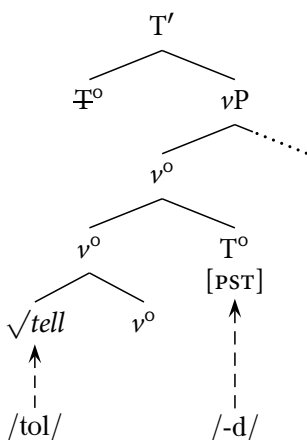- This is a nice excuse to look at a derivation:

(22) a. *Syntax/Spell Out*:

```
              T′
         ┌────┴────┐
        T°          vP
       [PST]       ╱ ┊····
                  v°
               ┌──┴──┐
             √tell    v°
```

b. *Merger/Lowering*:

```
              T′
         ┌────┴────┐
        T̶° ─ ─ ─ ─  vP
                  ╱ ┊····
                 v°
            ┌────┴────┐
           v°          T°
        ┌──┴──┐       [PST]
      √tell    v°
```

Vocabulary insertion:

```
                 T′
            ┌────┴────┐
           T̶°          vP
                     ╱ ┊····
                    v°
              ┌──────┴──────┐
             v°              T°
          ┌───┴───┐        [PST]
        √tell      v°         ┊
          ┊        ┊          ┊
        /tɛl/      ∅        /-d/
```

d. *Readjustment*:

```
                 T′
            ┌────┴────┐
           T̶°          vP
                     ╱ ┊····
                    v°
              ┌──────┴──────┐
             v°              T°
          ┌───┴───┐        [PST]
        √tell      v°         ┊
          ┊                   ┊
        /tol/               /-d/
```

Linearization might happen at Vocabulary Insertion. Let's not worry about it…

5.6   The embarrassment of riches

- Bobaljik mentions an 'embarrassment of riches' when it comes to the number of proposed postsyntactic operations on offer in DM.

- There are several regrouping rules – how many of them do we need?

- Several of the rules are thought to be quite powerful, *e.g.*, Impoverishment and Readjustment.

  Try to think of something you couldn't do with readjustment rules.

- These are good concerns to have. We want a constrained system that has as few pieces as possible. And we want those pieces to be necessary and well-motivated.

- Part of the criticism, I suspect, comes along with the original spirit of Minimalist approaches to syntax – to pare down the number of operations to the fewest possible.

- But I think this is also, to some extent, a result of Minimalism. If syntax is to be simplified, then other parts of the grammar may need to be complicated.

  *And at the end of the day, we need a story for why told isn't *telled.*

Terms

dissociated morpheme In DM, a morpheme added postsyntactically to the morphological structure after syntax.

DM Distributed Morphology

encyclopedia In DM, a list storing unpredictable information about meanings associated with (combinations of) morphemes, including the meaning of Roots, functional morphemes, idioms as wel, and additional information about how Roots are interpreted in the contexts they appear. See also Marantz (1997).

exponent In DM, phonological material inserted into a syntactic terminal by Vocabulary Insertion.

feature bundle In DM, a functional morpheme comprises a set of features.

Fission In DM, an operation which takes a single node in the syntax and splits it into two nodes in the morphological representation.

Fusion In DM, an operation that combines two sister nodes into a single X°, with the features of both input nodes, but no internal structure.

Impoverishment In DM, deletion of features from a morphosyntactic representation, prior to Vocabulary Insertion, with the result that impoverishment yields surface neutralization of underlying contrasts.

Lowering One implementation of Morphological Merger proposed by Embick and Noyer (2001).

Morphological Merger An operation where a relation between X and Y may be replaced by (expressed by) the affixation of the lexical head of X to the lexical head of Y.

readjustment rule In DM, rules that alter the form of an underlying representation (typically a root) in some morphological context.

root In DM, category-neutral terminals that make up open class or lexical vocabulary and do not have any syntactic or semantic features.

Subset Principle 'The phonological exponent of a Vocabulary Item is inserted into a position if the item matches all or a subset of the features specified in that position. Insertion does not take place if the Vocabulary Item contains features not present in the morpheme. Where several Vocabulary Items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.'(Embick and Noyer 2007: 298)

VI Stands either for Vocabulary Item or Vocabulary Insertion, depending on context.

Vocabulary Insertion In DM, an operation pairing syntactic terminals with phonological underlying representations.

Vocabulary Item In DM, objects in which phonological exponents are paired with conditions on insertion, stated in terms of features of functional morphemes.

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