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Morphology–phonology mismatches

We have a system now that can handle allomorphy and syncretism, but it has been designed around explaining concatenative morphological processes where affixes are attached to a root one after another. There are, however, morphological phenomena that cannot be explained by simple morphological concatenation. Today we will look primarily at INFIXATION, a process that we will see is heavily guided by phonology rather than the morphology.

Content warning: There will be scientifically motivated cursing in this lecture.

1 Overview

- So far, we have developed a syntactic account of affixation.

    - The base of a word – typically a root – sits in a low position in the tree.
    - Head movement takes this root and moves it through subsequently higher head positions.
    - Each of those higher heads is ultimately realized as an affix on the root.

(1)   a.
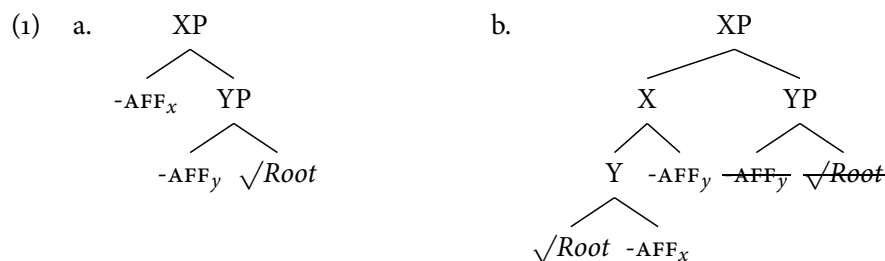
- The system we now have for realizing features on terminals allows us to account for allomorphy and syncretism.

    In addition to Readjustment Rules, which let us account for stem allomorphy.

    - This is a powerful system which, as we'll see below, allows us to account for some interesting alternations between words and affixes.

- This system runs on the assumption that we saw two weeks ago that the the syntactic structures we build limit the ways morphemes can be linearized.

    See the notes from the lecture on Linearization.

    - The No Tangling condition prevents lines in syntactic representations from crossing.
    - Some DM operations like Local Dislocation permit limited linear reordering of syntactic elements at o/r after Vocabulary Insertion.

- This is really good at placing suffixes and prefixes. What we will see today is that not all kinds of affixation have a purely syntactic source.

    - Our current system has no good way of dealing with INFIXES.

- As we'll see, we probably don't want it to.

    - Infixation is subject to phonological constraints rather than syntactic ones.
    - As long as our system feeds phonology, we are not at a significant impasse.

2 Our system so far

- We are using Distributed Morphology (DM) as our approach to morphology.

  Halle and Marantz 1993

- DM assumes that morphological structure is primarily built in the syntax, with additional operations that perform various morphology-specific tasks.

- It is worth reviewing our theoretical commitments at this point before we go looking at other things.

(2) *A summary of our theoretical commitments*:

  This builds on assumptions from Bobaljik 2017 and Embick 2015.

  a. There is no formal separation between syntax and morphology. The primary mode of morphological composition is the syntax, and there is syntactic structure above and below the word level.

  b. It follows from this that the primary elements that the syntax manipulates are morphemes and not words. From a syntactic perspective, there is no distinction between words and morphemes.

  The traditional distinction between BOUND and FREE MORPHEMES ends up being a phonological

  c. 'Morphemes' are either ROOTS or functional morphemes. Roots may have phonological material when they enter the derivation, but functional morphemes are no more than BUNDLES of SYNSEM FEATURES.

  d. There are several operations available to further manipulate syntactic structures after S-structure/Spell Out in order to make it adhere to the specific morphophonological requirements of a given language.

  e. Functional morphemes are realized by VOCABULARY INSERTION. This process matches the synsem features on a morpheme with a (potentially UNDERSPECIFIED) VOCABULARY ITEM. The Vocabulary Item determines what phonological EXPONENT is inserted in the morpheme.
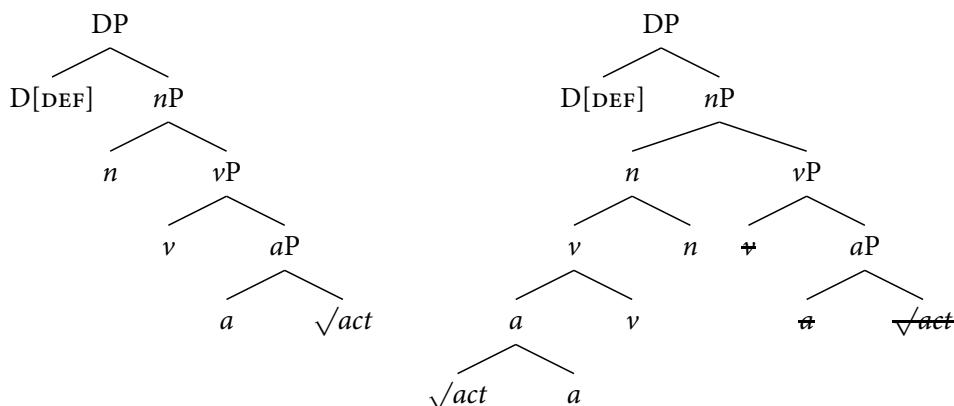
2.1 A simple derivation

- To look at a simple case, let's take the derivation of the DP *the activation* from selection of lexical items all the way to phonology:
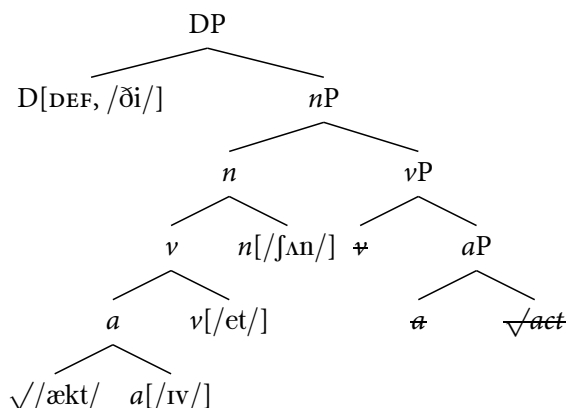
  You may recognize this word from Assignment 1 🗗.

(3) *A sketch of a partial derivation*:

  a. *Elements are selected from the list of syntactic atoms*:

  $$N=\{\dots D[\text{DEF}], \sqrt{act}, n, a, v, \dots\}$$

  b. *The elements are put in the tree. Head movement ensues*:

   c. *This tree gets is Spelled Out and sent to the PF branch.*

   d. *The functional nodes are subject to Vocabulary Insertion*:

   e. *The nodes in this tree are linearized*:

     – [$_D$ /ði/]^[$_n$ [$_v$ [$_a$ [$_\sqrt{}$/ækt/] /ɪv/] /et/] /ʃən/]

     – /ækt/^/ɪv/

     – /ɪv/^/et/

     – /e/^/ʃən/

   f. *The result is a string that can be fed to the phonology*:

     /ði/+/ækt-ɪv-et-ʃən/ → [ði.ˌæk.tɪ.ˈveɪˌʃən]

- So, as it stands, we have a system that can get us from elements drawn from the list of syntactic atoms/feature bundles to a linearized string.

2.2   A more complicated derivation

- Let's look at a more complicated problem: Definiteness marking in Danish. Here we will follow the analysis by Hankamer and Mikkelsen (2005).

   – Danish (like its closest relatives Icelandic, Faroese, Norwegian, and Swedish) can mark definiteness in a DP with an article or a suffix.

   – However, the article and suffix may not co-occur. The factors that condition which one appears seem to be syntactic.

- As a starting place, indefinite DPs in Danish look very similar to those English:

(4)   *Indefinite DPs in Danish*:

    a.   en hest   b.   en gammel   hest
         a   horse   an old.INDEF horse
        'a horse'   'an old horse'

   – When there are adjectives they precede the noun.

   – The determiner precedes both of these elements.

Presumably there are Vocabulary Items that tell us which exponents get inserted into the functional nodes. On some assumptions, there is only one *v*, one *n*, and one *a*, the realizations of which are determined contextually. It's probably more complicated than this, though; see Harley (2009: 329–332) for discussion.

Remember that M-words are concatenated separately from subwords.

Faroese, Norwegian, and Swedish often require them to co-occur. The facts around this are much more complicated; see LaCara 2011 for a summary.

- However, the pattern in definite DPs is more complicated.

(5)   *Definite DPs in Danish* (Hankamer and Mikkelsen 2005):

a.	hest -en	c.	*gamle hest-en
	horse -DEF		old.DEF horse-DEF
	'the horse'		*Intended*: 'the old horse'

b.	den gamle hest	d.	*den gamle hest-en
	the old.DEF horse		the old.DEF horse-DEF
	'the old horse'		*Intended*: 'the old horse'

  – Danish displays both a definite article and a definite suffix. The suffix must be used when there is no modifier on the noun (5a).

  – The definite article appears when there is an adjectival modifier or relative clause modifies the noun (5b). The suffix cannot be used in this case (5c).

  – The suffix and the article are in complementary distribution in DP; they may not co-occur (5d).

- The question is how to capture the pattern in (5). There is both a morphological component (suffixation) and a syntactic component (adjunction) involved.

- An idea, dating back to Delsing 1993, is that the definite article and the definite suffix are actually allomorphs of the same morpheme.

  – If they are both realizations of D[DEF], that would explain why they are in complementary distribution: There's only one determiner in a DP!

  – On our assumptions, that means that there would be two different Vocabulary Items for D[DEF], one inserting *den* and one inserting *-en*.

2.2.1 *Structural assumptions*

- Hankamer and Mikkelsen (2005) start from the above ideas. The thing they must figure out is how to condition each Vocabulary Item.

- They start by making several assumptions about the structure of DPs.

  – They argue that adjectives are adjuncts to nouns (or noun phrases) in Danish, which is the standard analysis of adjectives in most theories.

  – They also explicitly adopt Bare Phrase Structure (BPS; Chomsky 1995) over X̄-theory.

- Under BPS, a head X only projects a maximal projection XP if it needs to in order to combine with other material in the tree.

  – For example, if X takes Y as an argument, then X must project an XP node.

  – However, Y doesn't need to project a YP node because it doesn't take any arguments of its own.

- For the problem at hand, this means that if one wants to combine a determiner with a noun, the determiner will take that noun directly as its sister.

    - If the noun is modified by an adjective or a relative clause, it will project a maximal projection (NP) which the determiner combines with.

- We can see how this works with the indefinite DPs in (4) in the trees here:

(6) a.

DP
 ├── D[INDEF]
 │   *en*
 └── N
        hest

b.

DP
 ├── D[INDEF]
 │   *en*
 └── NP
        ├── A
        │   *gammel*
        └── N
            hest

2.2.2 *Vocabulary Insertion and structural sensitivity*

- In principle, the structure of definite DPs should be no different:

(7) a.

DP
 ├── D[DEF]
 └── N
        hest

b.

DP
 ├── D[DEF]
 └── NP
        ├── A
        │   *gamla*
        └── N
            hest
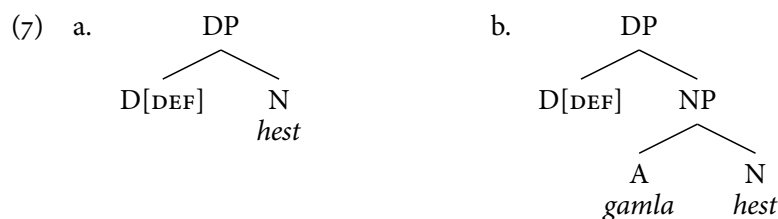
- Hankamer and Mikkelsen's trick is to propose that Vocabulary Items may be specified to apply only in specific syntactic environments. They propose that the suffix is inserted in D[DEF] when it takes a (minimal) N as its sister:

(8) a.   D[DEF] ↔ *-en* / if sister to a minimal N.
     b.   D[DEF] ↔ *den*

- This means that *-en* will be inserted in D[DEF] in (7a), but *den* will be inserted in D[DEF] in (7b).

    - As per the Subset Principle, because (8a) is more specified than (8b), it will be inserted in D[DEF] whenever the structural restriction is met.

- At this point, we don't need to say anything else about (7b); our linearization mechanism predicts it will be linearized as *den^gamle^hest*.

- However, *-en* is a suffix and it needs to get to the right of the noun.

    - The default order, which we see in other DPs, puts the determiner in front of the noun, to the left.

    - So we need to say something about how *-en* gets to the right of *hest* in (7a).

Remember that nouns are essentially arguments of determiners under the DP hypothesis.

And this is why insisting on BPS matters. Under modern standard X̄-theory, a noun must always project an NP node.

Unmodified indefinites confirm this.

- DM provides us with the operation Local Dislocation (Embick and Noyer 2001: 562–563), which is strongly implied by the discussion in Hankamer and Mikkelsen (2005: 105-106).

See the lecture notes on Linearization ⬈.

(9) *Local Dislocation*: $[X^{\frown}[Z^{\frown}Y]] \rightarrow [[_{Z^{\circ}} Z+X]^{\frown}Y]$

- Local Dislocation lets us trade an immediate linear precedence relation with one of adjunction, allowing *-en* to follow *hest*:

(10) $[_{DP}$ *-en* $[_{NP}$ *hest*$]] \rightarrow [_{DP} [_{NP} [_{N}$ *hest+en*$]]]$

- Thus, the approach to allomorphy developed in DM alongside a reordering operation like Local Dislocation can explain alternations between words and suffixes.

This sort of alternation is expected under a theory that makes no formal distinction between morphemes and words.

  – Vocabulary Insertion explains the alternation in phonological form.
  – Local Dislocation allows limited deviation from the predicted order of morphemes.

2.3 Summary

- As the Danish case shows, we have ways of manipulating the linear order of elements in our system, but all we can do is changing their relative orders.

- However, there are obvious places, even in English, where this approach fails catastrophically:

(11) *English expletive infixation*:

  a. abso-fuckin'-lutely   b. fan-fuckin'-tastic

  – Here, an expletive (curse, not pronoun) appears in the middle of a word. But these are not appearing at a (pre-existing) morpheme boundary.
  – *Absolutely* is morphologically complex, but there is no doubt that there is no morpheme boundary between *o* and *l* in this word.

The word is related to *absolve*, derived from Latin *ab+solvo*.

  – The same is true of *fantastic*; there's no morpheme break between *n* and *t*.

Fantastic is derived from *fantasy*, ultimately from an Ancient Greek verbalization of φἄντώσ (*phántos*) 'visible'.

  – Expletive infixation cannot be the result of just rearranging the order of morphemes. The expeletive is legitimately appearing *inside* another word.

- This can be seen as a form of extreme mismatch between the syntax and the morphology.

  – We simply cannot read the syntactic structure of the examples in (11).
  – There isn't even a bracketing paradox; there's no way to assign a bracketing.

In that sense, it is a violation of the Mirror Principle.

- Before we can look at this, though, we must talk about the division of labour between morphology and phonology. The division is not always clear.

3 The morphology–phonology interface

3.1 Phonology's role in affix selection

- It is well known that phonological form has an effect on morphology. It can often be difficult to draw a line between where one ends and the other begins.

- Take, for example, the nominative suffix in Korean, which has different allomorphs depending on whether it follows a consonant or a vowel:

(12) *Allomorphy of the Korean nominative suffix* (Embick 2010):

Allomorph	Environment	Example	Gloss
-i	C__	*pap-i*	'cooked rice'
-ka	V__	*ai-ka*	'child'

  – One might imagine that the selection of these suffixes has a broader phonological purpose.

  – For instance, given that languages have a preference for syllables with onsets rather than codas, the affixes above allow for Korean for a nice [$_\sigma$ CV] syllable structure.

Embick (2010) actually argues against this, since it's clear that there are languages that do not choose affixes to optimize their output forms. It's an interesting argument.

- Another interesting neologistic example is the derivational affix *-licious* discussed by Smith (2015).

  – This is a derivational affix that derives an adjective from (typically) a noun.

  – The resulting adjective means 'possessing positive characteristics of NOUN' or 'having an abundance of NOUN'.

  – It is derived from *delicious*, with the final two syllables having been reanalyzed as a suffix.

- Smith shows *-licious* appears in one of two forms.

Smith also investigates the similar *-(a)thon,* as well as cases like *-(e)teria,* and *-(a)holic,* but in less detail.

  – The form *-licious* tends to follow vowels

  – The form *-alicious*, with a preposed *a* tends to follow consonants.

- He also shows that it is sensitive to stress placement in the preceding stem

  – *-licious* tends to follow unstressed syllables.

  – *-alicious* tends to follow syllables with secondary stress.

(13) *The* -licious *alternation* (Smith 2015: 185):

V-*licious*	C-*alicious*	ŏ-*licious*
tree-licious	*curve-alicious*	*còugĕr-lícious*
jew-licious	*hunk-alicious*	*tùrkĕy-lícious*
ruby-licious	*polìce-ălícious*	*hèrŏ-lícious*

- Smith (2015) argues that the choice between *-licious* and *-alicious* is governed primarily by two factors: Avoiding sequences of two vowels, and avoiding sequences of two stressed syllables.

  – The form *-licious* itself bears stress on the first syllable: [ˈlɪ.ʃɪs].
  – The first syllable of *-alicious* is an unstressed vowel: [ə.ˈlɪ.ʃɪs].

- Therefore, choosing the right allomorph results in a better phonological form:

(14) *Avoid adjacent Vs*:   (15) *Avoid stress clash*:   (16) *Avoid stress clash*:

(14)
a. [ˌɹu.bi.ˈlɪ.ʃɪs]
b. *[ˌɹu.bi.ə.ˈlɪ.ʃɪs]

(15)
a. *[ˌhʌn.ˈklɪ.ʃɪs]
b. [ˌhʌn.kə.ˈlɪ.ʃɪs]

(16)
a. *[pol.ˌlis.ˈlɪ.ʃɪs]
b. [pol.ˌlis.ə.ˈlɪ.ʃɪs]

- Thus, it seems that phonological factors play a key role in allomorph selection.

  – Both stress placement and the kind of segment can play a role.

3.2   Where the lines blur

- What makes this hard is knowing what things are phonological and what things are (properly) morphological.

- Compare the cases above to Brazilian Portguese diminutive suffixes. There are two allomorphs, *-inh* and *-zinh*:

(17) *Diminutive suffixes in Brazilian Portuguese* (Ferreira 2005: 110):

Allomorph	Environ't	Example		Gloss
-inh	√ __	*cas-a*	→ *cas-inh-a*	'house'
		livr-o	→ *livr-inh-o*	'book'
		pent-e	→ *pent-inh-o*	'comb'
-zinh	C __	*mar*	→ *mar-zinh-o*	'sea'
		jornal	→ *jornal-zinh-o*	'newspaper'
	V͡V __	*irmão*	→ *irmão-zinh-o*	'brother'
		coração	→ *coração-zinh-o*	'heart'
	ó͘ __	*caju*	→ *caju-zinh-o*	'cashew'

  – Ferreira (2005) claims that *-inh* appears adjacent to the root, and that *-zinh* is conditioned by various phonological conditions.
  – Notice, too, that the phonological factors are awfully similar to those that go into choosing allomorphs of *-(a)licious*

- There *are* phonological factors that go into determining when *-zinh* is used, but these are mixed with morphological conditions as well.

- For example, what is *mar* if not a root? In the example here *-zinh* appears adjacent to it, and then a theme vowel appears after that.

Smith (2015) argues that the *a* cannot be deleted or epenthesized on the grounds that many other two-syllable neologistic affixes, like *-zilla* and *-tastic* do not show this alternation. That is, there is no general epenthesis/deletion operation in English that could explain this.

- – In fact, in all cases here, the syllable immediately preceding the diminutive receives stress in its absence.

- What's clear is that this can't be reduced to just wanting to create CV syllables, as in Korean. If it could be, we would expect *mar* to take *-inho* as the suffix.

4 Syllable structure and infixation

- With some background about how phonology plays a role in determining morphological forms, let us now turn to the other ways they might interact.

- As discussed above, certain phonological factors – *e.g.*, having CV syllables, avoiding stress clash – play a role in allomorph selection.

- As we'll see here, they also play a key role in infix placement.

4.1 Language games and syllable structure

- Many LANGUAGE GAMES involve complicated manipulations of phonological structure, showing that speakers have the ability to manipulate phonological structure below the level of the morpheme.

  Language games are also sometimes called *secret languages* or *argots*.

  - – The elements added or manipulated seem to have no semantic meanings.
  - – Rather language games are systematic phonological manipulations aimed at obscuring meaning or hindering understanding.

- An example from English is Pig Latin.

  - – Take the onset of the first syllable of a word.
  - – Add the nucleus /eɪ̯/ after this onset to form a new syllable
    - ○ If the word lacks an onset, epenthesize /w/
  - – Take this new syllable and move it to the end of the word.

  To do this, English speakers must be able to successfully target the onset of a word and recycle it for other purposes, inserting new nuclear material.

(18) *Some Pig Latin examples*:

a. /pɪg/ → [ʔɪg.peɪ̯] 'pig' d. /bi.kʌm/ → [ʔi.kʌm.beɪ̯] 'become'
b. /læ.tɪn/ → [ʔæ.ʔɪn.leɪ̯] 'Latin' e. /o.pɛn/ → [ʔo.pɛn.weɪ̯] 'open'
c. /nɪks/ → [ʔɪk.sneɪ̯] 'nix' f. /strɪkt/ → [ʔɪk.streɪ̯] 'strict'

- Another interesting case from French is *javanais*, where after every the onset of every syllable, the segments [-av-] are inserted (Plénat 1991).
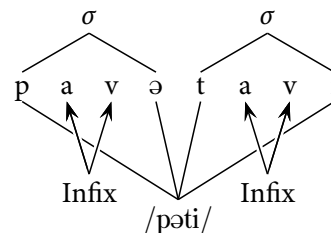
  An interesting problem here is that glides are treated as part of the nucleus for this process.

(19) a. /vjø/ → [va.vjø] *vieux* 'old'
b. /pə.ti/ → [pa.və.ta.vi] *petit* 'little'
c. /kljɛ̃/ → [kla.vjɛ̃] *client* 'client'
d. /a.tɛ.lje/ → [a.va.ta.və.la.vje] *atelier* 'workshop'
e. /puʁ.sɥi.vɛ/ → [pa.vuʁ.sɥa.vi.va.vɛ] *poursuivait* 'pursue (3SG.IMPF)'

- This requires access to the structure of the syllables themselves, since this conditions the placement of the infixes.

(20) *petit → pavetavit*

    a. $((pə)_\sigma (ti)_\sigma)_\omega$ Original word

    b. $((p\text{-}av\text{-}ə)_\sigma (t\text{-}av\text{-}i)_\sigma)_\omega$ [av]-Infixation

    c. $((pə)_\sigma (va)_\sigma (ta)_\sigma (vi)_\sigma)_\omega$ Resyllabification

- In other words, there is no way that placement of the infixes isn't determined by phonology in some way.

These data are also discussed by McCarthy and Prince (1993)

4.2 True infixes

- Now we turn to some true cases of morphological infixation, dealing with verbal agreement affixes that appear internal to the verb.

4.2.1 Sundanese

- The following examples are from Sundanese (Austronesian; Java), discussed initially by Robins (1959).

I found out about this case from a handout by Alan Yu, available here ⧉. (I apologize for linking to Academia.edu.)

(21) *Infixation in Sundanese* (Robins 1959: 343):

Singular	Plural	Gloss
bʏŋhar	bal<u>ʏ</u>ŋhar	'to be rich'
hormat	ha<u>l</u>ormat	'to honour'
lʏmpaŋ	la<u>l</u>ʏmpaŋ	'to run'
moal	ma<u>r</u>oal	'to not want'
ŋumbara	ŋa<u>l</u>umbara	'to go abroad'
sare	sa<u>r</u>are	'to sleep'

– Here, the plural agreement infix [al] or [ar] appears after the first consonant of the word.

The use of [al] *vs.* [ar] appears to be a phonologically conditioned alternation of the liquid.

- Presumably, verbs in Sundanese have a minimal structure similar to the one in (22) after Vocabulary Insertion

(22)
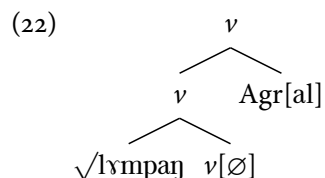
- No linearization of this tree will yield the correct form.

- We can only get [lʏmpaŋ]⌢[al] or [al]⌢[lʏmpaŋ].

- Even if we throw out the No Tangling condition, we cannot derive infixation from rearranging the terminals in the tree. We would literally have to find some way to insert one terminal inside of another.

- There is some sign, though, that the underlying system is doing something. In verbs that begin with vowels, [ar] appears as a prefix rather than an infix.

(23) *Infixation in Sundanese* (Robins 1959: 340, 368):

Singular	Plural	Gloss
alus	aralus	'to be pleasant'
omoŋ	aromoŋ	'to say'
indit	arindit	'to leave'

- A common way of interpreting this is to say that the language *wants* to linearize the agreement affix to the left of the verb.

  – We can derive the linearization [ar]^[omoŋ] with a tree like the one above.

- We just need to explain why [ar] gets stuck inside the verb. We could specify a phonological rule:

(24)   /ar/ → [$_{Wd}$ C-ar-V…] / __ [$_{Wd}$ CV…]

- If you're more into Optimality Theory (Prince and Smolensky 1993/2004), that sort of logic can easily apply here.

  – As discussed above, languages really like to have CV syllables whenever possible.

  – Moving /al/ over one segment allows Sundanese to have more CV syllables in words where /al/ is prefixed.

  – Moving the affix one segment over is the optimal way of accomplishing this, as moving it farther to the right deviates more from the underlying linearization.

4.2.2 Dakota

- A similar case can be seen in Dakota (Siouan; US), where agreement affixation shows different behaviour depending on the shape of the agreement affix.

- Like Sundanese, Dakota displays an infixed agreement morpheme /wa/ '1SG'.

(25) *First person agreement in Dakota* (Boas and Deloria 1941; cited in McCarthy and Prince 1993: 129):

Verb	1SG	Gloss
ća.pa	ća.wa.pca	'I stab'
ma.nų	ma.wa.nų	'I steal'
na.pca	na.wa.pca	'I swallow'
na.wi.zi	na.wa.wi.zi	'I am jealous'
a.li	a.wa.li	'I climb'

- Here we see the agreement affix appearing after the first syllable rather than after an initial onset consonant.

    – This occurs regardless of whether the word begins with a consonant.

- It is possible to write a rule that simply moved an agreement prefix after the first syllable.

(26)   /wa/ → [$_{Wd}$ (C)V-wa-CV…] / __[$_{Wd}$ (C)VCV…]

- Notice that the form of the infix is CV. Infixing /wa/ after the first syllable preserves the CVCV structure of the word without moving the infix to far from where it originated.

    – Notice that in the case of [a.li] → [a.wa.li] that, although the word has a [V.CV.CV] structure in the end, this avoids [wa.a.li], which is [CV.V.CV].
    – The idea here is that it is more important for the left edge of the root to be at the beginning of the word than the agreement affix. Again, this is a phonological requirement.
    – Putting /wa/ directly after the first syllable allows this to happen while permitting as many syllables as possible to have onsets.

- The 2nd person dual affix, however, has two allomorphs: [ṳ] and [ṳk].

- Because these affixes have different shapes, they behave differently, always appearing as prefixes:

(27) a.   [2DU] + √manṳ → /ṳ/ + /manṳ/ → [ṳ.ma.nṳ]
      b.   [2DU] + √ali → /ṳk/ + /ali/ → [ṳ.ka.li]

    – This is the only agreement *prefix* in the verbal paradigm, presumably because it doesn't have the CV form that the *infixes* have. For more extensive discussion, see McCarthy and Prince 1993: 129–132.

4.3 Expletive infixation

- Finally, let's come back to Expletive infixation in English.

(28) *English expletive infixation*:

    a.   abso-fuckin'-lutely   b.   fan-fuckin'-tastic

- Unlike the cases introduced above, this apparently apparently infixes whole words rather than just affixes.

- We know that many of the elements that participate in this process seem to be modifiers elsewhere in English.

(29) a.   fucking fantastic → fan-fuckin'-tastic
      b.   goddamn kindergarten → [?]kinder-goddamn-garden
      c.   [£]bloody unbelievable → un-bloody-believable

- It turns out that even this vulgarity is governed by phonological rules. Typically, the expletive must appear directly in front of the primary stress of the base word:

<div style="float:right; width:25%;">Here $\acute\sigma$ represents a syllable with primary stress, and $\grave\sigma$ represents a syllable with secondary stress.</div>

(30) a.   fan-fuckin'-tastic $\sigma[\grave\sigma\sigma]\acute\sigma\sigma$

   b.   *fanta-fuckin'-stic $^\star\sigma\acute\sigma[\grave\sigma\sigma]\sigma$

(31) a.   Mani-fuckin-toba $\grave\sigma\sigma[\grave\sigma\sigma]\acute\sigma\sigma$

   b.   *Ma-fuckin-nitoba $^\star\grave\sigma[\grave\sigma\sigma]\sigma\acute\sigma\sigma$

   c.   *Manito-fuckin-ba $^\star\grave\sigma\sigma\acute\sigma[\grave\sigma\sigma]\sigma$
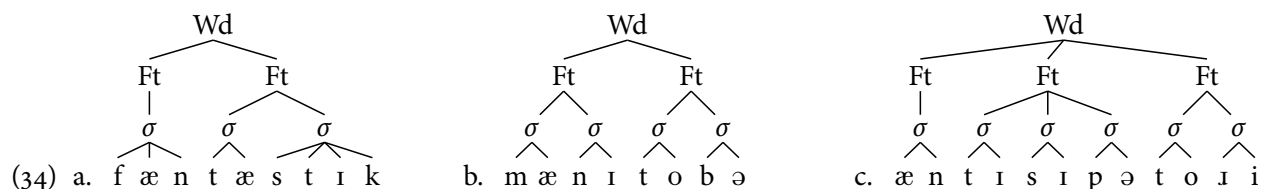
- McCarthy (1982) points out that infixes can precede secondary stresses as well:

(32) a.   kinder-goddamn-garten $\acute\sigma\sigma[\grave\sigma\sigma]\grave\sigma\sigma$

(33) a.   an-fuckin-ticipatory $\sigma[\grave\sigma\sigma]\acute\sigma\sigma\sigma\grave\sigma\sigma$

   b.   anticipa-fuckin-tory $\sigma\acute\sigma\sigma\sigma[\grave\sigma\sigma]\grave\sigma\sigma$

- McCarthy 1982 proposes that the rule is in fact governed by the prosodic structure of words.

  – Specifically, he claims that the expletive can only be inserted between two feet.
  – A foot is a grouping of syllables which contains minimally one and maximally three syllables.
 – In English, the leftmost syllable in a foot receives stress.

- Once we know the prosodic structure of a word, we can see where expletive insertion is allowed to occur:

(34) a. f æ n t æ s t ɪ k   b. m æ n ɪ t o b ə   c. æ n t ɪ s ɪ p ə t o ɹ i

<div style="float:right; width:25%;">I've simplified syllable and foot structure here since they are not immediately relevant.</div>

  – There are only two feet in *fantastic* and *Manitoba*. McCarthy's (1982)'s hypothesis predicts that expletives can only infix in one position in each.
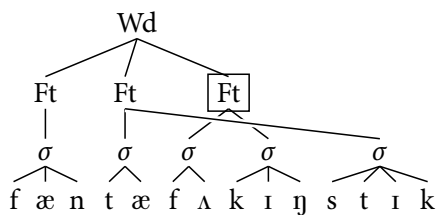 – *Anticipatory* contains three feet, so there are two places where an expletive may be infixed.

- As you may have noticed, the infixed expletives are all nice bisyllabic feet as well!

- When it comes time to insert one of these in the prosodic structure, this new foot simply slots in between two previously existing ones:
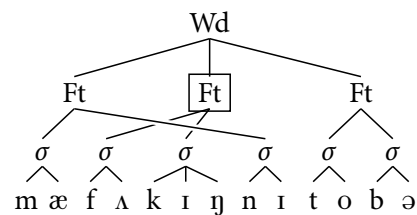
(35) f æ n f ʌ k ɪ ŋ t æ s t ɪ k
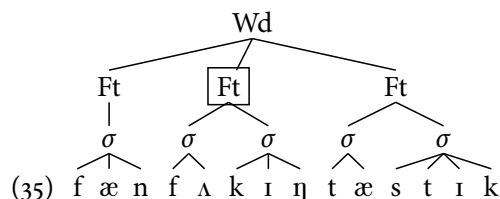
- Placing these segments does not respect the existing footing of the word:

(36) a.   *fanta-fuckin'-stic   b.   *Ma-fuckin'-nitoba

- As for the underlying syntactic structures of these things, I have no idea.

  – As mentioned above, the expletives appear to be modifiers in other contexts.

  – But you can't move a head to a modifier under normal conditions. How do these things get parsed as a single (phonological) word?

  – What makes the expletives infix here rather than getting linearized in front? Perhaps it's some special sort of compounding?

> Harley (2009) did try to do this with certain parasynthetic compounds by exploiting an ambiguity in BPS, but I don't know how viable this really is, either here or in general.

Terms

allomorph An allomorph is one of two or more complementary surface forms of a morpheme that surfaces in different phonological or morphological environments.

bound morpheme A morpheme that cannot stand on its own and that must attach to another morpheme.

DM Distributed Morphology

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.

free morpheme A morpheme that can appear as a word on its own.

infix An affix placed within a base.

Local Dislocation An implementation of Morphological Merger proposed by Embick and Noyer (2001) that swaps the order of linearly adjacent elements at or after Vocabulary Insertion.

Mirror Principle Morphological derivations must directly reflect syntactic derivations and *vice-versa* (Baker 1985: 375).

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.

No Tangling An assumption that limits the number of possible linearizations by assuming that branches in a tree will never cross each other.

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

syncretism Situations in which distinct syntacticosemantic environments (*i.e.*, distinct sets of synsem features bundled into a morpheme) show the same phonological exponent (Embick 2015).

synsem feature Features from the universal inventory of syntacticosemantic features; *e.g.*, [PAST] ('past'), [DEF] ('definite'), [PL] ('plural'), *etc*. (Embick 2015).

underspecifcation Describes Vocabulary Items that have a subset of the features that can be specified in a single syntactic terminal that it can apply to. This is one mechanism that can lead to syncretism (the other being Impoverishment).

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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