Class 22
Morphologically Conditioned Phonological Allomorphy?
The case of the early Germanic strong verbs

5/8/18

1 Introduction

- **Last time:** Carstairs-McCarthy (2001) classified possible kinds of allomorphy into four types.
  - ○ The first two should probably be handled primarily/completely with the phonology.
  - ○ The latter two should probably be handled primarily/completely with the morphology.

(1) Logically possible types of allomorphy (Carstairs-McCarthy 2001:113) [order different here]

a. Morphs phonetically **similar**, distribution **describable** in purely phonological terms.
↪ *Phonologically driven allomorphy*

b. Morphs phonetically **dissimilar**, distribution **describable** in purely phonological terms.
↪ *Phonologically conditioned allomorphy*

c. Morphs phonetically **similar**, distribution **not describable** in purely phonological terms.
↪ *Morphological allomorphy*

d. Morphs phonetically **dissimilar**, distribution **not describable** in purely phonological terms.
↪ *Morphological allomorphy*

- **Today:** I'll argue that there's a type of allomorphy which doesn't neatly fall into any of these categories.
  - ○ You might call it *morphologically conditioned phonological allomorphy*.
  - ○ The case study comes from the patterns of allomorphy in the early Germanic strong verb system.
    - ⋆ This is based on on-going work with Ryan Sandell (Sandell & Zukoff 2014, 2017, Zukoff & Sandell 2015, Zukoff 2017:Ch. 4).
  - ○ Abdul-Razak also has a somewhat similar case in Bùlì (Sulemana 2016).

→ If our analysis is on the right track, this will:
  - ○ Illustrate another way in which the phonology and morphology can interact (primarily in the phonological component) to create complicated morphophonological distributions, and
  - ○ Tell us more about the nature of the phonology-morphology interface.

2 The (early) Germanic strong verb system

2.1 Background

- In English, as well as most (all?) of the Germanic languages, the past tense is regularly marked with the "dental preterite suffix" /-d/. (Regular verbs are referred to as "weak verbs".)
- But English, and all of the other Germanic languages, also have small classes of irregular verbs — "strong verbs" — which form their past tense by changing the vowel of the verbal root ("ablaut").

(2) Some English strong verb alternations

Present			Past	
bite	[baɪt]	∼	*bit*	[bɪt]
take	[teɪk]	∼	*took*	[tʊk]
drive	[draɪv]	∼	*drove*	[droʊv]
lead	[lid]	∼	*led*	[lɛd]
sing	[sɪŋ]	∼	*sang*	[seŋ]

- These patterns largely trace back to patterns in Proto-Germanic, where the system is far more regular.

2.2 Preview of the puzzle

- Consider some of the data from Gothic (the earliest attested Germanic language).

→ **Each verb is representative of a class of verbs, describable in terms of the root's phonological shape.**

(3) Example Gothic strong verb paradigms

Root Shape	1SG.PRES		3SG.PRET		3PL.PRET		Gloss
/CiRC/	*binda*	[bind-a]	*band*	[band]	*bundun*	[bund-un]	'bind'
/CiC/	*giba*	[giv-a]	*gaf*	[gaf]	*gebun*	[geːv-un]	'give'
/CaC/	*fara*	[far-a]	*for*	[foːr]	*forun*	[foːr-un]	'travel'
/CaRC/	*halda*	[hald-a]	*haihald*	[hɛhald]	*haihaldun*	[hɛhald-un]	'hold'
/CVːC/	*floka*	[floːk-a]	*faiflok*	[fɛfloːk]	*faiflokun*	[fɛfloːk-un]	'bewail'

- There are three contrasting stem categories (the distinct preterite categories have merged in surviving Germanic languages).
- However, at first glance, the ways in which the categories differ from one another within each paradigm seems completely inconsistent, perhaps even random.
  - There is clearly no single affix (or even small set of affixes) which could reasonably derive all forms of a certain stem type across the different root shapes.

- We said last time that, despite the phonological similarities, the English irregular *present∼past* alternations like those in (2) are probably best housed in the morphology.
  - This was because the alternations seemed to be lexically idiosyncratic and conditioned purely by morphosyntactic category.
  - But here, I've told you that the allomorphy pattern is *predictable* based on the phonological shape of the root. This implies that phonology is strongly implicated in the distribution.

⋆ **Question:** Is the English-like morphological analysis the best way to treat this data too? Or is there something more insightful that can be done?

3 All the data

3.1 Gothic

- In Gothic, there are (depending on how you count) between 4 and 10 different surface patterns of "allomorphy" among 3 stems:

(4) Contrasting stems in Gothic

a. *Present* [overall default, same as infinitive; ≈ root]
b. *Preterite plural* [really preterite default, also found in preterite subjunctive]
c. *Preterite singular* [only found in preterite singular indicative]
d. (*Preterite participle* [equivalent to preterite plural stem in all but one case; I'll ignore it])

- The patterns (in Gothic terms) are shown in (5). [Don't worry about all the details here.]
  - The important point is that each pattern of allomorphy (each "Class") is associated with a particular phonological root shape.
  - → **Generalization:** The phonological shape of the preterite stems is predictable from the phonological shape of the root, once we know what the patterns are.

(5) Gothic strong verbs paradigms — surface forms (data from Lambdin 2006)

Class	Root Shape	1SG.PRES		3SG.PRET		3PL.PRET		Gloss
I	CijC	*beita*	[biːt-a]	*bait*	[bɛːt]	*bitun*	[bit-un]	'bite'
II	CiwC	*kiusa*	[kiu̯s-a]	*kaus*	[kɔːs]	*kusun*	[kus-un]	'choose'
III	Ci{N,L}C	*binda*	[bind-a]	*band*	[band]	*bundun*	[bund-un]	'bind'
IV	CiR	*nima*	[nim-a]	*nam*	[nam]	*nemun*	[neːm-un]	'take'
V	CiT	*giba*	[giv-a]	*gaf*	[gaf]	*gebun*	[geːv-un]	'give'
VI	CaC	*fara*	[far-a]	*for*	[foːr]	*forun*	[foːr-un]	'travel'
VIIa	CaRC	*halda*	[hald-a]	*haihald*	[hɛhald]	*haihaldun*	[hɛhald-un]	'hold'
VIIb	CeːC	*slepa*	[sleːp-a]	*saislep*	[sɛsleːp]	*saislepun*	[sɛsleːp-un]	'sleep'
VIIc	CoːC	*floka*	[floːk-a]	*faiflok*	[fɛfloːk]	*faiflokun*	[fɛfloːk-un]	'bewail'

- **The other important take away:** there is no overt affix, nor consistent featural change, which can derive the full set of preterite forms from the respective inputs.
  - i.e., it may be more parsimonious to claim we are dealing with a complex system of root/stem allomorphy than selection from different morphs for PRETERITE and SINGULAR.

3.2 Reconstructing back

- A lot of the complications result from sound changes in the late pre-history of Gothic/Proto-Germanic.
- Once we do some shallow reconstruction and account for a few sound changes (especially PGmc. */e/ > Goth. /i/), the picture becomes much clearer.

(6) Pre-Proto-Germanic strong verbs paradigms — stem patterns

Root Shape	Class	PRES	PRET.SG	PRET.PL	
/CeRC/	I	bejt-	bajt-	bit-	(= //bj̩t-//)
	II	kews-	kaws-	kus-	(= //kw̩s-//)
	III	bend-	band-	bund-	(= //bn̩d-//)
/CeC/	IV	nem-	nam-	neːm-	
	V	geb-	gab-	geːb-	
/CaC/	VI	far-	foːr-	foːr-	
/CaRC/	VIIa	hald-	<u>he</u>hald-	<u>he</u>hald-	
/CVːC/	VIIb	sleːp-	<u>se</u>sleːp-	<u>se</u>sleːp-	
	VIIc	floːk-	<u>fe</u>floːk-	<u>fe</u>floːk-	

- We can now easily extract the generalizations:

(7) Allomorphy patterns by class (*pres* ∼ *pret.sg* ∼ *pret.pl*)

a. **Class I–III:** *e* ∼ *a* ∼ *Ø* (→ *post-nuclear sonorants vocalize in pret.pl; nasals/liquids realized as [uR]*)
b. **Class IV–V:** *e* ∼ *a* ∼ *eː*
c. **Class VI:** *a* ∼ *oː* ∼ *oː* (→ *[oː] is lengthened correspondent of [a] (there's no short [o] or long [aː])*)
d. **Class VII:** --- ∼ RED ∼ RED

- None of these patterns reflects the regular phonology of the language (...some of it reflects the regular phonology of an earlier stage, as is typical with these sorts of problems).
- Likewise, there is still no obvious set of affixes which can economically derive this system, even given a powerful system of allomorph selection.

⋆ **My proposal:** We can actually still do all of this in the phonology, if we assume
(i) Null underlying representations for the relevant affixal morphemes, plus
(ii) A constraint(s) requiring *phonological contrast* between *morphologically related* stems.

4 Proposal

4.1 Basic components

1. The underlying representations of the preterite morpheme and the singular morpheme (in the appropriate morphosyntactic contexts) are phonologically null.

(8) Relevant Vocabulary Insertion rules

a. PRET ↔ /Ø/
b. SG ↔ /Ø/

2. There are constraints which call for phonological contrast between stems standing in particular morphosyntactic relations: REALIZE MORPHEME constraints.

(9) **REALIZE MORPHEME** (RM; Kurisu 2001:39)
Let α be a morphological form, β be a morphosyntactic category, and F(α) be the phonological form from which F(α+β) is derived to express a morphosyntactic category β. Then RM is satisfied with respect to β iff F(α+β) $\neq$ F(α) phonologically.

- *In plainer English:* if one category represents a strict superset of another category morphosyntactically, they cannot surface with exactly the same phonological exponents.
- Conceptually, this is basically a Base-Derivative "anti-faithfulness" constraint (Alderete 2001; see also Crosswhite 1999).

→ Phonological exponence in the preterite is the result of unfaithful mappings driven by the operation of REALIZE MORPHEME, and their interaction with markedness and faithfulness constraints.

4.2 Using RM for this case

- There are two broad generalizations that hold across the entire verbal system, encompassing both the strong verbs and the weak verbs:

⋆ For every verb in the language, there is a different phonological form for the preterite stem(s) than the present (default) stem (see, e.g., Meid 1971).
  - We already saw that this is true of strong verbs.
  - This is also true of weak verbs, whose preterite is marked by the dental preterite suffix.

⋆ There is also a strong tendency for the stem of the (indicative) preterite singular to be distinct from the stem of the preterite plural
  - This universally holds of the weak verbs, reflected in the number-conditioned allomorphy of the dental suffix: plural /-deːd-/ vs. singular /-d-/.
  - It holds also of the strong verbs of Classes I–V, which each have [a] in the preterite singular, but some other phonological differentiation from the present stem in the preterite plural.

  → Strong Classes VI and VII do not follow this generalization, but for principled reasons.

- We can use RM to capture these generalizations, if we assume the right constellations of morphosyntactic features in the output of the morphological derivations for different stem forms:

(10) Morphosyntactic features present at the output of the morphological derivation (in the indicative)

a.	*Preterite singular*:	{ROOT, PRET, SG}	
b.	*Preterite plural*:	{ROOT, PRET}	[~~NUM~~]
c.	*Present singular/plural*:	{ROOT}	[~~TENSE~~, ~~NUM~~]

- W.r.t. the feature PRET, RM will ensure that both types of preterite stems are distinct from their related present stems.
- W.r.t. the feature SG, RM will ensure that preterite singular stems are distinct from their related preterite plural stems (also from their related present stems, but this is already taken care of by PRET).

→ Problem is, the first distinction is always true, but the second one is false in a phonologically well-defined environment (see below).

- We can fix this by positing RM constraints on individual features, rather than having one blanket constraint:

(11) a. **REALIZE MORPHEME: PRETERITE (RM:PRET)**
Assign a violation mark * for any preterite stem which is not phonologically distinct from the default stem (i.e. the present stem) formed from the same root.

b. **REALIZE MORPHEME: SINGULAR (RM:SG)**
Assign a violation mark * for any preterite indicative singular stem which is not phonologically distinct from the default preterite stem (i.e. the preterite plural stem) formed from the same root.

- By ranking these two constraints in different places in the phonological constraint ranking (CON), we will be able to derive the differing scope of their effects.

5 Analysis

- The allomorphy patterns we are trying to explain are (again) the following:

(12) Allomorphy patterns by class (*pres* ∼ *pret.sg* ∼ *pret.pl*)

a. **Class I–III:** *e* ∼ *a* ∼ *Ø*
b. **Class IV–V:** *e* ∼ *a* ∼ *eː*
c. **Class VI:** *a* ∼ *oː* ∼ *oː*
d. **Class VII:** --- ∼ RED ∼ RED

The way the analysis works is:

- In the derivation for the preterite plural (default preterite stem), the faithful candidate gets blocked by RM:PRET.
  - The phonological evaluation then selects the *most optimal unfaithful candidate*.
  - Which candidate this is depends on how the underlying phonological structure of the root interacts with markedness and faithfulness constraints.
- In the derivation for the preterite singular, the faithful candidate gets blocked by RM:PRET **and** the normally optimal unfaithful candidate is additionally penalized by RM:SG.
  - If there is another candidate which does not violate any constraints which outrank RM:SG, that candidate is selected.
    - This ends up being the case in Class I–III and Class IV–V.
  - If all other candidates do violate a constraint(s) which outrank RM:SG, the normally optimal unfaithful candidate is chosen, failing to instantiate a contrast between singular and plural.
    - This ends up being the case in Class VI and Class VII.

- Preview of the details: order of unfaithful mappings
  1. *Vowel-deletion* (only /e/): /e/ → Ø
  2. *Vowel-lengthening*: /V̆/ → [Vː]
  3. *Vowel-backing* (only short vowels): /e/ → [a]
  4. *Reduplication*: /...ROOT/ → [$\underline{C_1 e}$-ROOT]

5.1 Strong Class I–III Preterite Plurals

- The optimal strategy for marking the preterite in the strong verbs is *vowel deletion*.
- This is observed in the basic case of the preterite plurals of Classes I–III.
  - For example: Class II √*kews* → PRET.PL *kus-* (//kw̩s-//)
- I will first focus on what is driving this change, and then turn to the question of how to select particular changes over others in the appropriate contexts.

- Deletion is preferable to faithful realization because RM:PRET ≫ MAXV-IO.

(13) **MAXV-IO**
Assign one violation mark * for each vowel in the input which lacks a correspondent in the output.

(14) **New Rankings:** RM:PRET ≫ MAXV-IO

(15) Preterite Plural of Class II (also Class I & III)

INPUT: /kews, Ø$_{PRET}$/ BASE: PRES [kews-]	RM:PRET	MAXV-IO
a. kews-	*!	
b. ☞ kus- (← //kws-//)		*

- Deletion is also preferable to (e.g.) *vowel backing*,[1] which we know is one of the other options employed in the system.
  - This is explainable via the relative ranking of faithfulness constraints: DEP[+back]-IO ≫ MAXV-IO

→ For reasons which will become apparent later, I will use MAXFEATURE and DEPFEATURE constraints to regulate feature changes (cf. Casali 1996, *et seq.*).
  - These are constraints that reference specified feature values, and take the feature as the locus of correspondence.
  - The segment remains a unit of correspondence as well, just not the one which is relevant for these constraints.

(16) **DEP[+back]-IO**
Assign one violation mark * for each [+back] feature in the output which was not present in the input.

(17) **New Rankings:** DEP[+back]-IO ≫ MAXV-IO

(18) Ruling out alternative mappings for Class II preterite plurals

INPUT: /kews, Ø$_{PRET}$/ BASE: PRES [kews-]	RM:PRET	DEP[+back]-IO	MAXV-IO
a. kews-	*!		
b. ☞ kus- (← //kws-//)			*
c. kaws-		*!	

[1] I assume [e] and [a] are both [-high], but un(der)specified for [±low].

5.2 Strong Class IV & V Preterite Plurals

- In Classes IV & V, the preterite plural is formed not by vowel deletion, but rather by *vowel lengthening*.
  - For example: $\sqrt{geb}$ → PRET.PL *geːb-*
- *Why do these forms not show deletion like Class I–III*? This behavior can be attributed to an emergent markedness pressure against creating new consonant clusters.

(19) ***CLUSTER (*CC)**
Assign a violation * for each sequence of two adjacent non-syllabic consonants in the output.

- Class IV & V roots are /CeC/.
  - When you try to perform vowel deletion on them, you get a new cluster: /CeC-/ ↛ *[CC-]
- Class I–III roots, on the other hand, are /Ce**R**C/.
  - When you perform vowel deletion on them, you can syllabify the post-vocalic sonorant, avoiding new clusters: /CeRC-/ → [CR̩C-]

→ If *CC is ranked sufficiently high, it can explain this difference.

- *CC evidently does divert the derivation away from the deletion mapping, in favor of the lengthening mapping (penalized by DEP[+long]-IO).
  - This can be generated with the ranking in (21).

(20) **DEP[+long]-IO**
Assign one violation mark * for each [+long] feature present in the output which was not present in the input.

(21) **New Rankings:** RM:PRET, *CC, DEP[+back]-IO ≫ DEP[+long]-IO

(22) Preterite Plural of Class V (also Class IV)

INPUT: /geb, Ø$_{\text{PRET}}$/ BASE: PRES [geb-]		RM:PRET	*CC	DEP[+back]	DEP[+long]	MAXV
a.	geb-	*!				
b.	gb-		*!			*
c.	gab-			*!		
d. ☞	geːb-				*	

5.3 Strong Class I–V Preterite Singulars

- While Class I–III and Class IV–V have distinct patterns for the preterite plural, they converge on *vowel-backing* for their preterite singulars.
  - Class V $\sqrt{geb}$ → PRET.SG *gab-*
  - Class II $\sqrt{kews}$ → PRET.SG *kaws-*
- In both cases, this is because:
  (i) The preterite plural has already claimed the optimal unfaithful mapping, and RM:SG disallows selection of the same stem form, and
  (ii) Markedness prevents each from selecting the other type's preferred unfaithful mapping.

- For Class IV–V:
  - We already know that *CC blocks the possibility of vowel deletion (25b).
  - RM:SG prevents selection of the normally optimal unfaithful mapping, vowel lengthening (25c).
  - As long as DEP[+back]-IO is the next lowest ranked faithfulness constraint, we will select vowel backing (25d) here over some other conceivable unfaithful mapping, e.g. vowel raising (25e), which violates (evidently higher-ranked) DEP[+high]-IO.

(23) **DEP[+high]-IO**
Assign a violation * for each [+high] feature in the output which was not present in the input.

(24) **New Rankings:** RM:PRET, RM:SG, DEP[+high]-IO, *CC ≫ DEP[+back]-IO

(25) Preterite Singular of Class V (also Class IV)

INPUT: /geb, Ø$_{PRET}$, Ø$_{SG}$/ BASES: PRES [geb-], PRET.PL [ge:b-]	RM:PRET	DEP[+high]	*CC	RM:SG	DEP[+back]	DEP[+long]	MAXV
a. geb-	*!						
b. gb-			*!				*
c. ge:b-				*!		*	
d. ☞ gab-					*		
e. gib-		*!					

- Given just this ranking, we would expect the Class I–III preterite singulars to show not vowel backing but rather vowel lengthening.
  - RM:SG here rules out vowel deletion (because it's been claimed by the preterite plural).
  - But we don't (yet) have any constraint to rule out lengthening; i.e. nothing equivalent to *CC in the Class IV–V derivation.

(26) Preterite Singular of Class II (also Class I–III)

INPUT: /kews, Ø$_{PRET}$, Ø$_{SG}$/ BASES: PRES [kews-], PRET.PL [kus-]	RM:PRET	*CC	RM:SG	DEP[+back]	DEP[+long]	MAXV
a. kews-	*!					
b. kus- (← //kws-//)			*!			*
c. 💣 ke:ws-					*	
d. ☹ kaws-				*!		

- It turns out, though, that there's a reasonable constraint that can do *CC's job:

(27) ***V:RC**
Assign one violation mark * for each output V:RC sequence (≈ *SUPERHEAVY).

- There's evidence that a constraint like this is active within the history of Germanic (and even stronger evidence in related IE languages) in the form of "Osthoff's Law" (cf. Collinge 1985:127–131).
  - Long vowels before sonorants in medial closed syllables are not allowed in Proto-Germanic. (They do get re-introduced later through syncope processes.)
  - Some historical evidence that long vowels which entered this environment actually shortened.

- This constraint would be violated by lengthening in CV̌RC roots.

→ Therefore, this constraint can divert away from the vowel lengthening mapping and towards the vowel backing mapping in Class I–III.

(28) **New Rankings:** *V:RC ≫ DEP[+back]-IO (≫ DEP[+long]-IO)

(29) Preterite Singular of Class II (also Class I–III)

INPUT: /kews, $Ø_{PRET}$, $Ø_{SG}$/ BASES: PRES [kews-], PRET.PL [kus-]	RM:PRET	*V:RC	RM:SG	DEP[+back]	DEP[+long]	MAXV
a. kews-	*!					
b. kus- (← //kws-//)			*!			*
c. ke:ws-		*!			*	
d. ☞ kaws-				*		

5.4 Strong Class VI Preterite Singulars and Plurals

- Class VI roots are of the shape /CaC/, i.e. have the same segmental shape as Class IV–V just with a different vowel quality.
- In the preterite plural, they show vowel lengthening like Class IV–V, just with a different vowel quality (as we might expect).
  - For example: Class VI √*far* → PRET.PL *fo:r-*

- Because the vowel for these roots is underlyingly [+back], rather than all the previous types which were [-back], we now need to consider an additional mapping type: *vowel fronting*.
  - In the MAX/DEPF approach, we could potentially use either DEP[-back]-IO or MAX[+back]-IO to rule this out.
  - MAX[+back]-IO is what we'll need (because of Class VIIa below).
- As long as MAX[+back]-IO ≫ DEP[+long]-IO, lengthening will still be preferable to fronting.

(30) **MAX[+back]-IO**
Assign one violation mark * for each [+back] feature in the input which is not present in the output.

(31) **New Rankings:** MAX[+back]-IO ≫ DEP[+long]-IO

(32) Preterite Plural of Class VI

INPUT: /far, $Ø_{PRET}$/ BASE: PRES [far-]	RM:PRET	*CC	MAX[+back]	DEP[+high]	DEP[+back]	DEP[+long]	MAXV
a. far-	*!						
b. fr-		*!	*!				*
c. ☞ fo:r- (← //fa:r-//)						*	
d. fer-			*!				
e. fur-				*!			

- Unexpected given all that we have seen thus far, the preterite singular **also** displays vowel lengthening, not some other unfaithful mapping which could have differentiated it from the preterite plural.
  - For example: Class VI $\sqrt{far}$ → PRET.SG *foːr-* (= PRET.PL)
- This tells us that RM:SG — the constraint advocating for different preterite singular and plural stems — must rank *below* all further faithfulness constraints (e.g., DEP[+high]-IO) that could be violated to generate a distinct output form.
  - One more such faithfulness constraint is INTEGRITY-IO, which actually will be violated in Class VII.
- So, note that, for the first time, the optimal output in these cases bears a RM:SG violation.
  → This is what motivates separating RM into constraints on particular features.

(33) **INTEGRITY-IO**
Assign one violation mark * for each segment in the input which stands in correspondence with multiple segments in the output.

(34) **New Rankings:** RM:PRET, MAX[+back]-IO, INTEGRITY-IO, DEP[+high]-IO ≫ RM:SG

(35) Preterite Singular of Class VI

INPUT: /far, $Ø_{PRET}$, $Ø_{SG}$/ BASES: PRES [far-], PRET.PL [foːr-]			RM:PRET	*CC	MAX[+back]	DEP[+high]	INTEGRITY	RM:SG	DEP[+long]	MAXV
a.		far-	*!							
b.		fr-		*!	*!					*
c.	☞	foːr- (← //faːr-//)						*	*	
d.		fer-			*!					
e.		$f_i e_j f_i a_j$r-					*!*			
f.		fur-				*!				

5.5 Strong Class VII Preterite Singulars and Plurals

- Lastly, we turn to the Class VII strong verbs, which form their preterites (both singular and plural) through *reduplication* (or, more precisely, phonological copying/splitting).
- Class VII cover roots of two types:
  a. Class VIIa = roots with underlying root vowel /a/ followed by two consonants (specifically *sonorant + obstruent*)
  b. Class VIIb–d = roots with underlying long vowels
     - /oː/ in Class VIIc
     - /eː/ in Class VIIb and Class VIId (which I'm going to continue to hide from you).
- What these different types have in common is:
  - If they underwent lengthening, this would result in (roughly) a superheavy syllable.
  - The contain an underlying prominent feature which is not allowed to be changed.

→ Given these conditions, they (and they alone) are allowed to reduplicate to satisfy RM:PRET.

5.5.1 Strong Class VIIa Preterite Singulars and Plurals

- Class VIIa forms both its preterite plurals and its preterite singulars with *reduplication*.
  - For example: √*hald* → PRET.PL *hehald-*, PRET.SG *hehald-*.
- The roots of Class VIIa are of the shape /CaRC/.
  - This shape is the same as Class I–III (/CeRC/), modulo the quality of the vowel.
  - The two are equivalent w.r.t. the (im)possibility of vowel lengthening, as they would both equally violate the constraint *V:RC if lengthening were to occur.

→ The current constraint ranking properly derives reduplication, once we fix the ranking of INTEGRITY-IO as the lowest among previously undominated constraints.

(36) **New Rankings:** RM:PRET, *V:RC, MAX[+back]-IO, DEP[+high]-IO ≫ INTEGRITY-IO

(37) Preterite Plural of Class VIIa

INPUT: /hald, $Ø_{PRET}$/ BASE: PRES [hald-]			RM:PRET	*V:RC	MAX[+back]	DEP[+high]	INTEGRITY	RM:SG	DEP[+long]	MAXV
a.		hald-	*!							
b.		hoːld- (← //haːld-//)		*!					*	
c.		hit- (← //hld-//)			*!					*
d.		held-			*!					
e.	☞	$h_i e_j h_i a_j$ld-					**			
f.		huld-				*!				

- MAX[+back]-IO plays an even more crucial role here than in Class VI.
  - Like in Class VI, it rules out the fronting candidate (37d).
  - Unlike in Class VI, it must also be responsible for eliminating the deletion candidate (37c), because there are no markedness constraints (i.e. *CC) which penalize the deletion candidate.

→ This is why we need MAX[+back]-IO rather than DEP[-back]-IO, and indeed why we need MAX/DEPF constraints in the first place.

⋆ Note that "reduplication" is emerging as a phonological repair for a RM:PRET violation, without the presence of a /RED/ morpheme in the input.
  - This pattern is thus more aptly be understood as *phonological copying* than reduplication proper, insofar as there is a difference (cf. Yu 2005).
- This is quite interesting from a diachronic perspective, because in earlier stages of the language (Proto-Indo-European), reduplication was morphological and obligatory on all preterite (then "perfect") stems, not just those which become Class VII (see Sandell & Zukoff 2014, 2017).

- Class VII, like Class VI, does not show a stem contrast between preterite plural and preterite singular.
  - This follows from the currently established ranking: RM:SG is ranked below all the faithfulness constraints whose violation could be employed to effect stem contrast.
  - INTEGRITY-IO is violated again (equally) in the derivation of the preterite singular, but still in service of RM:PRET not RM:SG.

(38) Preterite Singular of Class VIIa

INPUT: /hald, $\emptyset_{\text{PRET}}$, $\emptyset_{\text{SG}}$/ BASE: PRES [hald-], PRET.PL [hehald-]		RM:PRET	*V:RC	MAX[+back]	DEP[+high]	INTEGRITY	RM:SG	DEP[+long]	MAXV
a.	hald-	*!							
b.	ho:ld- (← //ha:ld-//)		*!					*	
c.	huld- (← //hld-//)			*!					*
d.	held-			*!					
e. ☞	$h_ie_jh_ia_j$ld-					**	*		
f.	huld-				*!				

5.5.2 Strong Class VIIb,c Preterite Singulars and Plurals

- Class VIIb & Class VIIc preterite singulars and plurals are likewise all formed through reduplication, with no differentiation between singular and plural.
  - Class VIIb are roots with underlying long /e:/.
    - For example: √*sle:p* → PRET.PL *sesle:p-*, PRET.SG *sesle:p-*
  - Class VIIc are roots with underlying long /o:/.
    - For example: √*flo:k* → PRET.PL *feflo:k-*, PRET.SG *feflo:k-*

- In both cases:
  - Lengthening can be ruled out by a constraint against trimoraic/overlong vowels, which plays exactly the same role as *V:RC in Class VIIa.

(39) ***V**$_{\mu\mu\mu}$
Assign one violation mark * for each trimoraic vowel in the output.

  - Deletion can be ruled out with a constraint against deletion of long vowels.

(40) **MAX[+long]-IO:**
Assign one violation mark * for each [+long] feature in the input that is not present in the output.

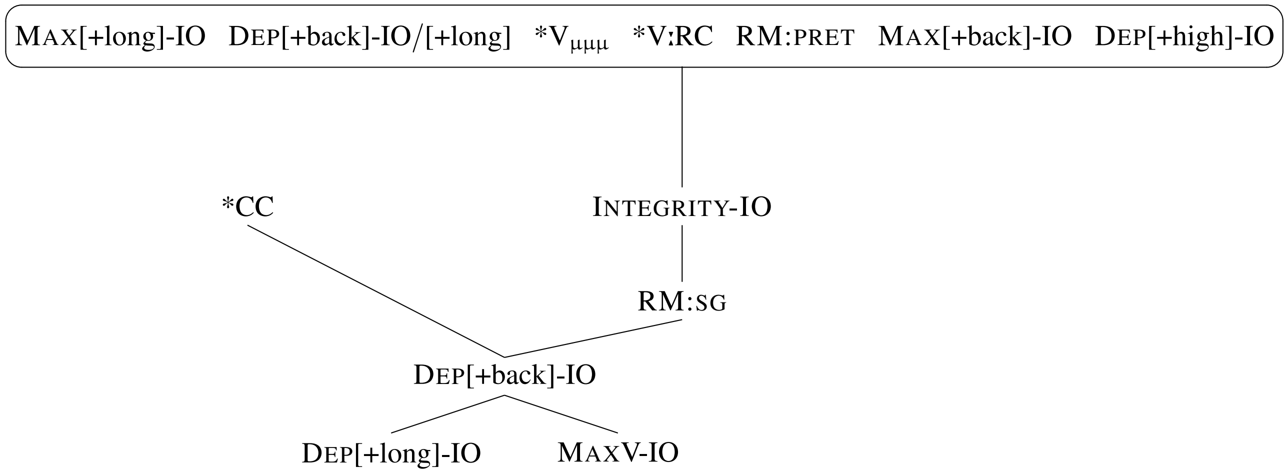
- For Class VIIc (/o:/), fronting is ruled out if MAX[+long]-IO ≫ INTEGRITY-IO.
- For Class VIIb (/e:/), however, ruling out backing is non-trivial.
  - With short vowels, backing is a licit repair for RM:PRET, and normally preferred to reduplication.
  - But this is evidently reversed if the vowel is underlyingly long.
  - → We might speculate that this is a sort of P-map effect, where backing is more noticeable on long vowels than short vowels, and thus can be penalized by a higher-ranked faithfulness constraint:

(41) ≈ **DEP[+back]-IO/[+long]:**
Assign a violation mark * for each [+back] feature in the output which
a. was not present in the input, and
b. coincides with a [+long] feature.

- When all these constraints outrank INTEGRITY-IO, we will derive the right results.
  - ↪ I'll leave that as an exercise for the reader.

5.6 Summary of Analysis

(42) **Hasse diagram of rankings**



6 Conclusion

- This analysis of the Germanic strong verb system illustrates a different type of allomorphy than discussed previously: ≈ morphologically conditioned phonological allomorphy (“MCPA”).
  - The phonology is directly sensitive to morphological contrast, via REALIZE MORPHEME constraints.
  - This morphological contrast can trigger phonological allomorphy that is conditioned purely by the ranking of standard phonological constraints.
- This is sort of the flip side of PCSA.
  - In PCSA, the morphology provides the phonology with a way to fix its problems, because it happens to make available multiple allomorphs.
  - In MCPA, the phonology provides the morphology with a way to fix its problems, because it can distort the phonological representation even in the wake of being given null URs.
- In both types, the phonology is **optimizing** (modulo a few suspect counter-examples; cf. Paster 2015, *a.o.*).
  - MCPA thus gives further evidence that phonology and morphology must be able to interact strongly within the phonological component...
  - → or rather, within an OT component that simultaneously has access to (certain kinds of?) phonological **and** morphological information (cf. Rolle to appear).

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