

Class 8

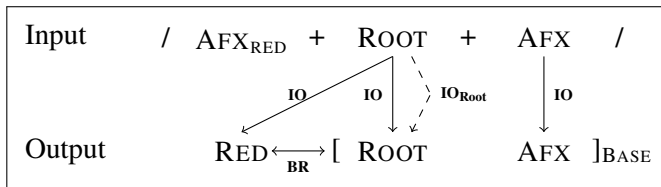
Reduplication and Existential Faithfulness (Struijke 2002)

11/9/17

1 Review

- Last time: when we assume that the reduplicant corresponds to the input via “broad IO correspondence” and that the root stands in a special correspondence relation with the input (Struijke 2002), we can account for the same things as IR faithfulness without some of the bad predictions/stipulations.

(1) Base-Reduplicant Correspondence Theory: Struijke model



- This was an improvement over the Spaelti (1997) model, which lacked the special Root correspondence relation, because it allows us to continue to capture standard TETU effects.
 - Yoruba was one of the examples:

(2) Root faithfulness copy + reduce in Yoruba

/RED+jε/	IDENT-V-IO _{RT}	*-[i]	IDENT-V-IO	IDENT-V-BR
a. ☹️ <u>ji</u> -[jε] _{RT}		*	*	*
b. <u>jε</u> -[jε] _{RT}		**!		
c. <u>ji</u> -[ji] _{RT}	*!		**	

- If this were the full story, however, it would make an incorrect prediction about other affixes:
 - In a language which displays TETU effects in reduplication, *all affixes* should also be subject to those TETU effects.

(3) Hypothetical affix TETU in Yoruba

/RED+jε+to/	IDENT-V-IO _{RT}	*-[i]	IDENT-V-IO	IDENT-V-BR
a. ☹️ <u>ji</u> -[jε] _{RT-to}		**!	*	*
b. ⚡️ <u>ji</u> -[jε] _{RT-ti}		*	**	*
c. <u>jε</u> -[jε] _{RT-to}		**!*		
d. <u>ji</u> -[ji] _{RT-to}	*!	*	**	

- Struijke (2002) gets around this by altering (IO) Faithfulness constraints to be quantified *existentially* rather than universally.

2 Existential Faithfulness

2.1 Definition

- The idea behind existential faithfulness is that a property of the input must be *preserved* on some output correspondent, not necessarily that all output correspondents must be *identical* for that property.
 - In the case of a single output correspondent, preservation is equivalent to identity.

- IDENT constraints in this framework are defined as:

(4) \exists -IDENT[\pm F]-IO: (Struijke 2002:20)

Let $\text{seg} \in \text{input}$ be in the domain of \mathfrak{R} , and seg is [α F];
 then there is some $\text{seg}' \in \text{output}$,
 such that $\text{seg}\mathfrak{R}\text{seg}'$ is [α F].

Some output segment corresponding to an input segment preserves the feature specification [α F] of that input segment.

- We can illustrate the differences between this definition and the traditional universally quantified definition with the following mappings:

(5) Assessing violations of \exists -IDENT[+voice]-IO

	<i>Satisfies</i>		<i>Violates</i>
Input	$g_{[+ve]}$		$g_{[+ve]}$
Output	a. \downarrow $g_{[+ve]}$	b. \emptyset	c. \downarrow $k_{[-ve]}$
Input	$g_{[+ve]}$		$g_{[+ve]}$
Output	d. $\swarrow \searrow$ $g_{[+ve]} \quad g_{[+ve]}$	e. $\swarrow \searrow$ $g_{[+ve]} \quad k_{[-ve]}$	f. $\swarrow \searrow$ $k_{[-ve]} \quad k_{[-ve]}$

- (5a,d) would satisfy any definition of IDENT, since all output correspondents have the [+voice] feature.
- (5b) would satisfy any definition, as long as IDENT is vacuously satisfied when there is no segmental correspondence.
 - If we assume the reverse, it is violated equally under either type of quantification.
- (5c,f) would violate any definition of IDENT, since all output correspondents exclusively have [-voice], i.e. lack [+voice].
- The crucial case is (5e).
 - It has one output correspondent that faithfully preserves the [+voice] feature, and one that doesn't.
 - Under universal quantification, this would incur a violation of IDENT for the correspondence between /g/ ↔ [k].
 - However, under existential quantification, the fact that there is preservation of the [+voice] feature on some output correspondent, i.e. /g/ ↔ [g], means that IDENT is satisfied.

2.2 Example


- An example of this comes from vowel reduction and reduplication in Lushootseed.
 - In unreduplicated words, where underlying vowels have only one correspondent in the output, unstressed vowels do not reduce (or rather “optionally” reduce; Struijke 2002:21n.).
 - But in reduplicated words, where one BR correspondent is stressed and the other isn't, the unstressed one reduces.
 - It can either be the reduplicant vowel (6d) or the root vowel (6c), depending on where the stress phonotactics place the stress.

(6) Vowel reduction in Lushootseed (Struijke 2002:21; Urbanczyk 1996)

Input	Output	Gloss
i. Unreduplicated words → no vowel reduction (actually “optional” vowel reduction)		
a. /ʔidig ^w at/	[ʔidig ^w ət]	‘say something’
b. /ʔag ^w al-əb/	[ʔág ^w al-əb]	‘yawn’
ii. Reduplicated words → vowel reduction in unstressed BR correspondent		
c. /RED-ʔag ^w al-əb/	[ʔá-ʔəg ^w əl-əb]	‘yawn’ (dim.)
d. /RED-taɬ-əd/	[tə-táɬ-əd]	‘little distance’

- This can be understood through \exists -IDENT[+voice]-IO:
 - In unreduplicated words, each input vowel has a single correspondent, so

(7) No reduction in unreduplicated words

/ʔa ₁ g ^w a ₂ l-əb/	\exists -IDENT-V-IO	*UNSTRESSEDFULLV
a.  ʔá ₁ g ^w a ₂ l-əb		*
b. ʔá ₁ g ^w ə ₂ l-əb	*!	

- * Optionality could be achieved by having a variable ranking between the two constraints.

- Assuming that clash is banned and that schwas are unstressed, we have the following candidates:

(8) Reduction in reduplicated words

/RED-ʔ _{a1} g ^w a ₂ l-əb/	∃-IDENT-V-IO	*UNSTRESSEDFULLV
a. ʔ _{á1} -ʔ _{a1} g ^w à ₂ l-əb	V ₁ : ✓ V ₂ : ✓	*!
b. ʔ _{á1} -ʔ _{a1} g ^w ə ₂ l-əb	V ₁ : ✓ V ₂ : ✗!	*
c. [☞] ʔ _{á1} -ʔ _{ə1} g ^w à ₂ l-əb	V ₁ : ☑ V ₂ : ✓	
d. ʔ _{á1} -ʔ _{ə1} g ^w ə ₂ l-əb	V ₁ : ☑ V ₂ : ✗!	
e. ʔ _{ə1} -ʔ _{á1} g ^w a ₂ l-əb	V ₁ : ☑ V ₂ : ✓	*!
f. ʔ _{ə1} -ʔ _{á1} g ^w ə ₂ l-əb	V ₁ : ☑ V ₂ : ✗!	
g. ʔ _{ə1} -ʔ _{ə1} g ^w á ₂ l-əb	V ₁ : ✗! V ₂ : ✓	
h. ʔ _{ə1} -ʔ _{ə1} g ^w ə ₂ l-əb	V ₁ : ✗! V ₂ : ✗!	

- Reduction still cannot apply to V₂:
 - It has only one chance to realize its features in order to satisfy ∃-IDENT-V-IO.
 - Therefore it must surface as [a].
 - ∃-IDENT-V-IO thus rules out (b,d,f,g).
 - On the other hand, reduction *can* now apply to *one of the output correspondents of V₁*:
 - ∃-IDENT-V-IO is satisfied as long as one output correspondent preserves the features.
 - ☑ means satisfaction under existential quantification but violation under universal quantification; i.e. only one correspondent of V₁ is faithful.
 - Since there are two output correspondents, the other is free to change its features without affecting ∃-IDENT-V-IO.
 - This is the case for (c) and (e) [also (d) and (f), but they are ruled out for V₂].
 - (a) is fully faithful, so it will satisfy any definition of IDENT.
 - (g) reduces both correspondents of V₁, so it will violate any definition of IDENT, including the existential one.
 - (a,c,e) are the candidates which faithfully realize V₂ and have at least one faithful correspondent of V₁.
 - Among these, both (a) and (e) have an unstressed [a], and so lose out on the markedness constraint.
 - By reducing the second correspondent of V₁, (c) has fixed the markedness problem while still being sufficiently faithful, so it is selected as the winner.
 - (Assuming this is the correct characterization of the distributional facts,) this result would not be derivable with universally quantified faithfulness constraints, because that would rule out all candidates except (a), which needs to lose to (c).
 - Bringing in Root faithfulness would not solve this particular problem, because the unfaithful mapping is in the root.
- ★ Variable ranking actually does predict a single, categorical result in this case, because all candidates are harmonically bounded by the winner w.r.t. these two constraints.

3 TETU in Kwakwala

3.1 “Reduplicant TETU” (i.e. normal TETU)

- Obstruent codas are normally permitted in the language, but they are disallowed in reduplicants.

(9) Obstruents not allowed to surface in reduplicants (Struijke 2002:47)

Root	Reduplicated		Gloss
k'ax ^w	<u>k'a:</u> -k'ax ^w -m'u:t	* <u>k'a:x^w</u> -k'ax ^w -m'u:t	'shavings'
ts'a:s	<u>ts'a:</u> -ts'əs-m'u:t	* <u>ts'a:s</u> -ts'əs-m'u:t	'old eel-grass'
te:ɬ	<u>te:</u> -taɬ-m'u:t	* <u>te:ɬ</u> -taɬ-m'u:t	'remains of bait'

- The syllable types generally permissible in the language are in (10).
 - Struijke claims that medial CCC clusters are passed as complex coda + simplex onset (CC.C)
 - Language permits word-final clusters but not word-initial clusters.

(10) Kwakwala syllable canon (O = obstruent, S = sonorant; Struijke 2002:48)

Type	Example	Gloss
CV	bə .xo:t	'torch'
CVV	dze: .daq ^w	'milky sea eggs'
CVO	gas .xa:	'to carry on fingers'
CVOO	ha:l' a: maxs .ta:	'to eat quickly'
CVVO	ya:x .k'a:	'to hop on one foot'
CVVOO	ts'ə. da:xs .tə.wə.lə.la:	'woman representative'
CVS	dəl .xa:	'damp'
CVSO	t'əls .ta:s	'to eat crabapples'
*CVVS(X)	✗	
*CVSS(X)	✗	

- This is due to a ban on superheavy syllables.
 - Short vowels have 1μ , long vowels have 2μ .
 - If coda sonorants are moraic, VVS+ and VSS+ would have $\geq 3\mu$.
 - Their absence can thus be attributed to a ban on $3+\mu$ syllables.
- Additional evidence that sonorant codas are moraic comes from stress assignment.
 - Primary stress falls on the leftmost heavy syllable (11a,b,c).
 - CVS syllables can attract stress even if followed by CVV(O) syllables (11d).
 - CVO syllables don't attract stress away from CVS (11e).

(11) Main stress (Struijke 2002:48)

a.	há:ɖa:pa:ma:		‘yarrow’
b.	xəsá:ɫa:	*xəsá:ɫa:	‘those who have disappeared’
c.	mé:xts’a:s		‘dreamer’


d.	x ^w ólɖo:s		‘Hexagrammus superciliaris’
e.	pəχdám	*pəχdám	‘time’

• We can describe the distribution of consonant moraicity with the following constraints:


- (12) **WEIGHT-BY-POSITION (WxP):**
Assign a violation * if a coda consonant is non-moraic.
- (13) a. *μ/Obs: Assign a violation for each moraic obstruent.
 b. *μ/Son: Assign a violation for each moraic sonorant consonant.
 c. *μ/V: Assign a violation for each moraic vowel.
 d. **Universal Ranking:** *μ/Obs ≫ *μ/Son ≫ *μ/V

• If WxP is ranked between *μ/Obs and *μ/Son, we get the right distribution.

(14) Coda sonorants are moraic

/CV ^μ S/	∃-MAX-IO	WxP	*μ/Son
a.  CV ^μ S ^μ			*
b. CV ^μ S		*!	
c. CV ^μ	*!		

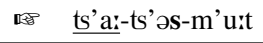
(15) Coda obstruents are non-moraic

/CV ^μ O/	∃-MAX-IO	*μ/Obs	WxP
a. CV ^μ O ^μ		*!	
b.  CV ^μ O			*
c. CV ^μ	*!		

• The absence of obstruent codas in reduplicants can be attributed to the interaction between (∃-)MAX-IO and WxP. (Existential quantification isn't really crucial here.)

- ∃-MAX-IO_{RT} (ranked anywhere) picks between deletion sites, in favor of deletion in the reduplicant.
- *μ/Obs rules out parsing obstruent codas as moraic to satisfy WxP (candidates omitted).

(16) Coda obstruents not copied into reduplicant

/RED+ts'a:s+m'u:t/	∃-MAX-IO	*μ/Obs	WxP	∃-MAX-IO _{RT}
a. <u>ts'a:s</u> -ts'ə-s-m'u:t			***!	
b.  ts'a:-ts'ə-s-m'u:t			**	
c. <u>ts'a:s</u> -ts'ə-m'u:t			**	*!
d. <u>ts'a:-</u> ts'ə-m'u:t	*!		*	*!
e. <u>ts'a:-</u> ts'ə-m'u:	*!*			*!

- This is standard TETU, and could easily be derived in any of the other frameworks we've looked at previously.

3.2 “Output TETU”

- The more interesting aspect of Kwakwala TETU is the behavior of vowel length & coda sonorants in reduplication.
 - They will show up in either the base or the reduplicant, but not both.
 - The distribution is based on the desire to avoid clashes.

3.2.1 Clash tolerance outside of reduplication


- Struijke claims that there are clashes between adjacent heavy syllables
 - Saba Kirchner (2010) seems to assume that there aren't clashes

(17) Clashes(?) in non-reduplicative words (Struijke 2002:57)

Real form	Reduction not observed	Gloss
góltk'ò:dì:ɬ	*góltk'ə̀dì:ɬ	'longer one side'
ts'ó:l'ə̀my'à:	*ts'ə̀l'ə̀my'ə̀	'black cheek'
hé:lò:m'à:là:	*hé:lə̀m'à:lə̀, *hə̀l'ó:m'ə̀là:	'to be in time'
té:nò:stà:là:	<i>etc.</i>	'to pole up river'

- The relevant point is that there are normally adjacent heavy syllables, and heavy syllables normally attract stress
 - If there are clashes: WSP \gg *CLASH
 - If there aren't: *CLASH \gg WSP
 - If there are actually no secondary stresses at all: CULMINATIVITY(MAX) \gg WSP
- \Rightarrow Any of these are consistent with the analysis (though the last one may be a little trickier), because WSP violations can still be minimized.
- I'll follow Struijke in assuming clashes, so WSP \gg *CLASH.
 - Since there's no reduction in the general case \exists -MAX-IO and \exists -IDENT[weight]-IO dominate *CLASH (Struijke 2002:58–59).

(18) No reduction and no deletion of coda sonorants to avoid clash

/ts'ó:l'ə̀my'á:/	\exists -MAX-IO	\exists -IDENT[weight]-IO	WSP	*CLASH
a.  ts'ó:l'ə̀my'á:				**
b. ts'ó:l'ə̀my'á:			*!	
c. ts'ə̀l'ə̀my'ə̀		*!*		
d. ts'ó:l'ə̀y'á:	*!			

3.2.2 Emergent clash avoidance in reduplication → heavy reduplicant

- Now let's look at the distribution of codas and vowel length in reduplicated forms
 - Struijke lists this as [k'á:~k'ax^w-m'ù:t] with [a] in second syllable. Saba Kirchner (2010:43) gives it with [ə]. [ə] makes much more sense, so I'm assuming that. Same for *qas*.
 - Saba Kirchner gives the type d. forms with [i:] and [u:] respectively; this makes no difference, all we care about is length.

(19) Reduplication with bimoraic roots ending in a laryngeally unmarked segment (Struijke 2002:60)

Type	Root	Reduplicated	Gloss
a.	wən	wón-wə-mù:t	'refuse of drilling'
	kən	kón-kə-mù:t	'what is left after scooping up'
b.	yənt	yón-yət-m'ù:t	'gnawings of a large animal'
	qəns	qón-qəs-m'ù:t	'chips'
c.	k'a:x ^w	k'á:-k'əx ^w -m'ù:t	'shavings'
	qas	qá:-qəs-m'ù:t	'tracks'
d.	dəy	dé:-də-mù:t	'refuse of wiping'
	xəw	xó:-xə-mù:t	'refuse of splitting wood'
		▷ /əy,əw/ → [e:,o:] / _]σ	

Generalizations:

1. Post-nuclear consonants never appear twice (always appear exactly once)
 2. The reduplicant is always heavy (bimoraic) and the base is always light
⇒ Word is always HLH
- Generalization 1 straightforwardly follows from the existential definition of MAX
 - A coda consonant will always be marked, so don't have it surface more times than necessary
 - It has to surface at least once, therefore only once
 - Generalization 2 is an emergent effect of clash avoidance
 - By placing the moraic coda consonant or long vowel in the reduplicant rather than the base, clash is avoided
 - Both of these follow from the ranking that explains the lack of deletion/reduction in non-reduplicated words, as long as we use existentially quantified faithfulness constraints.

(20) Coda sonorants in the reduplicant not the base

/RED-wən-m'ù:t/	∃-MAX-IO	WSP	*CLASH	∃-MAX-IO _{RT}
a. <u>wón</u> -wən-m'ù:t			*!*	
b. <u>wón</u> -wən-m'ù:t		*!		
c. [☞] <u>wón</u> -wə-m'ù:t				*
d. <u>wə</u> -wón-m'ù:t			*!	
e. <u>wə</u> -wə-m'ù:t	*!			*

- \exists -MAX-IO_{RT} must rank below *CLASH, or else the sonorant would be forced to appear in the root. This would predict (d). Same with \exists -IDENT[weight]-IO_{RT} for vowel length below.

(21) Long vowels in the reduplicant not the base

/RED-qa:s-m'ù:t/	\exists -IDENT[weight]-IO	WSP	*CLASH	\exists -IDENT[weight]-IO _{RT}
a. <u>qá:</u> -qà:s-m'ù:t			*!*	
b. <u>qá:</u> -qa:s-m'ù:t		*!		
c. <u>qá:</u> -qəs-m'ù:t				*
d. <u>qə</u> -qá:s-m'ù:t			*!	
e. <u>qə</u> -qəs-m'ù:t	*!			*

- We know from (16) that the obstruent will appear only in the base.
- The difference between obstruents and sonorants is that obstruents can't contribute weight, and thus putting them in the reduplicant isn't going to help solve the Clash/WSP problems.
- The interaction between the effects in (20) [sonorant codas must appear in the reduplicant] and (16) [obstruent codas must appear in the base] naturally extends to type b. roots /CəSO/:
 - $\sqrt{yənt} \rightarrow [yón-yət-m'ù:t]$
 - $\sqrt{qəns} \rightarrow [qón-qəs-m'ù:t]$

3.2.3 Emergent clash avoidance in reduplication → heavy base

- We might think we could derive this without existential faithfulness...until we see the forms with laryngeally-marked final C's.
 - Laryngeally marked C's (ejectives, voiced obstruents, glottalized sonorants) are not permitted before a consonant.
 - Glottalized sonorants are probably not moraic
 - They are repaired by epenthesizing a [ə] after the C.
 - When such roots are reduplicated, the heavy syllable is the base, not the reduplicant:

(22) Forms with bimoraic roots ending in laryngeally marked consonants (Struijke 2002:63)

Root	Reduplicated	Gloss
məndʒ	<u>mə</u> -mónɖə-mù:t	'leavings after cutting kindling wood'
q ^w ːa:l'	<u>q^wːə</u> -q ^w ːá:l'ə-mù:t	'embers'
sa:q ^w	<u>sə</u> -sá:q ^w ːə-mù:t	'peelings'

- The forced presence of the epenthetic vowel provides a buffer between the base syllable and the suffix syllable, such that stressing both will not create a clash.
 - This allows for Root faithfulness to emerge and select the base as the position for the heavy syllable.
 - Alternatively, we could see this as an emergent *LAPSE constraint.

- All candidates below obey the phonotactic via epenthesis
 - \approx *LAR]_σ \gg DEP-IO forces epenthesis following laryngeal C
 - Struijke (2002) can't use standard DEP because of the way she's re-defining faithfulness. So replace DEP with whatever you think penalizes epenthesis.
- Only considering candidates that satisfy WSP. Withholding total reduplication candidate for now.

(23) Coda consonants in the base with final laryngeal C

/RED-məndz-mu:t/	∃-MAX-IO	*CLASH	∃-MAX-IO _{RT}
a. <u>mən</u> -məndzə-mù:t		*!	
b. <u>mə</u> -məndzə-mù:t			
c. <u>məndzə</u> -mən-mù:t		*!	*
d. <u>məndzə</u> -mə-mù:t			*!*
e. <u>mən</u> -mədzə-mù:t			*!
f. <u>mən</u> -mə-mù:t	*!		**

- The candidates ruled out by ∃-MAX-IO_{RT} have a lapse where the winning candidate does not, so *LAPSE could alternatively explain this pattern.
- Now consider the winning candidate vs. one that reduplicates the whole root with epenthesis twice:
 - We can just use a size restrictor, ranked below ∃-MAX-IO_{RT} but above (∃-)MAX-BR, to derive the minimal size.
 - The constraint against epenthesis would also do the job. Once we move away from M&P's basic model, it becomes pretty clear that epenthesis into the reduplicant counts as normal epenthesis.


(24) Coda consonants in the base with final laryngeal C

/RED-məndz-mu:t/	∃-MAX-IO _{RT}	ALIGN-ROOT-L	∃-INTEG-IO	MAX-BR
a. <u>məndzə</u> -məndzə-mù:t		5!	4!	0+3
b. <u>mə</u> -məndzə-mù:t		2	2	3+3

3.3 Other cases

- Roots with short vowels and a final laryngeal C (CəC') reduplicate with Cə- + epenthesis after the root-final C, ending up with no heavy syllables:
 - $\sqrt{ts'əm}$ → [ts'ə-ts'əm'ə-mù:t] 'left after melting'
 - It's unclear whether there's a secondary stress on σ₂; it may be the case that lapses are tolerated before the main stress.
- This follows from the already established rankings:

(25) CəC' roots

/RED-ts'əm'-mu:t/	∃-MAX-IO _{RT}	ALIGN-ROOT-L	∃-INTEG-IO	MAX-BR
a.  ts'ə-ts'əm'ə-mú:t		2	2	2+3
b. ts'əm'ə-ts'ə-mú:t	*!	4	2	0+3
c. ts'əm'ə-ts'əm'ə-mú:t		4!	3!	0+3

- There's an inconsistency between Struijke (2002:65) and Saba Kirchner (2010:esp. 174) in the interpretation/transcription/analysis of CŸO roots.

- Both agree that these roots don't show overt copying.
- They disagree about the underlying form of the root and the length of the output vowel.

(26) Behavior of CŸO

Struijke (2002:65)		Saba Kirchner (2010)		Gloss
Root	<i>mut</i> form	Root	<i>mut</i> form	
a. ʔax	ʔax-m'ú:t	ʔəx	ʔa:x-m'ú:t	'waste left after some work'
b. q'əx	q'əx-m'ú:t	q'əx	q'a:x-m'ú:t	'piece bitten out'
c. ʔax ^w	ʔax ^w -m'ú:t	ʔəx ^w	ʔa:x ^w -m'ú:t	'waste scum'
d. ts'əx	ts'əx-m'ú:t	ts'əx	ts'a:x-m'ú:t	'hair singed off'
e. y'əx ^w	y'əx ^w -m'ú:t	y'əx ^w	y'a:x ^w -m'ú:t	'high water mark'

- Saba Kirchner's approach provides a much simpler and more consistent analysis:

- These forms are just lengthening of underlying /ə/ to [a:]

⇒ This lays the groundwork for his analysis of the system as mora affixation rather than morphological reduplication per se.

- Struijke's analysis is problematic for several reasons:

1. It leaves unexplained the difference between supposed /a/ roots and /ə/ roots, which would both come out as [a] in the *mut* form.

- I don't know on what basis she's making the decisions about underlying forms.
- From this small set of examples, maybe it's about the ʔ (which may not be underlying)

2. Her analysis of these forms is non-realization of RED driven by *CLASH and ∃-IDENT[weight]-IO.

- However, this requires that a candidate form like //ʔa-ʔax-m'ú:t// be stressed as *[ʔa-ʔax-m'ú:t], with secondary stress on the base, due to the requirement for iambic footing.
- In the foot-free stress approach, this would either have no stress on the first two syllables, or secondary stress on the initial syllable (not the second).
- Therefore, I couldn't derive non-realization by *CLASH.

- But there's all sorts of mysterious stuff about the vowel system, and it seems like there's serious problems with transcription in the main sources, so this is hard to adjudicate.

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