

# Class 11

## Reduplication-Phonology interactions in STS, and another look at the data

12/7/17

### 1 Reduplication-phonology interactions

- One domain in which BRCT and STS do make substantially different predictions is in regards to reduplication-phonology interactions.
- These differences stem largely (though not entirely?) from the fact the McCarthy, Kimper, & Mullin (2012) [MKM] deny the existence of BR correspondence.
  - This seems to be a programmatic decision as much as an empirical one.
    - HS basically does away with correspondence entirely, replacing it with the idea of operations.
    - It certainly gets rid of all non-IO correspondence.
- But it seems to me theoretically possible to have HS with surface correspondence, including BR, so this continues to be an empirical question.
- BRCT (McCarthy & Prince 1995, 1999), specifically the BR correspondence aspect of it, is motivated largely reduplication-phonology interactions that cannot be captured in ordering theories:
  - Back-copying overapplication
  - Overapplication of a process at the base-reduplicant juncture
  - Look-ahead effects(?)
- Also TETU effects, but we've seen that this there are other ways to capture these.
- Without BR correspondence, STS (or indeed virtually any other alternative framework) cannot generate these patterns.
- ⇒ Therefore, whether or not these patterns (or other types of interactions that require BR correspondence) truly exist should determine whether or not BR correspondence is part of the grammar (whatever else it looks like).

### 2 Predictions of STS

- MKM (Ch. 6) identify four types of interactions (plus the reduction facts discussed last time) which have been claimed in the literature:
  1. Ordinary overapplication
  2. Back-copying overapplication
  3. Underapplication
  4. Look-ahead
- They claim that STS can generate certain types of ordinary (i.e. non-back-copying) overapplication, but not the other three.

- They work hard to say that actually none of the other types actually exist, ergo STS is right.
  - A lot of their claims seem fairly reasonable.

## 2.1 Ordinary overapplication

### 2.1.1 STS can derive the basic type

- STS can derive (certain types of) non-back-copying overapplication in an equivalent way to rule ordering approaches.
  - A phonological process applies to the base before copying occurs, so the result of the process is copied into the reduplicant.
  - In STS, this is achieved by having the markedness constraint driving the process ranked above the HEADEDNESS constraint driving copying.
- The two examples MKM focus on are Chumash coalescence and Javanese *h*-deletion.
  - They only give the full analysis for Chumash, but Javanese is more straightforward (mostly).
- In Javanese, *h* deletes intervocalically.
- *h*'s which delete before a vowel-initial suffix have no BR-correspondent (unclear which copy is base and which copy is red).

(1) Javanese *h* deletion (McCarthy & Prince 1995:2)

	Stem	i. <u>_+C</u>	ii. <u>_+V</u>	iii. “Expected” Red	Gloss
a.	anɛh	anɛh-ku	anɛ.-e	—	‘strange’
b.	bəɖah	bəɖah-bəɖah	bəɖa-bəɖa.-e	*bəɖa[h]-bəɖa.-e	‘broken’
c.	ɖajɔh	ɖajɔh-ɖajɔh	ɖajɔ-ɖajɔ.-e	*ɖajɔ[h]-ɖajɔ.-e	‘guest’

- Assuming red is the lefthand copy (and not worrying about what constituent is actually being copied; probably *root* or *stem*), we generate the pattern by forcing deletion to occur before copying:

(2) Step 1: *h*-deletion

	/RED-bəɖah-e/	*VhV	MAX[h]	*HEADEDNESS(X)	*COPY(X-1)
a.	RED-bəɖah-e	*!		*	
b.	RED-bəɖa-e		*	*	
c.	bəɖah-bəɖah-e	*!			*

(3) Step 2: copying *h*-less constituent [then convergence]

	//RED-bəɖa-e//	*VhV	MAX[h]	*HEADEDNESS(X)	*COPY(X-1)
a.	RED-bəɖa-e			*!	
b.	bəɖa-bəɖah-e				*
✗	bəɖah-bəɖa-e				*

- ★ This still works even if the righthand copy is the reduplicant, as long as we assume that there is segmental adjacency across empty prosodic structure, which is what we need to say for Chumash.

- Chumash shows coalescence of a root-initial laryngeal and a prefix stop, with the result appearing in both base and reduplicant.

(4) C + laryngeal coalescence in Chumash (MKM:202): /k+RED+ROOT/

?aniš → kʔan-kʔaniš \*kʔan-ʔaniš ‘my paternal uncles’  
 hawaʔ → k<sup>h</sup>aw-k<sup>h</sup>awaʔ \*k<sup>h</sup>aw-hawaʔ ‘my maternal aunts’

## • Their analysis:

- The reduplicative morpheme is underlying an empty syllable.
- The (underlying?) morpheme order is prefixal *k* + reduplicative syllable + root.
  - If there is no material in the empty syllable, the *k* and the root count as being adjacent (5b).
- This violates the highest ranked (markedness) constraint (\*C+LAR) and has to be resolved first.
  - \*C+LAR violations are normally resolved through coalescence (violating UNIFORMITY).
  - (Properly anchored/local) copying would introduce a new locus of \*C+LAR violation (prefix+red juncture; (5c)), so copying cannot alleviate the violation.
- Therefore, coalescence happens first (i.e. before copying), even though it leaves a HEADEDNESS( $\sigma$ ) violation.
  - The HEADEDNESS( $\sigma$ ) violation can be resolved on the next step, but the string available for copying includes the coalesced segment, so that is what is copied.

## (5) Chumash overapplication: Step 1 (coalescence)

/k- $\sigma$ -hawaʔ/	*C+LAR	HEAD( $\sigma$ )	UNIFORMITY	*COPY(seg)
a. $\sigma$ + $\sigma$ $\sigma$ $\triangle$ $\triangle$ k <sup>h</sup> a waʔ		*	*	
b. $\sigma$ + $\sigma$ $\sigma$ $\triangle$ $\triangle$ k + ha waʔ	*!	*		
c. $\sigma$ + $\sigma$ $\sigma$ $\triangle$ $\triangle$ $\triangle$ k + haw + ha waʔ	*!			*

## • Weird/problematic things about this analysis:

- It requires that the *k* and the root are adjacent even though there is syllabic structure in between.
  - In (b) and (c), MKM don't show any syllabic affiliation for the *k*.
- No mention of how morpheme order is established, and what ramifications coalescing across the red syllable has.

- The existence of overapplication cases like these is not in dispute.
- Since STS can capture them, this is fine for STS.

### 2.1.2 Potential types of overapplication that would be problematic for STS

- There are two types of non-back-copying overapplication that STS cannot deal with.

- (6) a. Overapplication of a process conditioned by the base-reduplicant juncture  
 b. Overapplication of a purely allophonic process

- The problem with (6a) is easy to conceptualize:

- In STS, overapplication happens because a process applies to the base before copying
- If the process is conditioned at the base-reduplicant juncture, copying necessarily has already taken place
- There is no way for the effects of that process to be transferred to the copy, because the copy is now a separate part of the input.

→ This property of the system is due to the rejection of BR correspondence as much as it is due to the architecture of the STS framework.

- There are claimed cases of this sort, e.g. Malay nasal harmony; so MKM argue that all of them are spurious.
  - Among the ones they talk about, nothing they say seems unreasonable to me.

- The problem with (6b) takes a little more leg work to demonstrate.

- MKM construct a hypothetical example:

- Nasalization of vowels is in complementary distribution:

- (7) Distribution of nasalization


- a. Nasal before nasal stops /pani/ → [pāni], \*[pani] /pāni/ → [pāni], \*[pani]  
 b. Oral elsewhere /kati/ → [kati], \*[kāti] /kāti/ → [kati], \*[kāti]

- In either HS or POT, this can be derived using the allophonic ranking schema  $\mathbb{M}_{spec} \gg \mathbb{M}_{gen} \gg \mathbb{F}$ :


- (8) Ranking: \*VN  $\gg$  \* $\tilde{V}$   $\gg$  IDENT[nas]

- (9) Allophonic nasalization

- i. Before a nasal

/pani/	*VN	* $\tilde{V}$	IDENT[nas]-IO
a. pani	*!		
b.  pāni		*	*

- ii. Before an oral C

/kāti/	*VN	* $\tilde{V}$	IDENT[nas]-IO
a.  kati			*
b. kāti		*!	

- Assume this language has a prefixal CV reduplication process.
- In BRCT, if  $\text{IDENT}[\text{nas}]\text{-BR} \gg * \tilde{V}$ , then you can get nasalization outside of the  $\_N$  environment, contrary to the normal distribution.
  - Note that this holds regardless of our assumptions about correspondence between reduplicant the input, and the definition of the IO faithfulness constraints.
  - The only crucial ingredient is BR faithfulness.

## (10) Overapplication of allophonic nasalization in BRCT

/RED, pani/	IDENT[nas]-BR	*VN	* $\tilde{V}$	IDENT[nas]-IO
a. pa-pani		*!		
b. pa-pāni	*!		*	*
c. $\text{pa}^{\text{nas}}$ -pāni			**	*(*)
d. pā-pani	*!	*!	*	(*)

- In STS, where there's no BR faithfulness, only process ordering, it's not going to work this way.
  - If  $\text{HEADEDNESS}(\sigma) \gg * \text{VN}$ , copying will take place *before* allophonic nasalization, and so nasalization will have no chance to get into the reduplicant.
  - But, if  $* \text{VN} \gg \text{HEADEDNESS}(\sigma)$ , nasalization will take place first, and this will get copied into the reduplicant:

## (11) STS Step 1: nasalization

/ $\sigma$ , pani/	*VN	HEADEDNESS( $\sigma$ )	* $\tilde{V}$	IDENT[nas]
a. $\sigma$ -pani	*!	*		
b. $\text{pa}^{\text{nas}}$ -pāni		*	*	*
c. pa-pani	*!			
$\times$ pā-pāni			**	*

## (12) STS Step 2: copying (nasalization gets copied)

// $\sigma$ -pāni//	*VN	HEADEDNESS( $\sigma$ )	* $\tilde{V}$	IDENT[nas]
a. $\sigma$ -pāni		*!	*	
b. $\sigma$ -pani	*!	*		*
c. $\text{pa}^{\text{nas}}$ -pāni			**	
$\times$ pa-pāni			*	

→ The allophonic pattern re-asserts itself after copying

## (13) STS Step 3: denasalization of reduplicant

//pā-pāni//	*VN	HEADEDNESS( $\sigma$ )	* $\tilde{V}$	IDENT[nas]
a. pā-pāni			**!	
b. $\text{pa}^{\text{nas}}$ -pāni			*	*
c. pā-pani	*!		*	*

- This problem does not arise if it is a *neutralizing* distribution.

## (14) Neutralizing distribution of nasalization

	Underlyingly oral	Underlyingly nasal
Nasal before nasal stops	/pani/ → [pāni], *[pani]	/pāni/ → [pāni], *[pani]
Contrast elsewhere	/kati/ → [kati], *[kāti]	/kāti/ → *[kati], [kāti]

- In either HS or POT, this can be derived using the neutralization ranking schema  $M_{spec} \gg F \gg M_{gen}$ :

(15) Ranking: \*VN  $\gg$  IDENT[nas]  $\gg$  \* $\tilde{V}$ 

- For BRCT, the difference in ranking between the lower two constraints has no effect on overapplication (cf. (10)).
- But for STS, this difference is crucial:

(16) Neutralizing ranking STS Step 3: **convergence** (cf. (13))

//pā-pāni//	*VN	HEADEDNESS( $\sigma$ )	IDENT[nas]	* $\tilde{V}$
a.  pā-pāni				**
b. pa-pāni			*!	*
c. pā-pani	*!		*	*

- Because the contrast is normally permitted, there is no  $M \gg F$  ranking to force a change after copying.
- So, STS allows transfer of process application to the reduplicant only when the result is a phonotactically licit structure.
- This is not the case for BRCT, where BR faithfulness constraints can introduce otherwise illegal structures.
- There lots of claimed cases of this type (MKM:208).  
⇒ MKM have to deny all of them; I'm not convinced. More on this below.

## 2.2 Back-copying overapplication

- Back-copying overapplication refers to cases where a phonological property of the reduplicant is transferred back to the base.
- A standard hypothetical example is nasal place-assimilation:
  - Prefixal CVC reduplication pattern
  - Nasals must agree in place with following stops (AGREE[place]  $\gg$  IDENT[place]-IO), so a reduplicant-final nasal will assimilate to a root-initial heterorganic stop.
  - If IDENT[place]-BR  $\gg$  IDENT[place]-IO, the assimilated place will be copied back into the root.


## (17) Back-copying assimilated place (hypothetical) in BRCT (MKM:209)

/RED <sub>cvc</sub> -panit/	AGREE[place]	IDENT[place]-BR	IDENT[place]-IO
a. pan-panit	*!		
b. pam-panit		*!	(*)
c.  pam-pamit			*(*)

★ Additional weird predictions arise for cases where the root nasal is pre-consonantal:


- In the basic case, you predict that back-copying of place would affect not only the root nasal but also the stop that follows it:

(18) Back-copying plus assimilation in  $\sqrt{\text{CVNTX}}$

/RED <sub>cvc</sub> -panti/	AGREE[place]	IDENT[place]-BR	IDENT[place]-IO
a. pan-panti	*!		
b. pam-panti		*!	(*)
c. pam-pamti	*!		*(*)
d.  pam-pampi			**(*)

- If the language allows for nasal place to change but not stop place (i.e. IDENT[place]/[-nasal]-IO  $\gg$  IDENT[place]/[+nasal]-IO), back-copying could be blocked just in case the nasal was pre-stop:

(19) Back-copying blocked in  $\sqrt{\text{CVNTX}}$

/RED <sub>cvc</sub> -panti/	ID[place]/[-nas]-IO	AGR[place]	ID[place]-BR	ID[place]/[+nas]-IO
a. pan-panti		*!		
b.  pam-panti			*	(*)
c. pam-pamti		*!		*(*)
d. pam-pampi	*!			*(*)

- Back-copying can't arise in STS, because it lacks BR correspondence.
  - Again, it's really the lacking BR correspondence part, not the STS part.
  - Once copying takes place, there is no link between the “reduplicant” and the base.
  - Any process (whose context is not met in the base) which applies to the reduplicant subsequent to copying [by definition, process can only apply to the reduplicant after copying] will thus have no way of affecting the base.
- MKM argue (without much detail) that all the putative cases of back-copying are spurious.
  - It's not obvious that their wrong...

### 2.3 Underapplication

- In BRCT, underapplication = blocked overapplication:

(20) Underapplication ranking schema:

BR-FAITHFULNESS + BLOCKER  $\gg$  MARKEDNESS  $\gg$  IO-FAITHFULNESS

- Once you eliminate BR correspondence, underapplication is predicted to be impossible.

- The distribution of *g* vs. *ŋ* in Japanese mimetic reduplication looks like it might be underapplication.

(21) Normal distribution of Japanese *g/ŋ* (McCarthy & Prince 1995:105)

<i>g</i> initially		<i>ŋ</i> medially	
geta	‘clogs’	kaŋi	‘key’
giri	‘duty’	oyoŋu	‘to swim’
garasu	‘glass’	oruŋaN	‘organ’
		tomodachi-ŋa	‘friend-NOM’
		isshuukaN-ŋurai	‘one week-approximately’
gai-koku	‘foreign country’	koku-ŋai	‘abroad’
gaku-sei	‘student’	suu-ŋaku	‘mathematics’

(22) Mimetic reduplication (apparently) shows medial [g] (McCarthy & Prince 1995:106)

gara-gara	(*gara-ŋara)	‘rattle’
geji-geji	(*geji-ŋeji)	‘centipede’
gera-gera	(*gera-ŋera)	‘laughing’

- M&P (1995) analyze this as a BR-faithfulness effect ( $\approx$  underapplication of //g// $\rightarrow$ [ŋ]).
- Normal distribution determined by the ranking in (23) (fully allophonic, so IO faith irrelevant).

(23) Allophonic distribution: \*#ŋ  $\gg$  \*g  $\gg$  IDENT[nas]-IO

- Mimetic reduplication subject to undominated IDENT[nas]-BR:

(24) Underapplication in Japanese mimetic reduplication in BRCT

/RED, gara/	IDENT[nas]-BR	*#ŋ	*g
a. 𪛗 gara-gara			**
b. gara-ŋara	*!		*
c. ŋara-gara	*!	*!	*
d. ŋara-ŋara		*!	

- Without BR faithfulness, STS can’t generate this; it reduces to the same derivation as the allophonic overapplication case.
  - Even if the wrong allophone pops up at some point in the derivation, it will eventually get replaced by the correct one.
- MKM argue that each of the claimed cases of underapplication is actually some completely different effect.
- The Japanese case is (rightly) re-analyzed as a two-prosodic-words effect (MKM:211).
  - Mimetic reduplication shows a separate main stress on each member: *gara-gara* is [gará-gará].
  - If the *g~ŋ* alternation is about initial vs. medial, so if the two members are in different domains ((P)words), we expect *g* not *ŋ* in the second member as well: {gará}<sub>PWd</sub>-{gará}<sub>PWd</sub>



- There aren't that many claimed cases. The only one that seems like there might be something to it is Akan palatalization, but the whole thing is pretty complicated to begin with.

## 2.4 Look-ahead

- One additional type of interaction that only becomes an issue when thinking about serial derivation is “look-ahead effects”.
  - Look-ahead in reduplication would be a case where “copying seems to look ahead to the results of a subsequent phonological process” when determining what/how much to copy (MKM:213).
- This is not an obvious thing to be worried about when thinking just about parallel OT, because it is intrinsic to the model that what/how much you copy is dynamically determined based on the total result.
- MKM obviously claim they don't exist.
- Their hypothetical example is place-assimilation dependent copying:
  - The language has the following properties:
    - It only allows homorganic nasals as codas (and has evidence of nasal place assimilation alternations; maybe this isn't necessary).
    - It has a monosyllabic prefixal reduplicant.
- The shape of the reduplicant depends on whether there's a post-vocalic nasal:
  - You only get a coda if the base has a nasal (even if its an onset nasal), even if it has to change its place when it's in the reduplicant.



(25) Assimilation-dependent copying (MKM:213)

pa.ta → pa-pa.ta  
 pa.na → pam-pa.na


- In BRCT, it's no problem to do “copying” and assimilation at once.

(26) Assimilation dependent copying in BRCT

i. CVTV roots

RED <sub>σ</sub> -pata	IDENT[nasal]-BR	CODACOND	MAX-BR	IDENT[place]-BR
a.  pa-pata			**	
b. pat-pata		*!	*	
c. pan-pata	*!	*!	*	
d.  pam-pata	*!		*	*

ii. CVNV roots

RED <sub>σ</sub> -pana	IDENT[nasal]-BR	CODACOND	MAX-BR	IDENT[place]-BR
a. pa-pana			**!	
b. pat-pana	*!	*!	*	
c. pan-pana		*!	*	
d.  pam-pana			*	*

- But these constitute two different operations in STS, and thus can't happen on a single step; i.e., candidate (d) is not available on Step 1.
- If the problem with \*[pat-pa.ta] is CODACONDITION (i.e. place specification in coda), then copying the nasal (//pan-pa.na//) should be equally as bad, and thus the nasal shouldn't get copied either.
  - The nasal only gets copied because it can later change to a consonant that is licensed in coda position.
  - It's "looking ahead" when determining what to copy.
- Since it seems like you can't do this in STS, MKM say it doesn't exist.
  - There weren't any super convincing cases when MKM wrote the paper.
  - But Wei & Walker (2017) have recently shown that Mbe (cf. Walker 2000) does exactly this.

(27) Look-ahead in Mbe (Wei & Walker 2017)

i. No post-vocalic nasal → CV reduplicant			
a.	rû	rû-rû	'pull'
b.	jú.bò	jû-jú.bò	'go out'
c.	só.rò	sô-só.rò	'descend'
d.	tá.rò	tê-tá.rò	'throw'
ii. Post-vocalic nasal → CVN reduplicant			
e.	tâŋ	tân-tâŋ	'teach'
f.	g̃bé.nò	g̃bêŋm̃-g̃bé.nò	'collide'
g.	pûò.nì	pûm-pûò.nì	'mix'
h.	ɖûòŋ	ɖûn-ɖûòŋ	'be higher'
i.	lúo.ní	lûn-lúo.nì	'repair'
j.	jíó.ní	jîŋ-jíó.nì	'forget'

- If STS can't derive this, then they're in trouble.
- Wei & Walker (2017) explore a Copy + Deletion approach, and conclude that it doesn't really work.
  - At best, it requires an output with an empty syllable, and a weird contradiction about how to evaluate FOOT-BIN vs. AFFIX<sub>≤σ</sub>.
- But I think there may be a different way to save it, if we use a constraint other than (or in addition to) CODACONDITION:

## (28) \*[-syll,-nas]/\_σ: No non-nasal coda consonants

- It seems like we may need this in the first place to explain why non-nasals can't be saved in the coda via place assimilation.
  - I don't think this can be reduced to a no-geminate constraint, because liquids aren't allowed before stops either.
- If this outranks FOOT-BIN, and FOOT-BIN outranks CODACOND, then I think you could derive the difference between nasals and non-nasals.

- But this might not be compatible with the facts about diphthongs:
  - Root diphthongs correspond to singletons in the reduplicant: e.g. **lúo.nî** → **lûn-lúo.nî**
  - This inherently requires copy + deletion (à la onset reduction in Sanskrit)
  - ★ But if you normally copy the extra consonant to satisfy FOOT-BIN, this should be unnecessary when you already have a diphthong.
    - Since you can satisfy FOOT-BIN without the consonant, the consonant's CODACOND violation, even if low ranked, would be enough to prevent its copying.
- ⇒ This then is a look-ahead effect of its own.
- I see no way to solve this, so this remains a serious problem for STS.
- Note that this is a consequence of the serial architecture of STS, not the absence of BR correspondence.
  - Therefore, is a real argument against STS *per se*.

### 3 Looking more carefully at some of the data

#### 3.1 General thoughts

- MKM say everything works out just the way they need it to.
- I'm relatively on board with their claims that:
  - The underapplication cases are not underapplication,
  - Cases of overapplication of a process at the base-reduplicant juncture probably don't hold up,
  - Cases of back-copying are seriously dubious
- The things that I'm not on board with:
  - Their claim that there's no allophonic overapplication
  - Their claim that there's no look ahead effects (see Mbe above)
  - Their claim that they don't predict medial coda skipping (see last time).
- If this is the right breakdown, then this actually points towards something legitimate:
  - Their untenable claims are all consequences of the architecture of STS (and/or HS generally)
  - Their tenable claims are all consequences of jettisoning BR correspondence
- ⇒ If this is the right way to be looking at the data, this is suggestive evidence for getting rid of BR correspondence.
  - ★ Note though that this would just be an argument via overgeneration.
  - If any other types of effects (or indeed any new real instances of these kinds of effects) could be found that requires BR faithfulness to analyze, then BR correspondence needs to be back on the table.
- To my mind, if there's evidence for surface correspondence in other domains, it would be super weird if it doesn't hold in reduplication.
- I'm also not fully convinced that arguments based solely on overgeneration are *a priori* valid.
- My conclusion then is: the evidence for BR correspondence may be shakier than we might have thought, and we should seriously consider getting rid of it...but this isn't a necessity yet.

## 3.2 Some of the data

### 3.2.1 Javanese $a \sim \text{ɔ}$ (supposed allophonic overapplication)

- Dudas (1976) argues that  $a$  is in complementary distribution with  $\text{ɔ}$  in Javanese:

- (29)
- $\text{ɔ} / \_ \#$
  - $\text{ɔ} / \_ C\text{ɔ}$
  - $a$  elsewhere

- There is evidence from alternations under suffixation:

(30) Distribution of  $a$  vs.  $\text{ɔ}$  in Javanese

stem	gloss	derived
ɖjaksɔ	public prosecutor	ɖjaks-a-ne
ɖjəkɔ	young man	ɖjaka-ne
ɖjarwɔ	meaning	ɖjarwa-ne
ɖjɔɔ	drill	ɖjara-ne
karjɔ	work	karja-ne
kɔɔ	climbing vine	kara-ne
warnɔ	sort, variety	warna-ne
wɔɔ	say, speak	mara-ʔake

- This doesn't hold in reduplication:
  - Whichever quality is proper to the righthand copy is found also in the lefthand copy.

(31) Misapplication in reduplication (Dudas 1976:206)

stem	gloss	doubled	doubled affixed
ɖɔŋɔ	'prayer'	ɖɔŋɔ-ɖɔŋɔ	ɖɔŋa-ɖɔŋa-ne
ɖɔwɔ	'long'	ɖɔwɔ-ɖɔwɔ	ɖawa-ɖawa-ne
mɛɖjɔ	'table'	mɛɖjɔ-mɛɖjɔ	mɛɖja-mɛɖja-ne

★ **Caveat 1:**

- (29b) is a sort of vowel harmony rule.
- If this doesn't actually require syllable adjacency, then we expect  $[\text{ɔ}]$  in the first copy.
  - This would (unproblematically) require adding an additional condition to the distribution:

- (32)  $a / \_ C]_{\sigma}$

- To test this, we'd need a 3-syllable stem of the shape  $C\{a/\text{ɔ}\}CVC\{a/\text{ɔ}\}$ .
  - This predicts that the two should co-vary: both  $[\text{ɔ}]$  in the bare form, both  $[a]$  in the suffixed form.
- I haven't found any stems of this shape (they're normally disyllabic).

★ **Caveat 2:**

- [o] also alternates with [ɔ] according to more general tense/lax alternations
- It seems like there's enough alternating environments for both pairs to usually tell which it is, but this requires more careful examination of Dudas than I've done yet.
- Assuming that the harmony rule is not long distance, and thus cannot explain the misapplication in reduplication (“overapplication of /a/ → [ɔ]”), this would seem to constitute allophonic overapplication.
- MKM (208) say that it's not allophonic because there are “final *a*'s in loanwords and two native words (Poedjosoedarmo 1969:167)”, meaning that [a] and [ɔ] are actually contrastive.
- Here's what Poedjosoedarmo (1969) actually says:

“Word-final [orthographic] *a* is pronounced /ô/ [= ɔ] except in *ora* ‘no’, *mboja* ‘no’, and in some non-Javanese place names. In these cases, it is pronounced /a/.”

- Using the words for ‘no’ as evidence of regular phonology is wrong (I think Jason Riggle is going to tell us this on Friday).
  - Using place names as evidence for the regular phonology is super dubious.
- ⇒ Dudas's generalization is correct.

- Pending the long-distance harmony story, and maybe other complications with the /o/ alternations, I think this is decent evidence of allophonic overapplication, requiring BR correspondence.
- Javanese seems to also have allophonic overapplication of tense/lax alternations (at least for high vowels) in exactly the same direction.
  - These alternations appear to be overridden in the ELATIVE, which looks like its specifically marked by changing the final vowel to a tense vowel (Dudas 1976:Ch. 5, Archangeli 1995).
  - MKM claim that this means that tenseness is generally contrastive for high vowels.
  - I find this dubious — this seems like special faithfulness to a floating property of a morpheme, or maybe even a REALIZE MORPHEME type of effect for a null morpheme.
    - I haven't looked at this carefully enough yet to say anything definitive.
  - I take this case to still be an open question vis-à-vis allophonic overapplication.

**3.2.2 Luiseño č~š (supposed allophonic overapplication)**

- Munro & Benson (1973) claim that č and š are in complementary distribution in Luiseño:

- (33)
- a. č → š / \_#
  - b. č → š / \_[-cont] (where *l*, *r*, and nasals have to be [-cont])
  - c. č → č elsewhere (i.e. \_[+cont])

(34) Alternation examples (Munro & Benson 1973:17)

té:ŋališ	medicine	té:ŋaličum	medicines
qé:ŋiš	squirrel	qé:ŋičum	squirrels
-----			
kí:ča	house (abs.)	kíš	house (acc)
waní:ča	river (abs.)	waníš	river (acc.)
-----			
ʔé:či	above	ʔé:škawis	upper lip
móči-	to weave	móšlat	belt
né:ču-	to become an old woman	néšmal	old woman

- The rule fails to apply in at least one of the language's reduplicated formations:

(35) Misapplication in reduplicated adjectives

čára-	'to tear'	čará-čra-š	(*čará-šra-š)	'torn'
čóka-	'to limp'	čoká-čka-š	(*čoká-ška-š)	'limping'
[čáku-]	not attested	čakú-čku-š	(*čakú-šku-š)	'crest on roadrunner'
[číŋi-]	not attested	číŋí-čŋi-š	(*číŋí-šŋi-š)	aboriginal Luiseño god

- Exactly what sort of interaction this is depends on what we identify as the reduplicant, and how we formalize the allophony.
- But Marantz (1982:461f.) finds some data that seems to show that č → š is a neutralizing process not pure allophony.

(36) Contrast in the rule application environment (Marantz 1982:462)

č		š				
po-xečla	'its point, of an arrow'	vs.	pušla	'eye' (nom.)	~ pučil	'eye' (obj.)
			moš-la-t	'belt'	~ moči	'to weave'
-----						
čačmis	'a stone tool'	vs.	pa:ŋawišmi	'them of the water'	~ pa:ŋawiči	'him of the water'
			neš-ma-l	'old woman'	~ ne:ču-	'to become an o.w.'

- There also appear to be some consonant-initial suffixes that fail to condition the rule even though they are of the right phonological type (Marantz 1982:464).
- Marantz analyzes this as a (morphologically) derived environment effect: the rule only applies at (specified) morpheme boundaries (rather, some morpheme boundaries block).
- In the reduplicated forms, the environment for the rule is created by syncope, not by morpheme concatenation, and therefore does not apply.
- This type of analysis requires a theory of derived environment effects that substantially differentiates phonologically derived environments from morphologically derived environments.

- One would need to actually do the work to show that this pattern could be gotten in STS (or BRCT for that matter) without appeal to BR faithfulness, but it looks like it could be possible given the right theory of derived environment effects.

### 3.2.3 Akan palatalization (supposed underapplication)

- McCarthy & Prince (1995) claim that the lack of palatalization in some reduplicated words of Akan is the result of underapplication.

(37) Akan palatalization (Schachter & Fromkin 1968:162)

(Dialect(s))	Root	Reduplicated	Gloss
	<i>gya</i> [d̥jəʔ]	<i>gyigya</i> [d̥ji-d̥jəʔ]	‘accompany’
	<i>hye</i> [çɪʔ]	<i>hyehye</i> [çɪ-çɪʔ]	‘burn’
	<i>kye</i> [tɕɛ(ʔ)]	<i>kyekye</i> [t̥ɕɪ-t̥ɕɛ(ʔ)]	‘divide’
	<i>twa</i> [t̥ɕwəʔ]	<i>twitwa</i> [t̥ɕwi-t̥ɕwəʔ]	‘cut’
	<i>ka</i> [kaʔ]	<i>keka</i> [kɪ-kaʔ]	(*[t̥ɕɪ-kaʔ]) ‘bite’
(Ak-Fa <sup>1</sup> )	<i>haw</i> [hawʔ]	<i>hehaw</i> [hɪ-hawʔ]	(*[çɪ-hawʔ]) ‘trouble’
(As-Fa <sup>2</sup> )	<i>ha</i> [haʔ]	<i>heha</i> [hɪ-haʔ]	(*[çɪ-haʔ]) “

- Palatalization rule described in Schachter & Fromkin (1968:§3.6 (89f.)):

“In all dialects, the [+Back] non-vowels [k, g, w, h, ŋw (or [w̃])] are palatalized, in syllable-initial position, when they occur immediately before the [+Palatal] vowels /I/ and /E/, and are realized phonetically as [t̥ɕ, d̥j, ɸ, ç, ɲɸ (or ɸ̃)], respectively. Thus /kɛ/ → [t̥ɕɛ], (*kye* ‘divide’, /gɛ/ → [d̥jɛ] (*gye* ‘receive’), /wɪ/ → [ɸɪ] (*we* ‘nibble’), /hɪ/ → [çɪ] (*hye* ‘border’), and /wĩd/ (after becoming [ŋwĩn] through the application of other P-rules) → [ɲɸĩn] (*nwen(e)* ‘weave’). (The labialized [+Back] non-vowels [kw, gw, hw], which may, as a result of the [U]-deletion rule, P xvi (Section 3.50), occur immediately before [+Palatal] vowels, are also palatalized in all dialects, being realized as [t̥ɕɸ, d̥jɸ, çɸ] respectively — cf. Section 3.61 for details.) There is one major exception to this generalization: palatalization does not occur if the following syllable (within the same morpheme) begins with /t/ or /s/. Thus /kɛtɛ/ ‘mat’ is realized phonetically as [kɛtɛ], not [t̥ɕɛtɛ], while /kɛsɪ/ ‘big’ is realized phonetically as [kɛsɪ], not [t̥ɕɛsɪ].”

- MKM (211–212) argue that palatalization is not an active process of (contemporary) Akan.
  - Loanwords freely have dorsal + front vowel sequences.
- “Palatalization” rather seems to be a static property of roots.
  - This must be the result of a previously productive palatalization process which has run its course.
  - Some of the palatalization in roots might actually be opaque (it’s hard to tell from Schachter & Fromkin 1968 what forms are actual surface forms and which are derivationally intermediate forms).
- So MKM’s claim is reasonable for contemporary Akan.
  - I wonder what Akan reduplication looked like when the palatalization process was active...

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