Class 3
Introduction to Reduplication; Reduplicant Shape

2/13/18

1 Introduction

Reduplication: a class of processes where the phonological exponent of a morphological category is formed by "copying" material from a different portion of the phonological output.

⇒ The phonological material indicating the category co-varies with the phonological material of the particular base it attaches to, rather than being fixed across bases.

- For example, Diyari makes diminutives by prefixing a copy of (roughly) the first two syllables of the base:

(1) Diyari diminutive reduplication (Austin 1981:64)

a.	2σ	*pirta*	'tree'	→	*<u>pirta</u>-pirta*	'small tree'
b.	3σ	*kinthala*	'dog'	→	*<u>kintha</u>-kinthala*	'little dog, puppy'
c.	4σ	*wilhapina*	'old woman'	→	*<u>wilha</u>-wilhapina*	'little old woman'

- **Terminology:**
  - ○ *Reduplicant*: The "copy", i.e. the portion of the output word which consistently depends on the phonological properties of the rest of the word. (Usually indicated by underlining.)
  - ○ *Base*: The portion of the output word which the reduplicant copies (basically, everything which isn't the reduplicant).

- It's not always possible to be sure which string is the reduplicant and which is the base.
  - ○ In cases of total reduplication especially, the distinction often doesn't matter.
- It is often a matter of analysis which part is identified as the reduplicant.
  - ○ The distinction is more significant in some theories (e.g. Base-Reduplicant Correspondence Theory; McCarthy & Prince 1995, 1999) than others (e.g. Morphological Doubling Theory; Inkelas & Zoll 2005).

- **Big questions:**
  1. There is systematic variation (cross-linguistically and intra-linguistically) in the shapes of reduplicants. *What considerations go into determining reduplicant shape?* **[today's class]**
  2. Phonological processes/distributions frequently do not apply transparently in reduplicated words. *What theoretical machinery is required to accurately and restrictively describe the set of attested non-transparent reduplication-phonology interactions?* **[next two classes]**

2 Basic dimensions of variation in reduplicant shape

- Among reduplication patterns, we find a great amount of variation in what material is copied.

⋆ **Total reduplication vs. partial reduplication**

1. *Total reduplication*: an entire word (or morphological constituent) is copied; e.g. **Indonesian** (2).
    - The two parts often act like independent words, or like the two members of a compound.
    - The two parts usually look completely identical to corresponding unreduplicated word in isolation (≈ the "reduplicant" is a fully faithful duplicate of the base).

    ○ Therefore, total reduplication patterns often don't show much interesting phonology. But,
    - Javanese total reduplication (Dudas 1976) is important for understanding "over-application" and "under-application" and how phonology interacts with reduplication generally. (More on this in the next two classes.)
    - Indonesian shows interesting interactions between stress/accent and reduplication:

(2) Plural reduplication in Indonesian (McCarthy & Cohn 1998:32, 52; cf. Cohn 1989:185)

	indefinite		*definite*	
a.	búku-búku	'books'	bùku-bukú-ña	'the books'
b.	wanìta-wanìta	'women'	wanìta-wanitá-an	'womanly' (adj.)
c.	màsarákat-màsarákat	'societies'	màsaràkat-màsarakát-ña	'the societies'
d.	minúm(-)an-minúm-an	'drinks'	minùm(-)an-mìnum-án-ña	'the drinks'

- ◇ In the indefinite, where the reduplicated word is unsuffixed (or the two members contain the same suffixes), both members bear primary stress.
- ◇ In the definite, where the reduplicated word is suffixed, the first member now gets a secondary stress instead.

- Some people have interpreted this to be an effect of *identity* between base and reduplicant (Kenstowicz 1995, McCarthy & Cohn 1998, Stanton & Zukoff 2016); others have attributed it to more general properties of the morphological system of the language (Inkelas & Zoll 2005:§4.3).

⇒ The question of what aspects of reduplication belong to morphology and which belong to phonology is one of the major issues we'll be concerned with.

2. *Partial reduplication*: the reduplicant "copies" a phonological substring from the base; morphological constituency is (usually) ignored.
    - The copied substring may coincide with a constituent in some forms, but this is accidental.
        - ◇ For example, Diyari partial reduplication copies two syllables.
        - ◇ When the root is two syllables (1a), it looks like the whole root is being copied.
        - ◇ But when the root is longer (1b,c), we see that the process is not actually targeting the root.
    - Partial reduplication frequently displays phonological restrictions which do not hold of other parts of the language's phonology.
        - ◇ This (virtually) always goes in the direction of having *less marked* structures in the reduplicant than elsewhere — *the emergence of the unmarked* (TETU; McCarthy & Prince 1994a).
        - ◇ I'll argue that the disyllabic shape of the reduplicant in languages like Diyari is an instance of TETU, in that such a shape is optimal for the language's stress pattern.

⋆ **Number of syllables/moras that get copied**

1. 1 syllable; e.g. **Sanskrit** (3)
2. 2 syllables; e.g. **Diyari** (1)/(4)
3. Variable yet predictable; e.g. **Ponapean** (5): varies predictably between 1 and 2 moras

○ Sanskrit perfect tense reduplication always copies a CV syllable from the left edge

(3) Sanskrit perfect reduplication (Whitney 1885, Steriade 1988)

a. √*dar-* ‘pierce’ → *da-dā́r-a* ‘I have pierced’
b. √*beud*^{h}*-* ‘wake’ → *bu-bud*^{h}*-úr* ‘They have woken’
c. √*paiṣ-* ‘crush’ → *pi-piṣ-úr* ‘They have crushed’

○ Diyari diminutive reduplication always copies the first two syllables from the left edge

(4) Diyari diminutive reduplication (Austin 1981:38, 64)

a. 2σ *pirta* ‘tree’ → *pirta-pirta*
b. 3σ *kinthala* ‘dog’ → *kintha-kinthala*
c. 3σ *tyilparku* bird type → *tyilpa-tyilparku* (**tyilpa***r***-tyilparku*)
d. 3σ *ngankanthi* ‘cat fish’ → *nganka-ngankanthi* (**nganka***n***-ngankanthi*)
e. 4σ *wilhapina* ‘old woman’ → *wilha-wilhapina*

○ Ponapean copies *one or two* moras from the left edge, depending on properties of the base

(5) Ponapean reduplication (Kennedy 2002:225)

	1-mora stem	2-mora stem	3-mora stem	4-mora stem
2-mora reduplicant	pàa-pá tèpi-tép dòn-dód	duǹ-duné sipì-sipéd diǹ-dilíp	dùu-dùupék mèe-mèelél lìi-lì.aán	riì-ri.àalá
1-mora reduplicant		dù-duúp		tò-toòroór sò-soùpisék

→ No language consistently copies three syllables/moras. This is probably related to facts about prosodic structure. (More on this next time.)

⋆ **Conditions on codas/syllable weight**

1. Syllable has to be light/open; e.g. **Sanskrit** perfect reduplication (3), second syllable in **Diyari** (4c,d)
2. Syllable has to be heavy/closed; e.g. **Ilokano** (6)

○ One of the reduplication patterns in Ilokano consistently has a heavy syllable in the reduplicant.

- If the first syllable of the base is heavy (6a), copy the first syllable of the base as is.
- If the first syllable of the base is open (6b–d), copy the first syllable + the first following onset consonant (and parse the copy as a coda).
- If the first syllable of the base is open and followed by a [ʔ] (6e,f), copy the first syllable and lengthen the vowel.

(6) Heavy σ reduplication in Ilokano (McCarthy & Prince 1986:3,10; Hayes & Abad 1989)

a.	/takder/	→	ʔag-tak-tak.der	‘be standing’
b.	/basa/	→	ʔag-bas-ba.sa	‘be reading’
c.	/adal/	→	ʔag-ad-a.dal	‘be studying’
d.	/trabaho/	→	ʔag-trab-tra.ba.ho	‘be working’
e.	/da(ʔ)it/	→	ʔag-daː-da.ʔit	‘be studying’
f.	/ro(ʔ)ot/	→	ʔag-roː-ro.ʔot	‘be leaving’

⋆ **Position of reduplicant**

1. Prefix; all the partial reduplication we’ve seen so far
2. Suffix; e.g. **Manam** (7)
   → (though this could alternatively be analyzed as being infixed before the stressed syllable; many suffixal patterns are like this, especially those with “foot” reduplicants)
3. Infix; e.g. **Mangarayi** (8)
   → Many patterns involving infixation are probably characterizable as one of the next two
4. Variable; e.g. **Sanskrit** desiderative (9): oriented to the left, but can be infixed for phonotactic reasons
5. Adjacent to stress; e.g. **Samoan** (10): “prefixed” to the stressed syllable

○ Manam suffixal reduplication: copies the final two moras (= bimoraic foot)

(7) Manam (Lichtenberk 1983; from Donca’s 24.962 notes)

salága	→	salaga-lága	‘be long’ / ‘long (sg.)’
moí.ta	→	mo.ita.-íta	‘knife’ / ‘cone shell’
malabóŋ	→	malabom-bóŋ	‘flying fox’
ʔulan-	→	ʔulan-láŋ	‘desire’ / ‘desirable’

○ Mangarayi infixal reduplication: reduplicant infixed after initial C, copies following VC*

(8) Mangarayi plural reduplication (McCarthy & Prince 1986:36; Merlan 1982)

	Singular	Plural	
a.	gabuji	**g**-ab-**abuji**	‘old person’
b.	yirag	**y**-ir-**irag**	‘father’
c.	jimgan	**j**-img-**imgan**	‘knowledgeable one’
d.	waŋgij	**w**-aŋg-**aŋgij**	‘child’
e.	muygji	**m**-uygj-**uygji**	‘having a dog’

- ○ Sanskrit desiderative reduplication: CV reduplicant is
  - prefixed for C-initial roots, but
  - infixed past the initial V or VC for V-initial roots for phonotactic reasons (Zukoff 2017a:§6.6.2)

(9) Classical Sanskrit desiderative (Whitney 1885)

	Root shape	Root		Desiderative	
a.	CCV	√tvar	‘hasten’	t̲i̲-tvar-is̺a-	
		√stamb^h	‘prop’	t̲i̲-stamb^h-is̢a-	
b.	VC	√aɟ	‘drive’	a-ɟ̲i̲-ɟ-is̺a-	not *a̲ɟ̲-aɟ-is̺a-
		√īd̺	‘praise’	ī-d̺̲i̲-d̺-is̺a-	not *ī̲d̺̲-īd̺-is̺a-
c.	VCC	√arc	‘praise’	ar-c̲i̲-c-is̺a-	not *a-r̲i̲-rc-is̺a-
		√ubɟ	‘force’	ub-ɟ̲i̲-ɟ-is̺a-	not *u-b̲i̲-bɟ-is̺a-
		√aɲɟ	‘anoint’	aɲ-ɟ̲i̲-ɟ-is̺a-	not *a-ɲ̲i̲-ɲɟ-is̺a-

- ○ Samoan reduplication: CV reduplicant copies and precedes the stressed syllable.
  - Stress is on the penultimate mora (moraic trochees from the right).
  - When the word is only bimoraic, the reduplicant appears as a true prefix (10a,b).
  - When the word is longer, the reduplicant ends up as an infix (10c).

(10) Samoan reduplication (Broselow & McCarthy 1983:30)

a.	táa	t̲a̲-táa	‘strike’
	túu	t̲u̲-túu	‘stand’
b.	nófo	n̲o̲-nófo	‘sit’
	mó.e	m̲o̲-mó.e	‘sleep’
c.	alófa	a-l̲o̲-lófa	‘love’
	saváli	sa-v̲a̲-váli	‘walk’
	malí.u	ma-l̲i̲-lí.u	‘die’

Short answer:

- Alignment constraints (McCarthy & Prince 1993a) pull the reduplicant to one edge or the other.
- When the reduplicant’s alignment constraint can consistently be fully satisfied (given the ranking), the reduplicant surfaces as a true prefix (ALIGN-RED-L) or a suffix (ALIGN-RED-R).
- When ALIGN-RED & CONTIG-IO are dominated by other constraints, the reduplicant can infix.
  - ○ Consistent minimal infix (Mangarayi): ALIGN-X $\gg$ ALIGN-RED
  - ○ Variable (Sanskrit desiderative): MARKEDNESS $\gg$ ALIGN-RED — infixation happens only when certain markedness conditions are met. Same logic as Tagalog *-um-* infixation.
  - ○ Stress-based infixation (Samoan): less clear, some sort of faithfulness to stress $\gg$ ALIGN-RED.
- ANCHOR likely also involved (Nelson 2003, Lunden 2004; “Marantz’s generalization”, Marantz 1982).

⋆ **Is the reduplicant a faithful copy of the base, or is it less marked in some way** — *emergence of the unmarked* (TETU; McCarthy & Prince 1994a)

1. Faithful (no TETU):
    - **Diyari** — everything it copies it copies faithfully
    - **Ilokano** — everything it copies it copies faithfully, other than vowel length alternation in forms like *ʔag-daː-daʔit* (which is not about markedness reduction)
2. Faithful but reduced (phonotactic TETU):
    - **Sanskrit** cluster-initial roots copy without one of the consonants (9a)
3. Unfaithful due to process application (no TETU):
    - **Ponapean** forms like *dòn-dód* (*d* → *n* via independent coda condition effect)
3. Unfaithfulness due to featural TETU:
    - **Yoruba** (11) only allows the “least marked” vowel [i] in the reduplicant, regardless of base vowel

(11) Yoruba (from Alderete et al. 1999:337)

gbóná	→	gbí-gbóná	‘be warm, hot’/‘warmth, heat’
jɛ	→	jí-jɛ	‘eat’/‘act of eating’
rí	→	rí-rí	‘see’/‘act of seeing’

3 TETU and Base-Reduplicant Correspondence Theory

- TETU refers to cases where particular contrasts / marked structures which are otherwise permitted in a language are not permitted in a subset of morphological categories in that language.
    - TETU in the reduplicant is the most commonly discussed context.
    - TETU can also apply in fixed-segment affixes and other nonconcatenative morphology, like truncation.

→ TETU is the flip-side of Positional Faithfulness (Beckman 1998), where contrasts are said to be specially licensed in strong positions, either phonological (e.g. stressed syllables) or morphological (namely, roots).

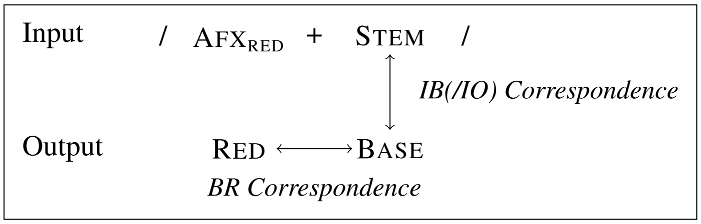
- In OT, TETU emerges when two categories participate in different correspondence relations — i.e. are regulated by distinct faithfulness constraints — and a markedness constraint is sandwiched between the two distinct faithfulness constraints.
- The banner example of this is in reduplication, where there are said to be special correspondence relations affecting the reduplicant. This theory is referred to as Base-Reduplicant Correspondence Theory (BRCT; McCarthy & Prince 1995, 1999).

3.1 Basics of BRCT

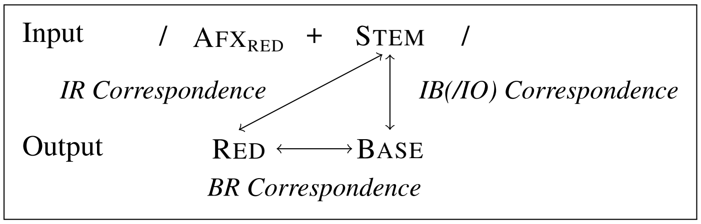
- In the original proposal, two models are considered: the “basic model” (12a), where there are two distinct correspondence relations; and the “full model” (12b), where there are three.
    1. The input root and the output root/base are related via Input-Output (Input-Base) correspondence.
    2. **The output base and the output reduplicant are related via Base-Reduplicant Correspondence.**
    3. The input root and the output reduplicant are related via Input-Reduplicant correspondence (full model only)

(12) Base-Reduplicant Correspondence Theory (McCarthy & Prince 1995:4)

a. Basic Model

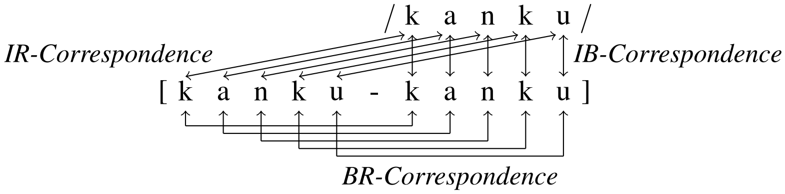


b. Full Model



(13) Illustration of the full model (Diyari *kanku-kanku*, Austin 1981:39)

[diagram taken from Stanton & Zukoff 2016]



The exact nature of the relation between the reduplicant and the input is a vexed question.

- A distinct IR relation is probably not quite right. See Spaelti (1997), Struijke (2002), Saba Kirchner (2010, 2013), *a.o.*, for relevant discussions and revisions (also my lecture notes from 24.964 last semester: https://stellar.mit.edu/S/course/24/fa17/24.964/).
- I'll assume the basic model for the purposes of this class.

- All of these correspondence relations have the same faithfulness constraints, just defined over different relations. For example, faithfulness constraints over BR relation include:

(14) a. **MAX-BR**:
Assign a violation * for each segment in the base without a correspondent in the reduplicant.

b. **DEP-BR**:
Assign a violation * for each segment in the reduplicant without a correspondent in the base.

c. **IDENT[F]-BR**:
Assign a violation * for each pair of segments standing in BR correspondence which differ on feature F.

→ Base ≈ Input; Reduplicant ≈ Output

3.2 Analyzing Yoruba TETU in the basic model

- In Yoruba, all bases take [i] as the vowel in the reduplicant, regardless of the base vowel.
  - Also, the [i] always has high tone, regardless of the base tone.

(15) Yoruba (from Alderete et al. 1999:337)

gbóná	→	gbí-gbóná	‘be warm, hot’/‘warmth, heat’
jɛ	→	jí-jɛ	‘eat’/‘act of eating’
rí	→	rí-rí	‘see’/‘act of seeing’

- The most straightforward way to capture this sort of interaction within the basic model of BRCT is the *copy* + *reduce* approach.

(16) **Copy + reduce**

a. *General schema*: IDENT-IO ≫ MARKEDNESS ≫ IDENT-BR
b. *Yoruba vowels*: IDENTV-IO ≫ *¬[i] ≫ IDENTV-BR

  - (Some, but probably not all, such cases of phonological fixed segmentism in reduplication can also be modeled with epenthesis; cf. Alderete et al. 1999.)

- In the basic model, reduplicants are not subject to IO correspondence. Therefore, IO faithfulness constraints will not protect marked features in the reduplicant.
  - That is, the ranking fragment IDENTV-IO ≫ *¬[i] will have nothing to say (directly) about what features surface in the reduplicant.
- The constraint that could protect the marked features in the reduplicant is IDENTV-BR, since the features will be present in the surface base.
  - But, given the ranking *¬[i] ≫ IDENTV-BR, this will not be the case.
  - The markedness constraint prevails, and only the unmarked features (i.e. those of [i]) are allowed to surface in the reduplicant.

⇒ The ranking (schema) in (16) thus allows marked features to be prohibited from reduplicants.
  - Non-TETU cases will simply have both IDENT-IO and IDENT-BR outrank MARKEDNESS.

(17) BRCT copy + reduce in Yoruba

/RED, jɛ/	IDENT-V-IO	*¬[i]	IDENT-V-BR
a. ☞ ji-jɛ		*	*
b. jɛ-jɛ		**!	
c. ji-ji	*!		

3.3 Reduplicant shape as prosodic TETU (topic for Thursday)

- We now know that unmarked features can emerge in reduplication via TETU. We already know from last week that truncation often results in unmarked *prosodic* shapes.

⇒ **My claim (not completely new):** The shape of the reduplicant can often be modeled as prosodic TETU.
  - Specifically, in a given language, the shape of the reduplicant often follows from directly from the prosodic constraints which are otherwise active in the language (see Zukoff 2016).

4 A brief history of theories of reduplicant shape

4.1 Templatic approaches

- McCarthy & Prince (1986) observed that reduplicant shapes tend to be describable as prosodic categories; things like a syllable, or a heavy syllable, or a foot. (See also Hyman 1985.)
  - ○ Prior to McCarthy & Prince (1986), reduplication was normally described in terms of C/V strings (e.g. Marantz 1982, Steriade 1988) or X strings (unspecified timing slots; Levin 1983, 1985).
- McCarthy & Prince (1986) proposed that reduplicant shape should be **underlying specified** as a member of the prosodic hierarchy, possibly with conditions on that category (e.g. binarity for feet).
  - ○ The empty prosodic category is then filled through autosegmental association.

(18) Prosodic Categories (McCarthy & Prince 1986:6)

Wd	'prosodic word'
F	'foot'
σ	'syllable'
σ_μ	'light (monomoraic) syllable'
$\sigma_{\mu\mu}$	'heavy (bimoraic) syllable'
σ_c	'core syllable' [= (C)V]

- ○ Under this approach, a language like Ilokano has an underlying heavy syllable template: $/\sigma_{\mu\mu}/$.

(19) Heavy σ reduplication in Ilokano (McCarthy & Prince 1986:3,10; Hayes & Abad 1989)

a.	/takder/	→	ʔag-tak-tak.der	'be standing'
b.	/basa/	→	ʔag-bas-ba.sa	'be reading'
c.	/adal/	→	ʔag-ad-a.dal	'be studying'
d.	/trabaho/	→	ʔag-trab-tra.ba.ho	'be working'
e.	/da(ʔ)it/	→	ʔag-daː-da.ʔit	'be studying'
f.	/ro(ʔ)ot/	→	ʔag-roː-ro.ʔot	'be leaving'

- ○ Some recent work has returned to using underlying templates in OT (Saba Kirchner 2010, 2013) and Harmonic Serialism (McCarthy, Kimper, & Mullin 2012).

- In early OT, template form was transferred from underlying representation to constraints (McCarthy & Prince 1993b, 1994a,b, 1995, *et seq.*).
  - ○ Rather than the reduplicant having specified UR, the UR is contentless (/RED/), and a violable constraint specifies the preferred reduplicant shape: e.g., RED = σ, or RED = FOOT.
  - ○ Additional constraints on the shapes of syllables and feet, and other phonotactics, could then too play a direct role in determining the ultimate surface shapes of reduplicants.
- When given explicit formalization, RED = X constraints are usually formulated as Alignment constraints (McCarthy & Prince 1993a), aligning the edges of the reduplicative morpheme to edges of prosodic constituents.

- Subsequent work in "Generalized Template Theory" (GTT; McCarthy & Prince 1994a,b, 1995, Urbanczyk 1996, 2001) sought to ground the choice of template in independent facts about the language.
- This was usually done by trying to ascribe prosodic properties of reduplicants to prosodic properties of more general morphological constituents:
  - ○ You define the reduplicative morpheme as a particular class of morpheme: affix, root, stem
  - ○ You define a size condition on that class of morphemes: e.g. AFFIX $\leq \sigma$, STEM = PRWD
  - ⇒ Syllable-sized reduplicants are affixes (i.e. RED = σ is really just AFFIX $\leq \sigma$)
  - ⇒ Foot-sized reduplicants are stems RED = FOOT is really just STEM = PRWD, and prosodic words must have a head foot

4.2 The a-templatic approach

- A stronger version of GTT is "a-templatic" reduplication (Spaelti 1997, Gafos 1998, Hendricks 1999, Riggle 2006, *a.o.*):

⋆ There are no templatic constraints or templatic URs.
⋆ Reduplicant shape is determined solely through the interaction of independently necessary constraints (mainly markedness constraints).
⋆ Partial reduplication is inherently **minimal**, subject to extension by other constraints.

- In this approach, there are essentially two types of reduplication, determined by the relative ranking of two constraints:

(20) a. Total reduplication: MAX-BR $\gg$ *size restrictor*
b. Partial reduplication: *size restrictor* $\gg$ MAX-BR

- "Size restrictors" / "size minimizers" are constraints (of various sorts) that, in effect, penalize the *presence* of material in the reduplicant.

(21) Some proposed size restrictor constraints

a.	*STRUC(TURE)-SEG/σ	(Riggle 2006; cf. Zoll 1994)
b.	ALL-FEET/σ-L/R	(McCarthy & Prince 1994b, Spaelti 1997, *a.o.*)
c.	ALIGN-ROOT-L/R	(Hendricks 1999, Zukoff 2017a,c, *a.o.*; cf. Riggle 2006)
d.	INTEGRITY-IO	(Spaelti 1997; cf. Riggle 2006, Saba Kirchner 2010, 2013)
e.	DEP(Seg)-BD/OO	(Gouskova 2004)

- When MAX-BR outranks all size restrictors (20a), you copy everything.
- When a size restrictor outranks MAX-BR (20b), you copy *as little as possible*.

- The fact that not all partial reduplication patterns are minimal ($\approx$ CV) results from other constraints that penalize the minimal shape outranking the size restrictor in ranking (20b).
  - ○ i.e., extension to a longer reduplicant can only be motivated by the presence of higher-ranked conflicting constraints: e.g. prosodic constraints like *CLASH, segmental phonotactics like OCP.
  - ○ The diversity of partial reduplication patterns is due to the diversity of possible conflicting constraints, and their interactions.

⋆ Put another way: **reduplicant shape is determined primarily by TETU.**

4.3 A sketch analysis of a-templatic reduplication in Gothic

- Gothic (Zukoff 2017a:Ch. 4) represents a clear case of minimal reduplication, with conditional extension.
  - It has prefixal partial reduplication which is by default CV.
  - When a particular phonotactic constraint would be violated by CV, it exhibits a longer reduplicant (namely, CCV).

- For roots beginning in *consonant+vowel* (C_1V), the reduplicant is C_1ɛ-.
- For roots beginning in *consonant+**sonorant**+vowel* (C_1R_2V), the reduplicant is also C_1ɛ- (22a).
- But, for roots beginning in *consonant+**obstruent**+vowel* (C_1T_2V), the red. is extended to C_1T_2ɛ- (22b).

(22) Cluster-initial reduplicated form in Gothic (Lambdin 2006:115)

		Present (1SG)		Preterite (1SG)		
a. **CRV roots**	'tempt'	*fraisa*	[frɛːs-a]	*faifrais*	[fɛ-frɛːs]	
	'sleep'	*slepa*	[sleːp-a]	*saislep*	[sɛ-sleːp]	
	'bewail'	*floka*	[floːk-a]	*faiflok*	[fɛ-floːk]	
	'weep'	*greta*	[greːt-a]	*gaigrot*	[gɛ-groːt]	
b. **CTV roots**	'possess'	*stalda*	[stald-a]	*staistald*	[stɛ-stald]	(not *[sɛ-stald])
	'divide'	*skaida*	[skɛːð-a]	*skaiskaiþ*	[skɛ-skɛːθ]	(not *[sɛ-skɛːθ])

- This is clearly a partial reduplication pattern, since not everything is copied. This means we need the ranking schema *size restrictor* ≫ MAX-BR (20b).
  - I'll use ALIGN-ROOT-L as the size restrictor:

(23) **ALIGN-ROOT-L:** Assign one violation * for each segment intervening between the left edge of the root and the left edge of the word.

- Under certain approaches to morpheme ordering / linearization, ALIGNMENT constraints of this sort are independently necessary to determine the relative order of morphemes in a word (McCarthy & Prince 1993a, Zukoff 2017b).

- This ranking fragment alone will select desired candidate (24a) over (24b,c), because it has fewer segments in the reduplicant (2 vs. 3,4).

(24) CV reduplicants for #CR clusters: √*floːk* → *fɛ-floːk* 'he wept'

/RED, floːk/	ANCHOR-L-BR	ALIGN-ROOT-L	MAX-BR	CONTIGUITY-BR
a. ☞ f$_i$ɛ$_k$-f$_i$loː$_k$k$_l$		**	**	*
b. f$_i$l$_j$ɛ$_k$-f$_i$l$_j$oː$_k$k$_l$		***!	*	
c. f$_i$l$_j$ɛ$_k$k$_l$-f$_i$l$_j$oː$_k$k$_l$		***!*		
d. ɛ$_k$-floː$_k$k$_l$	*!	*	***	
e. l$_j$ɛ$_k$-fl$_j$oː$_k$k$_l$	*!	**	**	

- To ensure that (24a) wins over (24d,e), we need the BR-faithfulness constraint ANCHOR-L-BR to outrank ALIGN-ROOT-L (and also another BR-faithfulness constraint CONTIGUITY-BR).

(25) a. **ANCHOR-L-BR:** Assign one violation * if the segment at the left edge of the reduplicant does not stand in BR correspondence with the segment at the left edge of the base.
  b. **CONTIGUITY-BR:** Assign one violation * for each pair of adjacent segments in the reduplicant which are not adjacent in the base.

- With respect to ALIGN-ROOT-L, (24a) fares worse than (24d) and identically to (24e).

→ So we know that a constraint(s) that penalize (24d) & (24e) worse than (24a) must outrank ALIGN-ROOT-L.
  - ○ Both (24d) & (24e) violate ANCHOR-L-BR, because the leftmost segment of the reduplicant does not match the leftmost segment of the base.

- (24a) avoid the ANCHOR-L-BR violation while still copying (almost) minimally by skipping the second base consonant, which incurs a CONTIGUITY-BR violation.
  - ○ As long as ANCHOR-L-BR ≫ CONTIGUITY-BR, we derive the right result.
  - ○ ALIGN-ROOT-L must also dominate CONTIGUITY-BR, so that (24a) can still win over (24b), which avoids the CONTIGUITY-BR violation at the expense of copying an extra segment.

- The basic case thus illustrates minimal copying subject to higher ranked constraints (here, ANCHOR-L-BR).
- In #CTV roots, non-minimal copying is motivated by a phonotactic constraint against particular types of consonant repetitions:

(26) **$*C_\alpha VC_\alpha$ / $\_C_{[\text{-sonorant}]}$:**
For each sequence of repeated identical consonants separated by a vowel ($C_\alpha VC_\alpha$), assign a violation * if that sequence immediately precedes an obstruent.

- ○ I call this constraint "NO POORLY-CUED REPETITIONS (*PCR)" in Zukoff (2017a), where I argue that it has phonetic underpinnings.
- ○ This constraint is crucial for explaining a variety of similar effects in the reduplication patterns of a number of ancient Indo-European languages, and elsewhere.

- The context for this constraint is met only by the minimal copying candidate for #CTV roots, not #CV or #CRV roots.

⇒ Therefore, diversion away from the basic pattern (27a) is called for only for #CTV roots.
  - ○ The ranking ANCHOR-L-BR ≫ ALIGN-ROOT-L, which was independently established for the #CRV roots, means that the optimal alternative is (27b), which copies an extra segment.

(27) CCV reduplicants for #CT clusters: √*stald* → *<u>ste</u>stald* 'he possessed'

/RED, stald/	ANCHOR-L-BR	$*C_\alpha VC_\alpha$ / $\_C_{[\text{-son}]}$	ALIGN-ROOT-L	MAX-BR
a. $\underline{s_i \varepsilon_k}$-$s_i t a_k ld$		*!	**	***
b. ☞ $\underline{s_i t_j \varepsilon_k}$-$s_i t_j a_k ld$			***	**
c. $\underline{t_j \varepsilon_k}$-$s t_j a_k ld$	*!		**	***

(28) Total ranking:
ANCHOR-L-BR, $*C_\alpha VC_\alpha$ / $\_C_{[\text{-son}]}$ ≫ ALIGN-ROOT-L ≫ MAX-BR, CONTIGUITY-BR

⋆ **Moral of the story:** Partial reduplication is minimal, unless high ranking constraints interfere with satisfaction of the size restrictor constraint.

- Next time we'll see how prosodic constraints can also induce extra copying and explain certain effects formerly attributed to "prosodic templates".

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