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’ → pirta-pirta ‘small tree’
   b. 3σ kinthala ‘dog’ → kinha-kinthala ‘little dog, puppy’
   c. 4σ wilhapina ‘old woman’ → wilha-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:


<table>
<thead>
<tr>
<th></th>
<th>indefinite</th>
<th>definite</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td><strong>buku-buku</strong></td>
<td><strong>buku-bukú-ña</strong></td>
</tr>
<tr>
<td></td>
<td>‘books’</td>
<td>‘the books’</td>
</tr>
<tr>
<td>b.</td>
<td><strong>wanita-wanita</strong></td>
<td><strong>wanita-wanitá-an</strong></td>
</tr>
<tr>
<td></td>
<td>‘women’</td>
<td>‘womanly’ (adj.)</td>
</tr>
<tr>
<td>c.</td>
<td><strong>májarék-at-májarék</strong></td>
<td><strong>májarék-at-májarék-ña</strong></td>
</tr>
<tr>
<td></td>
<td>‘societies’</td>
<td>‘the societies’</td>
</tr>
<tr>
<td>d.</td>
<td><strong>minúm(-)an-minúm-an</strong></td>
<td><strong>minúm(-)an-minúm-án-ña</strong></td>
</tr>
<tr>
<td></td>
<td>‘drinks’</td>
<td>‘the drinks’</td>
</tr>
</tbody>
</table>

○ 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
     a. √dar- 'pierce' → da-dār-a ‘I have pierced’
     b. √beudʰ- ‘wake’ → bu-budʰ-úr ‘They have woken’
     c. √paiš- ‘crush’ → pi-piš-úr ‘They have crushed’
   - Diyari diminutive reduplication always copies the first two syllables from the left edge
     a. 2σ pirta ‘tree’ → pirta-pirta
     b. 3σ kinthala ‘dog’ → kintha-kinthala
     c. 3σ tyilparku bird type → tyilpa-tyilparku (*tyilpar-tyilparku)
     d. 3σ ngankanthi ‘cat fish’ → nganka-ngankanthi (*ngankan-ngankanthi)
     e. 4σ wilhapina ‘old woman’ → wilha-wilhapina
   - Ponapean copies one or two moras from the left edge, depending on properties of the base

Ponapean reduplication (Kennedy 2002:225)

<table>
<thead>
<tr>
<th>1-mora stem</th>
<th>2-mora stem</th>
<th>3-mora stem</th>
<th>4-mora stem</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-mora reduplicant</td>
<td>pàa-pá</td>
<td>dùn-duñé</td>
<td>dùu-duùpék</td>
</tr>
<tr>
<td></td>
<td>tèpi-tép</td>
<td>sipì-sipéd</td>
<td>mèe-mèelél</td>
</tr>
<tr>
<td></td>
<td>dòn-dód</td>
<td>diñ-dilíp</td>
<td>li-li.aán</td>
</tr>
<tr>
<td>1-mora reduplicant</td>
<td>dù-duúp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 $\sigma$ reduplication in Ilokano (McCarthy & Prince 1986:3,10; Hayes & Abad 1989)

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

<table>
<thead>
<tr>
<th>Singular</th>
<th>Plural</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>salága</td>
<td>salaga-lága</td>
<td>‘be long’ / ‘long (sg.)’</td>
</tr>
<tr>
<td>moí.ta</td>
<td>mo.ita.-íta</td>
<td>‘knife’ / ‘cone shell’</td>
</tr>
<tr>
<td>malabóŋ</td>
<td>malabom-bóŋ</td>
<td>‘flying fox’</td>
</tr>
<tr>
<td>?ulan-</td>
<td>?ulan-lán</td>
<td>‘desire’ / ‘desirable’</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Singular</th>
<th>Plural</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>gabuji</td>
<td>g-ab-abuji</td>
<td>‘old person’</td>
</tr>
<tr>
<td>yirag</td>
<td>y-i-r-irag</td>
<td>‘father’</td>
</tr>
<tr>
<td>jimgan</td>
<td>j-im-g-imgan</td>
<td>‘knowledgeable one’</td>
</tr>
<tr>
<td>wangij</td>
<td>w-a-ng-angij</td>
<td>‘child’</td>
</tr>
<tr>
<td>muygji</td>
<td>m-uygj-uygji</td>
<td>‘having a dog’</td>
</tr>
</tbody>
</table>
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)

<table>
<thead>
<tr>
<th>Root shape</th>
<th>Root</th>
<th>Desiderative</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. CCV</td>
<td>√tvar</td>
<td>‘hasten’ tī-tvar-īṣa-</td>
</tr>
<tr>
<td></td>
<td>√stamb</td>
<td>‘prop’ tī-stambh-īṣa-</td>
</tr>
<tr>
<td>b. VC</td>
<td>√aj</td>
<td>‘drive’ a-īj-īṣa- not *a-aj-īṣa-</td>
</tr>
<tr>
<td></td>
<td>√iḍ</td>
<td>‘praise’ ī-di-ḍ-iṣa- not *iḍ-iḍ-iṣa-</td>
</tr>
<tr>
<td>c. VCC</td>
<td>√arc</td>
<td>‘praise’ ar-īc-īṣa- not *a-ṛc-ṛṣa-</td>
</tr>
<tr>
<td></td>
<td>√ubj</td>
<td>‘force’ ub-īj-īṣa- not *u-bi-ḥiṣa-</td>
</tr>
<tr>
<td></td>
<td>√aṇj</td>
<td>‘anoint’ aṇ-ḥ-jiṣa- not *a-ṇ-ṇ-ṣa-</td>
</tr>
</tbody>
</table>

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 ta-táa ‘strike’
   tūu tu-tūu ‘stand’

b. nófo no-nófo ‘sit’
   mó.e mo-mó.e ‘sleep’

c. alófa a-lo-lófa ‘love’
   saváli sa-va-váli ‘walk’
   malí.u ma-li-li.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-I-O are dominated by other constraints, the reduplicant can infix.
  - Consistent minimal infix (Mangarayi): ALIGN-X ≫ ALIGN-RED
  - Variable (Sanskrit desiderative): MARKEDNESS ≫ 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 ≫ 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-da:daʔiti (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 dôn-dôd (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

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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.

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

- 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

Input / AFX\textsubscript{RED} + STEM /  
Output RED ←BASE

IB/(IO) Correspondence

BR Correspondence

b. Full Model

Input / AFX\textsubscript{RED} + STEM /  
IR Correspondence

IB/(IO) Correspondence

Output RED ←BASE

BR Correspondence

(13) Illustration of the full model (Diyari \textit{kanku-kanku}, Austin 1981:39)

\[ \text{[diagram taken from Stanton & Zukoff 2016]} \]

IB-Correspondence

IR-Correspondence

BR-Correspondence

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), \textit{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. \textbf{MAX-BR:}
Assign a violation * for each segment in the base without a correspondent in the reduplicant.

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

c. \textbf{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)

<table>
<thead>
<tr>
<th>Base</th>
<th>Reduplicant</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>gbóná</td>
<td>gbí-gbóná</td>
<td>‘be warm, hot’/‘warmth, heat’</td>
</tr>
<tr>
<td>jé</td>
<td>jí-jé</td>
<td>‘eat’/‘act of eating’</td>
</tr>
<tr>
<td>rí</td>
<td>rī-ří</td>
<td>‘see’/‘act of seeing’</td>
</tr>
</tbody>
</table>

- 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** : IDENT-V-IO ≫ *[i] ≫ IDENT-V-BR

- 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 IDENT-V-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 IDENT-V-BR, since the features will be present in the surface base.
  - But, given the ranking *[i] ≫ IDENT-V-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

<table>
<thead>
<tr>
<th>/RED, jé/</th>
<th>IDENT-V-IO</th>
<th>*[i]</th>
<th>IDENT-V-BR</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Ji-jé</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. jí-jé</td>
<td>**!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. jí-ji</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Wd</th>
<th>‘prosodic word’</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>‘foot’</td>
</tr>
<tr>
<td>σ</td>
<td>‘syllable’</td>
</tr>
<tr>
<td>σµ</td>
<td>‘light (monomoraic) syllable’</td>
</tr>
<tr>
<td>σµµ</td>
<td>‘heavy (bimoraic) syllable’</td>
</tr>
<tr>
<td>σc</td>
<td>‘core syllable’  [ (C)V]</td>
</tr>
</tbody>
</table>

◦ Under this approach, a language like Ilokano has an underlying heavy syllable template: /σµµ/.

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

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. /takder/</td>
<td>→ ?ag-tak-tak.der</td>
<td>‘be standing’</td>
</tr>
<tr>
<td>b. /basa/</td>
<td>→ ?ag-bas-ba.sa</td>
<td>‘be reading’</td>
</tr>
<tr>
<td>c. /adal/</td>
<td>→ ?ag-ad-a.dal</td>
<td>‘be studying’</td>
</tr>
<tr>
<td>d. /trabaho/</td>
<td>→ ?ag-trab-tra.ba.ho</td>
<td>‘be working’</td>
</tr>
<tr>
<td>e. /da(ʔ)it/</td>
<td>→ ?ag-da-:da.ʔit</td>
<td>‘be studying’</td>
</tr>
<tr>
<td>f. /ro(ʔ)ot/</td>
<td>→ ?ag-ro-:ro.ʔot</td>
<td>‘be leaving’</td>
</tr>
</tbody>
</table>

◦ 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 = \(\sigma\) 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
   b. ALL-FEET/\(\sigma\)-L/R (McCarthy & Prince 1994b, Spaelti 1997, a.o.)
   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* (*C₁V*), the reduplicant is *C₁E*.
- For roots beginning in *consonant+sonorant+vowel* (*C₁R₂V*), the reduplicant is also *C₁E* (22a).
- But, for roots beginning in *consonant+obstruent+vowel* (*C₁T₂V*), the red. is extended to *C₁T₂E* (22b).

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

<table>
<thead>
<tr>
<th></th>
<th>Present (1SG)</th>
<th>Preterite (1SG)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. CRV roots</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘tempt’</td>
<td>fraisa [frːs-a]</td>
<td>faifrais [fə-frːs]</td>
</tr>
<tr>
<td>‘sleep’</td>
<td>slepa [sleːp-a]</td>
<td>saislep [sə-sleːp]</td>
</tr>
<tr>
<td>‘bewail’</td>
<td>floka [floːk-a]</td>
<td>faiflok [fə-floːk]</td>
</tr>
<tr>
<td>‘weep’</td>
<td>greta [gret-a]</td>
<td>gaigrot [gə-grot]</td>
</tr>
<tr>
<td><strong>b. CTV roots</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘possess’</td>
<td>stalda [stald-a]</td>
<td>staiståld [stə-stald] (not *[stə-stald])</td>
</tr>
<tr>
<td>‘divide’</td>
<td>skaida [skəːd-a]</td>
<td>skaïskaîp [skəː-skəːp] (not *[skəː-skəːp])</td>
</tr>
</tbody>
</table>

- This is clearly a partial reduplication pattern, since not everything is copied. This means we need the ranking schema size restrictor \( \gg \) 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: \( /f\text{lo}k\rightarrow f\text{ə-flo}k\) ‘he wept’

<table>
<thead>
<tr>
<th>/RED, flock/</th>
<th>ANCHOR-L-BR</th>
<th>ALIGN-ROOT-L</th>
<th>MAX-BR</th>
<th>CONTIGUITY-BR</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (\tilde{e}_k) (l,\tilde{e}_k\rightarrow l,\tilde{e}_k, k_i)</td>
<td></td>
<td>***</td>
<td>**</td>
<td>*</td>
</tr>
<tr>
<td>b. (l,\tilde{e}_k\rightarrow l,\tilde{e}_k, k_i)</td>
<td>***!</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (l,\tilde{e}_k, k_i\rightarrow l,\tilde{e}_k, k_i)</td>
<td>*<strong>!</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. (\tilde{e}_k\rightarrow l,\tilde{e}_k, k_i)</td>
<td>*!</td>
<td>*</td>
<td></td>
<td>***</td>
</tr>
<tr>
<td>e. (l,\tilde{e}_k\rightarrow l,\tilde{e}_k, k_i)</td>
<td>*!</td>
<td>**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 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**.
  \[\circ\] 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.
  \[\circ\] As long as **ANCHOR-L-BR** \(\gg\) **CONTIGUITY-BR**, we derive the right result.
  \[\circ\] **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)  
\[*C_\alpha VC_\alpha / _C[-sonorant]:\]
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.

\[\circ\] I call this constraint “**NO POORLY-CUED REPETITIONS (\"*PCR\")**” in Zukoff (2017a), where I argue that it has phonetic underpinnings.

\[\circ\] 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.
  \[\circ\] The ranking **ANCHOR-L-BR** \(\gg\) **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/ \(\rightarrow\) /stestald/ ‘he possessed’

<table>
<thead>
<tr>
<th>/RED, stald/</th>
<th><strong>ANCHOR-L-BR</strong></th>
<th>*(C_\alpha VC_\alpha / _C[-sonorant])</th>
<th><strong>ALIGN-ROOT-L</strong></th>
<th><strong>MAX-BR</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>(<em>s, \varepsilon_s-ta, ld</em>)</td>
<td>(\ast!)</td>
<td>(\ast)</td>
<td>(\ast\ast)</td>
</tr>
<tr>
<td>b. (\varepsilon)</td>
<td>(<em>s, t, \varepsilon_s-ta, ld</em>)</td>
<td></td>
<td>(\ast\ast)</td>
<td>(\ast)</td>
</tr>
<tr>
<td>c. (\varepsilon)</td>
<td>(<em>t, \varepsilon_t-st, a, ld</em>)</td>
<td>(\ast!)</td>
<td></td>
<td>(\ast\ast)</td>
</tr>
</tbody>
</table>

(28)  
Total ranking:
**ANCHOR-L-BR**, *\(C_\alpha VC_\alpha / _C[-sonorant]\) \(\gg\) **ALIGN-ROOT-L** \(\gg\) **MAX-BR**, **CONTIGUITY-BR**

\[\star\] **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”.

References


Saba Kirchner, Jesse. 2010. Minimal Reduplication. PhD Dissertation, University of California, Santa Cruz.
