Abstract: Gapapaiwa is an Oceanic Austronesian language spoken in Papua New Guinea. Verbal reduplication in Gapapaiwa involves an interesting variety of phonological patterns. When the verb root kavara ‘carry’ is reduplicated, it follows the dominant pattern in the language by reduplicating the leftmost metrical foot: kava-kavara. However, tou ‘cry’ has the reduplicated form tu-tou and uma ‘drink’ has the reduplicated form um-uma. In this paper, previously unpublished data collected over the last 25 years is used to identify nine relevant constraints and rank them according to dominance. A Hasse diagram is presented to summarize the crucial rankings for this specific language. The results demonstrate that Optimality Theory is an effective model to explain the phonological patterns of reduplication in Gapapaiwa.

1. Introduction

The purpose of this paper is to present an account of verbal reduplication in Gapapaiwa. Reduplication is used to encode plural in kin terms, diminutive in common nouns and imperfect aspect on verbs. This paper investigates the specific phonological patterns of verbal reduplication from an OT perspective (Kager 1999, McCarthy 2008). After a brief overview of the Gapapaiwa language to serve as a context, a data set of reduplicated forms is presented. Then the patterns of reduplication are identified in prose with examples. The base for verbal reduplication in Gapapaiwa is the leftmost metrical foot of the verb root which is then aligned so that the right edge of the reduplicant corresponds to the left edge of the verb root. Haplology and truncation then apply, resulting in an interesting range of variation in the phonetic forms. After presenting the reduplication patterns, I identify a list of OT constraints which are relevant and explain the implications of each. Based on a set of tableaux, I rank the constraints according to relative dominance. Finally, this ranking is summarized in a Hasse diagram.

Gapapaiwa is a Nuclear Papuan Tip Austronesian language of southeastern Papua New Guinea (McGuckin 2002). It is part of the Are-Taupota dialect chain and includes two dialects, the Gapa and the Paiwa, which are 95% cognate. There are 3000 speakers of Gapapaiwa who live on Cape Vogel in mainland Milne Bay Province.

The basic phoneme inventory for consonants in Gapapaiwa is presented in Table (1) below.

<table>
<thead>
<tr>
<th>UNVOICED STOPS</th>
<th>VOICED STOPS</th>
<th>NASALS</th>
<th>FLAP</th>
<th>UNVOICED FRICATIVE</th>
<th>VOICED FRICATIVES</th>
<th>GLIDES</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>b</td>
<td>m</td>
<td></td>
<td>v</td>
<td>v</td>
<td>w</td>
</tr>
<tr>
<td>t</td>
<td>d</td>
<td>n</td>
<td></td>
<td>s</td>
<td>γ</td>
<td>j</td>
</tr>
<tr>
<td>k</td>
<td>g</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Gapapaiwa consonant phonemes
The basic phoneme inventory for vowels in Gapapaiwa is presented in Table (2) below.\(^1\)\(^2\)

<table>
<thead>
<tr>
<th>-LOW</th>
<th>+HIGH</th>
<th>(i)</th>
<th>(u)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-LOW</td>
<td>-HIGH</td>
<td>(\varepsilon)</td>
<td>(o)</td>
</tr>
<tr>
<td>+LOW</td>
<td>-HIGH</td>
<td>(A)</td>
<td></td>
</tr>
</tbody>
</table>

Gapapaiwa is an agglutinative language. The minimum clause is the verb root with inflectional and derivational affixing.\(^3\) The basic constituent order within a verb cluster is as follows:

\[(1)\]

<table>
<thead>
<tr>
<th>Subj/tense</th>
<th>(irrealis)</th>
<th>(derivation)</th>
<th>(causative)</th>
<th>(reduplicant)</th>
<th>verb.root(_1)</th>
<th>verb.root(_2)</th>
<th>(object)</th>
</tr>
</thead>
</table>

The only obligatory affix is the clitic for subject agreement; therefore the minimal form is the verb root with the subject prefix:

\[(2)\] Subj/tense=verb root\(_1\)

i=peku

3/Past=fall

‘he/she fell’

2. Reduplicated forms

Reduplication of the verb root in Gapapaiwa is used to encode imperfect aspect, as illustrated in the data below.

<table>
<thead>
<tr>
<th>Verb Root</th>
<th>3Subj/Past+RED+Root</th>
<th>Gloss(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>kita</td>
<td>ikitakita</td>
<td>‘he was seeing’</td>
</tr>
<tr>
<td>vona</td>
<td>ivonavona</td>
<td>‘he was speaking’</td>
</tr>
<tr>
<td>bera</td>
<td>iberabera</td>
<td>‘he was doing’</td>
</tr>
<tr>
<td>vere</td>
<td>iverevere</td>
<td>‘he was giving’</td>
</tr>
<tr>
<td>nota</td>
<td>inotanota</td>
<td>‘he was thinking’</td>
</tr>
</tbody>
</table>

---

\(^1\)There is also an [i] in Gapapaiwa which has limited distribution and is not phonemic. It is not relevant to the discussion of reduplication presented in this paper.

\(^2\)When presenting data in this paper, orthographic spelling is followed. The phonetic equivalents for the orthographic conventions are as follows: \(/\varepsilon/\) will be written as \(e\), \(/\j/\) will be written as \(y\), \(/\r/\) will be written as \(r\), and \(/\gamma/\) will be written as \(gh\).

\(^3\)For a more detailed discussion of Gapapaiwa grammar, see McGuckin (2002).

\(^4\)The subject clitic throughout the examples in this table is third person without distinction as to gender or number. Therefore, the examples could be glossed as ‘he/she/it/they’.
Verb Root 3Subj/Past+RED+Root Gloss
bagi ibagibagi ‘he was working’
kena ikenakena ‘he was sleeping’
verau iveraverau ‘he was running’
makai imakamakai ‘he was sitting’
baba ibababa ‘he was walking’
tete itetete ‘he was creeping along’
rereghe irerereghe ‘he was distributing’
pupuni ipupupuni ‘he was erasing’
kaeva ikaevakavara ‘he was carrying’
panana ipanapanana ‘he was encountering’
ysawa iyawayawasa ‘he was healthy’
nipowana iniponipowana ‘he was praying’
yabumana iyabuyabumana ‘he was afraid’
yamona iyamoyamona ‘he was making’
kutayaragh iikutakutayaragh ‘he was biting it off’
nuwakapi inuwaniuwakapi ‘he was being jealous’
giruma igirugiruma ‘he was writing’
karata ikarakarata ‘he was burning’
edari iededari ‘he was splitting wood’
uma iumuma ‘he was drinking’
uwara iuwuwara ‘he was wallowing’
ekwa iekwekwa ‘he was searching’
oru iororu ‘he was going down’
ivu ivivu ‘he was fetching’
bau ibubau ‘he was smoking’
ghae igheghae ‘he was going up’
tou itutou ‘he was crying’
vaiv oivovao ‘he was gardening’
vitava ivitavitava ‘he was causing (it to) cook’
viniwupoya ivivinuwupoya ‘he was causing (himself to) worry’
vivuni ivivivuni ‘he was causing (it to) renew’

3. Reduplication patterns

3.1 Basic reduplication

The basic reduplication pattern in Gapapaiwa is to select the leftmost metrical foot of the verb root (CVCV) and insert a copy of that foot before the verb root.

(3) a. ‘see’ kita (kita) (kita)(kita)
b. ‘think’ nota (nota) (nota)(nota)
c. ‘work’ bagi (bagi) (bagi)(bagi)

If the verb root is longer than one metrical foot, the extra segments to the right of the metrical foot are not reduplicated.
This pattern applies even for much longer verb roots, as shown below.

(5)  

a. ‘be.afraid’ yabumana (yabu)mana (yabu)(yabu)mana  
b. ‘bite.off’ kutayaragha (kuta)yaragha (kuta)(kuta)yaragha  
c. ‘pray’ nipowana (nipo)wana (nipo)(nipo)wana

3.2 Reduplication with repeated syllables in verb root

If the reduplicated metrical foot contains a repeated syllable in its underlying form, haplology deletes one of the repeated syllables.

(6)  

a. ‘walk’ baba (baba) (baba)(baba) (ba)baba  
b. ‘creep’ tete (tete) (tete)(tete) (te)tete  
c. ‘distribute’ reregha (rere)gha (rere)(rere)gha (re)reregha

It is interesting to point out here that there is some residual phonetic evidence for this haplology. In a few families in the Gapapaiwa area, the older generation pronounces the vowel of the remaining syllable with more length than a normal vowel. However, the length has been lost among the younger generation, so it is not necessary to posit a constraint to account for it.

(7)  babababa tetete rereregha

3.3 Reduplication with vowel sequences

If the verb root begins with a vowel, the reduplicated form results in a two-vowel sequence: V.CV-V.CV. Gapapaiwa has a strong preference for CV syllables; therefore a truncation process applies and the first of the two vowels is deleted in this environment. (There are some exceptions to this rule which will make a good topic for another paper.)

V → Ø / ___ V

(8)  

a. ‘go.down’ oru (oru) (oru)(oru) (or)oru  
b. ‘fetch.water’ ivu (ivu) (ivu)(ivu) (iv)ivu  
c. ‘wallow’ uwara (uwa)ra (uwa)(uwa)ra (uw)uwara

There are a few one-syllable CVV verb roots. In these cases, the entire verb root is selected and reduplicated, then the truncation rule applies to delete the first of the two-vowel sequence.

(9)  

a. ‘go.up’ ghae (ghae) (ghae)(ghae) (ghe)ghae  
b. ‘smoke’ bau (bau) (bau)(bau) (bu)bau  
c. ‘garden’ vao (vao) (vao)(vao) (vo)vao
3.4 Reduplication with the causative prefix

Gapapaiwa has a complicated system of derivational prefixes, some of which are bleached semantically while others are still productive. When a derivational prefix is present on a verb root, the prefix is considered part of the stem and it often (but not always) reduplicates instead of the verb root. This pattern is unusual since the reduplicant is restricted to the one-syllable derivational prefix instead of the two-syllable leftmost metrical foot. In an exhaustive analysis, constraints should be posited to compel this.

The most productive derivational prefix is the causative \textit{vi} which is an example of this pattern. The causative raises the valence of the verb root and is also used to communicate volition or intentionality of an action. The basic verb root \textit{tava} ‘cook’ is intransitive. When the causative prefix is present, the prefix reduplicates rather than the first metrical foot of the verb root.

\begin{alignat}{2}
\text{(10) a. } & \text{Siya } \text{i-tava} & \quad \text{(11) a. } & \text{Siya } \text{a-vi-tav-i} \\
& \text{meat 3-cook} & \quad & \text{meat 1s-CAUS-cook-3s} \\
& \text{\textit{The meat is/was cooked.}} & \quad & \text{\textit{I cooked the meat. (I caused the meat to cook)}}
\end{alignat}

\begin{alignat}{2}
\text{b. } & \text{Siya } \text{i-tava-tava} & \quad \text{b. } & \text{Siya } \text{a-vi-vi-tav-i} \\
& \text{meat 3-RED-cook} & \quad & \text{meat 1s-RED-CAUS-cook-3s} \\
& \text{\textit{The meat is/was cooking.}} & \quad & \text{\textit{I was cooking the meat.}}
\end{alignat}

4. Constraints

Nine constraints apply to reduplication patterns in Gapapaiwa. They are \textit{MAX[root]}, \textit{RED=FOOT\_L}, \textit{MAX[BR]}, \textit{*REPEAT[syl]}, \textit{ALIGN[Red,R,Stem,L]}, \textit{*VV}, \textit{RIGHTANCHOR[BR]}, \textit{CONTIG[BR]}, and \textit{MORPHREAL}. The definitions of these constraints follow.

4.1 Preservation of the verb root: \textit{MAX[root]}

\textit{MAX[root]} is a faithfulness constraint that states that every segment of a root’s input has a correspondent in the output. Deletion of any segment in the root will result in a violation (Sample violation: ta→a) (McCarthy and Prince 1995)

4.2 Reduplicate one foot: \textit{RED=FOOT\_L}

This constraint states that a reduplicant equals the leftmost metrical foot of the base. This constraint assigns a violation for any syllable missing in the reduplicant that exists in the underlying form of the leftmost metrical foot of the base. It also assigns a violation for each syllable in the reduplicant that is extra, that does not have a correspondent syllable in the leftmost metrical foot of the base. (Downing 2000)

4.3 Reduplicate the entire verb root: \textit{MAX[BR]}

\textit{MAX base to reduplicant} is a faithfulness constraint that states that every segment of the base has a correspondent in the reduplicated form; in other words, reduplication is total.
Violations are assigned for each segment which is present in the underlying base form but is not present in the reduplicant. (Sample violation: RED+taki→tataki) (McCarthy and Prince 1995)

4.4 Prohibition of a repeated syllable: *REPEAT[syl]

The process of haplology prevents the repetition of the same syllable in Gapapaiwa. A violation incurs any time identical syllables are adjacent. (Sample violation: tete) (Yip 1995, Kennard 2004)

4.5 Alignment of reduplicated form: ALIGN[Red,R,Stem,L]

This morphological constraint aligns the right edge of the reduplicant with the left edge of the stem. It assigns violations for any reduplicant which is aligned elsewhere, specifically after the base of the verb instead of before. (Sample violation: RED+katapa→katapakata) (Downing 2000)

4.6 Prohibition of vowel sequence: *VV

This constraint assigns a violation for any two vowels in sequence. Truncation deletes one vowel of the two vowel sequence in this language, but this process does not apply to CVV syllables in the base because it is dominated by MAX[root]. It reflects the strong preference in Gapapaiwa towards optimum CV syllable structure. (Sample violation: taetae) (Casali 1997, Hayes and Wilson 2008)

4.7 Preservation of rightmost segment in reduplicant: RIGHTANCHOR[BR]

RIGHTANCHOR base to reduplicant means that the final element in R is anchored to the final element in B so that the segments are identical. It is a faithfulness constraint that is violated by the deletion of a segment at the right edge of a reduplicant when that segment corresponds to the right edge of the base. (Sample violation: RED+tapo→taptapo) (McCarthy and Prince 1993, 1995)

4.8 Preservation of contiguous segments in the reduplicant: CONTIG[BR]

CONTIGUITY base to reduplicant is a faithfulness constraint which requires that a string of contiguous segments in a base must correspond to the same contiguous string in the reduplicant. It is violated when a sequence of segments which exists in the input is broken in the output, either a medial gap caused by deletion or a medial segment added by epenthesis. (Sample violation: RED+t’il.par.ku →t’il.pa+t’il.par.ku) (McCarthy and Prince 1995)

4.9 Preservation of a morpheme: MORPHREAL

Morpheme realization pertains to exponence, requiring that some overt representation of a morpheme be present in the output candidate. This faithfulness constraint preserves a morphological element from being eliminated entirely in the output form. In the specific context of reduplication, at least some feature of the phonetic representation of the reduplicant must
survive in the output candidate and a violation results when the reduplicant is completely absent in the output. (Sample violation: RED+tou→tou) (Golston 1995)

5. Tableaux demonstrating crucial rankings

The following tableaux investigate sets of constraints in order to determine their relative dominance. In tableau (12) the verb root oru begins with a vowel, so the reduplication creates a two vowel sequence in the faithful candidate a (reduplicants are underlined). This violates the constraint *VV. However MAX[root] dominates this, so deleting the initial vowel in the verb root in candidate b causes a fatal violation. RIGHTANCHOR[BR] and MAX[BR] must be dominated by *VV in order to knock out faithful candidate a. So the optimal candidate is c, which deletes the last vowel in the reduplicant in order to produce a CV pattern in the output. This tableau makes it clear that *VV dominates both RIGHTANCHOR[BR] and MAX[BR].

(12) Input: /RED+oru/ ‘going down’

<table>
<thead>
<tr>
<th></th>
<th>Max[root]</th>
<th>*VV</th>
<th>RIGHTANCHOR[BR]</th>
<th>MAX[BR]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>______oruoru</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>______oru</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>______oru</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

In tableau (13) the verb root nipowana is four syllables long. Therefore the faithful candidate a, which reduplicates the entire verb root, is assigned two violations for exceeding RED=FOOTL by two syllables. The first violation is fatal. In a similar fashion, reduplicating three syllables of the verb root in candidate b causes one violation of RED=FOOTL, in addition to two violations of MAX[BR] for not reduplicating two segments present in the verb root. This knocks it out as well. Candidate d does not have any reduplicant at all, causing it to fatally violate MORPHREAL as well as MAX[BR] eight times (for leaving out all eight segments of the verb root). So candidate c is the winner even though it incurs four non-fatal violations of MAX[BR] for lacking four of the segments of the verb root in the reduplicant. This tableau demonstrates that RED=FOOTL dominates MAX[BR].

(13) Input: /RED+nipowana/ ‘praying’

<table>
<thead>
<tr>
<th></th>
<th>RED=FOOTL</th>
<th>MORPHREAL</th>
<th>MAX[BR]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>______nipowananipowana</td>
<td><em>!</em></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>______nipowananipowana</td>
<td>*!</td>
<td>**</td>
</tr>
<tr>
<td>c.</td>
<td>______niponipowana</td>
<td></td>
<td>****</td>
</tr>
<tr>
<td>d.</td>
<td>______nipowana</td>
<td></td>
<td>*! **********</td>
</tr>
</tbody>
</table>
In tableau (14) the verb root *reregha* has three syllables, of which the first two are identical. This causes two violations of *REPEAT*[syl]. Candidate *a* satisfies RED=FOOTL because the first metrical foot is reduplicated, but it violates MAX[BR] twice because it fails to reduplicate the last syllable in the root. However, *REPEAT*[syl] knocks it out because of the two identical syllables in the reduplicant. Candidate *c* is faithful to MAX[BR] by reduplicating the entire root but *REPEAT*[syl] also knocks it out with one extra violation for the repeated syllables, which is fatal. That leaves candidate *b* as the preferred candidate which has four non-fatal violations of MAX[BR] because the reduplicant is lacking two of the syllables that are present in the verb root.

<table>
<thead>
<tr>
<th>Tableau (14) Input: /RED+reregha/ ‘distributing’</th>
<th>MORPHREAL</th>
<th><em>REPEAT</em>[syl]</th>
<th>RED=FOOTL</th>
<th>MAX[BR]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. rerereregha</td>
<td>****!</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. rere* reregha</td>
<td>***</td>
<td>*</td>
<td>****</td>
<td></td>
</tr>
<tr>
<td>c. rereghareregha</td>
<td>****!</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. reregha</td>
<td>*!</td>
<td>**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In tableau (15) candidates for the reduplicated verb root *verau* are presented. As already demonstrated, the faithful candidate *a* that satisfies MAX[BR] is knocked out by *VV. Candidate *c* violates the constraint ALIGN[Red,R,Stem,L] because the reduplicant occurs after the verb root instead of before it. Candidate *d* violates the requirements of CONTIG[BR] which states that a contiguous substring of segments in the base must be preserved in the output candidate so that the same corresponding substring is also present in the reduplicant. So candidate *b* is the preferred candidate, demonstrating that CONTIG[BR] must dominate RIGHTANCHOR[BR].

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. verauverau</td>
<td>***!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. verauverau</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. verauvera</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. veruverau</td>
<td>*</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In tableau (16) the verb root *ekwa* begins with a vowel, which once again results in a fatal violation of *VV in the faithful candidate *a* when the reduplication of the first foot occurs. MAX[root] eliminates candidate *b* and thus protects the first vowel in the verb root from truncation. Candidate *c* is the winner, proving that MAX[root] and *VV must both dominate RED=FOOTL.
6. Comprehensive tableaux

The following tableaux (17) through (20) give a summary of the constraint rankings in Gapapaiwa reduplication, using four different inputs: kavara ‘carry’ (17), pupuni ‘erase’ (18), tou ‘cry’ (19) and uma ‘drink’ (20).

16. Input: /RED+ekwa/ ‘searching’

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ekwaekwa</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. ekwakwa</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. ekwekwa</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. Input: /RED+kavara/ ‘carrying’

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kavarakavara</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. kakavara</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. kavarakava</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>d. kavakavara</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. kavara</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

18. Input: /RED+pupuni / ‘erasing’

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. pupunipupuni</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. pupunipupu</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. pupupupuni</td>
<td></td>
<td></td>
<td></td>
<td>***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>d. pupupupuni</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. pupuni</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>
7. Crucial rankings of constraints and Hasse diagram

Based on the data in the tableaux, the following constraints are crucially ranked:

\[
\begin{align*}
\text{MAX[root]} & \rightarrow \text{RIGHTANCHOR[BR], RED=Foot}_L \\
*VV & \rightarrow \text{RIGHTANCHOR[BR], RED=Foot}_L \\
\text{RED=Foot}_L & \rightarrow \text{MAX[BR], RIGHTANCHOR[BR]} \\
\text{MORPHREAL} & \rightarrow \text{MAX[BR], RIGHTANCHOR[BR], *REPEAT[syl], RED=Foot}_L \\
\text{ALIGN[Red,R,Stem,L]} & \rightarrow \text{RIGHTANCHOR[BR]} \\
\text{CONTIG[BR]} & \rightarrow \text{RIGHTANCHOR[BR]} \\
*\text{REPEAT[syl]} & \rightarrow \text{RED=Foot}_L
\end{align*}
\]
8. Conclusion

Optimality Theory provides an excellent framework for identifying and documenting the phonological processes that occur in Gapapaia verbal reduplication. The interplay between markedness and faithfulness constraints is an interesting concept to work with. The assumption that constraints can be violable and that dominance ranking is language specific enables a phonologist to account for the amazing variety in languages around the world while at the same time working within the reasonable boundaries of language universal typologies.

Abbreviations

1s first person singular
3s third person singular
CAUS causative prefix
Past past tense
RED reduplicant
Subj subject

References


