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ONSET PROMINENCE IN OPTIMALITY THEORY*

ABSTRACT: Onset-influenced stress continues to attract debate in phonology and has been given various treatments in the literature. There are proposals arguing for moraic onsets (e.g., Topintzi 2004, Gordon 2005) as well as those, like the present one, appealing to the idea of onset prominence (e.g., Hayes 1995:271-6; Goedemans 1998:111; 132).

In this paper, stress in Arrernte and Pirahã, two languages purported to have onset-influenced stress, is analysed as a result of the ranking between general stress-related constraints and Onset Prominence constraints in Optimality Theory (Prince & Smolensky 1993/2004). The idea of onset prominence outlined here is based on the intuition that onsets demarcate the left-edge of syllables. Sonority, as outlined in Clements (1990), plays a critical role in determining how some consonants are better left-edge demarcators than others leading to a fixed universal ranking among the constraints within the Onset Prominence family.

KEYWORDS: onset prominence, sonority, stress, edge asymmetry, syllable weight

0. INTRODUCTION

The role of onsets in syllable weight continues to remain a matter of controversy. While traditional moraic theory (Hyman 1984; Hayes 1989; McCarthy & Prince 1986, 1990) maintains that onsets are weightless, there have been challenges to this position on empirical grounds (Everett & Everett 1983, 1984; Everett 1988; Topintzi 2004; Gordon 2005).

In this paper, I review onset-influenced stress in Pirahã and Arrernte (a. k. a. Western Aranda) and offer an analysis that is compatible with the position that onsets are weightless. Onsets in Pirahã not only influence stress in general, but syllables with a certain type of consonant in the

*Thanks to Lian-Hee Wee for his feedback on an earlier version of this paper. I would also like to thank the anonymous reviewer(s) for their helpful comments which have improved the draft considerably. Errors that remain are mine.

The EFL Journal 3:2 June 2012.
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onset (i.e. voiceless obstruents) are also preferably stressed over those with another type (i.e. voiced obstruents). In Arrernte, when the initial syllable is onsetless, stress “moves” from this syllable to the second syllable, which always has an onset, in tri-syllabic (or longer) words.

The analysis below is based on the idea of onset prominence (see Hayes (1995:271-5), Goedemans (1995:111) and Gordon (2005) for various interpretations). Specifically, onset prominence is interpreted here in terms of the demarcating property of onsets at the left-edge of syllables, and manifests as stress only when weight-related criteria are irrelevant or inadequate in deciding a unique syllable to stress. A family of constraints in Optimality Theory called Onset Prominence (ON-PROM) is proposed and argued for. The stress patterns will be seen to follow from the ranking between these and the other constraints in charge of stress.

Following this introduction, section 1 exemplifies the central issues with data from Arrernte and Pirahã. In section 2, the Onset Prominence constraints are proposed and the rationale underlying their formulation discussed. Section 3 sketches representative analyses for Pirahã and Arrernte and argues for the simpler version of ON-PROM adopted in the analysis of Arrernte to be basic. Section 4 concludes the paper with a summary of the important predictions.

A remark about the transcription is germane at this point. The words given in the dataset are all outputs or surface representations. In the running text (and notes), the outputs will be enclosed within square brackets, i.e. [output]. Inputs are used in tableaux and are enclosed within slashes, i.e. /input/. Syllable boundaries will be marked by the period ‘.’.

1. DATA

1.1 Pirahã
In the Amazonian language Pirahã (Everett & Everett 1983, 1984; Everett 1988) stress is independent of tone. Contrastive vowel length plays a key role with regard to stress, restricted to a tri-syllabic window at the
right-edge. All the data in (1) below are from Topintzi (2004:212). Since the accents mark tone, stressed syllables are marked in boldface.

\[ P = \text{voiceless obstruent}; \ B = \text{voiced obstruent (essentially stop)}; \ V = \text{short vowel}; \ VV = \text{long vowel}; > = \text{‘preferred over’} \]

1

(1)

\begin{enumerate}
\item \( PVV > BVV \)
\begin{itemize}
\item \( \text{pà.hài.bí} \) \quad \text{‘proper name’}
\item \( \text{pii.bi.gá́i} \) \quad \text{‘deep water’}
\end{itemize}
\item \( BVV > VV \)
\begin{itemize}
\item \( \text{bii.oá.ii} \) \quad \text{‘tired (lit: being without blood)’}
\item \( \text{gao.ii} \) \quad \text{‘proper name’}
\end{itemize}
\item \( VV > PV \)
\begin{itemize}
\item \( \text{pia.hao.gi.so.ai.pi} \) \quad \text{‘cooking banana’}
\end{itemize}
\item \( PV > BV \)
\begin{itemize}
\item \( ?\text{a.ba.gi} \) \quad \text{‘toucan’}
\item \( ?\text{ia.bi.ka.bi.ka.bi} \) \quad \text{‘proper name’}
\end{itemize}
\item \( \text{rightmost heaviest (when there is a tie)} \)
\begin{itemize}
\item \( \text{páo.hoa.hai} \) \quad \text{‘anaconda’}
\item \( \text{ti.po.gi} \) \quad \text{‘species of bird’}
\end{itemize}
\end{enumerate}

When there is a syllable with a long vowel within the tri-syllabic window, this syllable is stressed (cf. (1c)). Curiously, when vowel length\(^1\) cannot decide on a unique syllable to stress, the presence of an onset does. If there is a tie, a syllable with a voiceless onset, rather than a syllable with a voiced one, is stressed (cf. (1a, d)). If the tie remains unbroken, the rightmost heaviest syllable is stressed (cf. (1e)).

From the data in (1a-e) it is clear that a VV syllable always attracts stress over V syllables. Rhyme, in this case nucleus, weight is therefore the prime determinant of stress even in Pirahà. It can also be observed that the language allows vowel hiatus across the board. Trivially, only a

\(^{1}\) The data from Topintzi (2004) suggest that there are no codas, which may be another reason for burdening onsets with stress-related duty.
language that allows medial onsetless syllables can plausibly rely on medial syllables with onset to influence stress.

The core of Topintzi’s (2004) analysis of the stress pattern in Pirahã involves moraic voiceless onsets. The constraint weight-to-stress (Nucleus) outranks weight-to-stress (Margin) applicable only to voiceless onsets. While the analysis accounts for the facts, a constraint like weight-to-stress (Margin) is suspect from two directions. First, the Weight to Stress Principle (WSP)\(^2\) generally conceived calls for heavy syllables to be stressed, consequently unifying CVV and CVC syllables in languages where both these types of syllables are heavy. Weight-to-stress (Margin), however, seems to call for a certain type of onset (independent of the nucleus) to be stressed. Second, it is clear from (1) that onsets break weight-related ties. They need not be moraic themselves to do so.

Topintzi’s proposal requires voiceless onsets, not voiced ones, to be moraic\(^3\) to ensure that syllables with voiceless onsets are stressed when neither nucleus weight nor the mere presence of an onset is adequate in deciding which syllable to stress (cf. (1a, d) above). BVV, VV and PV syllables are all bimoraic now, the first two because of the long vowel and the last because of a short vowel plus a moraic voiceless onset. To ensure that a VV syllable is stressed when it competes with a PV syllable Topintzi ranks weight-to-stress (Nuc) over weight-to-stress (Margin) even as the preference for BVV syllables over VV ones (and BV over V) is captured through a constraint that aligns the left-edge of a stressed syllable with a consonant (a variation on Goedemans’ (1998:165) proposal). The effects of the alignment constraint will be epiphenomenal in the analysis outlined below (see 3.1). More importantly, the constraint weight-to-stress (Margin) will not be required because onsets are not moraic in the current proposal.

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\(^2\) See Kager (1997) for two interpretations of the Weight-to-Stress Principle, based on: (i) whether a syllable is stressed; and (ii) whether a syllable is footed (at all).

\(^3\) Evidently, this is related to the fact that voiceless segments in the present-day language have evolved from geminates (Topintzi 2004:215; Everett 1988).
1.2 Arrernte

Arrernte, an Arandic language spoken in Australia, is discussed in Davis (1988) and Gordon (2005). Goedemans (1998, Ch. 5) cites initial (primary) stress and trochaicity as areal features of the languages spoken in the region. In Arrernte, however, default initial stress is realised only when a word begins with a consonant (see (2a) and (2c-i, ii) below). Absent a word-initial onset, stress falls on the second syllable (see (2b)) in words with more than two syllables. Disyllables (see (2c)), however, are stressed initially. Vowel length is not phonemic\(^4\) in the language. The data cited are from Goedemans (1998:154) and Davis (1988:1); primary stress is marked with an acute accent and secondary stress with a grave accent:

(2)

\[(a)\]

(i) káputa ‘head’

(ii) wóratàra ‘place name’

(iii) lélantìnama ‘to walk along’

(iv) kútungùla ‘ceremonial assistant’

\[(b)\]

(i) ibátja ‘milk’

(ii) arálkama ‘to yawn’

(iii) ulámbulàmba ‘water-fowl’

(iv) utnádawàra ‘place name’

(v) artánama ‘place name’

(vi) ergúma ‘seize’

\[(c)\]

(i) gúra ‘bandicoot’

(ii) lánba ‘armpit’

(iii) éra ‘he, she, it’

(iv) ílba ‘ear’

(Primary) Stress on the second syllable when the first is onsetless in tri-syllabic and longer words has been taken as an argument for onset-influenced stress\(^5\) in Arrernte. Goedemans (1998:136-141), however, shows that this inference is not entirely convincing. He refers to a process called Initial Dropping by which certain languages in the region lost their initial syllables causing stress to land on the (formerly second, presently) initial syllable.

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\(^4\) The language appears to adopt syllabic trochees. In those words where a closed syllable does get stressed (see (2b-i, ii, iii) and (2c-ii, iv)) it seems to be because of the quantity-insensitive trochaic pattern. It is for the same reason that the closed second syllable in (2a-iii, iv) is not stressed.

\(^5\) There is also the radical proposal that all consonants are syllabified as codas at the word level in Arrernte (Breen & Pensalfini 1999).
Furthermore, in Mbaram, a language where Initial Dropping was attested, (former) initial syllables with long vowels left behind a default [a] considered defective for stress arguably because of its ‘residual’ status. Goedemans extends Initial Dropping and the defective status with respect to stress of vowel-initial first syllables to Arrernte, which makes onsetless initial syllables in the language ‘unstressable’. His Optimality-theoretic account (Goedemans 1998:165-6) captures this insight through a constraint that calls for the alignment of the left-edge of a stressed syllable with a consonant, whereas higher-ranked Nonfinality ensures initial stress in disyllabic words (Gordon 2005).

My analysis of Arrernte below will adopt alignment (McCarthy & Prince 1993) only to account for default initial stress. Non-initial stress will be shown to follow from the ranking of Onset Prominence constraints relative to the alignment constraint in question.

2.0 PRELIMINARIES AND CONSTRAINTS

2.1 Onset prominence
There have been many interpretations of prominence in the literature vis-à-vis onset-influenced stress. Hayes (1995:276) in his analysis of Pirahã marks prominence on a metrical grid by which PVV syllables have five grid marks, BVV four, VV three, PV two and V one. As Topintzi (2004:212) remarks such scales are arbitrary. Moreover, considering a PVV syllable to be more prominent intrinsically than a BVV syllable is as arbitrary as the claim that a PVV syllable has four moras and a BVV syllable has three.

Goedemans’ (1998:132-3) view of prominence is also metrical along the lines of Liberman & Prince (1977) and Kiparsky (1981). In this view, the higher the levels at which a segment is projected the more prominent it is. For instance, a non-moraic coda (like an onset) would have a marking only at the lowest level (Level 1) whereas the moras (‘µ’) of moraic elements would be projected at the next higher level (Level 2) as well. A moraic coda would receive its highest mark at Level 3 but the nucleus, being the syllable head and the most prominent element in a syllable, will
also be projected at Level 4 (see (3) below; adapted from Goedemans (1998:132)). This is similar to the implementation of stress in metrical theory where main stress has the “tallest grid column” and every subsequent level of stress has shorter columns.

(3)

<table>
<thead>
<tr>
<th>Level 4</th>
<th>x</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 3</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Level 2</td>
<td>μ</td>
<td>μ</td>
</tr>
<tr>
<td>Level 1</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Onset</td>
<td>Nucleus</td>
<td>(Moraic) Coda</td>
</tr>
</tbody>
</table>

Gordon (2005) defines prominence in terms of perception as intensity, i.e. loudness over time. By this proposal, if intensity is greater for a combine, e.g., PVV, compared to another, e.g., BVV, then the former is more prominent (see also Gordon (2002)). Gordon argues further for a correlation between the actual prominence values and onset moraicity.

Onset prominence in my proposal relates simply to the demarcating property of onsets at the left-edge of syllables. The hypothesis is that syllables with a consonantal beginning can be perceived stronger than those with a vowel beginning. By extension, a syllable which begins with a certain type of consonant (voiceless obstruents, for instance) can be still better perceived than a syllable which begins with another type of consonant (e.g., voiced obstruents or sonorants). This intuition will go into the formulation of the Onset Prominence constraints below.

The aforementioned interpretation of onset prominence is fed by important ideas found elsewhere in the literature. The prominence-as-demarcation view ties in with processes of fortition and lenition which make edges of prosodic categories (essentially syllable and feet) more and less salient respectively. Voiceless and voiced obstruents represent one phonological manifestation of fortis and lenis segments (see Bye & de Lacy (2008) and references therein; see Kager (1993:415) for a case of foot-initial consonant fortition from Chugach). The interpretation is also in line with the argument (Goedemans 1998:146-7) that it is not the intrinsic prominence of the consonant in the onset that matters but the sonority difference between this consonant and the following vowel that does:
the steeper the transition from onset to nucleus the easier to perceive it will be. This argument in turn ties in well with a central idea in Clements’ (1990:284, 301): the preferred syllable type according to the Sonority Cycle must rise maximally at the beginning (i.e. towards the nucleus). Consequently, syllables with low-sonority onsets (voiceless obstruents), which make the CV transition steeper, receive stress when competing with syllables which have higher-sonority onsets (voiced obstruents) in Pirahã. Finally, natural languages tend to privilege the left-edge, rather than the right-edge, of prosodic and morphological categories in specific ways (McCarthy & Cohn 1994:50; McCarthy & Prince 1993:56; Beckman 1998; Bye & de Lacy 2000; Hyman 2005). Onset prominence as left-edge demarcation can be considered an extension of this asymmetry to the syllable level, which can in turn be tied to the absence of word-medial onset-less syllables in many languages.

Pursuant to the discussion here, the Onset Prominence (ON-PROM) constraints will be proposed in 2.2, followed by an introduction of the other constraints with which they interact.

2.2 Constraints

Gordon (2005:43) also proposes a set of prominence constraints relativised to onsets. While the present proposal is guided by Gordon’s, it differs from his in crucial ways. Firstly, it is based on a harmonic scale whereby the relative prominence of consonants in the onset is inversely proportional to their sonority (Prince & Smolensky 1993/2004:155). Secondly, the harmonic scale entails that the ranking of the constraints derived from it is fixed. Finally, the markedness constraints I will propose are positively defined. Read in terms of the harmonic scale in (4) below, the constraints do not assert that an onsetless syllable cannot be prominent, but only that it is less prominent than a syllable with a sonorant onset.

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6 Clements’ (1990) sonority scale is stricter though. According to him, all obstruents, whether voiceless or voiced, are equally sonorous. The proposal here is, however, much closer to Jespersen’s (1904) sonority scale according to which voiceless obstruents are less sonorous than voiced obstruents. See also Steriade (1982:98; 221).

7 Gordon (2005:47) argues for negatively defined Onset Prominence constraints based on binary secondary stress in Banawá: e.g., [i.bú.fa] ‘to dump into water’; [u.wí.a] ‘to go out of fire’; [u.wá.ri.a] ‘one’ versus [wá.ra.bú] ‘ear’; [wánakùri] ‘spider’ (p. 24). However, the Banawá data are also amenable to analyses without such negative marking.
which in turn is less prominent than a syllable with a voiced onset and so on. While this may just be a difference in formulation, I assume it reflects the empirical reality more accurately.

2.2.1 Onset Prominence (ON-PROM)

The Onset Prominence Harmonic Scale is posited in (4) below, based on Goedemans’ (1998:155) proposal which itself reflects Clements’ (1990:304) idea that the preferred initial demisyllable, i.e. CV in a CVC syllable, maximises the sonority distance between C and V. (‘P’ = voiceless obstruents; ‘B’ = voiced obstruents; ‘R’ = sonorants; and Ø = lack of an onset; subscript ‘On’ stands for onset; ‘>’ = ‘preferred over’).

(4) Onset Prominence Harmonic Scale

\[ P_{On} > B_{On} > R_{On} > \emptyset_{On} \]

Prince & Smolensky’s (1993/2004) constraint alignment derives markedness constraints from harmonic scales whereby the markedness constraint militating against the most harmonic element is least-ranked\(^8\); and so on. Since the ON-PROM constraints below are positively defined, the elements in the harmonic scale and the corresponding markedness constraints are in the same order (compare (4) and (5)):

(5) ON-PROM\(^9\)

- \( PROM-P_{On} \): A syllable with a voiceless consonant in the onset is prominent
- \( PROM-B_{On} \): A syllable with a voiced obstruent in the onset is prominent.

\(^8\) See Gouskova (2003) for a ‘lenient’ interpretation whereby the most harmonic element in a scale is not under the scope of any markedness constraint.

\(^9\) The proposed ON-PROM hierarchy is based on sonority with respect to the feature [voice]. It is conceivable to think of ON-PROM in terms of other segmental properties or features as well. Geminate onsets provide a case in point. In Pattani Malay (Hajek and Goedemans 2003), syllables with word-initial geminates receive primary stress. Muller (2002) argues that word-initial geminates in Greek are tenser than their singleton counterparts. If “tenseness” proves to be a property that characterises word-initial geminates cross-linguistically, we could have \( PROM-Tense_{On} \gg PROM-Lax_{On} \) for languages where initial geminates are comprehensively syllabified in the onset and influence stress. Elsewhere, Calabrese (2009) argues that pre-consonant gemination in Sanskrit was motivated by the need to eliminate complex onsets (through root-spreading), which may itself be regarded as a strategy to make the sonority distance from onset to nucleus as steep as possible. This accords well with the general interpretation of onset prominence outlined in 2.1.
The ranking of the constraints in (5) is fixed given the sonority-based
type behind it. If ON-PROM does influence stress at all (based on its
ranking with other constraints) and if stress looks further at the class of
onsets (like in Pirahã) we would always expect syllables with voiceless
onsets to be stressed vis-à-vis those with a voiced onset. However, a
simpler version of ON-PROM will be shown to be adequate in the analysis
of Arrernte where as seen in 1.2 the mere presence of an onset is
sufficient to determine the stressed syllable. In 3.3, I will argue that the
simpler version is basic and must be expanded as (5) only when empirical
evidence so dictates.

2.2.2 The other constraints

If onset prominence influences stress only when other constraints in
charge of stress fail, ON-PROM has to be dominated by these constraints
given below. The constraint rankings will be worked out in section 3.

(6) **WSP** *(Weight-to-Stress Principle)*

Heavy syllables are stressed.

WSP is relevant in Pirahã which has phonemic vowel length but irrelevant
in Arrernte which does not. Recall that there is no need for weight-to-
stress (Margin) because onsets are non-moraic in this account.

The constraint that determines default initial stress in Arrernte is:

(7) **ALIGN-L** *(Stressed-σ, PrWd)*

Stressed syllables must be left-aligned with the Prosodic Word.

Whereas Pirahã allows final stress as a last resort, Arrernte never does
even if stress has to end up on an onset-less initial syllable in disyllabic
words. The constraint in (8) is therefore necessary.

(8) **NONFINALITY** *(Prince & Smolensky 1993/2004:45)*

The prosodic head of the word does not fall on the word-final syllable.

Finally, the ad-hoc constraint in (9) captures the window within which
the stressed syllable must be located in Pirahã.
Onset prominence in Optimality Theory

(9) \( *\text{EXTENDEDLAPSE-RIGHT} \) (*ELR) (Gordon 2005:45)

There cannot be more than two consecutive stressless syllables at the right-edge of a word.

I will also appeal to Topintzi’s (2004) \( \text{ALIGN-HEAD-RIGHT} \), which though outranked by other constraints, is responsible for final stress by default in Pirahã. Representative analyses of the Pirahã and Arrernte stress patterns are presented in section 3. Since unstressed words is not an option in either language, the constraint \( \text{LxWd=PrWd} \) must be undominated. Candidates without stress will be excluded from the tableaux.

3.0 THE ANALYSIS

3.1 Pirahã

The constraints that underlie the stress pattern in Pirahã are those of \( \text{ON-PROM} \), \( \text{WSP} \) and \( *\text{ELR} \). Since stress never crosses the three-syllable window at the right edge \( *\text{ELR} \) is never violated, so it has no significant role to play in the analysis.

The crucial interaction, then, concerns \( \text{ON-PROM} \) and \( \text{WSP} \). It is clear that \( \text{WSP} \) dominates \( \text{ON-PROM} \) from words where stress lodges on an onset-less syllable with a long vowel rather than a short-vowelled syllable with an onset. Preferred stress on a syllable with a voiceless onset over a syllable with a voiced one (when there is a tie in vowel length) falls out of the (fixed) ranking among the constraints in \( \text{ON-PROM} \). Finally, \( \text{ALIGN-H(EA)D-R} \) should be dominated by the other constraints since rightmost stress is ‘last resort’. The ranking in (10) is responsible for the stress pattern in Pirahã and is played out in the tableaux below:

(10) \text{Constraint ranking for Pirahã} \\
\text{WSP} \gg \text{PROM-P}_{\text{ON}} \gg \text{PROM-B}_{\text{ON}} \gg \text{PROM-R}_{\text{ON}} \gg \text{PROM-Ø}_{\text{ON}} \gg \text{ALIGN-HD-R}

In keeping with the general convention in Optimality Theory, ‘\( \pound \)’ marks optimal candidates, ‘\( * \)’ marks constraint violation and ‘\( *! \)’ marks fatal violation of constraints below. Square brackets encode the three-syllable window at the right-edge.
(11) $VV > PV$

<table>
<thead>
<tr>
<th>/piahaogisoaiipi/</th>
<th>WSP</th>
<th>PROM-P</th>
<th>PROM-B</th>
<th>PROM-R</th>
<th>PROM-Ø</th>
<th>ALIGN-HD-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. pia.hao.gi[so.ai.pi]</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. pia.hao.gi[so.ai.pi]</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>c. pia.hao.gi[so.ai.pi]</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

In (11), the second syllable from the right-edge is onset-less but has to be stressed because it has a long vowel while the competing syllables do not. In doing so, candidate (a) satisfies WSP and emerges optimal. Note that though PROM-Ø also favours the winner, it is too low-ranked to be decisive.

(12) $PVV > BVV$

<table>
<thead>
<tr>
<th>/piibigái/</th>
<th>WSP</th>
<th>PROM-P</th>
<th>PROM-B</th>
<th>PROM-R</th>
<th>PROM-Ø</th>
<th>ALIGN-HD-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. pii.bi.gái</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. pii.bi.gái</td>
<td>**!</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. pii.bi.gái</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In (12), candidate (b) violates undominated WSP twice and is ruled out. Candidates (a) and (c) both violate WSP once, leaving one of the two long-vowelled syllables without stress. Since candidate (a) respects PROM-P by stressing the syllable with a voiceless onset it emerges optimal, while candidate (c) which violates it loses the competition.

(13) $PV > BV$

<table>
<thead>
<tr>
<th>/?abagi/</th>
<th>WSP</th>
<th>PROM-P</th>
<th>PROM-B</th>
<th>PROM-R</th>
<th>PROM-Ø</th>
<th>ALIGN-HD-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ?a.ba.gi</td>
<td></td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. ?a.ba.gi</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. ?a.ba.gi</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
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</tbody>
</table>

The difference between (12) and (13) is that WSP is irrelevant in the latter while it was equally violated by two candidates in the former. The optimality vote is again down to the other constraints. PROM-P is the highest constraint violated by candidates (b) and (c) whereas PROM-B is the highest constraint violated (twice) by candidate (a). Candidate (a) is optimal due to Strict Domination of constraints.
(14) **Rightmost heaviest**

<table>
<thead>
<tr>
<th>/páohoahai/</th>
<th>WSP</th>
<th>PROM-P</th>
<th>PROM-B</th>
<th>PROM-R</th>
<th>PROM-Ø</th>
<th>ALIGN-HD-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>📅 a. páo.hoa.hai</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. páo.hoa.hai</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>!</td>
<td></td>
</tr>
<tr>
<td>c. páo.hoa.hai</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>!</td>
<td>!</td>
</tr>
</tbody>
</table>

The case in (14) is simple enough. When neither WSP nor ON-PROM can decide, the least-ranked ALIGN-HD-R chooses the candidate with stress on its rightmost syllable, namely (a).

The advantage of the analysis\(^{10}\) presented here is that onsets remain non-moraic. The ranking WSP >> ON-PROM reveals that onsets can influence stress only when competing syllables are tied over vowel length.

### 3.2 Arrernte

Recall (from 1.2) that Arrernte has only short vowels and adopts syllabic trochees (see note 4). WSP thus plays no role. ALIGN-L (Stressed σ, PrWd) (ALIGN-L for short) and ON-PROM, however, do interact. A simplified ON-PROM is adequate for Arrernte: PROM-C\_ON >> PROM-Ø\_ON. Only PROM-C\_ON will be visible though because even if PROM-Ø\_ON forces stress on an onset-less (initial) syllable, higher-ranked PROM-C\_ON will override it.

Stress on the second syllable in vowel-initial trisyllabic (or longer) words suggests the ranking: PROM-C\_ON >> ALIGN-L. Stress in disyllables is initial revealing the ranking: NONFINALITY >> PROM-C\_ON. The overall ranking in (15) will be exemplified in the tableaux below:

### (15) **Constraint ranking for Arrernte**

NONFINALITY >> PROM-C\_ON >> ALIGN-L.

---

\(^{10}\)This analysis could also find a logical complement in languages like Ao (Temsunungsang 2009: 62-8, 71-4) and Lithuanian (Steriade 1991) where only sonorant codas are considered moraic and Mizo where only sonorant codas license tones. Sonority-based Weight-by-Position (Zec 1995), or tonicity-by-position, may then be implemented as CODA-PROM with high-sonority codas being more prominent (and more likely to be moraic and/or tone-bearing).
(16) Stress on the second syllable

<table>
<thead>
<tr>
<th>/erguma/</th>
<th>NONFINALITY</th>
<th>PROM-C</th>
<th>ALIGN-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ér.gú.ma</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. er.gu.má</td>
<td>*!</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>c. ér.gu.má</td>
<td></td>
<td>**!</td>
<td></td>
</tr>
</tbody>
</table>

Candidate (c) in (16) respects ALIGN-L and NONFINALITY but violates PROM-C twice. Candidate (b) shares a PROM-C violation with candidate (a) besides violating undominated NONFINALITY. Candidate (a) stresses the second syllable, satisfies NONFINALITY and saves one violation of PROM-C to emerge optimal.

For a word with four-syllables, a hypothetical candidate stressed on the third syllable will have one more –gratuitous – violation of ALIGN-L, so a candidate with stress on the second syllable will still be optimal. In default-initial stress systems without medial onsetless syllables, stress can never cross the second syllable and ALIGN-L violations are minimised.

(17) Stress on the initial syllable

<table>
<thead>
<tr>
<th>/kaputa/</th>
<th>NONFINALITY</th>
<th>PROM-C</th>
<th>ALIGN-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ká.pu.ta</td>
<td></td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>b. ka.pu.tá</td>
<td>*!</td>
<td>**</td>
<td><em>!</em></td>
</tr>
<tr>
<td>c. ka.pú.ta</td>
<td></td>
<td>**</td>
<td>*!</td>
</tr>
</tbody>
</table>

All candidates in (17) violate PROM-C twice. NONFINALITY rules out candidate (b) and the competition between candidates (a) and (c) turns on ALIGN-L. Candidate (a) comes out optimal because its stressed syllable is left-aligned whereas the stressed syllable in candidate (c) is one syllable away from the left-edge.

(18) Disyllables: initial stress

<table>
<thead>
<tr>
<th>/ilba/</th>
<th>NONFINALITY</th>
<th>PROM-C</th>
<th>ALIGN-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ílba</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. ilbá</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Violating PROM-C is the only way to satisfy NONFINALITY, making candidate (a) with initial stress optimal.
Alyawarra has a stress pattern almost identical to Arrernte’s (Goedemans 1998:168). The difference is that vowel-initial disyllables are also stressed on the second syllable in this language. Ranking PROM-C above NONFINALITY derives the Alyawarra stress pattern.

3.3 ON-PROM – excursus

There is an empirical problem if ON-PROM as enunciated in (5) is taken to be basic. Repeated below for convenience as (19), it will predict unattested patterns in languages which merely look at the presence, not class, of onsets to determine the stressed syllable.

(19) $ON-PROM$

$$PROM-P_{ON} >> PROM-B_{ON} >> PROM-R_{ON} >> PROM-Ø_{ON}$$

Though ON-PROM was simplified as PROM-C >> PROM-Ø in the analysis of Arrernte (see 3.2), it is merely shorthand for (19) which is problematic against an input like /woratara/ that should come out as [wó.ra.ta.ra]. Since ALIGN-L is ranked below ON-PROM, however, primary stress would fall on the third syllable [ta] which has a voiceless onset, as opposed to the first two syllables which have sonorant onsets. NONFINALITY is irrelevant because [tá] would still satisfy it.

However, if PROM-C_{ON} >> PROM-Ø_{ON} is regarded basic, the problem disappears. This move seems correct as well. Empirical evidence has to dictate whether PROM-On has to be finer-grained like in (19) just like it has to dictate whether Weight-by-Position is relativised to word position (Rosenthal & van der Hulst 1999; Gordon 2004), or the sonority level of coda consonants (Zec 1995), or is retained as a parameter (Hayes 1989). Arrernte does not require the fine-graining; Pirahã does.

$PROM-C_{ON} >> PROM-Ø_{ON}$ could also be the driving force behind an interesting stress shift observed in doublets in Tamilian English (TE) (Vijayakrishnan 1978). For many speakers, English words beginning with [i, e] have a TE variant which begins with the front glide as in (20). Epenthetic consonants are ruled out presumably because of high-ranking DEP [Cons].
In the words in (20b) stress is ‘retracted’ from a heavy second syllable to a light initial syllable in the forms with the initial glide (arguably a rare case of PROM-C >> WSP). The data from TE may also be taken as evidence for the non-redundancy of PROM-RO within the Onset Prominence family.

The fact that PROM-C_ON >> PROM-Ø_ON is basic does not mean that the ranking in (19) can be tinkered with. In other words, there can be no language like Pirahã except that it prefers to stress syllables with voiced onsets over those with voiceless onsets, or a system like TE where an onset-less initial syllable is always stressed but one with a segmental onset need not be.

4 CONCLUSION

I have argued that the influence of onset prominence on stress in Arrernte and Pirahã follows from the ranking of ON-PROM with respect to ALIGN-L and WSP respectively. While maintaining the moraic-theoretic position that onsets are weightless, the proposal has demonstrated how onset prominence can manifest as stress when conventional criteria in charge of stress fail to pick out a unique syllable to stress.

In doing away with moraic onsets the proposal also predicts that there can be no regularised onset-weight stress systems like coda-weight ones. This is because the domination of ON-PROM by WSP, ALIGN and, arguably, other constraints like ONSET (i.e. ‘no word-medial vowel hiatus’) can give rise only to systems where the influence of onsets on stress is
positional (Arrernte) or gradient (Pirahā), not absolute. The fact that the present proposal ties in well with observations independently made for processes of lenition and fortition is also noteworthy. Specifically, ON-PROM has to do with left-edge demarcation of syllables and fortition has to do with strengthening the left-edges of syllables and feet.

The status of PROM-R<sub>on</sub> has to be investigated further. The case from TE is not clinching one way or another because only one type of onset is involved in the stress shift, the glide [j]. It would therefore be interesting to check if there are languages where syllables with obstruent onsets are generally stressed over those with sonorant onsets (or vice versa). This would help weaken or strengthen the place of PROM-R<sub>on</sub> within the Onset Prominence family.

REFERENCES


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