The Prosodic Word in Cushillococha Ticuna

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(North)western Amazonia is a tone hotspot, but its tone systems are relatively small.

- No more than two underlying tone heights -- at most /H, L, Ø/ (Hyman 2010)
- No more than three surface tone heights (Gomez-Imbert 2001)
- Low density of tones: not the case that every syllable comes pre-specified for tone
Introduction

Tone and stress are closely related in many of languages of western Amazonia:

- Tone is privative and licensed by stress
  - Hup (Epps 2005:123, 2008)
- Some tones are lexical, others are metrical
  - Iquito (Michael 2011)
  - Kashibo-Kakataibo (Zariquiey Biondi 2011)
Stress and tone in Cushillococha Ticuna

Ticuna is a major outlier among Amazonian tone languages (Anderson 1959; Montes 1995; Soares 2000).

- More tone heights and contours than any other Amazonian language
- Maximally high tone density

I argue that in addition to these tone properties, the Cushillococha dialect of Ticuna also displays stress.

- Stress licenses *additional* tone contrasts, rather than licensing tone.
- Stress conditions tonological processes.
Plan for today

1. Background: language, data, and fieldwork
2. Phonological and morphological background
3. Stress on nouns
4. Stress on verbs
5. Conclusions
The Ticuna macrolanguage

Spoken by 41,500-69,000 people in Colombia, Brazil, and Peru

Figure: Ticuna territory (map by Ministry of Transportation, Brazil)

- Classified as isolate/orphan (Carvalho 2009; Seifart & Echeverri 2014)
- Internal classification: at least 3 identifiable 'dialect' groups (Santos 2004; Montes 2004)
Fieldwork and data

Data in this talk: from 4 months of fieldwork in Cushillococha, Loreto, Peru in 2015 and 2016

- Cushillococha is a titled Ticuna community with ~3,000 people
- Most people in Cushillococha are dominant in Ticuna

I refer to the variety I study as 'Cushillococha Ticuna' (CT)

- Previous work on this variety by the SIL (Anderson 1959, 1962))
Table: Surface consonant inventory

<table>
<thead>
<tr>
<th></th>
<th>Labial</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiceless Stop</td>
<td>/p/</td>
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<td>/ʔ/</td>
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<td>Fricative</td>
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<tr>
<td>Nasal Stop</td>
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<td>/n/</td>
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<td>/ŋ/*</td>
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<tr>
<td>Approximant</td>
<td>/w/, /ʍ/*</td>
<td>/ɾ/</td>
<td></td>
<td>[j]</td>
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</tr>
</tbody>
</table>

* /ʍ/* and /ŋ/* are involved in changes in progress
Vowel inventory

Table: Vowel quality inventory

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<thead>
<tr>
<th></th>
<th>Front</th>
<th>Central</th>
<th>Back</th>
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<tbody>
<tr>
<td>High</td>
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<td>Mid</td>
<td>e</td>
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<td>o</td>
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<tr>
<td>Low</td>
<td></td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Rising Diphthong</td>
<td>ai</td>
<td></td>
<td>au</td>
</tr>
</tbody>
</table>

All vowel qualities can be nasal or oral. Nasality is a segmental feature, not a feature of the syllable or morph.
Tone is the fun part of the language:

- Five level tones -- written with numerals 1-5, 5 highest
- Four contour tones -- 31, 43, 41, 51

(1) Level tone contrasts:
Free word, V
a. 1: ă¹ 'row'
b. 2: ă² 'mosquito'
c. 3: ă³ 'give'
d. 4: ŋ⁴ 'copula verb'

(2) Level tone contrasts:
Free word, CV
a. 1: nă¹ 'stop crying'
b. 2: mũ² 'give:ANIM.OBJ'
c. 3: mu³ 'weave'
d. 4: mũ⁴ 'be numerous'
Tone: Tone 5

Tone 5 does not occur on 1σ lexical words, but it does occur on 1σ bound morphs. It also occurs on 2 + σ words.

(3) Tone 5 vs. other level tones
   a. 3 vs. 5: \( =\tilde{\iota}^3 \) 'accusative case' vs. \( =\tilde{\iota}^5 \) 'intransitive beneficiary case'
   b. 1 vs. 5: \( =na^1 \) 'dative case' vs. \( =wa^5 \) 'allative case'
   c. 3.1 vs. 3.5: po\(^3\)ri\(^1\) 'tobacco' vs. to\(^3\)ri\(^5\) 'turtle sp' (TG, \( \sim \) Omagua tarikaya)

Distribution and alternations indicate that all five of the level tones are phonemic.
Tone: Contour tones

Contour tones 31, 43, and 51 occur on lexical words. 41 is limited to grammatical morphs.

(4) Contour tone contrasts: Free word, V
   a. $\tilde{i}^{31}$ 'come/go/walk (pluractional)'
   b. $\tilde{u}^{43}$ 'come/go/walk (nonpluractional)'
   c. $i^{51}ra^1$ 'be small'
Laryngealization is contrastive on syllables with tone 1. It is a feature of the vowel and not due to glottal stop.

(5) Minimal and near-minimal pairs illustrating contrastive laryngealization

a. /a/: *ng¹ 'fall into trap' vs. *nã¹ 'stop crying'
b. /i/: *ŋi¹ 'steal' vs. *ŋi⁴ 'get married'
c. /e/: *ŋɛ¹ 'drop' vs. *ŋe³¹ 'be female'
d. /u/: *du¹ru¹ 'tremble' vs. *du¹ru¹ 'thunder'
e. /o/: *o¹ 'wound' vs. *o¹ 'fruit, generic'
f. /o/: *to¹ 'Night Monkey (*Aotus* sp)' vs. *to¹ 'other'
Morphology

Morphologically relevant word classes: nouns, adverbs, verbs

- Nouns are divided into inalienable and alienable nouns
  - Alienable nouns are prosodically independent words
    - $\text{ʔi}^5 \ 'grandfather, old man'$
    - $\text{ʔi}^5$ (1SG.POSS old.man) 'my grandfather'
  - Inalienable nouns (a) must be possessed and (b) behave as NP enclitics w/r/t their possessors
    - *$\text{ne}^1$ 'garden' unacceptable in isolation
    - $\text{ne}^1$ (1SG = garden) 'my garden'

- Verbs have extensive agreement and other morphology
- Nominal roots are typically disyllabic, verb roots are typically monosyllabic
Tone is much more conspicuous than stress in this language's phonology

- Maximally large tone inventory (Maddieson 1978)
- Maximally high tone density
- Many phonological processes affecting tone
- Extensive grammatical tone

So why talk about stress?

- All lexical phonological processes -- tonal and segmental -- are stress-conditioned
Stress on nouns

Nouns display a single stress on the first syllable. There are no other stresses.

- Alienable nouns: First syllable of the root
  - 'q¹ʔi⁵ 'old man, grandfather'
- Inalienable nouns: First syllable of the possessor
  - 'tfau¹ = a¹ne¹ 'my garden,' not tfau¹ = 'a¹ne¹

Adverbs and interjections pattern with nouns.
Evidence for stress

The stressed syllable displays:

1. Increased duration
2. Resistance to reduction in fast speech
3. Privileged phonotactic position
4. Privileged position in lexical phonology

Since 1 and 2 interact with sentence-level prosody, I focus on 3 and 4.
Stress: Phonotactics

The stressed syllable of a noun is phonotactically privileged
• /ʍ/, /d/, /ɲ/, /ŋ/, /au/, /ai/ allowed only in stressed syllable
• Contour tones allowed only on stressed syllable
(6) redisplaystheinventorywithphoneslicensedonlyin stressed syllables in red

(6) Segment and tone inventory by stress

<table>
<thead>
<tr>
<th>Consonants</th>
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<tr>
<td>Nuclei</td>
<td>/a e i o u i au ai/</td>
<td></td>
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<tr>
<td>Tones</td>
<td>1̰, 1, 2, 3, 4, 5; 31, 43, 51</td>
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</table>
Stress: Phonotactics

The syllable immediately following the stress is also privileged phonotactically:

- Stressed syllable can have /o/ regardless of onset
  - to¹ 'other,' do⁵¹wi¹ 'manioc bread,' o¹ 'wound'
- Following syllable can have /o/ only if its onset is ص or Ø
  - o²ʔo⁴ 'newborn baby,' ηo³ʔo¹ 'fish sp,' bo²ʔo³ 'plantain grub'
  - *(C₁)oC₂o where C₂ is supralaryngeal
- In later syllables, /o/ banned

Conclusion: /o/ is allowed in head foot of the prosodic word. Other marked segments allowed only in head syllable.
Two common lexical phonological processes apply only to stressed syllables.

1. Assimilation of noncentral vowel-/ɨ/ sequences
2. Dissimilation of /˧-˧/ tone sequences
Stress-Conditioned Processes: /ɨ/ Assimilation

When a noncentral vowel precedes oral /ɨ/ in the first two syllables of the word -- within a stress foot -- /ɨ/ assimilates totally to the noncentral vowel.

(7) /ɨ/ assimilation: Applies within a foot

a. /ŋi⁴³ = ?i⁴ne¹/ (3F = entire.body) → 
   ([ŋi⁴³?i⁴]ne¹) 'her entire body'

b. /ku⁴³ = ?i⁴ne¹/ (2SG = entire.body) →
   ([ku⁴³?u⁴]ne¹) 'your entire body'

c. /to¹ = ?i⁴ne¹/ (other = entire.body) →
   ([to¹?o⁴]ne¹) 'entire body of other (one)'
Stress-Conditioned Processes: /ɨ/ Assimilation

When a noncentral vowel-/ɨ/ sequence occurs beyond the first two syllables -- outside of a foot -- the /ɨ/ does not assimilate.

(8) /ɨ/ assimilation: Fails to apply outside of foot
a. /q¹ʔi⁵ = i⁴ne¹/ (old.man = entire.body) → [(ˈo¹ʔi⁵)i⁴ne¹] 'entire body of old man'

b. /ka³ru¹ = ne³ = i⁴ne¹/ (Carlos = son = entire.body) → [(ˈka³ru¹)ne³ʔe⁴ne¹] 'Carlos' son's entire body'

(8b) shows that the footing is not iterative. Otherwise *[(ˈka³ru¹)(ne³ʔe⁴)ne¹]
Stress-Conditioned Processes: /1̰-1/ Dissimilation

When tone 1̰ precedes tone 1 or 1̰ within a stress foot, the first tone 1̰ dissimilates to tone 5.

(9)  Tone 1̰ dissimilation: Applies within a foot
   a.  /1̰1/: /ką̂¹ = ?ã̂¹ti³/ (fruit.sp = yard) →
       [(ˈka⁵ã̂¹)ti³] 'yard planted with kə̂¹ trees'
   b.  /1̰1/: /ką̂¹ = a¹ne¹/ (fruit.sp = garden) →
       [(ˈka⁵a¹)ne¹] 'garden of kə̂¹ trees'
Stress-Conditioned Processes: /₁-₁/ Dissimilation

When tone ₁ precedes tone 1 or ₁ outside of a foot, there is no dissimilation.

(10) Tone ₁ dissimilation: Fails to apply outside of foot

a. /X₁₁/: /kɔ²rɛ₁ = ?ã¹tɨ³/ (sweet.potato = yard) → ([ˈkɔ²rɛ₁]ʔã¹tɨ³) 'yard planted with sweet potatoes'

b. /X₁₁/: /kɔ²rɛ₁ = a¹ne¹/ (sweet.potato = garden) → ([ˈkɔ²rɛ₁)a¹ne¹] 'garden of sweet potatoes'

c. /XX₁₁/: /tʃau¹ = e³ja¹ = a¹ne¹/
(1SG = sister = garden) →
[('tʃau¹e³]ja¹a¹ne¹] 'my sister's garden'

(10c) shows again that footing is not iterative. Otherwise *

*[('tʃau¹e³)ja⁵a¹ne¹]
Stress analysis for nouns

Generalizations to capture:

- All words contain exactly one stress.
- The stress is always initial.
- Monosyllabic words are allowed and have stress.
- There is no evidence of any stress or foot structure after the first two syllables.
Stress analysis for nouns

(11) Metrical rules for nouns

   a. All words must contain a foot.
   b. The foot must be a trochee (left-headed).
   c. The left edge of the word must be aligned with the left edge of a foot.
   d. The ideal foot contains exactly two syllables, but degenerate monosyllabic feet are allowed.
   e. Footing is not iterative.

Non-footed syllables are dominated by the Prosodic Word without an intermediating foot (Ito & Mester 2003 [1992]).
Stress analysis for nouns

(12) (11) produces correct footing in nouns

a. One foot at left edge of a $2\sigma$ word:
   /ko²r¿¹/ → [('ko²r¿¹')] 'sweet potato'

b. One foot at left edge of a $2 + \sigma$ word:
   /ko²r¿¹ = a¹ne¹/ 'sweet potato garden' (10c) →
   [('ko²r¿¹)a¹ne¹]

c. One degenerate foot in a $1\sigma$ word:
   /t¿¹/ 'Night Monkey' → [('t¿¹)]
Stress on verbs

Verbs are morphologically more complex than nouns

(13) Simplified verb template

-3 -2 -1 0
Pre-Proclitic = Sbj Proclitic = Obj Proclitic = Root

0 +1 +2 +3
Root -Suffixes = Enclitics = Subordinators

(14) Example verb with morphs in slots -3, -2, -1, 0, and +1

i⁵ˈtʃa³na³ˈpo⁴ʔo²tʃi⁴

i⁵ = tʃa³ = na³ = po⁴ -ʔɨ²tʃi⁴
DIR:out = 1SG.SBJ.MC.A = 3.OBJ.MC.A = hit -DIR:out

'I hit it out (of an enclosed space)'
In some cells of the subject proclitic paradigm, the subject proclitic is Ø.

(15) Verb with no overt subject proclitic

\[ wi^{43}i^{4} ga^{4} ja^{31} ti^{1} ga^{4} na^{2} ma^{1} ti^{31} \tilde{i}^{3} i^{5} ja^{31} ta^{5} ki^{3} \]

\[ wi^{43}i^{4} ga^{4} ja^{31} ti^{1} ga^{4} na^{2} - *ma^{1} ti^{31} = \tilde{i}^{3} i^{5} = \]
one PST man(II) PST 3.II- *wife(I) 3.I = ACC DIR =
Ø = ja^{3} = ta^{1} -ki^{3}
3.II.sca.A = AM = discard -NMLZ:II

'a man who abandoned his wife' (DGG, wer 0:17)
Stress on verbs: Generalizations

The morphological word consisting of a verb with its clitics and affixes has two stresses.

- **Always:** One stress on the initial syllable of the verb root.
- **If there is a subject proclitic:** One stress on the initial syllable of the subject proclitic.
  - Even if a pre-proclitic comes first (14)
- **If there is no subject proclitic:** One stress on the initial syllable of the proclitic group.
  - Even if it is a pre-proclitic (15) or object proclitic
- **No stresses on affixes or enclitics to the verb root.**
Stress on verbs: Generalizations

Verb with both subject proclitic and pre-proclitic (14):

\( i^5t\dot{s}a^3na^3po^4o^2t\dot{f}l^4 \)
- One stress on subject proclitic
- One stress on initial syllable of root; no stress on the suffix

Verb with no subject proclitic (15):

\( i^5\dot{a}^3ta^5ki^3 \)
- One stress on first syllable in proclitic group -- pre-proclitic
- One stress on initial syllable of root
Evidence for stress on verbs

Stressed syllables in the verb display:

- Increased duration (both stresses)
- Resistance to reduction (both stresses)
- Privileged phonotactic position (both stresses)
- Privileged position in lexical phonology (root stress; environments never appear for proclitic stress)
Stress-Conditioned Processes: Phonotactics

Root: First syllable can contain phonotactically marked phones.

- Segments /d m n m ai au o/
- Contour tones 31, 43, and 51

Proclitic Group: First syllable of subject proclitic only can contain phonotactically marked phones.

- Segments: /η/
- Contour tones 31 and 43
- Additional contour tone 41 -- only found on subject proclitics (and not always derived from /4.1/ sequence)
Root + Suffixes + Enclitics: First foot undergoes /ı/ assimilation and /ıI/ dissimilation.

- Size of the proclitic group does not affect stress-conditioned processes.
- Later syllables do not undergo the stress-conditioned processes.
Stress-Conditioned Processes: Lexical Phonology

(16) /i/ assimilation occurs between the first two syllables of the verb root + suffixes + enclitics

a. /na⁴=ŋu¹ʔi⁴ʔi⁴/
   (3.SBJ.MC.A = learn-DIR:back.and.forth) → 
   [na⁴ŋu¹ʔu⁴ʔi⁴] 's/he keeps learning and forgetting (it)'

b. /na⁴=ja³=ð²=ʔi¹ra¹/
   (3.SBJ.MC.I = 3.OBJ.MC.I = believe = sort.of) → 
   [na⁴ja³ʔð²ʔð¹ra¹] 's/he sort of believes it'
(17) /i/ assimilation fails to occur after the first two syllables of the root + suffixes + enclitics

a. /na⁴=nũ⁵ke³=?i⁴ne¹/ 
   (3.SBJ.MC.A-wrap.A = NI:entire.body) → 
   [na⁴nũ⁵ke³?i⁴ne¹] 's/he wraps his/her body'

b. /na⁴=ŋau¹=?tʃi⁵ru¹=?i⁵tʃi²/ 
   (3SBJ.MC.A-be.worn.out = NI:clothes = really) → 
   [na⁴ŋau¹?tʃi⁵ru¹?i⁵tʃi²] 'his clothes/cloth is really worn out'
Stress-Conditioned Processes: Lexical Phonology

Proclitic Group: Impossible to diagnose because of inventory. Proclitic Group plus Root: Does not undergo /i/ assimilation (18).

(18) /i/ assimilation: Fails to occur between subject proclitic and verb root

a. /tʃi³⁻i⁴³-ku²/ (1SG.SBJ.MC.I = walk-DIR:inward) → [tʃi³ʔi⁴³ku²] 'I enter'

b. /tʃi³⁻i⁴³-e³/ (1SG.SBJ.MC.I = walk-DIR:across) → [tʃi³ʔi³¹e³] 'I walk across (stream, path, street)'

But there are other phonological interactions between the Proclitic Group and root: glottal stop epenthesis
Any analysis of verb stress must recognize:

- **Stress assignment is sensitive to the basic distinction between roots and clitics**

- And *also* sensitive to the much less basic distinction between subject proclitics (slot -2) and other proclitics (slots -3, -1)
Assume ex hypothesi that the entire verb complex is one prosodic word. How far will our rules for nouns (11) take us?

- Noun grammar constructs exactly one foot at left edge of the prosodic word
  - Root will never be stressed
  - Subject proclitic will only be stressed if it is the first element of the proclitic group

- Solution for root stress: Write a rule requiring left edge of root to align with left edge of a foot
Stress analysis for verbs: Root stress

(19) Metrical rules for verbs

a. All words must contain a foot.

b. The foot must be a trochee (left-headed).

c. The left edge of the word must be aligned with the left edge of a foot.

d. The left edge of a verb root must be aligned with the left edge of a foot.

e. The ideal foot contains exactly two syllables, but degenerate monosyllabic feet are allowed.

f. Footing is non-iterative.
Stress analysis for verbs: Root stress

(20) In a word with a pre-proclitic and an object proclitic (15), (19) produces one stress on root and another stress on initial syllable of proclitic group

\[ i^5 = ja^3 = tã^1-ki^3 / \rightarrow \]

\[
[('i^5ja^3)('tã^1ki^3)] \checkmark
\]

(21) In a word with a pre-proclitic and a subject proclitic, (14), (19) produces one stress on root and another stress on \textit{pre-proclitic}

\[ i^5 = ts^a^3 = na^3 = po^4-?i^2tji^4 / \rightarrow \]

\[
[('i^5ts^a^3)na^3(po^4?i^2)tji^4] \times
\]
Stress analysis for verbs: Proclitic stress

We need a way to make the proclitic group $i^5 = tsa^3 = na^3$ parse as $i^5(tsa^3na^3)$ instead of $(i^5tsa^3)na^3$.

Possible ways to do this in the grammar:

- Rule against stressing pre-proclitic
- Rule aligning left edge of subject proclitic with left edge of a foot
  (Consistent with existing rule aligning left edge of root with left edge of a foot.)

Take note:

- Because of (15), pre-proclitic can't be extraprosodic
- It's a matter of notation whether the new rule refers to 'subject proclitics' or to 'slot -2 proclitics.'
(22) Final metrical rules

a. All words must contain a foot.
b. The foot must be a trochee (left-headed).
c. The left edge of the word must be aligned with the left edge of a foot.
d. The left edge of a verb root must be aligned with the left edge of a foot.
e. The left edge of a subject proclitic must be aligned with the left edge of a foot.
f. The ideal foot contains exactly two syllables, but degenerate monosyllabic feet are allowed.
g. Footing is not iterative.
Stress analysis for verbs: Proclitic stress

(23) In a word with a pre-proclitic and an object proclitic (15), (22) produces one stress on root and another stress on initial syllable of proclitic group

\[i^5 = ja^3 = ta^1-ki^3/ \rightarrow [(i^5j)a^3(ta^1ki^3)] \checkmark\]

(24) In a word with a pre-proclitic and a subject proclitic, (14), (22) produces one stress on root and another stress on subject proclitic

\[i^5 = tfa^3 = na^3 = po^4-?i^2tji^4/ \rightarrow [i^5(tfa^3na^3)(po^4?i^2)ti^4] \checkmark\]
Syntactic and prosodic constituency

(25) Prosodic constituency of (14)

PrWd

\[
\begin{array}{c}
   \text{i}^5 \\
   \text{F}_1 \\
   \text{tʃa}^3 \\
   \text{1SG.SBJ} \\
   \text{na}^3 \\
   \text{3.OBJ} \\
   \text{F}_2 \\
   \text{po}^4 \\
   \text{hit} \\
   \text{ʔɨ}^2 \\
   \text{DIR:out} \\
   \text{tʃi}^4 \\
\end{array}
\]

Perfect isomorphism in (25) between syntactic, morphological, and prosodic domains dominated by $F_1$. 
Conclusions

CT has both robust tone and robust evidence for stress. And stress and tone interact:

- Segmental phonotactics and tonotactics
- Stress-conditioned lexical phonology, including tonology
Conclusions

Stress and tone are related in much the same way in CT in Oto-Manguean languages:

- Stress licenses a larger number of contrasts on the stressed syllable -- Trique (DiCanio 2009), narrow Mixtec
- Unstressed syllables undergo synchronic reduction and diachronic apocope -- Chatino and Zapotec

Equally useful comparisons to SE Asian languages, for instance Tai-Kadai.
But stress in CT does have properties in common with stress in other Amazonian tone languages:

- Stress as a licensor of tone: cf. Hup
- Clitic groups behaving as independent stress domains: cf. Kashibo-Kakataibo (Zariquiey Biondi 2011)

Yet other languages 'as tonal as' Ticuna tend to be analyzed without stress -- e.g. CT's neighbor Bora (Thiesen & Weber 2012:98).
Acknowledgements

mo³ẽ²ʔɨ̃⁵tʃi²!
Acknowledgements

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Stress-Conditioned Processes: Reduction

Root + Suffixes + Enclitics: In fast speech, unstressed syllables undergo reduction, and stressed syllables do not.

- Regressive vowel quality assimilation: \( /tʃau^1 = ja^5 e^3 / \)
  
  \( 1\text{SG} = \text{hair} \) → \([('tʃau^1je^5)e^3]\) 'my hair'

- Apocope of segments: \( /ŋe^4 tʃa^1 i^1 / \) → \([ŋe^4tʃã^1]\) 'feel sad'

- Total apocope: \( /ma^3 r i^3 / \) → \([ma^3]\) 'now'


- \( /tʃa^3 = ja^1 / \) \( (1\text{SG}.\text{SBJ}.\text{MC}.\text{I} = 3.\text{OBJ}.\text{MC}.\text{I}) \) → \([tʃa^3a^1], [tʃa^3^1]\)

- \( /na^4 = ja^1 / \) \( (3.\text{SBJ}.\text{MC}.\text{I} = 3.\text{OBJ}.\text{MC}.\text{I}) \) → \([na^4a^1], [na^4a^1]\)
An alternative analysis: Two PrWds

Suppose we had assumed that the proclitic group was an independent PrWd, following Peperkamp (1996).

(26) Constituency of (14) under Peperkamp-style analysis:

```
PrWd
 /     \
|      |
PrWd   PrWd
 /     /
|      |
i⁵     F   F   tʃi⁴
 /     /
|      |
tʃa³   na³   po⁴ ʔi²
```
Disadvantages of the Two PrWds analysis

- Theoretical problem: Must relax assumption that PrWd is not recursive
- Tone problem: Lose generalization that tone 5 is never the only tone of a PrWd
- Segmental problem: Environment of glottal stop epenthesis becomes more complex
- Stress problem: Must still use either representations or grammar to produce exceptional peninitial stress on a proclitic group like /i^5 = tʃa^3 = na^3/

Advantage: psychological status; alienable noun incorporation