An Analysis of Amuzgo Nominal Tone

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1. Introduction
This paper\(^1\) presents an analysis of Amuzgo nominal tone based on the behavior of stem tones when a noun is suffixed by a singular possessor\(^2\). The addition of a possessor suffix to a noun may not only result in a different tone pattern for the noun stem, but the final syllable may also change in its controlled/ballistic status. To account for the full distribution of patterns seen in the Amuzgo data, I propose an autosegmental analysis which includes floating tones for the stems and possessor suffixes. This analysis is based on a two-tone system underlyingly, with the mid tones being derived. In addition, I propose that the distinction between controlled and ballistic syllables is that ballistic syllables have a floating low tone.

All data are from Xochistlahuaca Amuzgo (XA), a language spoken by about 20,000 people in the southeastern part of the state of Guerrero, and were collected by Amy Bauernschmidt and Marjorie Buck from the early 1950’s to 1976 when they lived in Xochistlahuaca and worked with numerous speakers. A full phonological description of XA is available in Bauernschmidt 1965 where she states that the three basic tones of XA are H (1), M (2) and L(3). There is also a HL down glide and the up glides LM and MH. As shown in (1), tones are affected by the controlled or ballistic status of the syllable, resulting in eleven tone patterns. There are two different patterns for a HL down glide in controlled syllables; only one in ballistic syllables. A LM up glide does not occur in ballistic syllables.

(1) Tone patterns by syllable type in XA

\[
\begin{array}{c}
\text{Controlled syllable} \\
1 \quad 2 \quad 13 \quad 21 \quad 32 \\
\end{array}
\quad
\begin{array}{c}
\text{Ballistic syllable} \\
1 \quad 2 \quad 13 \quad 21 \\
\end{array}
\]

In XA, the controlled/ballistic contrast has been written as a contrast in length. For example, \textit{xjo} ‘machete’ is a ballistic form and is written with a single vowel. \textit{Tjoo} ‘pitcher’, on

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\(^1\) I am grateful for Cheri Black’s comments on earlier drafts of this paper.

\(^2\) Plural possessor suffixes are not included at this time because of insufficient data at my disposal.
the other hand, is a controlled form and is written with a double vowel. Under an autosegmental analysis, however, all syllables in XA have just one tone-bearing unit (TBU).

2. Nouns and possession
There are two classes of nouns in XA: those which may exist NP-finally as free forms and those which are obligatorily possessed (i.e. are followed by the possessor NP). (2) shows that the addition of a possessor suffix to a noun may not only result in a different tone pattern for the noun stem, but the syllable may also change in its controlled (C) or ballistic (B) classification.

(2) Sample paradigms for noun possession

<table>
<thead>
<tr>
<th>Gloss</th>
<th>Free form</th>
<th>1s -ya/-a</th>
<th>2s</th>
<th>3s</th>
<th>Possessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>mouth</td>
<td></td>
<td>'ndyo'</td>
<td>H B</td>
<td>'ndom</td>
<td>B</td>
</tr>
<tr>
<td>pitcher</td>
<td>tsjoo</td>
<td>tsjoya</td>
<td>H B</td>
<td>tsjo'</td>
<td>H B</td>
</tr>
<tr>
<td>machete</td>
<td>xjo</td>
<td>xjooya</td>
<td>L B</td>
<td>xjo'</td>
<td>L B</td>
</tr>
<tr>
<td>shade</td>
<td>ncwa'n</td>
<td>ncwa'n:a</td>
<td>LM C</td>
<td>ncwa'n</td>
<td>MH B</td>
</tr>
<tr>
<td>land</td>
<td>tyuua</td>
<td>tyuaaya</td>
<td>M C</td>
<td>tyua'</td>
<td>MH B</td>
</tr>
<tr>
<td>tray</td>
<td>sto</td>
<td>stoya</td>
<td>M B</td>
<td>sto'</td>
<td>MH B</td>
</tr>
<tr>
<td>breast</td>
<td></td>
<td>tscwiya</td>
<td>H B</td>
<td>tscwi'</td>
<td>L B</td>
</tr>
<tr>
<td>forehead</td>
<td></td>
<td>staya</td>
<td>H B</td>
<td>sta'</td>
<td>M B</td>
</tr>
<tr>
<td>embroidered</td>
<td></td>
<td>xuaaya</td>
<td>MH C</td>
<td>xue'</td>
<td>M B</td>
</tr>
<tr>
<td>tunic</td>
<td></td>
<td>tycwii'a</td>
<td>MH C</td>
<td>tcwi'</td>
<td>MH B</td>
</tr>
<tr>
<td>leg</td>
<td></td>
<td>cotom'</td>
<td>HL B</td>
<td>cotom'</td>
<td>HL B</td>
</tr>
<tr>
<td>vest</td>
<td>cotomya</td>
<td>cotom'</td>
<td>HL B</td>
<td>cotom'</td>
<td>HL B</td>
</tr>
<tr>
<td>younger brother</td>
<td></td>
<td>tyje</td>
<td>HL B</td>
<td>ty'iu'</td>
<td>M B</td>
</tr>
<tr>
<td>scapula</td>
<td>tsei'snda'</td>
<td>tseisnda'</td>
<td>L B</td>
<td>tsei'snda'</td>
<td>H B</td>
</tr>
</tbody>
</table>

\[^3\] Allomorphs are conditioned by the presence of an immediately preceding glottal stop; -ya follows an open syllable, and -a follows a syllable-final glottal stop.

\[^4\] Only tones pertaining to stem-final syllables are relevant.
2.1 Observations from the data
Observations from the table in (2) include:
- A noun which bears [H] tone is always ballistic when a singular possessor suffix is added. When suffixed with 2s, the tone may or may not change to [HL].
- A noun which bears [L] tone may or may not have an up glide in its 1s or 2s form. If the up glide is present in its 1s form, the syllable is controlled. Even when an up glide is present in 2s forms, the syllable of the stem is always ballistic.
- A noun which bears [M] tone may have an up glide in its possessed form.
- Forms bearing a 2s possessor suffix are always ballistic.
- Except for those stems which bear [H] tone, forms with the 3s possessor suffix are always controlled.
- Free forms are sometimes ballistic and sometimes controlled, but their corresponding possessed form is always controlled.

2.2 Observations from other Otomanguean languages
Several observations may be made based on patterns in other Otomanguean languages:
- Noun phrases end with a down glide. Pike (1948: 95) describes a regular process in Huautla Mazatec in which nonpersonal (i.e. unpossessed) nouns end with a down glide. He states that nonpersonal nouns are characterized by the fact that “all of them except those having lexical toneme 4 are followed by a syntactic down glide when they constitute a close-knit noun phrase”.
- Certain morphemes bear a floating tone. For example, a floating H tone has been posited for the 1s suffix in Sierra Juárez Zapotec (Bickmore and Broadwell 1998) and floating tones are present in possessor suffixes in Ayautla Mazatec\(^5\).
- A syllable-final glottal stop is associated with a H tone. Rensch (1976: 110), for instance, makes the observation that morphemes which end with a glottal stop in proto-Popolocan correspond with morphemes in Mazatec that bear H tone.

3. Re-analysis of basic tones with a new definition for “ballistic”
In other Otomanguean languages such as Mazatec and Tlapanc (Black, this volume), independent nouns are characterized by a word-final down glide. I am assuming that in languages where this down glide is realized, a L tone links\(^6\) to the final tone of the noun phrase and I suggest that although there are no phonetic word-final downglides in Amuzgo (with the exception of [HL]), the L tone which is present at the end of independent nouns in other Otomanguean languages is also present in Amuzgo. The difference is that in Amuzgo, the L tone does not link; it is left floating.

I propose that XA has a constraint against floating tones linking and that it is precisely this floating L tone that makes a syllable “ballistic”\(^7\). At least two of the phonetic features associated with ballistic syllables in Amuzgo (post-syllabic aspiration and a sudden drop after the intensity

\(^5\) My husband, Larry, and I have been living in Ayautla and studying Mazatec since September of 1998 under the auspices of S.I.L.

\(^6\) Autosegmental Phonology (Goldsmith 1979, 1990) provides the framework for allowing tones to act independently of segments and is crucial to this analysis.

\(^7\) This leads to the hypothesis that all Otomanguean languages that have a constraint against floating L tones linking will have a ballistic/controlled contrast.
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peak (Mugele 1982:12), may be accounted for by the presence of a L tone. Also, Rensch (1976:173) claims that ballistic syllables are a reflex of syllables in Proto Otomanguean which had a coda *h, a fact which would also be consistent with the presence of a L tone.

3.1 Free forms and their surface tones
If a floating tone is present following all independent nouns (‘free forms’ in these data), why is it that not all of them are ballistic? Free forms which are controlled fit into two groups:

1. those which bear [H] tone, and
2. those which have surface M tone but pattern as MH in all three persons.

What is there about these two groups that is different from the other forms? In Ayautla Mazatec, if an independent noun is followed by a floating H tone, the normal NP-final down glide is not realized. The word-final floating L undergoes Final L Stray Erasure when it follows a floating H.

(3) Final L Stray Erasure: Floating L \( \rightarrow \emptyset \) / Floating H _#

I propose that the same process takes place in Amuzgo as well. What had been analyzed as a H tone would actually be an underlying floating H which causes Final L Stray Erasure. (Stems which are controlled in their free form and follow the same tone patterns as tyuua ‘land’ would also be analyzed as having an underlying floating H as would tsel’isndaa ‘scapula’.)

Once a floating L has undergone Final L Stray Erasure, a floating H tone may link to the TBU of its own morpheme. In (4), tsojo ‘pitcher’ is given as an example of a noun with an underlying floating H and a surface H tone.

(4) pitcher end of NP
tsojo underlying tones
    \( \begin{array}{c}
    \text{H} \\
    \text{L} \\
    \text{H} \\
    \text{H}
\end{array} \) Final L Stray Erasure

I suggest that nouns such as tyuua ‘land’ have a linked L as well as a floating H. In XA, a floating H may link to a TBU that bears no more than one tone, so the floating H links with the underlying L to form an up glide. Then a rule of Glide Neutralization applies in which a LH up glide goes to M at the end of a noun phrase.

(5) Glide Neutralization: LH \( \rightarrow \) M / _\( ^* \)NP

The derivation for tyuua ‘land’ is given in (6):
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(6) land tyuaa  
     end of NP
     underlying tones
     Final L Stray Erasure
     H linking
     Glide Neutralization

I claim that the underlying tone structure for the final syllable of *tsei'sndaa* 'scapula' is H, floating H. This sequence of H tones is a violation of the Obligatory Contour Principle (OCP) (McCarthy 1986) which is repaired in XA by having a H tone following a linked H change to L.

(7) OCP Repair: TBU  
               H → L / H _

The derivation for *tsei'sndaa* 'scapula' follows in (8):

(8) scapula tsei'sndaa'  
     end of NP
     underlying tones
     Final L Stray Erasure
     H linking
     Glide Neutralization

By postulating an underlying H-floating H tone pattern, the instances of [HL] which occur in controlled syllables but not in ballistic syllables may be accounted for.

Since a noun with a surface M tone may change to having [H] or tonal up glides in possessive constructions, it would appear to be less problematic if H and L are posited as the underlying tones of the nouns involved. The upglide [LM], for example, would be /LH/. The surface M tone would be generated by a rule of Glide-final H Lowering which states that the H tone in an underlying LH tone glide goes to M when the TBU to which it is linked is not noun phrase final. Its application would result in the proper surface tone for possessed forms with [LM] tone such as *tyjée* 'little brother'.

(9) Glide-final H Lowering: TBU) *NP  
               / |  
               H → M / L _
Nouns with a posited underlying L tone (eg. *xue* ‘embroidered tunic’) or H tone (eg. *sta* ‘forehead’) have surface M tone. They are both ballistic in their possessed form, so under this analysis they have a floating L tone also, as shown in (11) and (12). They undergo Neutralization Before Floating L which states that a tone will neutralize when there is a floating L in its morpheme. This rule applies to an underlying H tone only when it is linked to a word-final TBU. L tones are not restricted.

\[
\begin{align*}
(10) & \quad \text{Neutralization Before Floating L (morpheme-internal):} & T \to M / _ \text{Floating L} \\
(11) & \quad \text{embroidered tunic} \\
& \quad \text{\textit{xue}} \\
& \quad \text{\begin{array}{c}
L \quad \overset{1}{\text{\textit{L}}} \\
M \quad \overset{1}{\text{\textit{L}}}
\end{array}} \quad \text{underlying tones} \\
& \quad \text{Neutralization Before Floating L} \\
(12) & \quad \text{forehead} \\
& \quad \text{\textit{sta}} \\
& \quad \text{\begin{array}{c}
H \quad \overset{1}{\text{\textit{L}}} \\
M \quad \overset{1}{\text{\textit{L}}}
\end{array}} \quad \text{underlying tones} \\
& \quad \text{Neutralization Before Floating L}
\end{align*}
\]

I am suggesting that *tscwii* ‘breast’ and the nouns that pattern like it are underlingly toneless, but they have a preceding floating H. A preceding floating H may also link to a TBU in its own morpheme, but only if it will not be the last tone of the word. When a preceding floating H is prevented from linking, it still affects the default L tone by raising it to M.

\[
\begin{align*}
(13) & \quad \text{L Raising After Floating H:} & L \to M / \text{Floating H} \\
(14) & \quad \text{breast} \\
& \quad \text{\textit{tscwii}} \\
& \quad \text{\begin{array}{c}
\overset{1}{\text{\textit{H}}} \\
\overset{1}{\text{\textit{H}}} \\
\overset{1}{\text{\textit{H}}}
\end{array}} \quad \text{underlying tones} \\
& \quad \text{\begin{array}{c}
\overset{1}{\text{\textit{H}}} \\
L \quad \text{L by default}
\end{array}} \\
& \quad \text{\begin{array}{c}
\overset{1}{\text{\textit{H}}} \\
M \quad \text{L Raising After Floating H}
\end{array}}
\end{align*}
\]

Nouns that pattern with *xjo* ‘machete’ have no underlying tone. They receive a L tone by default, as shown in (15).

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(15) machete end of NP
    \textit{xjo} underlying tones
    \begin{tabular}{c|c}
      L & L assigned by default \\
    \end{tabular}

3.2 Evidence for a two-tone system

By combining a two-tone analysis for XA and the floating L definition for “ballistic” both the surface tones in free and obligatorily possessed forms and their ballistic or controlled nature may be accounted for. The proposed underlying tones along with an example of each are summarized in (16).

(16) Proposed underlying tones with resulting surface tones

<table>
<thead>
<tr>
<th>Surface Tone</th>
<th>Underlying Tone</th>
<th>Example Noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Ø Floating H</td>
<td>'ndyoo</td>
</tr>
<tr>
<td>HL</td>
<td>H Floating H</td>
<td>cotom</td>
</tr>
<tr>
<td>M</td>
<td>L Floating H</td>
<td>tseiBsndaaB</td>
</tr>
<tr>
<td></td>
<td>L Floating L</td>
<td>tyuaa</td>
</tr>
<tr>
<td></td>
<td>H Floating L</td>
<td>xue</td>
</tr>
<tr>
<td></td>
<td>Floating L Ø</td>
<td>sta</td>
</tr>
<tr>
<td></td>
<td>Floating H Ø</td>
<td>tscwii</td>
</tr>
<tr>
<td>L</td>
<td>L Floating L</td>
<td>sto</td>
</tr>
<tr>
<td></td>
<td>Ø Floating L</td>
<td>ncwa'n</td>
</tr>
<tr>
<td></td>
<td>Ø Floating L</td>
<td>xjo</td>
</tr>
<tr>
<td></td>
<td>L Floating L</td>
<td>tyjee</td>
</tr>
</tbody>
</table>

A two-tone system is supported in Rensch (1976: 126) where he generates the three levels of present-day Amuzgo from underlying H and L tones. Also, a two-tone analysis of XA tone is supported by how tones are assigned to borrowed words. Borrowed words with penultimate stress have tone pattern H L with H tone on the stressed syllable. In these cases, there is a distinct lack of the expected default M tone.

(17) \textit{cuento} ‘story’ \rightarrow cwento
    \begin{tabular}{c}
      H L \\
    \end{tabular}

(18) \textit{abuela} ‘grandmother’ \rightarrow wela
    \begin{tabular}{c}
      H L \\
    \end{tabular}

(19) \textit{silla} ‘chair’ \rightarrow sula
    \begin{tabular}{c}
      H L \\
    \end{tabular}

Another factor in support of a two-tone system is that it makes an analysis of tonal polarity, ‘a common state of affairs in two-tone systems’ (Kenstowicz 1994: 313) possible. Tonal polarity is crucial to the analysis of its possessor suffixes shown in section 5.
4. 3s possessor suffix
Of the three singular possessor suffixes, 3s is probably the most straight-forward. With the addition of a 3s possessor suffix to the possessed form of the noun, the final syllable of the stem is nasalized. Forms marked with 3s are almost always controlled; the only exceptions being nouns which I am analyzing as having an underlying floating H. Derivations are given for these noun stems as well as for others which have interesting tone changes when the 3s suffix is added.

4.1 Nouns which are always ballistic
Nouns with a floating H are always ballistic when suffixed with the 3s possessor. In OCP Repair, a H tone which follows a linked H becomes L. I claim that this is also true whether the second H tone is linked or floating. I suggest that besides the nasal feature, 3s also has a floating H tone and that it is subject to OCP Repair. The resulting floating L tone is what makes the syllable ballistic. The derivation of 'ndyoo 'mouth' in (20) represents forms with a floating H tone.

(20)  
\begin{align*}
\text{'ndyoo} & 3s \\
\text{'nom} & \quad [\text{nas}] \\
\text{3s} & \quad [\text{nas}] \text{ spreads left} \\
\text{\(H\)} & \quad \text{underlying tones} \\
\text{\(H\)} & \quad \text{H linking} \\
\text{\(H\)} & \quad \text{OCP Repair}
\end{align*}

Neutralization Before Floating L does not apply because the floating L here is not morpheme-internal. The result is a stem with H tone and ballistic characteristics.

4.2 Cases of alternate surface tones
As shown in examples (21) and (22) below, different surface tones are possible for nouns such as tsei'sndaa' 'scapula' depending on whether a rule of Stray Erasure, which deletes a floating tone when it is followed by another floating tone, takes place before or after H linking. If H linking is applied first, the result is a stem with HL tone and controlled characteristics.

(21)  
\begin{align*}
tsei'sndaa' & 3s \\
\text{tsei'sndaa''a} & \quad [\text{nas}] \\
\text{3s} & \quad [\text{nas}] \text{ spreads left} \\
\text{\(H\)} & \quad \text{underlying tones} \\
\text{\(H\)} & \quad \text{H linking} \\
\text{\(H\)} & \quad \text{OCP Repair}
\end{align*}

8 Other Otomanguean languages have been known to have floating H tones at morpheme boundaries. E. Pike (1956), for example, describes a process in Soytaltepec Mazatec in which the tone of a M-toned morpheme raises preceding a morpheme with a L tone. Since there is nothing intuitive about a L tone raising a M tone, an analysis based on current tone theory would likely posit a floating H tone.
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When Stray Erasure takes place before H linking, however, OCP Repair affects the floating tone. This results in a stem with H tone and ballistic characteristics.

\[(22) \quad \text{scapula} \quad 3s\]
\[tsei'sndaa' \quad [\text{nas}] \quad \text{spreads left}\]
\[tsei'snd"d" \quad [\text{nas}] \quad \text{underlying tones}\]
\[H \quad H \quad \text{Stray Erasure}\]
\[H \quad L \quad \text{OCP Repair}\]

### 4.3 A floating L tone is neutralized

Nouns with an underlying L tone and ballistic characteristics such as *sto* 'tray' have surface M tone and are controlled when marked with the 3s possessor suffix. Since they bear no underlying tone and floating L tones do not link, a L tone is assigned by default. It is raised to M by Neutralization Before Floating L.

\[(23) \quad \text{tray} \quad 3s\]
\[sto \quad [\text{nas}] \quad \text{spreads left}\]
\[stom\text{'m} \quad [\text{nas}] \quad \text{underlying tones}\]
\[L \quad H \quad \text{L assigned by default}\]
\[M \quad H \quad \text{Neutralization Before Floating L}\]
\[M \quad \text{Stray Erasure}\]

### 4.4 /LH/ tone has surface L tone

Nouns with underlying LH tone have surface L tone in the 3s form and they have controlled characteristics. As shown in (25), they undergo Glide Simplification, which states that a H tone deletes between a L tone and a word-final floating H or any floating L tone.

\[(24) \quad \text{Glide Simplification:}\]
\[
\text{TBU} \\
H \rightarrow \emptyset / L _ \quad \{\text{Floating H#}\} \\
\{\text{Floating L}\}\]
5. **1s possessor suffix**

When a noun is marked for 1s possession, the 1s possessor suffix is added to the free form of the noun when one exists and to the possessed form otherwise. The 1s form has suppletive allomorphs depending on whether the stem to which it is added is vowel-final. If it is, the segmental content of the 1s possessor suffix is \(-ya\); if the stem is glottal-final, it is \(-a\).

1s forms support the two-tone analysis for XA because its floating tone is determined by tonal polarity. If a H tone is linked to the stem, the floating tone associated with 1s is L. If a L tone is linked to the stem, the floating tone associated with 1s is H. If the stem has no underlying tone, a HL melody is associated with the 1s possessor\(^9\).

### 5.1 Nouns with an associated H tone are ballistic

Tonal polarity dictates a floating L tone for 1s possession on nouns with an associated H tone. These nouns all have ballistic characteristics in their 1s form.

(26) *mouth* \(\text{'ndyoo} -ya^{''}\)

\[
\text{underlying tones} \\
\text{H linking} \\
\text{1s tones assigned}
\]

(27) *forehead* \(\text{sta} -ya\)

\[
\text{underlying tones} \\
\text{1s tone assigned} \\
\text{Stray Erasure}
\]

---

\(^9\) It appears that OCP Repair does not apply when the linked H is part of a contour tone.

\(^{10}\) A HL melody in association with 1s forms does occur in other Otomanguean languages. Ayautla Mazatec has a set of verbs which appear to be unmarked for tone in which 1s forms show a HL melody. Also, H and L are the tones associated with 1s in San Francisco Ozolotepec Zapotec (Julie Nelson-Hernández, personal communication).

\(^{11}\) Since the [M] tone on \(-ya/-'a\) does not enter into the derivation, it will not be shown.
5.2 Nouns with a L tone are controlled
Nouns with a linked L tone like *ncwa⁴* 'shade' are controlled in their 1s form because tonal polarity dictates a floating H; no floating L is present.

(28)  shade  1s
    *ncwa⁴*  -a
    | L underlying tones
    | L H 1s tones assigned
    \ H linking
    \ LM Glide-final H Lowering

5.3 Alternate forms for nouns which are unspecified for tone
Nouns which have no underlying tone may have two surface forms when suffixed with 1s. They may have LM tone and be controlled or they may have a L tone and be ballistic. The difference is in whether 1s tones are assigned before or after the default tone is assigned. In (29) a L tone is assigned by default before 1s tones are assigned, and the result is a surface LM tone and controlled characteristics.

When 1s tones are assigned before a default tone is assigned as in (30), the result is a surface L tone and ballistic characteristics. Glide Simplification applies.

(29)  machete  1s
    *xjo*  -ya
    | underlying tones
    | L assigned by default
    | L H 1s tones assigned
    \ H linking
    \ LM Glide-final H Lowering

(30)  xjo  -ya
    underlying tones
    \ H L 1s tones assigned
    \ L H L assigned by default
    \ H linking
    \ L Glide Simplification
6. **2s possessor suffix**
The 2s possessor suffix is added to the possessed form of the noun. If the possessed form is vowel-final, the 2s form is closed and there is no tone change. If the possessed form is closed by a glottal stop, the 2s form may have a change in tone. No matter what is the controlled/ballistic state of the possessed form, the 2s form is always ballistic. I claim that the 2s possessor suffix has the shape:

(31) Glottal stop\(^{12}\) [L]

To account for the fact that tone changes may occur when the possessed form is closed, I posit a rule of Glottal Stop to Floating H.

(32) Glottal Stop to Floating H: glottal stop → floating H / glottal stop _

I claim that the glottal stop in the 2s suffix is an autosegmental feature for the following reasons:
- The 2s form for ‘younger brother’ (*ty'iu’*) gives evidence for spreading of the [constricted glottis] feature.
- Tone patterns show a glottal stop to floating H change.
- It blocks Final L Stray Erasure\(^{13}\), H linking and L Raising After Floating H.

6.1 **Open and closed syllables**
*Tsjjo* ‘pitcher’ has an underlying floating H tone and its possessed form is closed by a glottal stop. Glottal Stop to Floating H applies. The result is a stem with HL tone and ballistic characteristics.

(33) pitcher

\[tsjjo'\]

<table>
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<tr>
<th>2s</th>
<th>underlying tones</th>
<th>Glottal Stop to Floating H</th>
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</thead>
<tbody>
<tr>
<td>[H]</td>
<td>[L]</td>
<td></td>
</tr>
<tr>
<td>[H]</td>
<td>[H]</td>
<td>[L]</td>
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\[\] H linking

\[\] H linking

\[\] H L OCP Repair

*Ndyoo* ‘mouth’ also has an associated floating H tone but its possessed form is an open syllable. As shown in (34), the glottal stop from 2s attaches to the final vowel, and there is no tone change.

---

\(^{12}\) Black (2004) reports that in Tiapanec a suffix which bears a L tone is preceded by a glottal stop.

\(^{13}\) In Sierra Juárez Zapotec (Bickmore and Broadwell 1998) a rule of Rightward High/Mid Spread is blocked by the presence of a glottal stop.
An Analysis of Amuzgo Nominal Tone

(34) mouth

\[ \begin{array}{c}
\text{'ndyo}\text{'o} \\
\text{'ndyo'}
\end{array} \]

\[ \begin{array}{c}
\text{underlying tones} \\
\text{H linking}
\end{array} \]

Vowel-final nouns with an underlying L and a floating L tone such as \textit{xue} 'embroidered tunic' have a surface M tone in their 2s form because they undergo Neutralization Before Floating L. Glottal-final forms such as \textit{tycwi} 'leg', however, have surface MH tone because they undergo Glottal Stop to Floating H, as shown in (35).

(35) leg

\[ \begin{array}{c}
\text{tycwi'} \\
\text{L} \quad \text{L} \quad \text{L} \quad \text{underlying tones} \\
\text{L} \quad \text{L} \quad \text{H} \quad \text{L} \quad \text{Glottal Stop to Floating H} \\
\text{L} \quad \text{H} \quad \text{L} \quad \text{Stray Erasure} \\
\text{M} \quad \text{H} \quad \text{L} \quad \text{L Raising} \\
\text{MH} \quad \text{L} \quad \text{H linking}
\end{array} \]

6.2 Alternate surface tones for nouns which are unspecified for tone

\textit{Xjo} 'machete' has no underlying tone and two possible surface tone patterns in its 2s form. When Stray Erasure is applied before H linking as in (36), the result is a stem with L tone.

(36) machete

\[ \begin{array}{c}
\text{xjoo'} \\
\text{L} \quad \text{underlying tones} \\
\text{H} \quad \text{L} \quad \text{Glottal Stop to Floating H} \\
\text{L} \quad \text{H} \quad \text{L} \quad \text{L assigned by default} \\
\text{L} \quad \text{L} \quad \text{Stray Erasure}
\end{array} \]

When H linking is applied before Stray Erasure as in (37), however, the result is a stem with MH tone.
7. Conclusion
The three new claims being proposed here are:

1) "Ballistic" syllables are actually syllables which have a floating L tone. This floating L tone may interact with other tones on the tone tier in predictable ways.
2) The singular possessor suffixes have associated floating tones
3) A two-tone analysis for Amuzgo is preferable over the traditional three-tone analysis.

Under this new analysis, what had seemed to be a random assignment of "controlled" and "ballistic" characteristics as well as the formerly inexplicable tone changes on noun stems may be accounted for. More importantly, they may be predicted.
- Forms bearing a 2s possessor are always ballistic because the shape of 2s involves a word-final floating L.
- Forms bearing a 3s possessor are always controlled, except for those which have a floating H tone because the application of OCP Repair results in a word-final floating L tone.
- Free forms are sometimes ballistic and sometimes controlled, but their possessed form is always controlled because the L tone which is added to free forms occurs only NP-finally and the possessed form is always followed by its possessor.
- A [LM] up glide does not occur on ballistic syllables because the application of Glide Simplification results in a surface L tone.
- A second type of [HL] down glide occurs in controlled syllables because OCP Repair applies to a sequence of two H tones.
- Forms bearing L or M tone may or may not show an up glide when a possessor suffix is added because of options dictated by tonal polarity in 1s forms and by rule options in 2s and 3s forms.

Forms involving plural possessor suffixes remain for further study.
Verbs, which are considered to have more complex tonal variation than nouns have, were not considered at all in this study. To have merit, the claim that "ballistic" is actually the presence of a floating L tone would have to prove true in verbs also.
References


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REPORT 13

SURVEY OF CALIFORNIA AND OTHER INDIAN LANGUAGES

CONFERENCE ON OTOMANGUEAN AND OAXACAN LANGUAGES

March 19-21, 2004
University of California at Berkeley

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Leanne Hinton, Series Editor

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INTRODUCTION

This volume of Survey reports is a sample of the papers heard at the Conference on Otomanguean and Oaxacan Languages (COOL), which took place at UC Berkeley March 19-21, 2004. There is more scholarly investigation being done on Otomanguean languages and other languages of Oaxaca today than ever before, yet unlike other groups such as Uto-Aztecanists and Mayanists, Otomangueanist and Oaxacanist scholars have not had a regular forum in which to meet and share their ideas. In 2000 a one-time conference took place at UCLA called La Voz Indígena de Oaxaca, organized by Pamela Munro, G. Aaron Broadwell, and Kevin Terraciano. As a result of this conference many of the participant linguists were able to make new and fruitful contacts with each other and several proposed that the conference should become a recurring event. With the help of the UC Berkeley Graduate Assembly, Graduate Division, Center for Latin American Studies, and the departments of Linguistics, Anthropology, and Ethnic Studies, four years after the original UCLA conference COOL was finally able to follow in its footsteps. Now there are plans for a third conference to be held very appropriately in the city of Oaxaca at the Centro Cultural Santo Domingo in 2006, organized by Alejandro de Ávila. We all hope that this will become an on-going event and it appears that COOL is on its way to becoming a regular, biannual and international conference.

Rosemary Beam de Azcona
COOL 2004 Organizer
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