Vowels in Lendu may be reduced if the tones they bear can be preserved by being shifted to adjacent segments. In CV words this is possible only if C belongs to a class of consonants, C'. In CV₁V₂ words, V₁ may be reduced but direction of tone shifting depends on presence or absence of a morpheme boundary between the vowels.

1. Introduction

In connection with the vowel reduction, the stability of tone patterns will be tested on a series of examples taken from Lendu, a Central Sudanic language spoken in North Eastern Zaire.

Two cases of tone shift associated with vowel reduction are presented:

(1) Leftward tone shift onto the adjacent consonant:
   CV \rightarrow C
   T \rightarrow T

(2) Rightward tone shift onto the adjacent vowel:
   CV₁V₂ \rightarrow CV₂
   T₁T₂ \rightarrow T₁T₂

In both cases tone melody (in Goldsmith's sense) remains unchanged.

*An earlier version of this paper under the heading "Lendu Tones and Stability Phenomenon" was selected for presentation to the Seventh Conference on African Linguistics. I am indebted to G. Manessy, B. Vattuone and J. Voorhoeve, and to my informants M. Njabu, husband and wife. In his comment, J. Voorhoeve had a hunch that this treatment of vowel reduction "might also offer an explanation for C₂ restrictions in N.W. Bantu. N.W. Bantu often has nouns of this shape -C₁VC₂, in which -C₂ can only be a nasal, voiced consonant or glottal stop. Fricatives are excluded. The C' set would in that case be different of course. C'' might be reduced to glottal stop after vowel reduction."


2 Here I am concerned only with "lexical" tones shifting.
Lendu presently has three level tones and one contour (Rising). In CV words, vowel reduction (hereafter VR apparently restricted to [-low] vowels) may take place if and only if C belongs to a certain subset C' (of the consonantal set C = {p, b, b', t, d, d', c, c', j, k, g, kp, gb, m, n, tʃ, ʃ, tʃ, dʒ, f, v, s, z, ʃ, ʒ, h, r, r̩, l}) characterized by the aptitude for receiving the "free" tone. C' consists of s, z, tʃ, ʃ, r, r̩, and I don't know of any property that all and only these consonants have other than the aptitude for tone bearing.

If C belongs to the complement C'' of C', whose members are never toned, no VR can take place. Therefore, it seems to me a natural assumption to posit that, all vowels being basically toned (and surfacing as such), all consonants are basically toneless and only a subset C' of them may surface toned (as result of VR).

2. Tone Shifting in CV Words

In the monosyllabic pattern C_{i}^{3,6} which is the preferred word pattern in Lendu, VR may apply provided the rightmost consonant belongs to C'. Whenever the VR process takes place, tone shifts leftwards onto the adjacent C' consonant.

Consider the following:

(3)  sʍ or ʃ 'to shoot'
     tʃe or tʃ 'underneath'
     krə or kr 'to cut'
     st (northern variant) š (standard form) 'skin'

The examples in (3) support the hypothesis in (4).

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3 More details about Lendu tone system and tone processes can be found in Trifković (1977, forthcoming).

4 Underscore indicates added articulatory features (here: africación).

5 I do not use the feature [syllabic] to characterize C' because in Lendu consonant "syllabic" would merely mean "sometimes tone bearing" (i.e. derived tonological aptitude).

6 More precisely, the preferred word type is CV. Occasionally also CCV occurs. Quite exceptionally, I found also CCR.
Vowel Reduction for C'V

\[ \begin{align*}
C'V & \rightarrow C \\
T & \quad T
\end{align*} \]

If the adjacent consonant belongs to C", this process is blocked.

\[ \begin{align*}
C''V & \quad \not\rightarrow \quad *C \\
T & \quad T
\end{align*} \]

In fact, no word final C" are found in the language, whilst toned word final C' frequently occur.

3. Tone Shifting in CVV Words

Lexical formation in Lendu involves suffixation. Consider, for example, the \(-i\), i.e. \(-V_2\), suffixed to CV roots giving morpheme sequences CV+V, i.e. derived \(V_1V_2\) sequences. If \(C\) belongs to \(C'\), the shift in (6) takes place.

\[ \begin{align*}
C'V+i & \rightarrow C'i \\
T_1T_2 & \quad T_1T_2
\end{align*} \]

, i.e.

\[ \begin{align*}
C'V+V & \rightarrow C'V \\
T_1T_2 & \quad T_1T_2
\end{align*} \]

Examples are seen in (7).

(7) \(s\hat{\sigma} + i \rightarrow \hat{s}i\) 'variety of grass'

\(r^i + i \rightarrow r^i\) 'ghost'

If \(C\) belongs to \(C''\), no VR takes place and both vowels are retained.

\[ \begin{align*}
C''V+i & \rightarrow C'i \\
T_1T_2 & \quad T_1T_2
\end{align*} \]

, i.e.

\[ \begin{align*}
C''V_1V_2 & \rightarrow C'V \\
T_1T_2 & \quad T_1T_2
\end{align*} \]

Examples are seen in (9).

(9) \(t\hat{\sigma}i \rightarrow \hat{\sigma}i\) 'bees'

\(n^i \rightarrow n^i\) 'woman slave'

In fact, this is the history of derived \(CV_1V_2\) word pattern in Lendu.

\[ \begin{align*}
T_1T_2 & \quad T_1T_2
\end{align*} \]

The obvious generalization is: when a CV morpheme final vowel drops, the tone shifts leftwards onto the adjacent \(C\) (see (4) and (6)). If the adjacent \(C\) belongs to \(C''\), i.e. cannot receive it, VR is blocked (see (5) and (8)).

Now let us consider another process in which underlying \(CVV\) (instead of derived ones as in (8) above) are involved. This underlying pattern happens
to be the surface pattern presently exhibited by the northern variant of the language. Compare:

(10)  Northern variant  Standard language

<table>
<thead>
<tr>
<th>Northern variant</th>
<th>Standard language</th>
</tr>
</thead>
<tbody>
<tr>
<td>níla</td>
<td>nà</td>
</tr>
<tr>
<td>klë</td>
<td>ké</td>
</tr>
<tr>
<td>bàdo</td>
<td>bò</td>
</tr>
<tr>
<td>báí</td>
<td>bí</td>
</tr>
<tr>
<td>∗jáü</td>
<td>∗jü</td>
</tr>
</tbody>
</table>

A systematic relation between Northern and Standard forms is revealed which could be captured either by (11) below or by assuming that both forms are derived from a common source. Even if this were the case, I don't see why (11) should be excluded as an intermediate stage.

(11)  \[ C'V_1V_2 \rightarrow C''V_2 \]

\[
\begin{array}{c}
T_1T_2 \\
\end{array} \quad \begin{array}{c}
T_2 \\
\end{array} \quad \begin{array}{c}
T_2 \\
\end{array}
\]

This relation holds with C'VV forms as well:

(12)  

<table>
<thead>
<tr>
<th>C'VV forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>tsoò</td>
</tr>
<tr>
<td>rëè</td>
</tr>
<tr>
<td>sùú</td>
</tr>
</tbody>
</table>

The formula in (13) is thus parallel to that in (11).

(13)  \[ C'V_1V_2 \rightarrow C'V_2 \]

\[
\begin{array}{c}
T_1T_2 \\
\end{array} \quad \begin{array}{c}
T_1 \\
\end{array} \quad \begin{array}{c}
T_2 \\
\end{array} \quad \begin{array}{c}
T_1T_2 \\
\end{array}
\]

Therefore, independently of the subcategorization of C, in basic vocalic sequences we can posit:

(14)  

<table>
<thead>
<tr>
<th>Vowel Reduction for CV_1V_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV_1V_2 \rightarrow CV_2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>T_1T_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>T_1</td>
</tr>
<tr>
<td>T_2</td>
</tr>
</tbody>
</table>

This process deletes \( V_1 \) and the tone shifts rightwards onto the adjacent morpheme-mate \( V_2 \) even if the adjacent C could receive it by leftward shift. Rightward shift being preferred (whenever possible), in order for (6) to be derivable instead of (13) we have to suppose that either tone shift is blocked across morpheme boundaries or that it takes place before \( V_2 \) is suffixed.
4. Conclusion

In Lendu, vowels can be deleted provided their tone can be preserved by shift. The condition under which tone can be shifted is statable as follows:

a. on adjacent segments
b. within morpheme boundaries
c. preferably onto following vowel
d. alternatively, onto preceding consonant, provided it belongs to C'

In short, VR may be stated as in (15).

(15) Vowel Reduction (VR)

\[
V \rightarrow \emptyset/ \begin{cases} \#C_1 \rightarrow V^+ \\ \#C_0C' \rightarrow + \end{cases}
\]

If neither rightward nor leftward tone shift is possible, VR is blocked. This tone preserving condition on VR is tentatively translated in terms of phonological context in (15).

Reference to C' being necessary, the question arises whether C' is a natural class in phonology. I don't know the answer.

REFERENCES


