Tonal Patterns of Gizey

Amedeo De Dominicis

University of Tuscia (Viterbo, Italy)
dedomini@unitus.it

Abstract

This paper aims to give the first description of tones in Gizey. The description will be carried out not only on the basis of the analysis of speech production, but also by means of perceptive tests.

1. Gizey classification and location

Gizey is an unwritten, so far undescribed, tonal language. It is classified in the family of Chadic (or Chado-Hamitic) languages, one of the four families of the Afroasiatic phylum. Gizey belongs to the Biu-Mandara or the Masa branch, which includes two sections: Masa (Masa, Gizey) and Musey (Musey, Ham, Marba-Lew, Monogoy) ([1]; [2]; [3]; [4]; [5]; [6]; [7]; [8]; [9]; [10]). According to Scignobos’s census [11], Gizey is spoken in the south of Chad and in the north of Cameroon by about 12,000 speakers. Of course, it is not an endangered language, but it has not been described yet and it is not included in the Ethnologue archive ([12]; [13]). The data refer to 10 speakers living in Djougounta, a little village in the Cameroon region called Far North (Department of Mayo-Danay, Arrondissement de Guéré).

2. Data

The data were collected in July 2005. The corpus is constituted by the following list of minimal pairs and triplets: [baldaʔ] = ‘thigh’ / ‘stick’; [dudutaʔ] = ‘fontanelle’ / ‘dragonfly’; [djadjaʔ] = ‘earthenware pot’ / ‘dream’ / ‘cold’; [poj] = ‘to walk (accomplished)’ / ‘to walk (unaccomplished)’;

[t] = ‘to eat (accomplished)’ / ‘to eat (unaccomplished)’;
[buaʔ] = ‘to bark’ / ‘to rot’;
[fikitaʔ] = ‘straw’ / ‘partridge’;
[gunaʔ] = ‘to jinx’ / ‘to feel bloated’;
[gɛjaʔ] = ‘leg’ / ‘millet stem’ / ‘rhino’;
[gunəʔ] = ‘tree’ / ‘to twist’;
[guldaʔ] = ‘left side’ / ‘plank’;
[gurunaʔ] = ‘kids’ / ‘ox enclosure’;
[gurutaʔ] = ‘humpback’ / ‘to go crazy’;
[mulaʔ] = ‘oil’ / ‘village chief’;
[t]ɛjtaʔ = ‘candle millet’ / ‘season that begins after the great rains’;
[t]ɛrnaʔ = ‘spine’ / ‘pique-boeuf’ / ‘bird’;
[t]iwaʔ = ‘beer filter’ / ‘star’;
[duŋaʔ] = ‘inheritance’ / ‘to join’;
[djuʔaʔ] = ‘to slice the boule’ / ‘pilchard’;
[hejaʔ] = ‘to sing’ / ‘to be absent’;
[waldaʔ] = ‘you-you cry’ / ‘a time without rain’ / ‘millet grain’.

The forms of the article are /na/ for masculine, /da/ or /ta/ for feminine.

3. Noun/verb comparison

Before pause, Gizey noun and verb roots ending in vowel add a glottal stop or the final vowel becomes creaky or unvoiced. In final utterance position, nouns are suffixed by a definitiveness marker (an article expressed by a consonant + vowel (Root + CV)). Thus, in this position noun structure is: root + (CV, or CV, or CV). E.g.: [gu] ‘tree’ → [gu(n)naʔ], [gu(n)na], [gu(n)na]. In citation (nominalized) forms, the verb undergoes the same phenomenon: e.g. [gün] ‘to twist’ → [gunaʔ], [guna], [guna].

As far as tonal levels patterns (levels H, L) are concerned, these suffixes are H or L, that is, they do not belong to a given tonal level: a great tonal variation in speakers production has been detected, even if on the same suffix. Nevertheless, in perceptive tests the same subjects clearly recognize minimal pairs noun/verb, like [gunaʔ] ‘to twist’ / ‘tree’. So, we rather looked for (and founded) tonal patterns in shapes than in levels. Actually, nouns suffixes show a surface falling contour tone, whereas verbs suffixes show a H tone. The table 1 shows the data of five speakers (Fouryoum, Gilemu, Lawmanga, Marhayna and Tchensou) concerning the opposition noun/verb in four cases:

1. [dʒuʔaʔ] = ‘inheritance’ / ‘to join’
2. [dʒuʔaʔ] = ‘to slice the boule’ / ‘pilchard’
3. [gunaʔ] = ‘tree’ / ‘to twist’
4. [gurutaʔ] = ‘humpback’ / ‘to go crazy’

The tone on verbal suffixes (/na/, /ta/) tends to be H, whereas on corresponding noun suffixes it tends to be lower, but very varying in levels.

Table 1. Tonal levels (in semitones) on suffix for [dʒuʔaʔ], [dʒuʔaʔ], [gunaʔ], [gurutaʔ].

<table>
<thead>
<tr>
<th></th>
<th>Fouryoum</th>
<th>Gilemu</th>
<th>Lawmanga</th>
<th>Marhayna</th>
<th>Tchensou</th>
</tr>
</thead>
<tbody>
<tr>
<td>to join</td>
<td>1.55</td>
<td>4.29</td>
<td>4.37</td>
<td>11.29</td>
<td>1.74</td>
</tr>
<tr>
<td>inheritance</td>
<td>0.91</td>
<td>4.09</td>
<td>2.37</td>
<td>8.3</td>
<td>1.6</td>
</tr>
<tr>
<td>to slice the boule</td>
<td>2.08</td>
<td>4.74</td>
<td>5.04</td>
<td>11.39</td>
<td>2.26</td>
</tr>
<tr>
<td>pilchard</td>
<td>0.38</td>
<td>3.14</td>
<td>2.58</td>
<td>10.07</td>
<td>1.5</td>
</tr>
<tr>
<td>to twist</td>
<td>-0.48</td>
<td>4.35</td>
<td>4.73</td>
<td>12.81</td>
<td>2.51</td>
</tr>
<tr>
<td>tree</td>
<td>-0.54</td>
<td>1.97</td>
<td>1.5</td>
<td>8.18</td>
<td>2.24</td>
</tr>
<tr>
<td>to go crazy</td>
<td>1</td>
<td>2.99</td>
<td>3.48</td>
<td>13.48</td>
<td>2.27</td>
</tr>
<tr>
<td>humpback</td>
<td>0.52</td>
<td>2.92</td>
<td>3.9</td>
<td>8.85</td>
<td>1.87</td>
</tr>
</tbody>
</table>

1. The forms of the article are /na/ for masculine, /da/ or /ta/ for feminine.
2. The boule is a local dish cooked with millet flour boiled in water.
tonal inversion. For instance, we give the list of tonal levels (in semitones) on all noun suffixes, uttered by the same speaker (Bahaodi): [walda] “stick” = 1.65; [fala] “thigh” = 1.97; [tsja] “candle millet” = 3; [tsja] “season after rains” = 0.03; [tserna] “spine” = 1.67; [tserna] “pique-boeuf” bird = 1.18; [tkita] “partridge” = 4.47; ([tkita] “straw” = 3.2; [tiwata] “beak filter” = 4.16; [tiwata] “star” = 4.72; [duduta] “dragonfly” = 5.26; [duduta] “fontanelle” = 1.59; [duejd] “cold” = 2.93; [duejd] “dream” = 3.38; [duejd] “pot” = 1.2; [gajta] “leg” = 0.82; [gajta] “millet stem” = 3.87; [gajta] “rhino” = 0.61; [gulda] “left side” = 0.79; [gulda] “plank” = 2.81; [guna] “tree” = 4.6; [gunuta] “kids” = 2.51; [gunuta] “ox enclosure” = 6; [gunuta] “humpback” = 1.62; [djuna] “inheritance” = 4.04; [djuta] “pilchard” = 2.94; [muta] “oil” = 1.94; [muta] “village chief” = -0.12; [walda] “a time without rain” = 0.57; [walda] “millet grain” = 0.88; [walda] “you-you cry” = 4. We see a huge tonal level variation, even if the suffix is the same and it is pronounced by the same speaker.

If we consider the tonal shape of noun suffixes, then we easily realize that the tonal contour is quite always falling.

To confirm the hypothesis we expected to detect a downstep (\(^{1}\)) in sentence 1 and not in sentence 2:

1. [gün] “I twist” / to twist / ‘dragonfly’
2. [an gün] “I twist” / to twist / ‘dragonfly’

Lexically the definitiveness suffix is associated to an underlying H tone. This one surfaces as H in the case of verbs. While, in the case of nouns, the L underlying tone relinks to the right with the following H tone, and it surfaces as F contour tone.

In order to check our hypothesis, we recorded and analyzed two sentences:

1. [gün nü guña] / ‘The tree fell to the ground’.
2. [än gün gına] / ‘I twist the tree’.

Indeed, if the noun [gün] ‘tree’ is endowed with floating L, then this should reassociate to the following H tone on [n] ‘fell’ and downstep it (\(^{1}\)H). While downstep should not act in the case of the verb [gün] ‘to twist’ and so we should not find downstep in sentence 2. In fact, that is what happens.

The test confirmed our expectations: the root [gün] in nouns (‘tree’) induces downstep on its right. While the same root [gün] in verbs (‘to twist’) does not. The reason lies in the effect of floating L that belongs to the tonal skeleton of the noun root.

We can argue that the tonal patterns of nouns suffixes – that surface as F – result from the combination of H + floating L.

4. Recognition test on minimal pairs & triplets

The aim of recognition test was to check the representativeness of recorded signals by 10 speakers (Malakdi, Lawmanna, Lawmanga, Gilemu, Bahaodi, Marhayna, Fouryoum, Dinamou, Tehensou and Nhiba).

The test was carried out by 7 subjects (none of them was in the list of the 10 speakers). The task was a random listening recognition test. Between each consecutive listening we had a chat with the subject in order to ease his cognitive task. Here we present the results only for some of the minimal pairs ([duduta], [poj], [til]).

4.1. Results: [duduta] = ‘cranium fontanelle’ / ‘dragonfly’

As one can see in table 3, ‘fontanelle’ by Bahaodi is performed LLF and it is well recognized (7/7 subjects); ‘dragonfly’ by Bahaodi is performed LHF and it is well recognized (7/7 subjects); ‘fontanelle’ by Gilemu is performed LLF and it is well recognized (6/7 subjects); ‘dragonfly’ by Gilemu is performed LHF and it is well recognized (7/7 subjects); ‘fontanelle’ by Lawmanna is performed LLF and it is well recognized (7/7 subjects); ‘dragonfly’ by Lawmanna is performed LHF and it is well recognized (7/7 subjects); ‘fontanelle’ by Marhayna is performed LLF and it is well recognized (6/7 subjects); ‘dragonfly’ by Marhayna is performed LHF and it is well recognized (7/7 subjects); ‘fontanelle’ by Fouryoum is performed LLF and it is well recognized (7/7 subjects);
‘dragonfly’ by Fouryoum is performed LHF and it is well recognized (7/7 subjects); ‘fontanelle’ by Dinamou is performed LLF and it is well recognized (7/7 subjects); ‘dragonfly’ by Dinamou is performed LHF and it is well recognized (6/7 subjects); ‘fontanelle’ by Tchensou is performed LLF and it is well recognized (7/7 subjects); ‘dragonfly’ by Tchensou is performed LHF and it is well recognized (7/7 subjects); ‘fontanelle’ by Nihla is performed LHF and thus it is mistaken for ‘dragonfly’ (7/7 subjects); ‘dragonfly’ by Nihla is performed LHF and it is well recognized (7/7 subjects).

The tonal opposition is performed & recognized as far as the signals by Bahaodi, Gilemu, Lawmanga, Lawmanna, Marhayna, Fouryoum, Dinamou and Tchensou (both ‘dragonfly’ & ‘fontanelle’ signals by Malakdi and Nihla are recognized as ‘dragonfly’: their pairs are homotone) are concerned.

The tonal patterns of recognized signals are:

<table>
<thead>
<tr>
<th></th>
<th>‘fontanelle’</th>
<th>‘dragonfly’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahaodi</td>
<td>LLF 7/7</td>
<td>LHF 7/7</td>
</tr>
<tr>
<td>Gilemu</td>
<td>LLF 6/7</td>
<td>LHF 7/7</td>
</tr>
<tr>
<td>Malakdi</td>
<td>LHF 0/7</td>
<td>LHF 7/7</td>
</tr>
<tr>
<td>Lawmanna</td>
<td>LLF 7/7</td>
<td>LHF 7/7</td>
</tr>
<tr>
<td>Lawmansa</td>
<td>LLF 6/7</td>
<td>LHF 6/7</td>
</tr>
<tr>
<td>Marhayna</td>
<td>LLF 7/7</td>
<td>LHF 7/7</td>
</tr>
<tr>
<td>Fouryoum</td>
<td>LLF 7/7</td>
<td>LHF 7/7</td>
</tr>
<tr>
<td>Dinamou</td>
<td>LLF 7/7</td>
<td>LHF 6/7</td>
</tr>
<tr>
<td>Tchensou</td>
<td>LLF 7/7</td>
<td>LHF 7/7</td>
</tr>
<tr>
<td>Nihla</td>
<td>LHF 0/7</td>
<td>LHF 7/7</td>
</tr>
</tbody>
</table>

Table 3. [duduta?].

4.2. Results: [poj] = ‘to walk (accomplished)’ / ‘to walk (unaccomplished)’

Like Masa, Gizey too distinguishes verbal aspects (accomplished vs. unaccomplished) by means of tone. Particularly, in verbs of the so-called “second class” (beginning with voiced consonant) the accomplished is performed H tone and the unaccomplished L tone; whereas in the “first class” verbs (beginning with unvoiced consonant) accomplished is L and unaccomplished H.

As one can see in table 4, the signals by Dinamou, Fouryoum, Nihla and Malakdi follow these expectations and in the perceptive test they have been recognized (in the sentence [an poj blawi] “I have walked very much”/ “I walk very much”).

Results:

\[
\begin{align*}
\text{[poj]} & = \text{‘to walk (accomplished)’}: L \\
\text{[poj]} & = \text{‘to walk (unaccomplished)’}: H
\end{align*}
\]

Results:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Signal} & \text{‘to walk (acc.)’} & \text{‘to walk (unacc.)’} \\
\hline
\text{Malakdi} & \text{L 7/7} & \text{H 7/7} \\
\text{Fouryoum} & \text{L 7/7} & \text{H 7/7} \\
\text{Dinamou} & \text{L 7/7} & \text{H 7/7} \\
\text{Nihla} & \text{L 7/7} & \text{H 7/7} \\
\hline
\end{array}
\]

Table 4. [duejda?].

4.3. Results: [ti] = ‘to eat (accomplished)’ / ‘to eat (unaccomplished)’

In the case of [ti] the results are less clear: as one can see in table 5, 6/9 speakers perform [ti] ‘to eat (accomplished)’ with L tone and 6/9 speakers perform [ti] ‘to eat (unaccomplished)’ with H tone. But Dinamou makes no tonal opposition between accomplished and unaccomplished (less than a quarter of tone); and Lawmanna and Tchensou reverse tonal pattern.

The utterance was [ka mu an ñ funa an naj ti la ñ] “Yesterday I ate the boule, now I don’t eat any more”.

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Signal} & \text{‘to eat (acc.)’} & \text{‘to eat (unacc.)’} \\
\hline
\text{Bahaodi} & \text{L 7/7} & \text{H 7/7} \\
\text{Gilemu} & \text{L 7/7} & \text{H 7/7} \\
\text{Malakdi} & \text{L 7/7} & \text{H 7/7} \\
\text{Lawmanna} & \text{H 0/7} & \text{L 0/7} \\
\text{Lawmanga} & \text{L 7/7} & \text{H 7/7} \\
\text{Marhayna} & \text{L 7/7} & \text{H 7/7} \\
\text{Fouryoum} & \text{L 7/7} & \text{H 7/7} \\
\text{Dinamou} & \text{H 0/7} & \text{H 7/7} \\
\text{Tchensou} & \text{H 0/7} & \text{L 0/7} \\
\hline
\end{array}
\]

Table 5. [ti].

4.4. Results: \([\text{poj}] = \text{‘to walk (accomplished)’} / \text{‘to walk (unaccomplished)’}\)

As one can see in table 6, the signals by Dinamou, Fouryoum, Nihla and Malakdi follow our expectations and in the perceptive test they have been recognized (in the sentence [an poj blawi] “I have walked very much”/ “I walk very much”).

Results:

\[
\begin{align*}
\text{[poj]} & = \text{‘to walk (accomplished)’}: L \\
\text{[poj]} & = \text{‘to walk (unaccomplished)’}: H
\end{align*}
\]

Results:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Signal} & \text{to walk (accomplished)} & \text{to walk (unaccomplished)} \\
\hline
\text{Malakdi} & \text{L 7/7} & \text{H 7/7} \\
\text{Fouryoum} & \text{L 7/7} & \text{H 7/7} \\
\text{Dinamou} & \text{L 7/7} & \text{H 7/7} \\
\text{Nihla} & \text{L 7/7} & \text{H 7/7} \\
\hline
\end{array}
\]

Table 6. [poj].

4.5. Results: \([\text{baa?} = \text{‘to bark’} / \text{‘to rot’}\)

As one can see in table 7, [baa?] ‘to rot’ by Nihla HH has been recognized by seven out of seven (7/7) subjects and his ‘to bark’ LH by five out of seven (5/7). [baa?] ‘to rot’ by Bahaodi LH has been mistaken for ‘to bark’ by five out of seven (5/7) subjects and his ‘to bark’ LH has been recognized
by five out of seven (5/7). [bua?] 'to rot' by Marhayna LH has been mistaken for 'to bark' by five out of seven (5/7) subjects and his 'to bark' LH has been recognized by five out of seven (5/7). [bua?] 'to rot' by Malakdi LH has been mistaken for 'to bark' by five out of seven (5/7) subjects and his 'to bark' LH has been recognized by five out of seven (5/7). [bua?] 'to rot' by Lawmanga LH has been mistaken for 'to bark' by six out of seven (6/7) subjects and his 'to bark' LH has been recognized by five out of seven (5/7). [bua?] 'to rot' by Bahaodi LH has been recognized by five out of seven (5/7). [bua?] 'to rot' by Dinamou LH has been mistaken for 'to bark' by five out of seven (5/7) subjects and his 'to bark' LH has been recognized by five out of seven (5/7). [bua?] 'to rot' by Gilemu LH has been mistaken for 'to bark' by five out of seven (5/7) subjects and his 'to bark' LH has been recognized by five out of seven (5/7). [bua?] 'to rot' by Tchensou LH has been mistaken for 'to bark' by six out of seven (6/7) subjects and his 'to bark' LH has been recognized by five out of seven (5/7) subjects and his 'to bark' LH has been recognized by five out of seven (5/7). [bua?] 'to rot' by Fouryoum LH has been mistaken for 'to bark' by five out of seven (5/7) subjects and his 'to bark' LH has been recognized by five out of seven (5/7).

Results:
[bua?] 'to bark' = LH
[bua?] 'to rot' = HH

<table>
<thead>
<tr>
<th>to bark</th>
<th>to rot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahaodi</td>
<td>LH 5/7</td>
</tr>
<tr>
<td>Gilemu</td>
<td>LH 5/7</td>
</tr>
<tr>
<td>Malakdi</td>
<td>LH 5/7</td>
</tr>
<tr>
<td>Lawmanna</td>
<td>LH 3/7</td>
</tr>
<tr>
<td>Lawmanga</td>
<td>LH 5/7</td>
</tr>
<tr>
<td>Marhayna</td>
<td>LH 5/7</td>
</tr>
<tr>
<td>Fouryoum</td>
<td>LH 5/7</td>
</tr>
<tr>
<td>Dinamou</td>
<td>LH 5/7</td>
</tr>
<tr>
<td>Tchensou</td>
<td>LH 5/7</td>
</tr>
<tr>
<td>Nihla</td>
<td>LH 5/7</td>
</tr>
</tbody>
</table>

4.6. Results: [tjikita?] = ‘straw’ / ‘partridge’

As one can see in table 8, [tjikita?] ‘straw’ by Bahaodi LLF has been recognized by seven out of seven (7/7) subjects and his ‘partridge’ HHF by six out of seven (6/7). [tjikita?] ‘straw’ by Fouryoum LLF has been recognized by seven out of seven (7/7). [tjikita?] ‘straw’ by Dinamou LLF has been recognized by seven out of seven (7/7) subjects and his ‘partridge’ HHF by six out of seven (6/7). [tjikita?] ‘straw’ by Lawmanna LLF has been recognized by seven out of seven (7/7) subjects and his ‘partridge’ HHF by six out of seven (6/7). [tjikita?] ‘straw’ by Tchensou LLF has been recognized by seven out of seven (7/7) subjects and his ‘partridge’ HHF by six out of seven (6/7).

4.7. Results: [gana?] = ‘to jinx’ / ‘to feel bloated’

As one can see in table 9, the pair is not discriminated, even if the signals ‘to feel bloated’ with lower first tone are generally recognized and thus we could argue that: [gana?] ‘to feel bloated’ = LH. The signal [gana?] ‘to jinx’ has been always mistaken for ‘to feel bloated’ (6/7) and in fact it was always performed as homotone to ‘to feel bloated’ (LH); except the signals by Lawmanna and Malakdi that show the following tonal patterns:
[gana?] ‘to feel bloated’ = HH (and HL for Malakdi)
[gana?] ‘to jinx’ = LH
And thus this signal [gana?] ‘to jinx’ with LH is recognized as ‘to feel bloated’ (6/7), more than their [gana?] ‘to feel bloated’ with HH (5/7).

<table>
<thead>
<tr>
<th>to jinx</th>
<th>to feel bloated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahaodi</td>
<td>LH 1/7</td>
</tr>
<tr>
<td>Gilemu</td>
<td>LH 6/7</td>
</tr>
<tr>
<td>Malakdi</td>
<td>LH 1/7</td>
</tr>
<tr>
<td>Lawmanna</td>
<td>LH 1/7</td>
</tr>
<tr>
<td>Lawmanna</td>
<td>LH 1/7</td>
</tr>
<tr>
<td>Marhayna</td>
<td>LH 1/7</td>
</tr>
<tr>
<td>Fouryoum</td>
<td>LH 1/7</td>
</tr>
<tr>
<td>Dinamou</td>
<td>LH 6/7</td>
</tr>
<tr>
<td>Tchensou</td>
<td>LH 1/7</td>
</tr>
</tbody>
</table>

4.8. Results: [walda?] = ‘you-you cry’ / ‘a time without rain’ / ‘millet grain’

As one can see in table 10, [walda?] ‘you-you cry’ by Bahaodi LF has been recognized by seven out of seven (7/7) subjects and his ‘millet grain’ HF by seven out of seven (7/7); ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7). [walda?] ‘you-you cry’ by Dinamou LF
has been recognized by seven out of seven (7/7) subjects and his ‘a time without rain’ was performed LF and thus mistaken for six out of seven (6/7); the signal ‘millet grain’ was not produced (Dinamou did not know the word). [walda?] ‘you-you cry’ by Fouryoum LF has been recognized by seven out of seven (7/7); ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7). [walda?] ‘you-you cry’ by Gilemu LF has been recognized by seven out of seven (7/7) subjects and his ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7); the signal ‘millet grain’ was not produced (Gilemu did not know the word). [walda?] ‘you-you cry’ by Lawmanna LF has been recognized by seven out of seven (7/7) subjects and his ‘millet grain’ HF by seven out of seven (7/7); ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7). [walda?] ‘you-you cry’ by Lawmanna LF has been recognized by seven out of seven (7/7) subjects and his ‘millet grain’ HF by seven out of seven (7/7); ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7). [walda?] ‘you-you cry’ by Malakdi LF has been recognized by seven out of seven (7/7) subjects and his ‘millet grain’ HF by seven out of seven (7/7); ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7). [walda?] ‘you-you cry’ by Marhayna LF has been recognized by seven out of seven (7/7) subjects and his ‘millet grain’ HF by seven out of seven (7/7); ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7). [walda?] ‘you-you cry’ by Nihla was performed HF and thus confused with ‘millet grain’ by six out of seven (6/7) subjects and his ‘millet grain’ HF has been recognized by five out of seven (5/7); ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7). [walda?] ‘you-you cry’ by Tchensou LF has been recognized by seven out of seven (7/7) subjects and his ‘millet grain’ HF has been recognized by seven out of seven (7/7); ‘a time without rain’ was performed LF and thus mistaken for ‘you-you cry’ (6/7). Thus, the speakers oppose only two words according to tonal patterns and in the perceptive test only two different words are recognized.

Results:

[walda?] ‘you-you cry’ = LF
[walda?] ‘a time without rain’ = HF
[walda?] ‘millet grain’ = HF

---

Table 10. [walda?].

<table>
<thead>
<tr>
<th></th>
<th>you-you cry</th>
<th>a time without rain</th>
<th>millet grain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahaodi</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Gilemu</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Malakdi</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Lawmanna</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Lawmansa</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Marhayna</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Fouryoum</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Dinamou</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Tchensou</td>
<td>LF 7/7</td>
<td>LF 1/7</td>
<td>HF 7/7</td>
</tr>
<tr>
<td>Nihla</td>
<td>HF 1/7</td>
<td>LF 1/7</td>
<td>HF 5/7</td>
</tr>
</tbody>
</table>

5. **Length vs. tone**

In order to verify the phonetic grounds of the oppositions in the minimal pairs, we carried out an experiment where vowel length matches against vowel tone. We made use of the minimal pair [dùdutà?] ‘fontanelle’ = LLF / [dùdùtà?] ‘dragonfly’ = LHF. We picked the signals pronounced by Bahaodi that reached a good percentage of identification in perceptive tests. We manipulated these signals by increasing and decreasing /ù/ length in the second syllable, step 20 ms, but leaving its tone unchanged (2.42 semitones in ‘fontanelle’ vs. 7.06 semitones in ‘dragonfly’). We submitted the listening and identification test to 3 subjects. They had to listen to the original signals and to the ones that had been manipulated in length and to identify them either as ‘fontanelle’ or as ‘dragonfly’.

The results show that the perception of the opposition is triggered only by tonal patterns and that the variation of length does not induce any shift in the identification of meaning. Indeed, the signals [dùdutà?] LLF and its alterations (-60, -40, -20, +20, +40, +60 ms.) were always recognized as ‘fontanelle’. The signals [dùdùtà?] LHF and its alterations (-60, -40, -20, +20, +40, +60 ms.) were always recognized as ‘dragonfly’.

6. **Provisional conclusions**

- The analysis of the corpus leads to suppose that Gizey tonal patterns consist of two tones (H, L).
- But we found only few minimal pairs in the lexicon.
- Moreover, in identification and discrimination tests we observed that Gizey speakers often misunderstood and did not recognize tonal oppositions.
- The tonal oppositions in the aspectual paradigm of the verbal system seem to get better results. Like Masa, Gizey arranges verbs in two classes (according to the voiced/unvoiced nature of the first consonant in the root) and expresses the aspect (accomplished /unaccomplished) by means of tone (H/L).
- In short, data lead to suppose that tones in Gizey perform a weak functional load.

7. **Perceptive test on verbal paradigm: testing**

In order to verify the functional load of tones in the verbal paradigm, we carried out a listening test on two utterances by Malakdi, where the speaker performs the
accomplished/unaccomplished aspectual opposition by means of tonal oppositions. In sentence 1 the verb belongs to the first class and the tonal pattern for accomplished/unaccomplished is L/H; in sentence 2 the verb belongs to the second class and the tonal pattern for accomplished/unaccomplished is H/L:

1. [kamu] [an] [ti] [foo] [djivini] [an] [dej] [ti] [foo]  
   Yesterday I ate the boule, tomorrow I will eat the boule.
2. [kamu] [an] [güs] [fujiufu] [djivini] [an] [dej] [güs] [füko]  
   Yesterday I bought a goat, tomorrow I will buy a goat.

In order to test the degree of linguistic relevance of tonal oppositions conveying aspectual morphemes, we manipulated the original sentences by means of a signal editing device. We inverted the position of [ti] ‘eat’ / [ti] ‘ate’ in the sentence 1 and of [güs] ‘buy’ / [güs] ‘bought’ in the sentence 2. The resulting sentences 3 and 4 should be considered unacceptable (*) by Gizey speakers.

3. *[kamu] [an] [ti] [foo] [djivini] [an] [dej] [ti] [foo]  
   Yesterday I eat the boule, tomorrow I will eat the boule.

4. *[kamu] [an] [güs] [fujiufu] [djivini] [an] [dej] [güs] [füko]  
   Yesterday I buy a goat, tomorrow I will bought a goat.

8. Perceptive test on verbal paradigm: remarks

In the test 10 subjects were asked to listen to the 4 utterances and answer to the question: ‘Are they correctly uttered?’. The sentences 1 and 2 were always judged correctly uttered, utterance 3* was wrong only for 2/10 subjects; utterance 4* was wrong only for 3/10 subjects. The results show that the unacceptability of sentence 3* and 4* was not detected. Consequently, they call into question the linguistic relevance of tonal oppositions.

9. Perceptive test on verbal paradigm: conclusions

The results of the test call our attention to the asymmetry between production and perception in tonal manifestation of aspectual opposition in verbal paradigm. From a perceptive point of view, subject answers show that lexical (‘yesterday’, ‘tomorrow’) or morphological (future marker [dej]) information conveys stronger cues than verbal morphemes (H vs. L), in order to identify the verbal aspect. Nevertheless, with respect to production, natives regularly show standard occurrence of tonal oppositions to express verbal aspects.

10. Conclusions

The data and the analysis that we carried out until now allow us to argue the phonological relevance of two tones in Gizey (H, L).

L tone may be floating in nominal roots. On the other hand, we observed a remarkable asymmetry between production and perception in natives tonal competence.

These arguments corroborate the feeling of a weak functional load of tonal pairs: we founded a number of cases of overlapping and homophony in nominal system. Moreover, in the verbal system we demonstrated that the aspectual paradigm is decoded through lexical or morphological cues more than through tonal patterns.

Finally, the analysis gave us a linguistic picture of Gizey as a language whose tonal system is endangered. It is hard to settle whether Gizey tones are going to be missing or simply they never managed to prevail in Chadic area.

11. Bibliographic references