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# TONAL INVERSION IN GEJI AND PELU

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Henry Tourneux, in his 2007 article “L’inversion tonale en kotoko” (Tourneux 2007) drew our attention on a phenomenon concerning systematic tone variations contrasting a Low and High final tone in the tone patterns of two dialects of Kotoko. A similar phenomenon was observed in our study of Geji, a Chadic language spoken in Bauchi State, Nigeria. This paper aims at documenting this variation and accounting systematically for it with a set of simple phonological rules.

Geji belongs to the South-Bauchi-West (SBW) branch of Western Chadic languages. The internal classification of SBW languages in (Table 2) below is adapted from (Shimizu 1978; Lewis 2009).

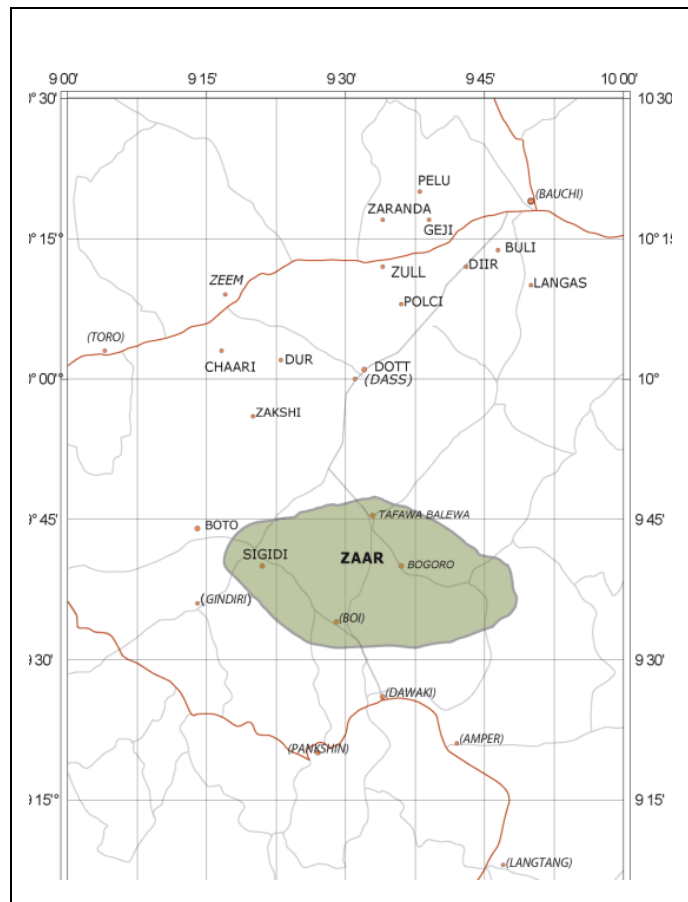
**Table 1. Internal Classification of SBW**

LANGUAGE CLUSTERS	LANGUAGES	DIALECTS
<i>Sub-group North</i>		
<u>Geji</u>	{ <u>Geji</u> Zaranda	{ Bolu <u>Pelu</u> <u>Geji</u> Zaranda
		{ Dir Zul Baram Diir
Polci	{ Polci	{ Buli Langas (Luri†) Lundur Polci
<i>Sub-group South</i>		
Zeem	{ Chaari Lushi	{ Zeem†, Dyarum (?) Tule† Chaari Lushi† Bàraza
Dass	{ Baraza Dott	{ Dùr Zumbul Wangdày Zòdi
Saya	{ Zakshi Zaar	{ Zàkshi Boto Zari Sigidi (Guus) Zaar of Kal Zaar of Marti Zaar of Bogoro

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Geji is a little documented language spoken north of the Bauchi-Jos road, on the eastern side of the Zaranda mountain. The map below shows the geographic situation of Geji in relationship with neighbouring SBW languages, and Zaar, their better-known SBW cousin.

**Geji, Zaar and other SBW languages**



Apart from a mention in (Shimizu 1978) and *Ethnologue* (Lewis 2009) as a dialect of Geji, Pelu is not otherwise documented. A quick lexical survey shows that Geji and Pelu are very close dialects, with practically no lexical and little morphological variations. As an illustration of the lexical stability, see (Table 2) below

**Table 2. Pelu and Geji Lexical Stability**

	Pelu	Geji
wasp	<i>kábà̀lkà̀n<sup>1</sup></i>	<i>kábà̀lkà̀n</i>
ant sp.	<i>fyá: fyā:</i>	<i>fyá: fyā:</i>
dog	<i>kāđī</i>	<i>kāđī</i>
cat	<i>kūlē</i>	<i>kūlē</i>
horn	<i>nō:</i>	<i>nō:</i>
tree sp. (wild custard apple)	<i>mbwā:kī</i>	<i>mbwā:kī</i>
mahogany	<i>lānkā</i>	<i>lānkā</i>

<sup>1</sup> Geji and Pelu (resp. G. and P.) both have 3-tones. High tone (H) is noted by an acute accent on the vowel (*á*), Low tone (L) with a grave accent (*à*), and Mid tone (M) with a macron (*ā*). Falling tone (F) is noted by a circumflex accent (*â*), and Rising tone (R) by a caron (*ǎ*).

## 1. Tone inversion in pre-pausal forms

However, despite this stability, tonal inversion is often observed in pre-pausal forms, where monotonal nouns in Geji correspond to rising tone patterns (R or MH) in Pelu

**Table 3. Pre-pausal Tonal Inversion**

	Pelu		Geji	
head	<i>gǎ:</i>	R	<i>gā:</i>	<i>M</i>
guinea-fowl	<i>dʒó:n</i>	R	<i>dʒō</i>	<i>M</i>
baboon	<i>hǔ:</i>	R	<i>hwō:mī</i>	<i>MM</i>
testicle	<i>ndī:sí</i>	MH	<i>ndí:sí</i>	<i>HH</i>
scorpion	<i>yēndál</i>	MH	<i>yéndál</i>	<i>HH</i>
dove	<i>kūlú</i>	MH	<i>kúlú</i>	<i>HH</i>
tongue	<i>lāká</i>	MH	<i>láká</i>	<i>HH</i>
beans	<i>bā:lí</i>	MH	<i>bá:lí</i>	<i>HH</i>
millet sp.	<i>swā:ní</i>	MH	<i>swá:ǵí</i>	<i>HH</i>
porcupine	<i>gūsni</i>	MH	<i>gùsni</i>	<i>LL</i>
dirt	<i>dāskān</i>	MH	<i>dāskān</i>	<i>MM</i>
fish	<i>kwē:sí</i>	MH	<i>kwē:sī</i>	<i>MM</i>
tree sp. ( <i>Bombax costatum</i> )	<i>bī:kí</i>	MH	<i>bī:kī</i>	<i>MM</i>

The word bird (G. *yá:ḡi*; P. *yā:hi*) even shows complete tonal inversion (G. HL; P. MH). This corresponds to the impossibility, in Geji pre-pausal nouns, to have a rising tone pattern. It should be noted, however, that this pattern is commonly found in verbs:

*Mā*      *pāki*    *wī.*  
 PL.AOR    finish    ACC  
 ‘we finished’

This means that the absence of rising melodies is not the result of a general phonological constraint, but may have to do with some lexical particularity of Geji. In order to explore this hypothesis, let us look at what obtains when tones are elicited in the context “it is a \_\_\_”, equivalent to the Hausa so-called stabilizer \_\_\_ *ne/ce*.

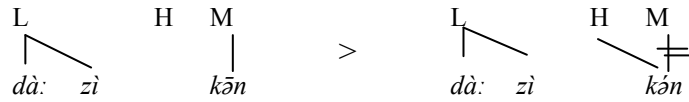
## 2. The stabilizer and floating High tones

In Geji and Pelu, the stabilizer has the form and structure structure \_\_\_ *kān*. Like Hausa *ne/ce*, Geji /*kān*/ has a variable tone. In a first approach, it was thought to bear a Mid lexical tone. In Geji, this Mid tone is replaced by copying the last tone of the noun it follows. This is congruent with the fact that in Geji, the Mid tone is replaced by any other tone in case of tone spreading or copying. In Pelu, the Mid tone of *kān* it is replaced by a tone that is polar with the one it follows: M after H and H after –H (i.e. M and L).

**Table 4. Geji & Pelu stabilizer**

		Geji	Pelu
bedbug	<i>búli</i>	<i>kān</i>	<i>kān</i>
flea	<i>swā:sī</i>	<i>kān</i>	<i>kān</i>
warthog	<i>dānzì</i>	<i>kān</i>	<i>kān</i>

However, with some monotonal L or M Geji nouns, the stabilizer, instead of copying the last tone of the pre-pausal form, appears with a H tone : ‘finger-millet’; *dā:zì kán*, ‘it is finger-millet’. A first solution to account for this change in the tone of the stabilizer is to posit a floating H tone (e.g. *dā:zì*, LL<sup>H</sup>), linking with the particle:



This solution accounts for the lexical data listed in (Table 5) below:

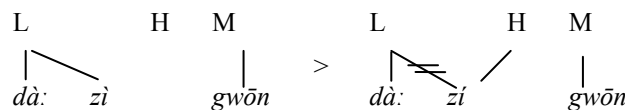
**Table 5. Geji nouns with floating tones**

	Pelu		Geji	
finger-millet	<i>dà:zì</i>	<i>LH</i>	<i>dà:zì<sup>H</sup></i>	<i>LL<sup>H</sup></i>
red sorrel	<i>d̥zìd̥á</i>	<i>LH</i>	<i>d̥zìd̥á<sup>H</sup></i>	<i>LL<sup>H</sup></i>
blood	<i>hùlán</i>	<i>LH</i>	<i>hùlán<sup>H</sup></i>	<i>LL<sup>H</sup></i>
speech	<i>gàbá</i>	<i>LH</i>	<i>gàbá<sup>H</sup></i>	<i>LL<sup>H</sup></i>
donkey	<i>zà:kí</i>	<i>LH</i>	<i>d̥zà:kí<sup>H</sup></i>	<i>LL<sup>H</sup></i>
bark	<i>gùk̥k̥án</i>	<i>LH</i>	<i>gùk̥k̥án<sup>H</sup></i>	<i>LL<sup>H</sup></i>
wild yam	<i>gùlkí</i>	<i>LH</i>	<i>gùlkí<sup>H</sup></i>	<i>LL<sup>H</sup></i>
lungs	<i>hū:hú:</i>	<i>MH</i>	<i>hū:hū:<sup>H</sup></i>	<i>MM<sup>H</sup></i>
lizard	<i>bàlkáŋ</i>	<i>LH</i>	<i>bàlkáŋ<sup>H</sup></i>	<i>MM<sup>H</sup></i>
land monitor	<i>dàkál</i>	<i>LH</i>	<i>dàkál<sup>H</sup></i>	<i>MM<sup>H</sup></i>
friend	<i>yēlán</i>	<i>MH</i>	<i>yēlán<sup>H</sup></i>	<i>MM<sup>H</sup></i>
lie	<i>lālì</i>	<i>MH</i>	<i>lālì<sup>H</sup></i>	<i>MM<sup>H</sup></i>
mucus	<i>yēlál</i>	<i>MH</i>	<i>yēlál<sup>H</sup></i>	<i>MM<sup>H</sup></i>
hornbill	<i>būrtú</i>	<i>MH</i>	<i>būrtú<sup>H</sup></i>	<i>MM<sup>H</sup></i>
tree sp. ( <i>Grewia bicolor</i> )	<i>hōllì</i>	<i>MH</i>	<i>hōllì<sup>H</sup></i>	<i>MM<sup>H</sup></i>
horse	<i>kāpsí</i>	<i>MH</i>	<i>kāpsí<sup>H</sup></i>	<i>MM<sup>H</sup></i>
thorn	<i>jī:lì</i>	<i>MH</i>	<i>jī:lì<sup>H</sup></i>	<i>MM<sup>H</sup></i>
citrus	<i>lē:mó</i>	<i>MH</i>	<i>lē:mó<sup>H</sup></i>	<i>MM<sup>H</sup></i>
tree sp. ( <i>Detarium S.</i> )	<i>gàŋál</i>	<i>MH</i>	<i>gàŋgāl<sup>H</sup></i>	<i>MM<sup>H</sup></i>
pepper	<i>tāttā:séj</i>	<i>MMH</i>	<i>tāttā:ŋí<sup>H</sup></i>	<i>MM<sup>H</sup></i>
mosquito	<i>hūlēndí</i>	<i>MMH</i>	<i>hūlēndí<sup>H</sup></i>	<i>MMM<sup>H</sup></i>

The difference between Pelu and Geji tone patterns would be explained as a different treatment in rising melodies: Pelu has the whole melody linking on the pre-pausal form, whereas Geji has a floating Hi tone which links with the 1<sup>st</sup> syllable that follows and is dropped in pre-pausal position, producing a monotonal noun.

### 3. Floating High tones and the indeterminate quantifier

However, this explanation runs into a problem with the indeterminate quantifier /*gwon*/, pl. : /*d̥zon*/, ‘some..., another / other...’, as in *bàlì gwōn*, ‘some/another monkey’. Let us assume that the quantifier, for the same reasons as for stabilizer /*kən*/, has a Mid lexical tone. Floating H tones, as in e.g. *dà:zì<sup>H</sup>*, instead of linking with the quantifier *gwōn*, (e.g. *dà:zì \*gwón*), link with the last syllable of the noun thereby producing the very rising melody which is not attested in pre-pausal form: *dà:zì (LL<sup>H</sup>) + gwōn > dà:zì gwōn*, ‘some finger-millet’ :



Since the quantifier *gwōn/d̥zwōn* begins with a voiced obstruent, we can explain this by saying that H tones cannot link with syllables with an initial depressor consonant (D), in accordance with what obtains in other Chadic languages with consonant-tone interaction (Wolff 1987;

Odden 2007; Caron 2009). If we follow this hypothesis, *gwòn* has a Mid tone pattern, and its initial D consonant acts as a barrier (is “opaque”) to H tones. However, the tones of *gwòn* in other contexts vary in a way that is difficult to explain if it has a Mid tone. Let us compare the behaviour of *gwòn* with that of *kàn*:

<i>kādī</i> ‘dog’	<i>kādī kàn</i>	<i>kādī gwòn</i>
<i>kúlú</i> ‘dove’	<i>kúlú kàn</i>	<i>kúlú gwòn</i>
<i>bàlì</i> ‘monkey’	<i>bàlì kàn</i>	<i>bàlì gwòn</i>
<i>dànzi<sup>H</sup></i> ‘warthog’	<i>dànzi kàn</i>	<i>dànzi gwòn</i>
<i>wá:tán</i> ‘rain season’	<i>wá:tán kàn</i>	<i>wá:tán gwòn</i>

The L tone on /*gwon*/*ɔ̄gwon*/ following *kādī* (MM) and *wá:tán* (HF) is a problem if we consider that the lexical tone of /*gwòn*/ is M, since we would expect the following surface realizations: *kādī* / *wá:tán* \**gwòn*.

#### 4. An alternative to lexical floating tones

In order to reconsider the question, let us use the rules for the surface realization of tone combinations that were established in (Caron 2009):

	L	H	M
L	M	H	L
H	M	H	H
M	L	H	M

These rules apply normally if

- 1) /*gwon*/ has a lexical Low tone (*gwòn*)
- 2) the lexical form of *dànzi<sup>H</sup>* (BB<sup>H</sup>) is abandoned for *dànzi* (BH)
- 3) the last tone of the determined noun copies onto the first syllable of the quantifier
- 4) the initial D consonant does not block the rightward movement of H tones:



As predicted, the two forms of /*gwon*/ (*gwòn* and *gwòn*) are accounted for by these rules in all contexts:

<i>kādī</i>	+	<i>gwòn</i>	>	<i>kādī gwòn</i>	(M+L > L)
<i>kúlú</i>	+	<i>gwòn</i>	>	<i>kúlú gwòn</i>	(H+L > M)
<i>bàlì</i>	+	<i>gwòn</i>	>	<i>bàlì gwòn</i>	(L+L > M)
<i>dànzi</i>	+	<i>gwòn</i>	>	<i>dànzi gwòn</i>	(H+L > M)
<i>wá:tán</i>	+	<i>gwòn</i>	>	<i>wá:tán gwòn</i>	(M+L > L)

It is worth mentioning here that the combination L+L > M (e.g. *bàlì gwòn* < *bàlì + gwòn*), however unexpected, is quite regular in Geji.

However, the new lexical LH tone pattern adopted to replace the former LL<sup>H</sup> does not produce the expected result with the *kàn* stabilizer. If, as stated above, the Geji stabilizer has a Mid tone that copies the last tone of the noun it follows, we would expect to have \**dànzi kàn* instead of what obtains, i.e. : *dànzi kàn*. This can be accounted for if we state that *kàn* is a clitic with no lexical tone, and the OCP applies on the domain N=clitic, *dànzi=kàn*. The LL pre-pausal form is accounted for, whatever the other rules, by the action of intonational downdrift (Cf. Schneeberg 1974 for an equivalent phenomenon in Zaar).

## 5. Conclusion

This paper has offered a unified account of the tonal inversion observed between two dialects of Geji, a Chadic South-Bauchi language spoken west of Bauchi in Nigeria. In Geji proper, in prepausal nominal forms, the rising melodies that are documented in the Pelu dialect are avoided and replaced by monotonal patterns. These prepausal forms are accounted for by the action of intonational downdrift. The variation of the LL / LH tone patterns in certain nouns, together with that of the indeterminate quantifier *g̀wòn/d̀wòn* and the stabilizer *=kən* are explained by the use of simple rules of tone spreading and copying, which interact with surface rules of tone combinations. This presents a further limitation to the role of Depressor Consonants in Geji, as they do not act as barrier to H tones, but account in a limited way, for the diachronic explanation of the birth of a 3-tone system from an initial 2-tone situation (Cf. Caron 2009). Once again, we can but notice the need for distinctive features among close neighbours as a source for the development of dialects.

### List of abbreviations

M	Mid tone
H	High tone
L	Low tone
R	Rising tone
F	Falling tone
G	Geji
P	Pelu
PL	Plural
AOR	Aorist
ACC	Accomplishment
//	surrounds segmental (without tone) forms
D	Depressor (consonants)

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