### Tone-Vowel Correlation and "Templatic Effect" in Hausa Plurals

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## [1] Introduction

*Tone-consonant interaction:*

- Depressor consonants and High tone blocking consonants (cf. Odden 02, Ahoua 03, Brashaw 03...).

*Tone-vowel interaction:*

- An uncommon phenomenon cross-linguistically. Nevertheless, in several languages tones and vowels seem to interact directly or indirectly:

(a) In the Foochow dialect of Chinese –Northern Min languages- High tones morphophonemically raise vowels from low to mid and from mid to high (cf. Wang 1967).

(b) In Limburg Dutch dialects, tone contrast has given rise to vowel quality differences. That is, diphtongal vowels split into several diphtongal vowels and mid monophtongs split into lower vowels (cf. Gussenhoven & Aatrs 2000, Hermans & Oostendorp 2000).

(c) Several studies indicate a tendency for higher vowels to be uttered with a higher pitch than lower vowels in similar environments (cf. Peterson & Barney 1952, Lehiste & Perterson 1961, Hombert 1977).

*Tone-vowel interaction in Hausa:*

Pilszczikowa-Chodak (1972) pointed out a regular correlation between vowel height and tone value in Hausa verbs and noun plurals. The values of the tones assigned to the final vowels depend on the quality of these vowels:

- a high vowel takes a High tone
- a low vowel takes a Low tone

Newman (1975) brings several counterexamples which do not undergo this generalisation.

## [2] Aims

I will show that:

i. Tone-vowel correlation is relevant and predictible in Hausa plurals,

ii. It is morphologically constrained. That is, it takes place in particular morphological sites located in the plural template.

iii. Tones interact with all and only vowels that result from certain morphological operations, i.e. those vowels which are "templatically" derived.

## [3] Hausa Vowels and tones

Hausa, a western Chadic language, has:

5 short vowels / i, u, e, o, a/ with their long counterparts

2 diphthongs /ai, au/

3 tones: High marked [´], Low marked [`] and Falling marked [^]:

Examples:

"dad" bàabá  vs. báabà "mom, auntie"

"to cook" dáfàa vs. dàfáa "cook!"

dâ "formerly", lìimâm "imam".

## [4] Hausa plural classes

Hausa has 46 plural classes.

Newman (2000:431) suggested to reduce them to 15 major classes.

Hellwig & Mcintyre (2000) distinguished 3 systems:

(i) a semantic system –the oldest one- based on changes in tone pattern and vowel sequences

(ii) a prosodic system, transitional

(iii) a suffix system.

## [5] Data

The vowels concerned with the correlation are underlined below:

| | *singular* | *plural* | | *singular* | *plural* |
|---|---|---|---|---|---|
| « old cow » | gúzúmáa | gúzàarée | « house » | gídáa | gídàayée |
| « white » | fáríi | fáràarée | « type of drum » | táushìi | táfàashée |
| « earth » | kásáa | kásàashée | « stream» | ràafii | ráafúkàa |
| « plot of cotton » | gárkáa | gáràakée | « dog » | kàrée | kárnúkàa |
| «grass bracelet » | tàfáa | táfàafée | « bicycle » | kèekée | kéekúnàa |
| « itinerant trader » | fã̃rkée | fã̃tàakée | « axe » | gàatáríi | gáatúràa |

## [6] Counterexamples Newman (1975).

| | *singular* | *plural* | | *singular* | *plural* |
|---|---|---|---|---|---|
| « boy » | yáaròo | yaàráa | « clod of corn » | dámìi | dâmmáa |
| « friend » | àbóokii | àbòokái | « ring » | zóobèe | zôbbáa |
| « woman » | màcè | máatáa | « edge » | géefèe | gyâffáa |
| « wife » | míjìi | mázáa | « heathen » | ã̃rnèe | ã̃rnáa |

## [7] Observations

The examples in [5] show a regular correlation between the underlined vowels and the tones that they bear. That is:

- a high vowel bears a High tone
- a High tone is assigned to a low vowel /a/
- lexical vowels, i.e. the first vowel of each stem, never undergo the correlation. It is usually the vowels that result from derivational operations that undergo the correlation, i.e. 2nd and 3rd vowels of the stem
- the tone asssigned to the final vowel is systematically the opposite of the preceding tone.

## [8] Tone patterns distribution

Examples given in [5]

| *Singular* | *Plural* |
|---|---|
| LH | HHL |
| | HLH |
| HL | HLH |
| HH | HLH |
| HHH | HLH |
| LHH | HHL |

- only two patterns in the plurals given in [5]: HHL and HLH.
- if initial L in the singular then HHL pattern in the plural
- if initial H in the singular then HLH pattern in the plural (except tàfáa > táfàafée)

## [9] Other observations

- plurals given in [5] all contain three consonants or two consonants with a reduplicated $C_2$.

- A default consonant /k, n or y/ is suffixed to the plural forms when the stem contains less than three consonants,
- the second vowel in the plural forms is always /a/. It becomes /u/ when preceded or followed by a velar consonant.

The counterexamples given in [6] show the following characteristics:

- they do not undergo the tone-vowel correlation as their equivalents in [5]
- their plurals all exhibit less than three consonants
- they show vowel alternations between singular and plural
- apart from some exceptions, their vowel alternation is regular: ii $\Rightarrow$ aa, ii $\Rightarrow$ ai, ee $\Rightarrow$ aa.

## [10] Afroasiatic internal -A- plurals

The plurals in [5] all show an internal vowel infixed between $C_2$ and $C_3$ or between reduplicated $C_2$.

The -A- plural formative is widely attested in Afroasiatic languages:

|  | *singular* | *plural* |  |  | *singular* | *plural* |  |
|---|---|---|---|---|---|---|---|
| *Cl. Arabic* | raml | rimaal | "sand" | *Kotoko* | gə̀nə̀m | gə̀nàm | "woman" |
|  | kalb | kilaab | "dog" |  | sə̀ymə̀ | sə̀yàmè | "ear" |
|  | sirr | ʔasraar | "secret" |  | slèr | slàrè | "tooth" |
| *Mehri* | hóotər | hiitáar | "kid female" | *Ge'ez* | faras | ʔafraas | "horse" |
|  | bəḳəreet | əbḳaar | "cow" |  | hagar | ʔahguur | "town" |
|  | ḳəbóoź | ḳəbáwź | "herd of camels" |  | met | ʔamtaat | "husband" |

## [11] The plural Template

*Classical Arabic internal plurals*: Kihm (2003) hypotheses a derivational empty site in the plural template, located between the second and third root consonants. This site serves to connect the internal -A-.

I suggest that all plurals in [5] are derived by use of the template given in [12]. This template contains two derivational sites: one located between $R_2$ and $R_3$ (R = root consonant) and the other is located at the end of the form.

**[12]    $R_1 \bullet R_2 \bullet \{\ \}_{DS1} R_3 \bullet \{\ \}_{DS2}$**

The derivational sites are delimited by curly brackets. Full stops between Rs stand for vowels:

- The first derivational site (DS1) is activated by the internal –a- which becomes –u- when preceded or followed by a velar.
- The second site (DS2) is filled by external material.
- Both sites are activated.

## [13] Templatic effect

My analysis of the tone-vowel correlation in plurals in [5] is based on the assumption that:

*"All and only vowels inside the two sites in [12] undergo the correlation."*

The tone-vowel correlation is limited to at most 11 plural classes among 46

## [14] Newman's counterexamples

The plurals given in [6] do not undergo tone-vowel correlation because they have nothing to do with templatic morphology. They behave completly differently from the examples in [5] in that:

- they use none of the two derivational sites specified in [12]
- their final vowels simply alternate with their singular counterparts.

The vocalic alternations in [6] exhibit an apophonic derivation:

míj**ìi** ⇒ máz**áa**

  I  ⇒     A

ãr̃n**èe** ⇒ ãr̃n**áa**

  I  ⇒     A          <——apophonic elements

  |

  A

       Pilszczikowa-Chodak (1972:419) suggested that <u>dâmmáa</u>, <u>zôbbáa</u> and <u>gyâffáa</u> were originally trisyllabic. I assume that they are derived from <u>dáamàamáa</u>, <u>zóobàabáa</u> and <u>gyáafàafáa</u>, respectively.

       Their final High tone is due to a tonal contrast: prohibition of assigning the same tone value to two identical and consecutive vowels.

**[15] Two main consequences**

> The tone-vowel correlation is locally constrained in Hausa plurals.

> There are at least two major classes of plurals in Hausa: (i) those that use templatic derivation (examples given [5]) and (ii) those that use vowel alternation (say apophony) (examples given in [6]).

**References**

Bradshaw, Mary. 2003. Consonant-tone interaction in Siswari. *Studies in Phonetics, Phonology and Morphology.* 9.2: 277-294.

Gussenhoven , C.& F. Aarts. 2000. The dialect of Maastricht. ms.University of Nijmegen, Centre for Language Studies.

Hermans, Ben & Oostendorp, Marc van. 2000. On the Interaction between Vowel Quality and Tone in Limburg Dutch Dialects. *Tromsø Tone Symposium*. 7 June 2000.

Hombert, Jean-Marie. 1977. Development of tones from vowel height. *Journal of Phonetics* 5: 9-16.

Kihm, Alain. 2003. Les pluriels internes de l'arabe: système et conséquences pour l'architecture de la grammaire [2003]. Recherches Linguistiques de Vincennes, 32:109-156.

Leben, William. 1978. The representation of tone. In V. Fromkin (ed.), *Tone: A Linguistic Survey*. New York: Academic Press, 177-219.

Lehiste, I. & G. Peterson. 1961. Some basic considerations in the analysis of intonation. JASA 33: 419-425.

Newman, Paul. 1975. The Non-Correlation of Tone and Vowel Height in Hausa [July 1975]. Studies in African Linguistics, Volume 6, Number 2: 207-13.

Odden, David. 2002. Consonant-Tone Interaction in Zina Kotoko. *Stanford Linguistics Colloquium*. April 2002.

Peterson, G. E. & H. L. Barney. 1952. Control methods used in the study of vowels. *JASA* 24: 175-184.

Pilszczikowa-Chodak, Nina. 1972. Tone-Vowel Height Correlation and Tone Assignment in the Patterns of Verb and Noun Plurals in Hausa. *Studies in African Linguistics*. Volume 3, Number 3: 399-421.

Pilszczikowa-Chodak, Nina. 1975. On the Correlation of Tone and Vowel Height in Hausa: a Replay to Newman. [December 1975]. Studies in African Linguistics, Volume 6, Number 3: 315-321.

Wang, W. S-Y. 1967. Phonological features of tone. *I.J.A.L.* 33-2: 93-105.

Yip, M. 2002. *Tone*. Cambridge. Cambridge University Press.