

VARIATION AND PALATALISATION IN THE PRODUCTION OF THE PLURAL PREFIX IN MERU: A STUDY OF THREE DIALECTS

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ABSTRACT

The proto-Bantu plural prefix marker *bi- for class 8 nouns/ has evolved into many forms across the Meru dialect continuum which belongs to the Central Kenya Group. However, the nature and extent of this variation is poorly understood. To shed light on this issue, five pairs of singular-plural class 7/8 nouns were recorded from 75 speakers across three dialects including the northern and southern dialects Tigania and Chuka as well as Imenti which is considered a standard variety of Meru bordering Tigania to the south. The prefixes were found to be palatalised labial in Imenti and varied between alveolar and alveolo-palatal in Chuka. For Tigania, there was a mixture of all of these both between and within speakers and whose choice was also influenced by the dialect of the experimenter. The observed variability nevertheless conforms to well-established patterns of sound change that connect palatalised labials, palatalised dorsals, and apical consonants.

Keywords: Bantu, Meru dialects, sound change, palatalisation, morphophonological variation.

1. INTRODUCTION

The present study forms part of a larger project to model morpho-phonological variation in dialects and dialect continua that happen to differ in one or more regular sound changes. The specific focus in this paper is on the variation in the plural prefix attachment to stems of class 8 nouns in the dialects of the Meru language which is of Bantu origin and spoken on the north eastern slope of Mount Kenya.

1.1 Background to Meru

For a very long time, the area where the Meru dialects are spoken belonged to one geo-political district called “Meru district” which was subdivided in 1992 into three districts namely, Meru, Nyambene and Tharaka Nithi. Later these districts were further subdivided and amalgamated again in 2010 when Kenya introduced a devolved system of governance into 47 counties. The old “Meru district” currently belongs to two counties of Meru (County no.12) and Tharaka Nithi (County number 13). Chuka where data for this paper was collected from belongs to Tharaka Nithi

county, and Tigania and Imenti belong to the Meru County. According to [1], before the colonial era, “Meru” comprised five (Igembe, Tigania, Imenti, Miutini and Igoji) of the nine sections of the so-called Meru dialects. The British administrators later included Tharaka in the adjoining eastern plains, as well as Mwimbi, Muthambi and Chuka that border Meru to the south (Fig. 1). The classification of these groups as belonging to the Meru dialects has been controversial.

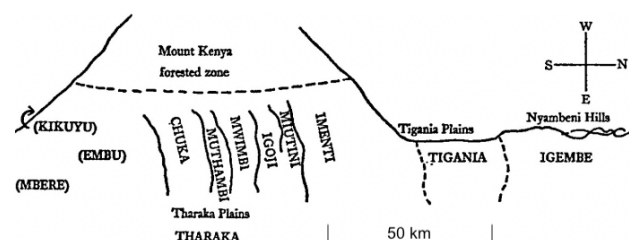


Figure 1. The Meru district and its dialects/languages. Adapted from Fadiman (1973).

Some have suggested that Tharaka and Meru are two distinct languages [1-5]. Chuka has also been argued to belong to the separate Gikuyu language [4,6]. Despite these differences, there is some agreement that these varieties are mutually intelligible and form part of a dialect continuum (2,5,7,8-11). Imenti is the most dominant dialect and sometimes considered to be the closest to a standard accent of Meru: it has the most developed literature and it is also used in the formative years of schooling (grades 1-3).

In common with many Bantu languages [12], the Meru dialects [8-11] have a seven vowel system and vowel length is contrastive. Voiced stops only occur in clusters following nasals (and may be prenasalised) and are lenited to voiced continuants intervocalically where they contrast with voiceless stops. There are nasal consonants at four places of articulation. Meru has a basic CV structure and may have lexical tone (although there are no studies to confirm this). As in most Bantu languages, singular and plural prefixes are paired in Meru according to the division of nouns into several noun classes [13, 14].

1.2 Morpho-phonological variation

A morpho-phonological and lexical analysis of six dialects of the Meru-Tharaka group was carried out

by Kanana ([9-11] who found one of the greatest areas of divergence between them was in the plural formation of class 8 nouns. Whereas the plural prefix originally derived from a proto-Bantu bilabial stop /*bi/ was typically voiced palatalised labial in Imenti, in Chuka it was found to be voiceless and had a primary non-labial, lingual constriction. These studies were however limited: there were no acoustic recordings and the data were based on typically just 1-2 participants per dialect. The present study extends this analysis to a larger pool of speakers and to the so far unanalysed region of Tigania. The main reason for analysing Tigania was to determine whether plural formation is influenced to a greater extent by Imenti with which it shares its southern border compared with the geographically more distant Chuka. Another reason for analysing these dialects is that such differences in the plural prefix are relevant for understanding palatalisation as a sound change in the rare case of when palatalised labials become palatal, post-alveolar, or alveolar [15-17].

2. METHOD

The participants included 75 multilingual adult Meru speakers (median age of 36 years and age range 21-89 years) of three dialects: Chuka ($n = 26$, 14F), Imenti ($n = 23$, 6F), and Tigania ($n = 26$, 9F). The participants were screened as local dialect speakers of these regions. The participants provided informed written consent and were compensated for their participation. The participants spoke English and Swahili and none had any known language, speech or hearing problems.

The recordings took place in the participants' villages of residence. In each location, two participants were simultaneously recorded in two different rooms with limited background noise. The recordings were conducted by a native speaker of Imenti (the second author of this paper) in one of the rooms and by a native speaker of the local dialect as well as by a trained phonetician (the first author of this paper) in the other. The experiment was an isolated word production task consisting of a randomized order of 2-3 repetitions of 96 words, with one word at a time presented on a computer monitor in both English and in Swahili. The plural and singular were presented together on the monitor. The task was to produce the equivalents in the local dialect. Each presented word was formed from a morphological prefix and a stem. Words were repeated if the participants gave another equivalent (e.g., 'woman' or 'small girl' for the intended word 'girl'). The speech was recorded with a Beyerdynamic TG H54c head-mounted microphone at 44.1 kHz onto a Tascam US-2x2 interface

connected to a laptop using SpeechRecorder 3.12.0 [18].

The present study is focused on a subset of these materials in order to analyse the variation in the place of articulation of a plural prefix combined with five different class 8 noun stems: /ara/ ('finger'), /eβa/ ('sorrow'), /imba/ ('corpse'), /oŋgo/ ('head') /ora/ ('frog'). A total of 979 words was analysed derived from these 5 plural prefix-stem combinations \times 75 speakers with an average of 2.6 repetitions per word.

The speech signal was forced-aligned with WebMAUS [19]. The training model used for this purpose was German because it was found to give the most accurate segmentation. The output was structured into a speech database using EMU-SDMS [20]. Segment boundaries were hand-corrected independently by a trained research assistant and the first author of the paper. The analysis was based on an auditory transcription of the plural prefix supported when relevant by the visual information in the waveform and spectrogram. Cases of transcription difficulty were discussed amongst all three authors.

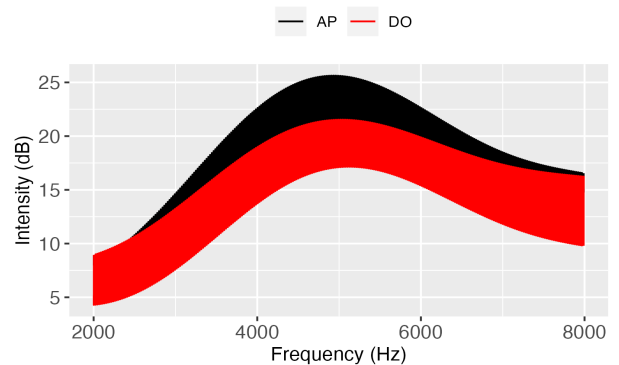


Figure 2. Superimposed DCT-smoothed spectra extracted at the temporal midpoint of frication showing all 69 /tʃ, ʃ/ (AP: black) and all 275 /ɛ, tɛ/ (DO: red) spectra from Chuka and Tigania together.

The auditory distinction between the post-alveolar sibilants /tʃ, ʃ/ and alveolo-palatal /tɛ, ɛ/ was amongst the most difficult. Acoustically, /tʃ, ʃ/ fricatives can be expected to have a slightly more curved spectrum than those produced with a palatal constriction because they also have a steeper amplitude rise to a peak between 2-8 kHz [21, 22]: some acoustic evidence that the plural prefixes identified as /tʃ, ʃ/ spectra were more curved/had a higher amplitude peak that those identified as /tɛ, ɛ/ is shown in Fig. 2.

3. RESULTS

Since this was exploratory, non-hypothesis driven research, the results are presented without any statistical tests.

3.1 Dialect variation in the plural prefix

In Fig.3, the choice of place of articulation in the plural prefix was found to vary both within and between each dialect. As far as the latter is concerned, Fig. 3 shows that there is a division between Imenti whose plural prefix is a palatalised labial as opposed to the other two dialects that have a lingual prefix varying in place of articulation between dental and palato-alveolar.

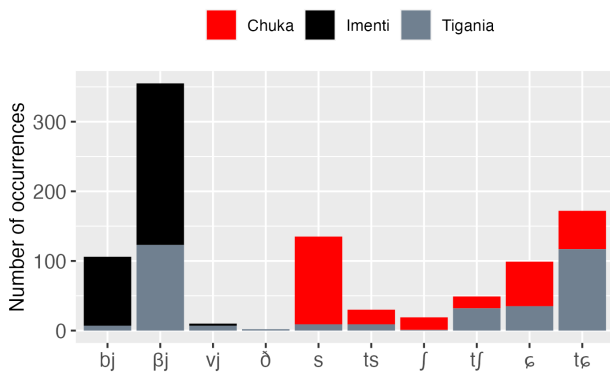


Figure 3. The distribution of phonetic variants for marking plurals in class 8 nouns in three Meru dialects.

A further analysis was undertaken to determine whether there were any factors that might cause the variation between labial and non-labial prefixes in the Tigania plural suffixes. There was no influence of age nor speaker sex. However, as Fig. 4 shows, the choice of the plural suffix in Tigania was influenced by the interviewer: proportionally more speakers used a labial when the interviewer's dialect background was Imenti, but a (non-labial) lingual consonant when the interviewer was a local from the same region Tigania.

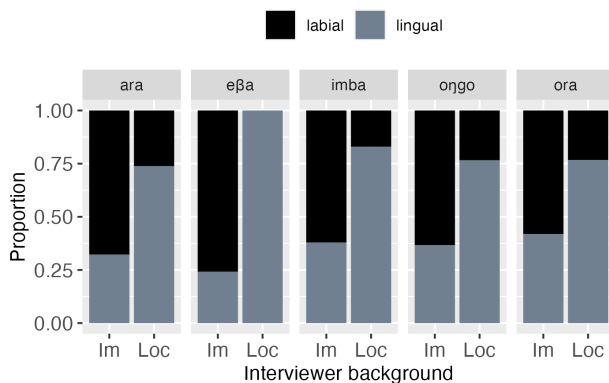


Figure 4. The proportion of phonetic variants in Tigania by stem produced with a labial or lingual prefix when the experimenter was of an Imenti (Im) or Tigania (Loc) background.

Fig. 5 shows that this place difference in producing the plural prefix was not entirely caused by between-speaker variation: thus, although there were some speakers who always produced the prefix with a labial

(black) and some who always produced it with a lingual (grey), there was also a minority (red) of speakers that for the same interviewer (and in the same session) produced the plural prefix sometimes with a labial and sometimes with a lingual consonant.

3.2 Differences between Chuka and Tigania

The focus here is on whether there were any place differences between Chuka and Tigania when plurals were produced with a lingual (non-labial) place of articulation. Fig. 3 had suggested a preference in Tigania for dorsal consonants /ɕ, tɕ/ as opposed to consonants produced with a primary apical/laminal stricture /s, ts, ʃ, tʃ/ in Chuka. Fig. 6 shows this by-dialect place preference for all five stems. Fig. 7 shows that while most speakers produced the prefix either only with an apical (black) or only with a dorsal (grey) there was also a minority of speakers (red) that variably produced the plural prefix either with an apical or with a dorsal consonant.

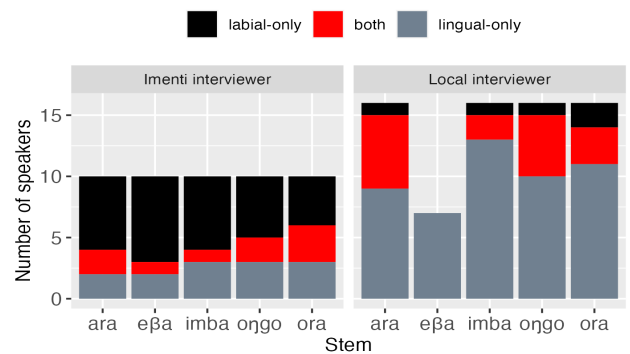


Figure 5. The number of Tigania speakers by interviewer and stem who produced either only labial or only lingual or both labial and lingual plural prefixes.

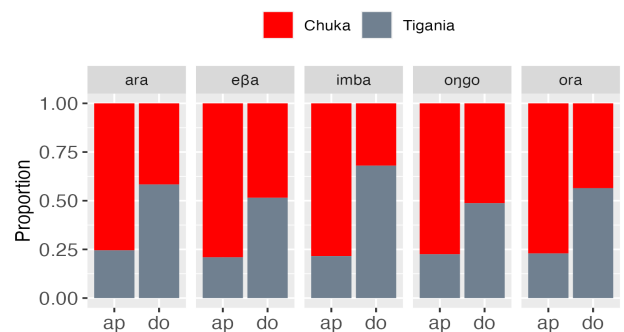


Figure 6. The proportion of variants produced with an apical/laminal (ap) or dorsal (do) consonantal prefix in Chuka and Tigania.

Thus, together with Fig. 5, the data in Fig. 7 shows that while most of the variation in the place of articulation of plural prefixes is due to between-speaker differences, there is also a certain degree of

within-speaker variation in the selection of place of articulation in producing the plural suffix.

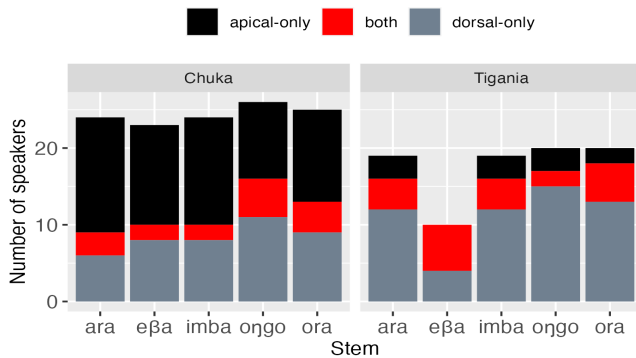


Figure 7. The number of speakers in Chuka (left) and Tigania (right) by stem who produced either only an apical or only a dorsal or both apical and dorsal plural prefixes.

4. DISCUSSION

The study of palatalisation of the plural prefix has shown a wide range of place of articulation variation across three dialects of Meru that are located within some 100 km of each other. Consistently with earlier findings [8-11], whereas the plural prefix in Imenti was found to be a (palatalised) labial, in Chuka it was variably produced at alveolar, post-alveolar, and aveolo-palatal places of articulation. The new finding is that Tigania has characteristics of both regions: that is, the Tigania plural suffix can be labial as in Imenti, but also span the same range of lingual places of articulation as in Chuka. A further investigation showed that apical productions were more likely in Chuka than in Tigania.

The greater influence of Imenti on Tigania than on Chuka is likely to come about both because Imenti and Tigania are geographically closer and because Meru Town (which has the greatest population of the Imenti speaking region) is an administrative centre for Tigania. There is also frequent population movement between Imenti and Tigania due to trade in farming. Prior to the completion in the last 20 years of the tarmacked 100 km Mati road linking Meru and Chuka, travel between these regions was slow and sometimes (as in the rainy season) impossible [23]. Moreover, the Chuka region has its own administrative region in Kathwana to the east of Chuka town. For all these reasons, and consistently with much other research, communication density and population interaction [24-26] are likely to be major factors that explain the closer similarity in the phonetics of the Imenti and Tigania plural prefixes.

The variation in the place of articulation of the plural prefix was found to be both between and within speakers. This result suggests that this variation is cognitively represented especially so for the Tigania

speakers for which the variation was skewed by the investigator's background. There is considerable evidence that speakers adapt their style to their interlocutors [27]. For the present study, we suggest that style-shifting may have formed a central part of the Tigania speakers' greater use of the labial plural prefix (that was found to typify the Imenti dialect) when the experiment was conducted by the Imenti investigator. When the same investigator conducted the experiment under the same conditions with the Chuka speakers, no such shift towards a labial place of articulation was observed. The lack of adaptation to the investigator in Chuka may be because Chuka only has lingual plural prefixes (Fig. 3) whereas some Tigania speakers produced a labial prefix even when the investigator was of a local Tiganian background (Fig. 5, right panel).

Based on the evidence that the plural prefixes are derived from reconstructed proto-Bantu /*b_l/ [2], then Imenti with its palatalised labial prefixes is the most conservative of the dialects analysed in this study while Chuka and Tigania have introduced innovations that may have derived from the typologically rare sound change [28,12] by which labials undergo full palatalisation [29, 30]. Following Ohala [16], labial palatalisation typically involves a change from a labial to an alveolar place of articulation (e.g., standard Czech /pjɛt/, Bohemian /tɛt/, [31]) brought about by the acoustic similarity between palatalised labials and dentals/alveolars, and also because the labial burst is typically perceptually weaker than the high F2 transition that cues an alveolar place of articulation. Hock [28] questions the applicability of Ohala's acoustic idea to cases of labial palatalisation in Romance languages, while Bateman's analysis [32] of Moldavian suggests instead an articulatory explanation by which the glide hardens and then the labial is lost leading to the diachronic progression /bji → bji → bgji → gji/. Chuka may have developed palatalised dorsals (analysed as alveolo-palatals in this study) from palatalised labials following this type of articulatory progression suggested by Bateman [29, 32] and subsequently introduced a further innovation by which the palatalised dorsals have been fronted resulting in alveolar and post-alveolar prefixes following the well-attested sound change of velar palatalisation [33, 34]. In this scenario, Tigania would be diachronically less advanced than Chuka, given that its plural prefix is often produced with labials and fewer apicals. Whether such differences from Imenti to Tigania to Chuka mirror the diachronic progression of palatalised (labials → dorsals → apicals) requires further analysis also of the five or so dialects that intervene geographically between Imenti and Chuka.

5. ACKNOLEGMENTS

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