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ALTERNATION OF THE VELAR PHONEMES OF THE TERA LANGUAGE

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ABSTRACT: *In the current study, I examine the alternations that the velar fricatives of Tera [k g x ɣ ŋg] undergo focusing on phonological and morpho-phonological conditioned alternations. Secondary data was used in the study and also my intuition as a native speaker of Tera. Phonologically conditioned alternations showed that the velar phonemes of Tera undergo labialization and the labialized forms [k^w g^w x^w $ɣ^w$ $ŋg^w$] are realized as a result. These are however not allophones of the velar phonemes as minimal pairs can be found for all the velar phonemes and labialized velar phonemes, for instance, /g/ in gari [gari] 'overripe' and /g^w/ in gwari [g^wari] 'to grow'. Thus, they are considered separate phonemes. For morpho-phonologically conditioned alternations, labialized velar phonemes are not realized differently by their environment in compound words. In definite plurals, the velar phoneme [k] in plurals alternates with the labialized velar phoneme [k^w] in definite plurals.*

KEYWORDS: Alternations, Tera, Velar Phonemes, Phonological Condition, Morpho-Phonological Condition

INTRODUCTION

Tera, also called Nyimatli [ɲimaɬi] is the language of the Tera people. It is spoken in Gombe state and parts of Borno state in north east Nigeria. Tera belongs to the cluster of the Biu-mandara branch of the Chadic language family. There are two sub-groups of the Tera language namely western and eastern cluster which are divided based on their linguistic correspondence with the present day geographical separation of the area. Tera speaking towns are divided into west, east, north, south and central. This division could account for the differences in dialects of the language (Newman 1963, 1969; Tench 2007a; Musa 2017). Tera phonology consist thirty five consonants, eleven monophthongs and four diphthongs (see appendix for the consonants and vowels of Tera). There are five velar phonemes [k g x ɣ ŋg] in Tera and they undergo some kind of alternation as a result of labialization and when they do, [k^w g^w x^w $ɣ^w$ $ŋg^w$] are articulated. This paper describes these alternations based on the following conditions:

1) Phonologically conditioned

2) Morpho-phonologically conditioned

   a) Compound words

   b) Definite plural nouns

The estimated number of languages spoken in Nigeria is over 400. There are three major languages, Yoruba, Hausa and Igbo and a few more are considered medium languages (e.g. Idoma, Fulani, Efik, Kanuri). All the other languages are termed minority languages in which Tera is one of them (see Gordon and Grimes 2005, Tench 2007b Musa 2017). Tera is one of the minority languages spoken in Nigeria and has a standardized orthography used in a limited literature. Tera new orthography has only recently been developed by the Nyimatli language

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project (2015). The author of this paper is a native speaker of Tera from the western cluster, specifically Difa. The dialect of Tera spoken in the western cluster is identified as the standard dialect of Tera as it is commonly used in media (radio) for broadcasting News, (Tench 2007a, Musa 2017). The examples and illustrations of Tera are based on the western dialect spoken in Difa village, the standard dialect which is also used in the new orthography as represented in e.g. *Lagarkati Shogar Me Nyimatli* 'A book for learning Tera language' 1 – 4 (2007), *Labar Mbarkandi nu Luka Bulaki* 'A good story written by Luke' (2008), *Mewar Alqawarang* 'The New Testament' (2016). The aim of this paper is to attempt an explanation of the changes that occur with velar phonemes in Tera and try to establish if the labialized velar phonemes are separate phonemes or allophones of the velar phonemes. Importantly, as there are no much research done on this minority language, this research aims at bringing the language into limelight and prompting more research on other linguistic areas of Tera.

Phonologically Conditioned

Phonological alternation is the basic type of alternation that introduces us to the other types of alternations being looked at in this paper. Basically, alternation refers to any kind of change that occur in pronunciation and traditionally known as 'sound change'. Trask (1996) states that "all types of change in pronunciation are collectively known as phonological change" one of which is 'labialization'. Labialization is an alternation which is caused by a phonetic or phonological change, Davenport and Hannahs (2010). It is a general term referring to a secondary articulation involving any noticeable lip-rounding. Lip rounding here functions as an integral feature in the identity of the labialized sound because it affects the sound and gives it a protruding effect, Crystal (2011). Clark and Yallop (1995) identified two types of labialization. The first is simultaneous labialization which takes place in the cause of articulation and it is marked by a subscript [$_w$]. The second is transitional labialization which is "most evident at the end of the main articulation as part of transition to the next segment" marked by superscript [^{w}]. This paper mainly focuses on the second type, i.e. transitional labialization. As the main focus of this paper is on Tera velar morphemes, a good starting point would be an introduction to the velar phonemes of Tera. Table 1 presents the velar phonemes of Tera showing the positions they occur in words in onset (initial), intervocalic (medial) and coda (final) positions.

Table 1: Tera velar phonemes with examples of the positions they occur in words

Phoneme	Onset	Intervocalic	Coda
/k/	kuzhom	shoka	tu̲k
	[kuʒom]	[ʃoka]	[tɨk]
	'better'	'squirrel'	'listen'
/g/	goma	pugam	ndu̲g
	[goma]	[pugam]	[ndɨg]
	'market'	'blind'	'to stop'
/x/	khar	lakhta	ɓyakh
	[xar/	/laxta/	/ɓyax/
	'hand'	'to separate'	'to tear'
/ɣ/	ghoo	magham	zhaghzhagh
	[ɣo:]	/maɣam/	zhaɣzhaɣ
	'to cry'	'God'	'joy'
/ŋg/	ngguzur	shinggaa	songg
	/ŋguzur/	/ʃiŋga:/	soŋg
	'rag'	'to compress'	'to shift'

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In Table 1, the velar phonemes of Tera are in contrastive positions as they occur in any environment i.e. in onset, intervocalic and coda positions. In addition, they can be followed by any Tera vowel (see appendix) when they occur in onset and intervocalic positions except when they occur in coda position where they cannot be followed by any phoneme.

Alternation occurs when Tera velar phonemes undergo labialization. Although these sound starts as velar but then transit into a labialised segment giving it a protruding and rounding effect. This can be seen in the following examples:

Example 1: Labialized velar phonemes of Tera with examples of words

/kʷ/	kwari	[kʷari]	‘to remember or think’
	kwaaɗa	[kʷa:ɗa]	‘to repair’
/gʷ/	gwang	[gʷaŋ]	‘ten’
	gwa	[gʷa]	‘to obtain’
/xʷ/	khwaati	[xʷa:ti]	‘small opening’
	khwaatan	[xʷa:tan]	‘profit’
/ɣʷ/	ghwari	[ɣʷari]	‘to dry’
	ghwaɗi	[ɣʷaɗi]	‘to beat’
/ŋgʷ/	nggwaɗyi	[ŋgʷaɗi]	‘to pour’
	nggwatang	[ŋgʷataŋ]	‘beginning’

The velar phonemes [k g x ɣ ŋg] now have a lip-rounding and a protruding effect because of the labialization that has occurred and as a result [kʷ gʷ xʷ ɣʷ ŋgʷ] are articulated. In the words in Example 1, the labialised velar sounds occur in word initial position only and are followed by a vowel that is [–high –round] (i.e. either [a] or [a:]). There is evidence in Tera that show that the labialized velar phonemes are separate phonemes and not allophones of the velar phonemes. They are in contrastive distribution as minimal pairs can be found for each of the pairs. Consider the pairs of words in Example 2.

Example 2: Minimal pairs for the velar vs labialized velar phonemes

/k/	katli [kaɬi] ‘to nail’	vs	/kʷ/	kwatli [kʷaɬi] ‘to untie’
/g/	gari [gari] ‘overripe’	vs	/gʷ/	gwari [gʷari] ‘to grow’
/x/	khati [xati] ‘sickness’	vs	/xʷ/	khwati [xʷati] ‘small opening’
/ɣ/	ghari [ɣari] ‘to pack’	vs	/ɣʷ/	ghwari [ɣʷari] ‘dry’
/ŋg/	ngga [ŋga] ‘to drop’	vs	/ŋgʷ/	nggwa [ŋgʷa] ‘an expression of doubt’

The pairs of words in Example 2 establishes velar phonemes as separate phonemes from the labialized phonemes because they can occur in the same environment on the basis of the minimal pairs examples.

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Morpho-Phonological Conditioning

Having looked at the phonologically conditioned alternations occurring with the labialised velar phonemes, it was established that the velar and labialized velar phonemes are not allophones but separate phonemes. We now turn to the morpho-phonological alternations looking at the alternations that occur in compound words and definite plural nouns.

Compound Words

In section 1.2, an instance of phonological alternation due to labialization was described. It was provided that labialised velar phonemes occur only in word initial position and followed by the vowels [a] or [a:]. There are some exceptions in compound words where labialized velar phonemes occur intervocalicly. This alternation occur due to the process of compounding two or more words to form one word. Consider the following words in Example 3.

Example 3: Labialization in Tera compound words

a) ɗye-ghwaɗi – 'cane'

   /ɗye-ɣʷaɗi/

   Something-beat

b) khati-gwaanji – 'leprosy'

   /xati-gʷa:nʤi/

   Sickness-big

c) nu̲-kwaaɗa – 'cobbler'

   /nɨ-kʷa:ɗa/

   doer-repair

d) zhinerem-gwaanji – 'lord'

   /ʒinerem-gʷa:nʤi/

   our father-big

In the words in Example 3, evidence is seen for the compounds consisting of two phonological words which when compounded produce a single word which is a noun. In the words in example 3, in as much as the labialized velar phonemes occur intervocalicly, their articulation is not affected by the environment in which they occur because they still maintain their labialized status. Also assimilation does not occur due to the preceding vowel or consonant. Their production is not altered, they remain the same in form and articulation.

Definite Plural Noun

Definite noun marking in Tera is distinct in the sense that it has different forms for marking singular and plural nouns. Newman (1963) identified two forms of definite noun marking as used in Tera, these are -a [a] and -kwa [kʷa]. While -a is used to mark singular nouns; -kwa is

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used to mark plural nouns; and they are affixed as a suffix to the word stem. A description of the definite singular maker is provided first as a basis for looking at the definite plural marker.

In the new orthography of Tera, three different forms of singular noun markers are used, these are -yang [jaŋ], -rang [raŋ] and -ang [aŋ] (Nyimatli Language Project 2015). These forms have been used in the literatures mentioned in the introduction of this paper. These changes could instinctively be said to have occurred due to historical and/or social changes, (see Odden 2005 for a synchronic argument for the physiological reality of abstract analysis in Tera). Consider the following examples in Table 2.

Table 2: Singular noun markers

Suffix	Stem	Definite Noun (Singular)
–yang [jaŋ]	maavi	maavyang
	[ma:vi]	[ma:vjaŋ]
	'slave'	'the slave'
	ghai	ghayang
	[ɣai]	ghayang
	'town'	'the town'
–rang [raŋ]	goma	gomarang
	['goma]	[gomaraŋ]
	'market'	'the market'
	gaɓa	gaɓarang
	[gaɓa]	[gaɓaraŋ]
	'hoe'	'the hoe'
–ang [aŋ]	ndumbul	ndumbu̲lang
	[ndumbɨ̲l]	[ndumbɨ̲laŋ]
	'canoe'	'the canoe'
	dleng	dlengang
	['ɮeŋ]	[ɮeŋaŋ]
	'mountain'	'the mountain'
	kalau	kalauang
	[kalau]	[kalauaŋ]
	'dust'	'the dust'
	zharau	zharauang
	[ʒarau]	[ʒarauaŋ]
	'potash'	'the potash'

In the data in Table 2, evidence is provided where words that end with [+front +high] vowel [i] or diphthong [ai] drop the final vowel sound and take the suffix -yang [jaŋ] in the definite singular noun. Words that end with the [–high –round] vowel [a] do not drop the vowels but rather add suffix -rang [raŋ] to the stem for the definite singular noun. Likewise, words ending with a consonant and words that end with [+high +round] vowel [u] or diphthong [au] do not drop the final phoneme but add the suffix -ang [aŋ] to the stem. Therefore, it can be deduced that the phonetic environment of the stem determines the definite singular marker.

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In the case of plural marking, Tera marks plural by adding the suffix -ku to the stem. Interestingly, definite plural marker which is also a suffix is a labialized velar [kʷ] followed by a [–high –round –back] vowel [a]. Unlike the singular noun that has three different markers, the definite plural noun only has one marker -kwa [kʷa]. Consider the following words in Table 3.

Table 3: Plural noun marker

Suffix	Stem	Definite noun (plural)
-kʷa	dlengku	dlenkwa
	[ɮeŋku]	[ɮeŋkʷa]
	'mountains'	'the mountains'
	maaviku	maavikwa
	[ma:viku]	[ma:vikʷa]
	'slaves'	'the slaves'
	chelemku	chelemkwa
	[ʧelemku]	[ʧelemkʷa]
	'giraffes'	'the giraffes'
	ɓeelarku	ɓeelarkwa
	[ɓe:larku]	[ɓe:larkʷa]
	'infants'	'the infants'
	nd̲umb̲ulku	d̲umb̲ulkwa
	[ndɨmbɨlku]	[dɨmbɨlkʷa]
	'canoes'	'the canoes'
	ghaiku	ghaikwa
	[ɣaiku]	[ɣaikʷa]
	'towns'	'the towns'
	nusuku	nusukwa
	[nusuku]	[nusukʷa]
	'women'	'the women'
	gaɓarku	gaɓarkwa
	[gaɓarku]	[gaɓarkʷa]
	'hoes'	'the hoes'

In the examples in Table 3, it is evident that words maintain their forms and the plural marker -ku is used for all words whether they end with a vowel or consonat. The final segment of the sound does not determine the form of the plural marking neither does the phonetic environment. When the definite plural marker is added, the velar phoneme [k] alternates to the labialized velar [kʷ] and the following vowel changes from [u] to [a] for the definite plural marker [kʷa]. For words that end with the vowel [a], the consonant [r] is added to the stem before adding the suffix for either singular or plural markers, e.g. gaɓa [gaɓa] 'hoe' and ɓeela [ɓe:la] 'infant'.

There is also a certain alternation which is morphologically conditioned that involves total change of the word. Although this is not related to the topic of this paper, however, it is worth mentioning as this section discusses plural formation in Tera. Davenport and Hannahs (2010) describes this type of alternation as 'suppletion' in which the plurals involve changing their form completely. They do not comply with the rule of plural marking as such the speaker must

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learn them on a "one-off basis". There is not much of this type of alternation in Tera. The only common instance is the plural form for woi [woi] 'child' which presumably would be woiku* like other nouns, but it is qusaangga [ɠusa:ŋga] 'children'. The suffix -yang [jaŋ] is used for definite noun marking in both singular and plural producing woyang [wojaŋ] 'the child' and qusaanggyang [ɠusa:ŋgjaŋ] 'the children'. Additionally, there is a voicing conditioned alternation whereby voicing of the fricative changes from voiceless to voiced in plurals described in Davenport and Hannahs (ibid). For example, khusku [xusku] 'man' becomes khuzuku [xuzuku] 'men'. However, this is not applicable in nusu [nusu] 'woman' and nusuku [nusuku] 'women'; the prediction would be that all words with voiceless fricatives will change to voiced fricatives in their plurals, but that is not the case here. Therefore, this very alternations may be characterised as historically determined.

CONCLUSION

There are three main findings regarding alternations of the velar phonemes in this study. First, for the phonological conditioned alternations, it was established that Tera labialized velar phonemes /kʷ gʷ xʷ ɣʷ ŋgʷ/ are not allophones but separate phonemes of the velar phonemes /k g x ɣ ŋg/ due to the difference in their physical varieties. The data presented in section 1.2 shows that velar phonemes and labialized velar phonemes can occur in the same environment on the basis of the minimal pairs test which establishes them as separate phonemes and not allophones. For instance, /x/ in khati [xati] 'sickness' vs /xʷ/ in khwati [xʷati] 'small opening' and /ɣ/ in ghari [ɣari] 'to pack' vs /ɣʷ/ in ghwari [ɣʷari] 'dry'. This claim is justified when we consider the description of allophones. Katamba (1989) defines allophones as "various physical distinct sounds which count as executions of a given phoneme". For instance, in English, phonemes /p/, /t/, /k/ can be realised differently phonetically depending on the environment which they occur, i.e. they occur in complementary distribution. For example, phoneme /t/ has allophones [tʰ], [t], [t̚] and [ʔ]. /t/ is aspirated in word initial position e.g. in 'top' [tʰɒp]; it is produced normally in intervocalic positions e.g. in 'stop' [stɒp], and in word final position, it is either unreleased e.g. in 'cot' [kɒt̚], or produced with a glottal stop e.g. in 'cot' [kɒʔ], Davenport and Hannahs (2010). The velar phonemes and the labialised velar phonemes of Tera are not in complementary distribution because the velar phonemes occur in any position of a word. They are therefore said to be in contrastive distribution. Although there is evidence for the occurrence of the labialised velar phonemes intervocalicly, it is only when they change form e.g. in compound words and definite plural marker. It was also established that the velar phoneme /k/ alternates with the labialized velar phoneme /kʷ/ in definite plural making and the vowel changes from [u] to [a]. This was seen in the data presented in section 1.3.2 where plurals (except in woi 'child') are marked with the suffix -ku and in definite plural marking, -ku [ku] changes to -kwa [kʷa] with labialization. For instance, maaviku 'slaves' – maavikwa 'the slaves', ndumbulku 'canoes' – ndumbulkwa 'the canoes'. It was established that the phonetic environment does not affect definite plural markings as it does for definite singular marking. Whereas three different markings are realized for definite singular marking, i.e., words that end with the vowel [i] or diphthong [ai] drop the final vowel sound and take the suffix -yang [jaŋ] e.g. maavi 'slave' – maavyang 'the slave'. Additionally, words that end with the vowel [a] do not drop the vowel but add the suffix -rang [raŋ] to the stem e.g. goma 'market' – gomarang 'the maket'. Also, words that end with either a consonant, vowel [u] or diphthong [au] do not drop the final phoneme but add the suffix -ang [aŋ] to the stem e.g. ndumbul 'canoe' – ndumbulang 'the canoe', zharau 'potash' – zharauang 'the potash'.

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This study attempted to describe the kinds of alternations that the velar phonemes undergo, the phonology of Tera is an area of extensive research. After all, there is little work done on the linguistics of Tera generally. The data presented in this study reveals that there is much going on in the linguistics of Tera. Other areas of future research include the tonal aspects of Tera, being a registered tonal language, there is so much to discover about the tonal system of this understudied language. Additionally, there are other phonemes in Tera that also undergo some change. For instance, the phonemes /ɓ, m, v, k, g/ undergo palatalization and /ɓʲ, mʲ, vʲ, kʲ, gʲ/ are realized. A similar study which looks at the kind of alternation due to palatalization is an interesting area of research.

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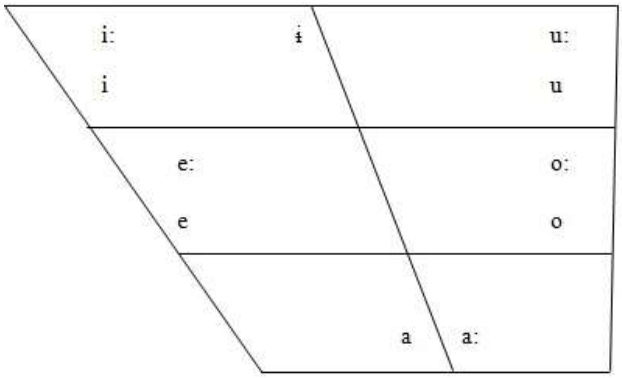
Appendix A: Tera consonants

	Bilabial	Labio-dental	Alveolar	Post-alveolar	Palatal	Velar	Labial-velar	Glottal
Stop	p b		t d			k g		
Affricate				tʃ dʒ				
Implosive	ɓ		ɗ			ɠ		
Pre-nasalized	ᵐb		ⁿd	ᶮdʒ		ᵑg		
Nasal	m		n	ɲ		ŋ		
Fricative		f v	s z	ʃ ʒ		x ɣ		h
Lateral fricative			ɬ ɮ					
Trill			r					
Lateral Approximant			l					
Approximant					j		w	
Gloattalized approximant				ʔj				

Appendix B: Tera vowels and diphthongs



/ai, eu, au, oi/

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