

Phonological Adaptation of the Swahili Loanwords in the Ndali Language

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Abstract

This paper highlights phonological adaptation processes of the Swahili loanwords in the Ndali language. The study was conducted in Ileje District, in Songwe Region. The data were collected through the Ndali written texts, elicitation guides, and observation of native speakers' oral conversations. The study was guided by the Optimality Theory (OT) which suggests that loanwords change to suit the phonotactic constraint of the native language. It was revealed that the Ndali language uses epenthesis and substitution as adaptation procedures for lexicons which are not well molded to influence them to fit in with the acquiring rules. More importantly, the findings revealed that with regard to borrowing, the Ndali language has changed its phonological structure by introducing new consonants and allowing consonant clusters. The study recommends further studies on phonological adaptation processes in other districts where the Ndali language is spoken as a native language such as Mbozi District and in other Bantu languages to come up with reasonable generalisations across languages. Other language levels including semantics, phonetics, morphology and pragmatics should be highly considered since the studies will act as the way of preserving African indigenous languages and will act as instrumental tools towards promoting ethnic community languages.

Key Words: Ndali, Optimality, loanword, epenthesis, and substitution

Introduction

Loanwords arise when one language borrows lexical items from another language due to trade, colonization, migration, religion, education, or

technological advancement. Linguists have observed that the contacts have made no language insusceptible from outside impacts (Swilla, 2000; Petzel, 2005; Bassene, 2012; Mapunda & Rosendal, 2015, Chebanne & Phili, 2015). Borrowing leads to language development due to introduction of foreign sounds and consonant clusters in the recipient language. Each language has a unique set of permissible sounds and syllable structures. When a borrowed word contains sounds or structures not present in the borrowing language, adjustments must be made to fit the phonological constraints of the recipient language. This phenomenon, referred to as phonological change in loanwords, helps maintain the phonotactic rules, fluency, and intelligibility of the borrowing language.

Several studies on language contact and borrowing have been done in different African languages, particularly Bantu languages by scholars like Swilla (2000) in Ndali, Mapunda and Rosendal (2015) in Ngoni, Bernander (2012) in Bena, Chebanne and Phili (2015) in Kalanga, Mutua, (2013) in Kamba. Petzell (2005) in Kagulu and Batibo (1996) in Tswana and Swahili languages, have investigated and attested that African languages have obtained a number of vocabularies through borrowing from other languages including Swahili. Studies reveal that the situation of ethnic community languages has changed greatly since the wide spread of Swahili which is a national and an official language in Tanzania (Batibo, 1992; Mekacha, 1993; Yoneda, 1996; Yoneda, 2010; Mwakasege, 2021). The findings of these studies indicate that Swahili language has become the donor and dominant language to ethnic community languages. It is within this context, that Yoneda (2010) doubts that the use of Swahilised Matengo words will increase rapidly and broadly. Therefore, loanwords are an inevitable products of language contact, especially in multilingual societies. When

foreign words enter a recipient language, they often undergo phonological changes to conform to the sound system of the borrowing language. This process is known as phonological adaptation or phonological nativisation.

Ndali is one of the Tanzanian ethnic community languages that has been in close contact with Swahili speaking community for many years and, therefore, some of its vocabulary exhibit to have been originated from Kiswahili (Swilla, 2000; Mwakasege, 2021). The findings of these studies reveal the existence of phonological, morphological, and semantic changes in the Ndali language. It is within this context, this study explores the types and mechanisms of phonological changes that occur in loanwords across languages, focusing on common patterns namely sound substitution and vowel epenthesis.

Ndali Language

The Ndali language is spoken in Ileje, Momba and Mbozi districts in Songwe Region, Rungwe and Kyela districts in Mbeya Region. The language is also spoken in Zambia and Malawi (Swilla, 2000; Mwakasege, 2021). With regard to Guthrie's latest version, the Ndali language is coded M31 (Maho, 2009). The Ndali language is in close contact with Swahili language, which dominates education, government, media, and urban interactions. As a result, many Ndali speak Swahili language (Mwakasege, 2021). This sociolinguistic context has led to extensive borrowing of Swahili vocabulary into Ndali language. The Ndali language is bordered by other Bantu languages such as Safwa (M25), Nyakyusa (M31), and Nyiha (M23).

Contact Situation

The Ndali language has been in contact with different languages such as German, Swahili, Nyakyusa, Chewa and English languages (Swilla, 2000; Mwakasege, 2021). Currently, Ndali language is in contact with Swahili and English languages. The language is mainly influenced by Swahili language (Mwakasege, 2021). In Tanzania, Swahili is used as a national language; it is taught as a subject from pre-primary to tertiary level; it is also used as a medium of instruction from pre-primary to primary and some tertiary levels of education. Additionally, borrowing is concomitant to the status of Swahili language which is considered as spiritually, academically, technologically, and culturally prestigious. As a result of prolonged contacts, the Ndali language has undergone some phonological changes (Mwakasege, 2021).

Phonological Borrowing

Loanwords are not adopted wholesale. Rather, they are modified to suit the phonological system of the recipient language. This process is known as phonological adaptation. Sound change is the base of all changes in other aspects of linguistics such as morphological, syntactic, lexical and semantic changes. When foreign words enter a language, they undergo various modifications in sound structure to conform to the native sound patterns despite the fact that sometimes it is possible to take certain sounds from other languages without any modification (Coetsem, 2016; Yoneda, 2010; Boen, 2014).

Loanwords are adapted through appropriate phonologisation strategies (Coetsem, 2016; Yoneda, 2010; Boen, 2014). The sounds missing in the borrowing language can be substituted with those available in the donor

language. Substitution tends to preserve sounds from deletion and tries to reshape the word closer to the input form, but at the same time, because some sound combinations are not allowed in the recipient language, they undergo certain adaptations (Chebanne & Phili, 2016). In substitution, an item is replaced to the phonetically close phonemes in the recipient language. Syllable clusters undergo simplification process by breaking down of consonant clusters by affixing a vowel between the successive consonants (Chebanne & Phili, 2016).

Literature review reveal that phonological description has received little attention across Bantu languages as well as the language understudy. In Ndali language, many studies base on morphological aspects particularly tense/aspect negation, verb forms (see for example, Maho (1999) and Stegen (2002) highlighted the role of these markers in clause construction; Nurse 2003) indicate that tone in Ndali serves grammatical as well as lexical functions, though more research is needed to fully describe its tonal system. Phonological and morphological analysis of the Ndali language have been undertaken primarily by Bantu linguists such as Mtenje (1990), and Mwakasege (2021) often in the context of comparative studies. Additionally, Nurse (1999) and Mtenje (1990) have investigated the lexical similarity between Ndali and Nyakyusa languages, concluding that while they share many features, they are mutually unintelligible due to phonological divergence and unique lexical items.

However, some of these studies indirectly touch upon certain phonological aspects of the respective language. This makes difficult to understand some patterns, rules, history, structure, variation and future development of languages. In this regard, the paper investigates how Swahili words are

reshaped to conform to the Ndali's phonological norms, focusing on observable and recurring phonological changes.

Theoretical Framework

The study was guided by the Optimality Theory (OT) which suggests that loanwords change to suit the phonotactic of the native language. They change because there is a native rule that compels them to change specifically to acquire native features. Loanwords change because requirements on surface syllable structure compel them to change (Uffmann, 2001). This is why the rule-based explanation of loanwords proposed earlier fails to account for how loanwords are nativized, as Yip (1993) points out: "rule-based analyses of loanwords miss the generalization that when a language adopts a loanword into its vocabulary it attempts to bring that word into conformity with the phonology of the language."

Golston and Yang (2001) argue that "rule-based analysis of loanwords results in rules that are neither rules of the donor language nor of the native language." They suggested that in the phonological adaptation of loanwords, the rules of Universal grammar seem to apply. This suggestion may also not hold in all cases because the phonological adaptation of loanwords differs from one language to another depending on the segments that exist in the native language and the phonotactic constraints that the syllable structure of the language in question possesses. This makes constraint based modules of loanword adaptation useful in the study of loanword phonology. Constraint-based approaches are better suited for explaining loanword phonology.

Kenstowicz (2012) insists that it is suitable to use OT to formally express the conflict that is observed in loanword adaptation where the segment in the loanword tries to remain faithful to the source of the loanword and also tries to fulfil the segmental and phonotactic constraints that exist in the recipient language. Also, Yip (1993) has shown how loanwords undergo phonological nativisation using the constraints in the phonological system of the recipient language (Wornyo, 2016).

Prince and Smolensky (1993), propose the Basic Syllable Structure Constraints. These constraints describe the universally unmarked characteristics of syllable structure. They propose the CV structure as the basic syllable structure. They propose a set of constraints for a syllable structure governed by the Basic Syllable Structure.

This theory is relevant to this study because the loanwords in Ndali language are remodelled to suit the phonotactic constraints of the Ndali language. Also, the theory is relevant to this study because certain foreign sounds and consonant clusters from Swahili loanwords have been maintained. This finding is in line with the assumption of this theory which states that the segment in the loanword tries to remain faithful to the source of the loanword and also tries to fulfil the segmental and phonotactic constraints that exist in the recipient language.

Methodology

This study was conducted in Ileje District in Songwe Region. The choice of this area based on the fact that this was the area where the researcher could get authentic data because area is largely populated by the Ndali native speakers. To accomplish this study, both primary and secondary data were

used. The primary data were collected through elicitation guides and observation of native speakers' conversations. The research informants were adults and elderly Ndali native speakers aged 60 to 80 years. A total of twenty informants were involved based on the point of saturation. The selection of informants was done purposively based on being a native speaker who was born and raised in Ndali speech community.

Through elicitation guides, the researcher read questions to informants, and after that, the responses given were filled in by the researcher himself helped by a selected individual, a native speaker who was also born, and raised in the Ndali speech community, and well knowledgeable about his ways of life and the language. The elicitation guides contained constructions written in Kiswahili about terms referring to various objects and ideas that were expected to have been used in Ndali society. The primary data were supplemented by secondary data, written texts, namely *Upuusi umunandi umupukushi* (Paka mdogo mdadisi (Little nosy cat) by Niederseer (2013); *Iseke* (Matunda-Fruits) by Mbugi and Panja (2015); *Ifikanu ifya mu chiposo* (Wanyama wa porini-Wild animals) by Loveland et al. (2011); *Inongwa iNyiisa isha Yeesu Kilisiti isa muumwo shisimbigwe nu Yoohani* (Habari Njema za Yesu Kristo-The Good News of Jesus Christ); *Njuga iya Chindali* (Ndali Language of Tanzania) by Wycliffe Bible Translators (2014); *Ubhubhine ubwa sekema* (Ugonjwa wa Malaria-Malaria illness) by Kajange et al. (2008); Narratives of Ndali Life and Culture by Botne and Schafer (2008) were used to detect loanwords and changes in phonology of the Ndali language. Ultimately, a total of 300 Swahili loanwords in Ndali language were obtained. The gathered data were then analysed thematically and discussed qualitatively.

Presentation and Discussion of the Findings

This section presents the Ndali sound inventory. It also presents and discusses phonological adaptation mechanisms, and direct phonological borrowing.

Ndali sound inventory

The consonants used in the Ndali language are /b/, /ɸ/, /d/, /f/, /g/, /k/, /l/, /m/, /n/, /ŋ/, /p/, /r/, /s/, /ʃ/, /t/, /w/, /j/, and /z/. The sounds /d/, /g/ and /j/ are prenasalised by /n/ to form digraphs *nd*, *ŋ* and *jn*. Moreover, the sound /b/ is prenasalised by /m/ to form the digraph *mb*. The glottal sound /h/ is joined with s and c to form ʃ and ɸ digraphs. The sounds /ʒ/ and /v/ are not part of Ndali consonant sounds stock. The Ndali language comprises of open syllables.

Table 1: Ndali Consonant Inventory

	Bilabial	Labial Dental	Alveola r	Palatal	Velar	Glottal
Plosive	/p/, /b/		/t/		/k/	
Nasal	/m/		/n/	/ɲ/	/ŋ/	
Fricative		/f/	/s/, /z/	/ʃ/		/h/
Approximant	/β/			/ɣ/		
Lateral Approximant			/l/			
Trill			/r/			
Glide				/(j)/	/(w)/	

Source: Swilla (2000); Nurse (1979; 2008); Swilla (2000); Botne and Schafer (2008), Maho (1999); Stegen (2002) and Mwakasege (2021)

Phonological adaptation mechanisms

The approaches used to integrate foreign words into Ndali are epenthesis, substitution, and direct phonological borrowing. In borrowing, some sounds of the loanwords are adapted to fit the structure of the target language. However, in some circumstances, loanwords are not adapted. The following are the strategies used to integrate loanwords into the Ndali language:

Epenthesis

Epenthesis implicates injecting a sound fragment in any position in a word except a word-initial position (Massamba, 2010). It is, generally, inspired by the need to meet the phonotactic rules of a recipient language (Mwita, 2009). The results unearth that the borrowed words are forced to follow the syllable structure of the Ndali language to be part of its system. Because of this reason, it was seen that the Ndali language entrench vowels in consonant gangs to clear any cluster that disturbs its constraints. This is clear in the examples provided hereunder:

Table 2: Vowel Insertion

S/N	Ndali	Kiswahili	Gloss
a	/i-siketi/	/sketi/	skirt
b	/i-teleni/	/treni/	train
c	/o-kilisiti/	/kristo/	Christ
d	/i-beta/	/blu/	blue

Source: Field Data (2025) and Mwakasege (2021)

The findings reveal that the vowels [i], [e], and [u] are entrenched in the medial position to breakdown the consonant clusters. Epenthesis takes place when the vowel [u] breaks up clusters in the environment of a labial consonant and [i] when the environment is non-labial. As evidenced by the examples given overhead, the vowel /u/ or /i/ is epenthesised to separate these consonant clusters, where a particular atmosphere conditions each

occurrence. Thus, the syllable pattern in these borrowed words is CV, which is in line with Ndali phonology. These findings are in line with Owino (2003) who asserts that when a loanword contains consonants which can not be analysed as grouping into sequences of acceptable syllables in the language, epenthesis applies to create permitted syllables. He further, adds that it, therefore, acts in order to maintain the desired syllable structure.

Ndali, like other Bantu languages, comprises of open syllables and, therefore, it does not license consonant gangs of words. In the same vein, Batibo (1996) who contends that both Tswana and Swahili languages, generally, use the nativisation rules to nativise foreign clusters. Also, these findings concur with Owino (2003) who confirms that the Dholuo language sometimes add a final epenthetic vowel to some loanwords coming into the language having closed syllable.

However, the findings reveal that some consonant clusters of the loanwords in Ndali language have been tolerated. This is evidence in the following data: /ɔ:gastɪ/ ‘August’, /mʊseptɛmba/ ‘in September’, /alfɑ/ ‘beginning’, and /ɔktɔ:βalɑ/ ‘October’ whereby the consonant lots ‘st’, ‘pt’, ‘lf’, and ‘kt’ have not been inserted with vowels. These results are similar to Batibo (1996) who notes that the Tswana and Swahili languages may also tolerate some foreign clusters.

On the other hand, these findings are contrary to the assumption of the Optimality Theory which supposes that the recipient language modifies the construction of the loanwords to fit its context. The consonant clusters are sometimes accepted when found in the medial position but not final position

of a word. This is because, the Ndali language comprises of open-ended syllables. It is plausible to argue that a certain consonant cluster is tolerable if it is pronounceable in the borrowing language.

Moreover, it is obvious that certain consonant lots are tolerated because they help to simplify pronunciation processes of the borrowed lexical items. Therefore, it is possible that consonant clusters are not accepted in the Ndali language as well as other Bantu languages because they are not pronounceable in recipient languages. It is within this context, then that, consonant clusters are modified to fit the phonotactic form of the Ndali language while others are not. Additionally, the few cases of consonant sequences being accommodated in the language may be due to one of the following factors: the level of bilingualism of the speaker, his attitude towards the source language, and the stylistic environment. Often a speaker with little access to the source language may produce structures closer to the native language system than the speaker more exposed to the source language. And if he considers that the proper articulation of the source language forms may improve his social standing, then he will produce structures closer to the source language forms. The same is also true when the source language enjoys prestige status among the target language community.

This suggests that not all consonant clusters in all environments are not accepted in the Ndali language rather the environment and the type of consonant cluster are critical bases. Likewise, it is likely that a certain speech community may not allow consonant clusters but with time, because of contact, that speech community may accept some consonant clusters

provided they are located in a certain environment and that they are pronounceable.

Substitution

Substitution is a process whereby consonants and vowels in the target language are replaced with others from the source language (Mwita, 2009). The findings revealed that during linguistic borrowing, a sound segment is succeeded by a different sound so that the words can fit into the Ndali language. It is within this context we see that consonant substitution has been demonstrated in the data. This is because voiceless sounds in the Ndali language do not have voiced cohorts. Therefore, when the loanwords with voiced sounds are received by the Ndali language, the voiced sounds are substituted by voiceless ones. It ought to be noticed that there are additionally a few sounds that are found in the Swahili language but they are not accessible in the Ndali language. It is within this context that, when words with such sounds from the Swahili language get into the Ndali language, the sounds are substituted so that the words can fit in the Ndali phonology. This is evident in the data below:

Table 3: Consonant substitution

S/N	Ndali	Kiswahili	Gloss
a	/ɪ-ʃɪpɪmɔ/	/kipimo/	Measurement
b	/i-luka/	/duka/	Shop
c	/iyali/	/gari/	Vehicle
d	/selasɪni/	/θelaθɪni/	thirty
e	/i-fɪlatɔ/	/viatɔ/	shoes

Source: Field Data (2025) and Mwakasege (2021)

The precedents above demonstrate that during borrowing, the consonants /k, d, g, θ, v/ get substituted by /ʃ, l, ɣ, s, f/. Additionally, some Swahili voiced consonants are replaced by voiceless ones when integrated into the Ndali

language. It is the case of consonant such as [v], which changes into [f]. This is attested in Table 3e. Not only that but also, it was observed that a voiced sound could replace another voiced sound. This is evident in Table 3b and c whereby the voiced sound /l/ replaces the voiced sound /d/. More interestingly, it was unveiled that a voiceless sound could replace another voiceless sound (see examples in Table 3a and d) whereby the voiceless sounds /tʃ/ and /s/ replace the voiceless sounds /k/ and /θ/. In the same vein, Mwakasege (2024), argues that the status differences of consonants is the determinant of consonant substitution. This is because the sounds [k, d, g, θ, and v] are not part of the Ndali sound inventory (Swilla, 2000; Botne & Schafer, 2008; Mwakasege, 2021). These sounds are difficult to be pronounced in the Ndali language. Therefore, these sounds are substituted to the pronounceable sounds in the Ndali language.

Regarding what determines consonant substitution, it was noted that the similarity in the point of articulation is the fundamental determinant of consonant substitution. This observation is in line with the Optimality Theory, which presupposes that sounds in proximity to each other can transform each other, and they can do as such when they are ideal beside each other. For example, /t/ and /d/ are stops. Additionally, it was revealed that, in order for substitution to occur, there must be differences in the status of the respective consonants in terms of point of articulation. For instance, a liquid sound /l/ could replace a stop sound /d/ in Table 3b. Also, an affricate /tʃ/ could replace a stop /k/. This is evident in example 4a. Hence, to some extent, these findings are contrary to Mwakasege (2024) who asserts that for substitution to take place there must be similarity of the consonants in terms of point of articulation.

Furthermore, it is seen that vowel substitution is apparent in the data of the current study. The vowel sounds of loanwords entering the Ndali language are substituted with the Ndali vowel sounds. Vowel substitution was noted in the Ndali loanwords from Swahili language. In the Ndali language, vowel substitution takes place at the medial or final position of the word. The data beneath outline this:

Table 4: Vowel Substitution

Source: Field Data (2025) and Mwakasege (2021)

S/N	Ndali	Kiswahili	Gloss
a	/u-mokati/	/mkate/	bread
b	/i-sefolila/	/sufuria/	sauce pan
c	/i-silikali/	/serikali/	government
d	/i-swela/	/swala/	antelope

The data above demonstrate that there is a propensity of substituting the word-final vowel /ε/ with /ɪ/. The underlying vowel /ʊ/ is substituted by /ε/. Moreover, it was seen that there are occurrences (however not very many) where the vowel /ʊ/ is kept up, in the Ndali language. Further, the precedent in Table 4(d) above demonstrates that a vowel /a/ is substituted by /ε/. It was additionally realised that in order for vowel substitution to occur, the two respective vowels must share the values for instance, /ɪ/ and /ε/ are both mid front vowels. This is in accordance with the Optimality Theory, which says that sounds near to each other can transform each other, and they can do so when they are ideal alongside each other. In the same regard, Weinreich (1963) argues that phonological adaptation of loanwords may occur on the basis of similarities in shape and distribution. In addition, these results are in line with Owino (2003) who says that the Dholuo language replaces foreign segments with native sounds which are acoustically and auditorily closest to the foreign sounds.

On the other hand, the data present a few special cases where two vowels that do not share esteems are substituted. This is exemplified in Table 4(b) where the back round vowel /ʊ/, is substituted by the mid-front vowel /ɛ/. Hence, this finding is a contribution to Optimality Theory. In the same vein, Evans (2014) asserts that the English words that are adopted by Lubukusu language undergo some vowel changes like vowel substitution, vowel deletion and vowel insertion to fit into Lubukusu speech system.

However, there are many instances where the vowels /ɑ/, /ʊ/, /ɛ/, and /ɪ/ are kept up. The following data demonstrate this fact:

Table 5: Unsubstituted Vowels

S/N	Ndali	Kiswahili	Gloss
a	/imbɔnda/	/pɔnda/	Donkey
b	/inde:ɣɛ/	/ndeɣɛ/	Aeroplane
c	/ɔmwɛ:fi/	/mwɛzi /	Month

Source: Field Data (2025) and Mwakasege (2021)

Nonetheless, based on the findings, it is remarked that few sounds of the loanwords which are not part of the Ndali sound inventories have not been substituted rather they have been kept up. For example, in the Ndali language the sound /z/ in /ibizɪnɛsɪ/ ‘business’, /uɛ:zi/ ‘AIDS’ , /ɔbalɔzi/ ‘ten cell leader’ has been introduced. It should be noted that sounds are substituted to meet phonotactic constraints of the receiving language. Therefore, it is plausible to argue that this consonant has not been substituted because of the possibility of being pronounceable in the receiving language. Similarly, Owino (2003) unveils that some foreign sounds are adopted in into the sound system of the Dholuo language either to fill some phonological gaps in the language or non-linguistic.

Conclusion and Recommendations

The study has noted that the loanwords in the Ndali language undergo phonological changes. It has been observed that the Ndali language modifies the structure of the loanwords to fit its context. Surprisingly, the study divulged that some foreign sounds and consonant gangs have been tolerated. Contrary to the Optimality Theory (OT) which suggests that Loanwords change to suit the phonotactic constraint of the native language, it is plausible to contend here that it is not always that all loanwords are adapted to fit the structure of the recipient language. Nonetheless, these findings cannot be deliberated conclusive, rather more studies concerning phonological adaptation processes of the Swahili loanwords are needed to come up with credible generalisations, particularly in Bantu languages.

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