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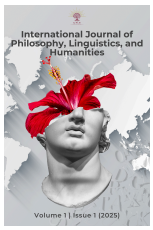

Research Article

Phonological Integration of Swahili Loanwords in Hehe

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Abstract

Linguistic borrowing apply to all languages of the World. However, as the contexts in which loanwords are borrowed vary, the way they are integrated into the grammars of the recipient languages differ from language to language. This study investigates the mechanisms used to integrate Swahili loanwords into phonological system of Hehe language. The study is based on data that were collected from Nzihi and Kiponzelo villages in the southern highlands of Tanzania by analysing spoken texts and conducting focus group discussions with the native speakers of Hehe. The findings indicated that the Hehe lexicon has changed because of massive importation of Swahili loanwords owing to various socio-political factors including trade and the authorities' negligence to promote the use of the language in formal domains. Due to their foreign phonological features, loanwords are often present articulation challenges for native speakers. In order to be accepted by the phonological system of Hehe, loanwords are integrated using one or a combination of replacement, devoicing, epenthesis, feature changing, and re-syllabification. There are notable peculiarities in the way these mechanisms operate in Hehe when compared to the way they operate in other languages. Hence, the findings underscore linguists the language-specific nature of loanword integration.

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Introduction

One of the major sources of language change is importation of loanwords. According to Lehmann (1962), this occurs when speakers of a particular language are in contact with speakers of another language for reasons such as immigration, trade, conquest, technology, and music. Callahan (2014) opines that, in such a contact situation, speakers usually borrow words for filling lexical gaps and for prestige. For instance, a recipient language may lack certain terms for the introduced object or concept; hence, in order to fill such a lexical gap, the language inevitably borrows a term for that object or concept in order to facilitate communication. Borrowing for prestige occurs when speakers of a language imports words from another language even though the borrowed words have equivalents in their language by duplicating words.

Now, as loanwords pose articulatory challenges to the native speakers of the recipient languages, they are subjected to phonological nativization; that is, they have to be integrated or adopted into the phonology of the recipient language so that they become articulateable. In this case, whereas integration of a loanword involves modification of its features (usually phonology and morphology) so that they agree with the phonological system of the recipient language, adoption occurs when a loanword penetrates into the grammar of the recipient language along with its foreign features. Adoption may affect the features of the recipient language. Even though Coetsem (2016) affirms that adoption can bring into the recipient language phonological, morphological and semantic features through lexical fusion, this is dependent on the speakers' exposure to the grammar of the source language. Unlike adoption, integration does not cause serious changes to the recipient language. This is because it is required just in order to clear out feature discrepancies between the source language and the recipient language; thus, making it be articulated natively by the speakers. Linguists argue that, after integration, a loanword that would otherwise be rejected by speakers because of having features that make it hard to be articulated by the native speakers of the recipient language becomes articulateable just like other native words, as Aloufi (2016) argues. However, it should be borne in mind that whether a lexical item penetrates through integration or adoption, it affects the recipient language by bringing in terminologies that are foreign to its lexicon. This study focuses solely on mechanisms used to integrate loanwords into the phonological system of the recipient language.

Integration of a loanword is determined by certain conditions. Batibo (1996) affirms that a re-syllabification process should take place in the segmental tier in order to allow proper syllable and templatic associations in loanwords. The context in which borrowing occurs (i.e. linguistic and non-linguistic factors) seems to contribute significantly to this situation. Anderson, Sayeed and Vaux, (2015) argue that linguistic factors include aspects related to the size of phoneme inventories, syllable structure and phonotactic rules while the non-linguistic factors refer to the socio-linguistic setting of speakers' bilingualism, speakers' historical background and their psychological reasons. This proves that a loanword is never accepted in a recipient language until its loan features are repaired using an appropriate mechanism to make it resemble the features of the native words.

In Bantu languages, integration of loanwords is done in accordance with three attributes of the syllable structure (Bantu syllable). Bickmore (1991) states that the first attribute is that all vowel segments are dominated by V-elements on the templatic or skeletal tier, the second is that the V-elements is necessarily forming the nucleus of the syllable, and the third is the C-elements to the left form the onset of the syllable. In light of these attributes, Batibo (1996) and Schadeberg (2009) have pointed out that integration of loanwords is accomplished through vowel insertion, consonant truncation

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and cluster tolerance. However, the available literature tends to indicate inconsistencies in the mechanism applied and how they operate in the integration of loanwords from one Bantu language to another. As such, the current study looks into the mechanisms used to integrate Swahili loanwords into the Hehe phonological system.

Sociolinguistics and Phonological System of Hehe

Hehe is an Ethnic Community Languages (ECL) which is mainly spoken in Iringa region in the southern highlands of Tanzania (Ethnologue, 2020). According to Ethnogue's (2020) report, Hehe is first language to more than 1,425,000 people. In Guthrie's (1967-71) language classification, Hehe is classified as belongs to Zone G60 of the Bena-Kinga language group. This study focusses on the central dialect because it is claimed to be pure Hehe.

Contact Situation between Hehe and Swahili

The contacts between Hehe and Swahili are traced back to around 17th century. Nurse and Spear (1985) point out that the Hehe people had various contacts with Swahili speakers through trade and the campaign of spreading Islamic even before the 1700s. These contacts gave the Hehe people an opportunity to use and borrow Swahili words. As Mumford (1934) observes, Swahili language served as a lingua franca for the Swahili and Asian trade intermediaries in the caravans; thus, becoming known to many Hehe people by 1930. More borrowing of Swahili words into Hehe seems to occur during the colonial era. Illife (1969) states that the German colonial government in Tanganyika used both German and Swahili as media of communication. This gave the Hehe an opportunity to learn and borrow words from them. Yet, Maliki (1996) affirms that even though the German regime in Uhehe ceased when Tanganyika became a mandate state under the British following the decision made by the League of Nations after the First World War, many Hehe people had already acquired some knowledge of both German and Swahili. The British government in Tanganyika also encouraged the use of both Swahili and English as media of communication and important subjects in school; so, giving people (including the Hehe) another opportunity to learn Swahili and borrow words from it.

Moreover, many Swahili words appear to penetrate into Hehe during Tanganyika has struggled for independence. This is according to Blommaert's (2013) statement that the members of the Tanganyika National Union political party designated Swahili as their language of communication in the independence campaigns, making it to be known even to Hehe. After independence in the 1960s, the new government continued to recognize Swahili as an official language and discouraged the use of ECLs like Hehe in formal setting including in schools. Muzale and Rugemalira (2008) inform that this was due to fear of tribalism and hardship in unifying the newly born nation. The recognition of ECLs as languages deserving to be studied, translated, or documented came later when the cultural policy was inaugurated in 1997. Up to the present, the ECLs (including Hehe) have never been given a chance to be used in formal setting. Swahili remains the dominant language. From Swahili, the ECLs borrow lexical items that they integrate in their phonological systems. As said earlier, since the way languages integrate loanwords differs due to different factors, it is vital to study loanwords integration in Hehe. As such, this study examines the mechanisms used to integrate Swahili loanwords into the phonological system of Hehe.

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Synopsis of Hehe and Swahili Phonological Systems

The phonological system of any language is demonstrated in its phoneme inventory system, syllable structure, and phonotactic patterns. As the case of the phonological systems of other languages, the phoneme inventory of Hehe comprises vowel and consonants. There are five basic vowels in the Hehe phoneme inventory. These include: /i/, /ɛ/, /a/, /ɔ/, and /u/. However, since each of them has a counterpart articulated with some sort of tenseness; hence, being a long one; the language comprises ten vowels (Odden & Odden, 1999). Moreover, a loanword whose syllable has a cluster of two or more unrelated vowels is hard to articulate. Therefore, to simplify its articulation, the Hehe speakers would modify it through glidilization; hence, when the front vowel /i/ is followed by a non-front high vowel, the glide /y/ occurs, but when the high back vowel /u/ is followed by a non-high front vowel the glide /w/ occurs. In contrast, the phoneme inventory of Swahili comprises twelve vowels. These vowels fall into three groups: five short vowels (/i/, /ɛ/, /a/, /u/, /ɔ), five long vowels (/i:/, /ɛ:/,/a:/ ,/u:/, /ɔ:/) and two diphthong vowels (/au/, /ɔa/) (Webb & Kembo-Sure, 2001; Akidah, 2013).

Besides, the number of consonants in Hehe's phoneme inventory is 17. These comprise six plosives such as /p, b, t, d, k/, and /g/; four nasals such as /m, n, ɲ/ and /ŋ/.;four fricatives /f, /v/, /s/ and /h/; two glides /w/ and /j/, and one lateral /l/. In contrast, Swahili comprises 26 consonants. These include: /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /ɵ/, /ð/, /s/, /z/, /ɲ/, /ŋ/, /x/, /r/, /h/, /m/, /n/, /ʃ/, /ʧ/, /χ/, /ɟ/, /ɣ/, /l/, and /ʤ/ (Akidah, 2013). This means that the dental fricatives /ɵ/ and /ð/, alveolar fricative /z/, palatal fricative /ʃ/, palatal affricates /ʧ/ and /ʤ/, alveolar trill /r/, and palatal plosive /ɟ/, which are present in Swahili do not exist in the phoneme inventory of Hehe.

The syllables of Hehe words are always open (Odden & Odden, 1999). They comprise patterns of a single short vowel V, the CV consisting of a single consonant and a single short vowel and CVV consisting of a single consonant plus a single long vowel. Other patterns include CCV that comprises a single nasal, a single consonant plus a single short vowel, or CCV of a single consonant, a single glide plus a single short vowel; and the pattern of the CCVV comprising a single nasal, a single consonant plus a single long vowel. In contrast, the Swahili words comprise open and close syllables. These fall into five patterns namely CV, V, CCV, CVC, and CCCV (Akidah, 2013). The syllable patterns of Hehe is somehow related to those of Swahili. For instance, the pattern of CCV occurs in Swahili too. However, while the Swahili syllable allows co-occurrence of almost all consonants including /mb/, /mp/, /nt/, and /nd/, the Hehe CCV pattern allows only three consonant clusters namely /mb/, /nd/ and /ng/. As a result, the consonant clusters such as those comprising /mp/, /nt/, /nk/ found in Swahili words like kampeni 'campaign', asante 'thank you', pinki 'pink are hard for the speakers of Hehe to articulate. It is the phonological differences between Hehe and Swahili which make it hard for the Hehe to articulate such loanwords from Swahili if they are not reformed.

Literature Review

Speakers usually integrate loanwords by using certain mechanisms in order to clear out feature discrepancies between source languages and the recipient languages. Windford (2013) observes that the syllable structure of a recipient language checks a loanword and determines its articulateability before integrating it by using a certain mechanism. However, the literature appear to show inconsistences in the mechanisms employed to integrate loanwords in some languages. For instance, German integrates some of its loanwords through devoicing (cf. loanwords Universität, and muzik versus counterpart Latin words Universitas and musica). This shows that whereas the features of the voiceless /as/ was altered into features of the voiced /ät/ to form the version Universität, the version muzik was derived by altering the

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features of the voiceless /c/ into those of the voiced /z/. Ross (2002) opines that devoicing is quite widespread in the German speech, especially in the casual conversation. Devoicing is used to integrate some of the Swahili loanwords too. However, contrary to German, this involves alteration of the voiceless /s/ for the voiced sounds /z/ and /ð/ as well as voiceless /ʃ/ (cf. loanwords musiki and sambi versus the English counterpart words 'music' and Arabic word danb).

In Kinyarwanda, most loanwords are integrated through epenthesis. Usually, a loan cluster of consonants in syllables of a loanword is broken by inserting certain vowels between consonants that are in the cluster. However, Kayigema and Mutasa (2015) observe that both vowels and consonants can be introduced in a loanword to make it cope with its CV syllable structure (cf. loanwords beligiji and begeti versus counterparts' French words 'belge' and English 'bucket'. In this case, while /i/ has been inserted between /l/ and /g/ in 'belge', the same /i/ has been introduced in the coda position of 'bucket', and /j/ get put in 'belge'; making /ck/ in 'bucket' be replaced by /g/ to derive versions beligiji and begeti. In Tswana, epenthesis involves vowels only. Batibo (1996) maintains that this operates through harmonization, onset assimilation rules, or the low vowel insertion. The epenthesis through harmonization involves breaking down a consonant cluster by inserting a vowel whose feature corresponds to a preceding vowel in the loanword' stem (cf. loanwords banka and fomo versus counterpart English words 'bank' and 'form'). This shows that, in order to derive the version banka, the vowel /a/ was inserted after the cluster -nk because it is preceded by a low /a/ while to derive the version fomo, the vowel /ɒ/ has been inserted after m- because it is preceded by a low vowel /ɔ:/. This rule applies in integration of English loanwords in Swahili too (Schadeberg, 2009). However, while in Swahili, it is the loan stem's pre vowel which determines the features of the vowel to be applied to break the consonant cluster, in Tswana, both the pre and post vowels of a loan stem determine the features of a vowel to be inserted to break consonant clusters. Epenthesis through onset assimilation involves breaking of a loan consonant cluster by inserting a vowel whose features agree with those of the onset of an immediately preceding loanword's stem. Batibo (1996) holds that when a preceding consonant is bilabial or labio-dental, speakers apply the vowel /ʊ/, but when the preceding consonant is a non-labial, then vowel /ɪ/ or /i:/ is applied (cf. Tswana loan sekole 'school' and boriki 'brake').The vowel /e/ in the loanword sekole was therefore selected because it shares features with /ɒ/. Similarly, the vowel /i/ that precedes the coda /l/ in the loanword boriki was inserted because it comprises the non-bilabial consonant /r/. Epenthesis of low vowel either involves introduction of the low vowel /a/ between clusters or to a loanword's onset position (cf. loanwords terena and aura versus counterpart English words 'train' and 'hour'. It is shown that epenthesis of the low vowel highly applies in Tswana, serving as a nominal terminative of final vowels in verbal and noun stems; hence, making this rule be a relatively peculiar attribute of this language.

Some of the Swahili loanwords are integrated using replacement mechanism. Schadeberg (2009) assert that as it lacks consonants /q/ and /kh/, once a loanword containing one of these sounds is borrowed, the speakers fail to articulate until it is integrated to resolve phonotactic violations. The interdental fricative /q/ is replaced with the velar plosive /k/ while the velar fricative /kh/ is replaced with the glottal fricative /h/ (cf. loanwords wakfu and tarehe versus counterpart Arabic words waqf and tarikh). In German, replacement is verified when vowels -a and -ia contained in a loanword are consecutively substituted with vowels -e, and -ie (cf. loanwords hostie and tabelle with counterpart Latin words hostia and tabella). Ross (2002) confirms that, if a word containing a sound that is not found in the German inventory of phonemes is borrowed, speakers replace it with the phonetically nearest sound. Although the aspects involved in the integration of Swahili and German vary, we can discern that the small size of the languages' inventory's phonemes necessities the use of this mechanism. Due to having a small size of phonemes inventory

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compared to that of Swahili, Hehe appear to integrate its loanwords by replacement, but there is a lack of research-based information about how this is operated exactly.

Materials and Methods

This study was conducted in Nzihi and Kiponzelo villages nearby Kalenga in Iringa region in the southern highlands of Tanzania. The rationale for the selection of these villages is that the speakers of the central dialect of Hehe, which constitute pure Hehe dwell there. Madumulla (1995) opines that the variety spoken in the central region nearby Kalenga in Iringa represents the language of the Hehe throne. Data were collected from primary and secondary sources through analysis of texts and focus group discussion. Analysis of spoken texts enabled us to visit different places such as farms, households, market, shops, schools, and parishes where speakers use the language natively. There we did the data collection by conducting face-to-face conversations with informants. At the farms, we asked the informants to narrate stories about drought, floods, harvesting and growing of various crops in the farms. With this, we aimed to make sure that the collected information reflected the way Swahili loanwords are usually used in Hehe speech. This exercise involved informants found at other places too. To ensure consistency in the informants' responses, we occasionally used unstructured and probing questions to seek for information related to the questions already asked to 82 informants until the saturation point was reached. In order to rule out any fault that might occur because of age, gender and education level, the informants from whom we collected the data had varied demographic and socio-economic characteristics.

Besides, in order to validate the collected information, the words whose status appeared to be unclear were noted to be crosschecked during the focus discussion. For that reason, we selected eight participants purposively to participate in focus group discussion whereby their selection was based on the resourcefulness they had exhibited during the analysis of spoken texts. They participated in two separate sessions of focus discussions, each comprising four participants. Since loanwords are usually related to cognates, identifying them is usually problematic (Coetsem, 2016). Therefore, being aware of this challenge, we crosschecked the collected information using a list of proto Bantu vocabularies to ascertain ourselves that they were true loanwords. In the end, 671 words were confirmed to be loanwords. To determine the mechanisms used to integrate them and loan segments that were simplified to make the loanwords fit into the Hehe phonological system, we intuitively sorted and classified the collected loanwords. Then, the collected information were analysed qualitatively following Hennink's (2014) argument that making a detailed judgment based on information gathered from the field by using more than one method is achieved when the analysis is done descriptively.

Results and Discussions

The Hehe speakers showed to be facing difficulty to use the Swahili loanwords that contain foreign phonological features. As such, in order to be able to use those loanwords like native words, they integrate them into their language's phonological system by using replacement, devoicing, epenthesis, feature changing, and re-syllabification, or a combination of any of these mechanisms. The selection of a mechanism to be used is determined by the Hehe phoneme inventory, syllable structure, phonotactic rules, and assimilation rules.

Replacement is one of the dominant integration mechanisms that involves substation of foreign sounds contained in a loanword with native sounds to simplify pronunciation in languages (Windford, 2013). As

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illustrated in (1), in Hehe, this involves substitution of six consonants and clusters with four native consonants in loanwords.

(1)	Swahili		Hehe		Gloss
a)	*sigara*	[sɪgara]	*sigala*	[sɪgala/]	cigarette
b)	*shuka*	[ʃuka]	*suka*	[sʊka]	bed sheets
c)	*thumuni*	[ɵumunɪ]	*sumuni*	[sumunɪ]	fitty cent
d)	*asante*	[asante]	*asande*	[asande]	thanks
e)	*kompyuta* [	kɒmpjʊta]	*kompyuta*	[kɒmpjʊta]	computer
f)	*kiwanja*	[kɪwandʒa]	*kivansa*	[kɪvansa]	open field

Example (1) shows that consonants /r/, /ʃ/, /ɵ/, /nt/, /mp/, and /ndʒ/ contained in Swahili words were substituted with native consonants /l/, /s/, /nd/, and /mb/ to derive Hehe versions.

Replacement applies in integrating loanwords in German too. According to Ross (2002), the German phoneme inventory lacks the sounds -a and -ia that occur in the final position of Latin loanwords. So, its speakers substitute these sounds with native sounds -e and -ie respectively (cf.loanwords *tabelle* and *hostie* versus Latin words *tabella* and *hostia*). In Hehe, replacement of sounds in loanwords applies to consonants only. Unlike in Hehe where replacement tend to occur dominantly, in Swahili, it involves only two consonants /q/ and /kh/. Schadeberg (2009) affirms that, this is done to simplify the articulation of loanwords containing foreign consonants /q/ and /kh/ (cf. loanwords *wakati* 'time' and *tarehe* 'date' versus counterparts' Arabic words *waqt* and *tarikh*). The size of the Hehe consonant inventory is smaller than that of Swahili. This affirms that the selection of replacement to repair the well formedness of a loanword is motivated by the small size of inventory of sound system of Hehe, as Ross (2002) maintains that if a loanword containing a sound that is not found in a recipient language, the speakers often replace it with a sound that approximates its phonological features.

Devoicing involves alteration of the features of loanwords' alveolar fricative /z/, dental fricative /ð/ and labio dental fricative /v/ into voiceless alveolar fricative /s/ and the voiceless labio-dental fricative /f/. This is illustrated in (2).

(2)	Swahili		Hehe		Gloss
a)	zaka	[zaka]	*saaka*	[sa:ka]	tithe
b)	*ndizi*	[ŋdɪzɪ]	*ndiisi*	[ŋdi:sɪ]	banana
c)	*dhambi*	[ðambɪ]	*saambi*	[sa:mbɪ]	sins or turpitude
d)	*dhulumu*	[ðʊlʊmʊ]	*sulumu*	[sʊlʊmʊ]	treat unjustly
e)	*vita*	[vɪta]	*fiita*	[vɪta]	war
f)	*vitabu*	[vɪtabu]	*fitabu*	[fɪtabu]	books

The data in (2) is clear that whereas the features of the consonants /z/ and /ð/ contained in loanwords were changed into those of the voiceless alveolar fricative /s/, the features of the dental fricative /v/ were altered into features of the voiceless labio-dental fricative /f/.

Unlike in Hehe, in Swahili, devoicing merges consonants /z/, /ð/ and /ʃ into a single consonant /s/. According to Schadeberg (2009), this occurs in spoken form. As Swahili merges consonants /z/, /ð/ and /ʃ/ into single consonant /s/, the way devoicing operates in this language resembles the way it does in Hehe. Yet, we can note that, while this mechanism involves alteration of loan consonants /z/, /ð/ into consonant /s/ and the consonant /v/ into /f/ in Hehe, in Swahili, it merges consonants /z/, /ð/ and /ʃ/ into the consonant /s/. In German, devoicing involves sounds /ät / and /c/ which occur in Latin words *Universität*

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and *muzik*. Ross (2002) affirms that the voiced /ät/ of the version *Universität* replaced the voiceless /as/, and to derive the version *muzik* the voiceless /c/ was replaced with the voiced /z/. This attests that even if different languages share a certain integration mechanism, the way that mechanism operates in those languages vary.

Epenthesis is one of the widespread mechanisms used to repair the ill-formedness of loanwords that have consonant clusters in their syllables (Crystal, 2003). The mechanism operates by introducing vowels between the consonants to conform to the phonotactic constraints of recipient language. As demonstrated in (3 – 5), Hehe uses epenthesis to break consonant clusters and vowel clusters.

(3)		**Swahili**		**Hehe**		**Gloss**
	a)	*treni*	[trɛnɪ]	*tileni*	[tɪlɛnɪ	train
	b)	*labda*	[labda]	*labuda*	[labuda]	perhaps
	c)	*elfu*	[ɛlfu]l	*elufu*	[ɛlufu]	thousand
	d)	*trekta*	[trɛkta]	teleketa	[tɛlɛkɛta]	tractor
	e)	*plastiki*	[plastɪkɪ]	*pulasitiki*	[pulasɪtɪkɪ]	plastic
	f)	*gredi*	[grɛdɪ]	*giledi*	[gɪlɛdɪ]	grade
	g)	*bluu*	[blu:]	*buluu*	[bulu:]	blue

From (3), it is seen that the vowels /ɪ/ and /u/ are introduced between consonant clusters tr-, -bd- and -lf- to derive the syllable versions [ti], [bu] and [lu] respectively. The selection of these vowels is sanctioned by the nature of the consonant preceding the loan stem. Hence, when the preceding consonant of a loan stem is bilabial, the vowel /u/ is applied, but when the preceding consonant is non-bilabial, then speakers apply the vowel /i/. The epenthesis of consonant is accomplished by introducing the consonants /v/ or /l/ to break the vowel clusters in loanwords. As demonstrated in (4) and (5), this occurs at the mid and final positions of loanwords.

(4) Insertion of /v/ or /l/ at loan stems' mid position

	Swahili		**Hehe**		**Gloss**
a)	*taa*	[ta:]	*tala*	[tala]	oil lamp
b)	*saa*	[sa:]	*sala*	[sala]	watch
c)	*fua*	[fua]	*fuva*	[fuva]	wash a cloth

In example (4), it is apparent that when a loan stem ends in a high back vowel /u/, the voiced labio-dental fricative /v/ is selected to be applied, but when it ends in a low vowel /a/, then the alveolar lateral /l/ is selected to repair the loanword's syllable structure.

(5) Epenthesis of /l/ at loan stems' final position

	Swahili		**Hehe**		**Gloss**
a)	*kitambaa*	[kɪtamba:]	*kitambala*	[kɪtambala]	cloth
b)	dagaa	[daga:]	dagala	[dagala]	sardines
c)	*kondoo*	[kɒndɔ:]	*kondolo*	[kɒndɒlɒ]	sheep

In (5), it is observed that the vowel clusters -aa-, -uu- and -oo- were cleared by introducing the lateral alveolar /l/ to derive the CV syllable pattern. It is therefore evident that harmonization rules determine the use of the consonant /v/ or /l/ to break vowel clusters in monosyllabic loan stems in Hehe. This is because when a loan stem comprises two or more syllables, the lateral /l/ is used to break the vowel cluster. In Tswana, epenthesis involves onset assimilation, epenthesis of low vowel, or harmonization rules (Batibo, 1996). Onset assimilation is the insertion of a vowel whose features are related to those of the onset of the stem of an immediately preceding loanword. Thus, when the preceding consonant of a loan stem is

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bilabial or labio-dental, the vowel /ʊ/ is applied and when the preceding consonant is a non-labial, then the vowel /ɪ/ or /i:/ is selected (cf. Tswana loan *sekole* 'school' and *boriki* 'brake'). The epenthesis of a low vowel involves introducing to the loan stem the low vowel /a/, either between clusters or at onset position (cf. loanwords *terena* and *aura* versus their counterpart English words 'train' and 'hour'). Epenthesis through harmonization involves clearing a loanword's consonant cluster by inserting a vowel whose features correspond to those of the preceding vowel in the loanword (cf. loanwords *banka* and *fomo* versus counterparts' the English words 'bank' and 'form').

Unlike in Tswana where the selection of a vowel to be used in the epenthesis process is dependent on the assimilation and epenthesis, in Hehe, it is the harmonization rules which determine the selection of vowels /ɪ/ or /i:/, /ʊ/ or /u and consonants /v/ or /l/ to be used to repair the consonant or vowel clusters in loanwords. This is an indication of how epenthesis operates differently in these two languages. Epenthesis is reported to also operate in Kinyarwanda loanwords. According to Kayigema and Mutasa (2015), epenthesis in Kinyarwanda involves vowels and consonants (cf.loanwords *beligiji* and *begeti* versus the French word *belge* and English word 'bucket'). However, while a single a loanword cannot be repaired using both vowels and consonants in Hehe, in Kinyarwanda, this is possible.

Feature changing encompasses another mechanism used in integrating loanword in Hehe. This mechanism involves altering the features of diphthongs /au/ and /ɔa/ and consonants /ɣ/, /ɟ/ and /ʄ/ in loanwords to make them resemble the features of native Hehe words. This is exemplified in (6).

(6)	**Swahili**		**Hehe**		**Gloss**
a)	*gauni*	[gaʊn]	*gawuni*	[gawuni]	gown
b)	*ndoa*	[ŋdɒa]	*ndowa*	[ŋdɔwa]	marriage
c)	*gharama*	[ɣalama]	*galama*	[galama]	expense
d)	*kijiko*	[kɪɟɪkɒ]	*kigyiko*	[kɪgjikɒ]	spoon
e)	*chai*	[ʄaɪ]	*kyai*	[kjaɪ]	tea drink
f)	*mji*	[mɟi]	*mugi*	[mugi]	town

Example (6) indicates that the Hehe speakers alter the features of the diphthongs /au/ and /ɔa/ in loanwords into the features of the glide /w/ and successively alter the features of the consonants /ɣ/, /ɟ/ and /ʄ/ into those of the consonants /g/, /gy/ and /ky/ respectively. In Urban Hijaz Arabic, the features of the diphthong /eɪ/ contained in English loanwords such as 'spray' and 'trailer' are altered into those of the monophthong /ɪ/ to derive versions *ʔɪsbira* and *tirala* (Aloufi, 2016). We can therefore note that unlike in some languages (such as Urban Hijaz Arabic) where feature changing applies to vowels only, in Hehe it applies to both consonants and vowels.

Re-syllabification involves mending the loanwords' syllables using more than one mechanism to make them articulated according to the Hehe structure and phonotactic constraints. Example (7) illustrates how this mechanism operates as per the analysed data.

(7)	**Swahili**		**Hehe**	**Gloss**
	Krisimasi	[krisɪmasɪ]	*ikilisimasi* [ikilisimasi]	Christmas holiday
	hospitali	[hɒspɪtalɪ]	*sibitali* [sibitali]	hospital
	troli	[trɒlɪ]	*kitololi* [kitɔloli]	trolley
	askari	[askarɪ]	*musilikali* [musilikali]	soldier
	mesenja	[mesendʒa]	*mumasinsala* [mumasinsala*ʃ*	messenger

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Example (7) demonstrates that in order to derive the version *ikilisimasi*, the cluster kr- has been cleared by inserting the high front vowel /ɪ/ to form the syllable [ki]. The same vowel /ɪ/ was introduced in the initial position before replacing the alveolar trill /r/ with the alveolar lateral /l/. The version *sibitali* was derived by dropping the first syllable [hɒ] of the word '*hospitali'*, and then inserting the high front vowel /ɪ/ within the cluster sp- to form the syllable [sɪ]. Then, the voiced bilabial plosive /b/ was used to replace the voiceless bilabial plosive /p/. Besides, to derive the version *kitololi,* the syllable [kɪ] was attached to the initial part to serve as noun prefix of the stem *troli*. Next, the alveolar trill /r/ was replaced by the alveolar lateral /l/ to form the cluster -tl- from the cluster tr-. Finally, speakers introduced the low vowel /ɒ/ between plosive /t/ and the trill /r/. In Hehe, the selection of this mechanism is done to ensure that the loanwords borrowed from Swahili conform to the dominant CV syllable structure. Re-syllabification appears not be special for integration loanwords in Hehe only. In Tswana, it is exhibited when loanwords such as *foune* and *aena* are nativised versions from English words 'phone' and 'hour'. In this case, whereas the vowel /ɒʊ/ of the loan stem 'phone' was modified to derive syllables [fou] and [ne] of the version *foune*, the vowel /aʊə/ of the loan stem 'iron' was modified to derive the syllables [ae] and [na] of the integrated version *aena*. Batibo (1996) observes that it is usual for Tswana speakers to modify two or three vowels of the loan stems into separate syllables to simplify the articulation of English loanwords. This is due to the differences in the contexts of borrowing across languages.

Conclusions and Recommendations

This paper has explored the extent to which the Hehe lexicon has been affected by importation of loanwords as result of contacts with Swahili due to trade, the spread of Islamic culture, colonial administration, independence political movements, and the authorities' negligence to promote the use of the language in the formal setting. It has been established that, in order to be articulateable as per the Hehe phonological system, a Swahili loanword is integrated by using one or a combination of mechanisms such as replacement, devoicing, epenthesis, feature changing, and re-syllabification. However, there are notable peculiarities in the way these mechanisms operate in Hehe when compared to the way they operate in other languages. Consistent with Aloufi (2016), this is because the context of borrowing vary drastically across languages. Therefore, linguists should consider treating loanwords integration as a language-specific phenomenon. Based on the findings, we recommend further research on the influence of Swahili loanwords on tone of Hehe lexicon to enrich the existing literature.

Author Contribution

The corresponding author recognises the contribution of his co-authors and team working that was paid throughout the period of writing, reviewing and proof reading.

Limitations of the Study

As stated in section 1.1, Hehe is known for having three major dialects such as *Kisuungwa*, *Kikosisamba* and *Central dialect* (commonly known as *Ikihehe icha umutwa uva avahehe* 'a variety of the seats of Hehe chiefs'. As such, it might be plausible to hear that the data were collected in more villages where other dialects are spoken. Hence, since only two villages where only one dialect is spoken were involved, this explains a major constraint of this study.

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The authors would like to inform that informed consent was obtained from all subjects involved in the study.

Conflict of Interest

The authors declare that have no conflict of interest; and ensure that all AI-generated content has been reviewed and validated, taking full responsibility for the accuracy, originality and integrity of the work.

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