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Phonological analysis of kĩtigania borrowed words from the maa language: An optimality

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Abstract
The notion of loanwords in languages that are in a contact situation is a phenomenon that is very common and unavoidable. For languages of the world, language change is remorseless, inevitable and ceaseless. This is because every day there are new innovations, change of ideas and emerging technologies that force language to be dynamic so as to keep up with the changes. Even as languages borrow, linguistic borrowing which entails loan word adaptation is an overwhelmingly phonological process. This phonological analysis has not been adequately examined in Kĩtigania borrowing from the Maa language whereby both are in contact situation. That is why this article did a phonological analysis of Kĩtigania borrowed words from the Maa language using the Optimality Theory's markedness and faithfulness constraints. Data used in this article was collected using descriptive research design. Purposive sampling was done to select ten Maa and ten Kĩtigania speakers who were neither too old nor too young. These respondents had control over their articulators. Then interviews were conducted with all the respondents to elicit words borrowed to Kĩtigania and their meanings. The findings revealed that when borrowed segments are adapted to Kĩtigania, they undergo sound modification so that those adapted are faithful to those in the source language (Maa Language) and they are present in the Kĩtigania inventory. However, the loans undergo structure modification so as to fit the Kĩtigania syllabic structure. Nevertheless, markedness dominated faithfulness in Kĩtigania borrowing. Therefore, this article concludes that similarity of sounds between two languages brought by shared features as well as a language's inventory and syllabic structure play a big role in Kĩtigania borrowing. In addition, different repair strategies which result to phonological processes are employed in Kĩtigania borrowing. They include; deletion, substitution and voicing or weakening.

Keywords: Borrowing; optimality; markedness; structural well-formedness

Introduction
Linguistic borrowing is a process whereby a new loan is established in speech community involving both the adaptation of the loan word by one or more native speakers and the subsequent transmission of the loan word from those initial borrowers to the other members of the speech community. In the adaptation of loan words, the speaker attempts to remain faithful to the source word but at the same time makes the loan word to conform to the native language segmental, inventory, phonotactic constrains and prosodic structures. Hashemi (2011) notes that the recipient language will phonemically replace non-existing donor consonants with similar existing ones in terms of place and manner of articulation as well as phonation. However, others are of the view that this adaptation is based on the perspective of auditory similarity rather than proximity in feature geometry or shared natural classes (Kenstowicz, 2005) [16]. Nonetheless, Campbell (2015) adds that non-native phonological patterns are subject to accommodation where loan words that do not conform to native phonological patterns are modified to fit the phonological combinations that are permitted in the borrowing language.

Linguistic borrowing takes place because there is no language in the world that is self-sufficient. For various reasons, every language finds itself borrowing new words and names from other languages. The borrowing sometimes is as a result of necessity that can be explained by the fact that the world keeps on changing, new discoveries and inventions are made every day and consequently there is a need to either borrow or come up with new terminologies to describe new phenomena (Russ, 1992) [14]. However, sometimes languages borrow because of prestige. This happens when speakers of a particular language adopt a

loanword yet their language has an adequate way of expression for the same word. For instance, loan word '*ngare*' from Maa language means water. The Kĩtigania dialect has its equivalent, '*rui*' but occasionally, the two words are used.

Kĩtigania is a Bantu language which is a dialect of the larger Ameru language spoken in Eastern parts of Kenya. Guthrie (1970) classifies the larger Ameru language as zone E53. The language is called Kĩtigania while the speakers are called the Tiana people. The Maa language on other hand is perceived as the parent language which houses eighteen dialects notable among them being the Samburu, Maasai and Ilchamus (Lentete, 2016) [7]. It belongs to the Nilotic group of languages and specifically the Eastern Nilotic languages. The Maa dialects are mutually intelligible and Maa is regarded as the standard dialect.

Historically, Tiana people who speak the Kĩtigania language which is a dialect of the Kimerũ language had contact with the Maa speaking people (Maasai and Samburu communities). The contact occurred during the warrior years of Ithalie, Michubu and Ratanya age sets (1750-1780s) after the pre Meru clans had seized control of both Mt Kenya lower forest and Tiania plains. Contemporary Amerũ refer both Maa language and those who speak it as 'ũrũ'.The name Merũ was borrowed from Maa language as "Mierũ".

The Tiana people and the Maa Speaking communities did not co-exist peacefully but their existence was characterized by rivalry and antagonism probably because of their dissimilar interests; while the Maa people are naturally pastoralists the Tiana were farmers. Despite the rivalry and antagonism between the Maa and the Tiana people, to date there is clear evidence that the Maa speaking communities had a lot of influence on the Tiana people especially on culture, traditions and language.

The Kĩtigania language has foot prints of the Maa language in the names of places, people, and rivers. This article analysed these borrowed words in Kĩtigania and the phonological processes they report considering that Maa comprises a group of Nilotic languages while Kĩtigania is typically Bantu.

A language's inventory as well as the syllabic structure determine the phonological adjustments that a language will employ in linguistic borrowing. Kĩtigania's inventory comprises of twenty-four consonants and seven vowels all of which have their long counterparts (Muriira, 2017) [10]. The consonants are: /ᵐb/, /t/, /ⁿt/, /ⁿd/, /k/, /ᵑk/, /ᵑg/, /β/, /ʃ/, /ð/, /nð/, /ɣ/, /l/, /c/, /ⁿc/, /ⁿJ/, /m/, /n/, /ɲ/, /ŋ/, /w/, /r/, /ɾ/ and /j/. The vowels are as follows: /a, a:/, /ɛ, ɛ: /, /e, e:/ /i, i:/, /ɔ, ɔ: /, /o, o:/ and /u, u:/. In Kitiania's orthography, the long vowels are differentiated from the short vowels by doubling the vowel and the graphemes are [i, ĩ, e, a, o, ũ, u]. Maa Language on the other hand has 25 consonant sounds (Levergood, 1987), represented as /p/, /b/, /t/, /d/, /k/, /g/, /J/, /ᵐb/, /ⁿd/, /ⁿJ/, /ᵑg/, /ⁿc/ /s/, /ʃ/, /c/, /j/, /m/, /n/, /ɲ/, /ŋ/, /l/, /r/, /ɾ/, /w/ and /y/. Levergood notes that dialects may differ in the number of consonant sounds they have but these are generally the representative. As for the Maa vowels, Lentete (2016) [7] notes that most of the Maa dialects have seven vowels all of which have their long counterparts. They are represented as follows: /a, a:/, /ɛ, ɛ: /, /e, e:/ /i, i:/, /ɔ, ɔ: /, /o, o:/ and /u, u:/. Also vowel harmony is typical among the Nilotic speakers. Thus, vowels differentiate for +ART or –ART feature.

On the syllabic structure, Kĩtigania being a Bantu language reports a simple open syllabic structure. This means that Kitiania disallows coda consonants. This means that a syllable within the Kĩtigania must necessarily end with a vowel. On the other hand, Maa language allows closed syllables meaning codas are allowed. Hence, a syllable within the Maa language may end with a coda consonant. With these distinct syllable structures, this article analysed how Kĩtigania language adopts loan words borrowed from the Maa language within Optimality Theory's constraints.

Literature on linguistic borrowing generally indicates that borrowed segments tend to undergo systematic phonological adaptations. For instance, Kambuziya, Hashemi, Aghagolzade and Golfam (2014) [13] did a study on the phonological adaptation of Arabic loanwords in Persian with a main focus on consonant sounds. They found that Persian speakers replaced loanwords containing consonants with those which were very close in terms of place of articulation. Hence, the Persian alveolar fricatives /s/ and /z/ replace the Arabic interdentals /θ/, /ð/ respectively, while the voiced uvular fricative /ʁ/ was adapted as the voiced uvular plosive /ɢ/, the voiceless pharyngeal fricative /ħ/ is adapted as the voiceless glottal fricative /h/, the bilabial glide /w/ is replaced by the voiced labiodental /v/ and finally, the pharyngeal fricative /ʕ/ is adapted as the glottal plosive /ʔ/. Another study by Silverman (1992) [15] established that English consonants are replaced by those in close correspondence in Cantonese. Consequently, the English voiced bilabial plosive /b/ is replaced by Cantonese /p/ while the voiced alveolar plosive /d/ is replaced by its voiceless counterpart /t/. Both Persian and Cantonese belong to different language families which is why this article investigated adaptation in Kĩtigania to ascertain whether it will report similar phonological adaptations.

Miao (2005) [9] is also another study on linguistic borrowing where he investigated English loans in modern Mandarin Chinese. He found that the English voiceless bilabial plosives /t/ and /p/ are adapted as Mandarin aspirated plosives /tʰ/ and /pʰ/ respectively. Similarly, the English loans undergo syllabic structure modification whereby consonants are preserved via vowel epenthesis. However, the voiced alveolar plosive /d/ at coda position in English is adapted as /t/ in Mandarin along with vowel epenthesis. Faezeh and Zafaranlu (2013) [6] is also another study on the mapping of German diphthongs in Persian loanwords using Prince and Smolensky's (1993) [4] Optimality Theory. They found that the Germany diphthongs are changed to simple vowels in Persian language. While the front round vowels are changed to back round vowels; thus, the roundness feature overrides the fronting feature. They further note that there is no schwa in Persian, thus, it is simply realized as /e/. Therefore, Campbell's (2015) view that the borrowing language's phonological pattern must necessarily modify incoming loans so as to fit the phonological combinations that are permitted in the borrowing language is supported.

Mose, Nandelenga and Ayieko (2019) [12] do a study on the inventory constraints of Ekegusii borrowing from English using Prince and Smolensky's Optimality theory. They found that English vowels tend to be substituted with those in Ekegusii which they have shared features in terms of vertical and horizontal tongue position, tenseness as well as shape of the lips. On consonantal segments, they indicate that the sounds that were adapted shared at least the major-class features, laryngeal, manner and place features with

those they replaced. In addition, segments that are unmarked and preferred cross linguistically were adapted over the marked ones. Moreover, markedness features override faithfulness in Ekegusii borrowing. Although Kĩtigania is a Bantu language just like Ekegusii, there was a need to carry out this investigation to establish if it reports the same phonological adaptations. Moreover, their study focused on borrowing from English which is an Indo-European language while this article focuses on borrowing from Maa language which is a Kenyan language.

The literature presented herein indicates that the borrowing language adjusts the borrowed segments replacing them with those found in the language's inventory. Secondly, apart from Ekegusii which is a Bantu language just like Kĩtigania, all the other languages belong to different language families. Thus, there was a need to carry out this investigation so as to establish if Kitiania reported similar if not the same phonological adaptations in borrowing.

Materials and Methods

This study used a descriptive research design. This design is appropriate since it provides a picture of a phenomenon as it naturally occurs; hence, providing a foundation upon which a sound description can be done (Mugenda, 2008) [2]. Then purposive sampling was done to select ten Maa speakers and Ten Tiana speakers who were neither too young nor too old. Bowern (2008) argues that for a phonological study, respondents selected must have control of their articulators. The respondents selected were then interviewed and their responses which included segments borrowed from Maa language and their meanings recorded. Thereafter, the data was transcribed and then analysed using Prince and Smolensky's (1993, 2004) [4, 5] Optimality Theory tenets. This theory proposes that the grammar of all languages have a set of universal constraints which are part of Universal Grammar or the innate language knowledge that humans have. Depending on the phonology of a particular language, different languages will rank their constraints drawn from the universal pool of constraints resulting to an individual language's constraint hierarchy. Thus, the markedness constraints which entail a language's structural well-formedness interact with the faithfulness constraints which demand faithfulness to the source language to determine that which is the most optimal for the borrowing language.

Findings and Discussions

The findings of this investigation revealed that the Kitiania has borrowed segments from the Maa speaking communities. Consider the examples provided in the data below.

Maa Input	Kitiania Output	English Gloss
Lisumai [lisumai]	Lithumai [liðumali]	Name of a person
Ngusiru [ŋusiru]	Nguthiru [ŋuðiru]	Name of a place
Wasumara [wasumara]	Wuathumara [waðumara]	Name of a river
Silai[sirai]	Thilai [ðilai]	Ostrich
Sirua [sirua]	Thirua [ðirua]	Greyish blue
Isikira [isikira]	Thĩĩra [ðeera]	Part of something used for decoration

From the above examples it is explicit that voiceless alveolar fricative /s/ is adopted as the voiced inter-dental fricative /ð/ in Kitiania. This adaptation can be explained by the fact that both are fricatives and Kitiania's inventory lacks the voiceless alveolar fricative /s/. Hence, the closest is the interdental fricative. Optimality Theory can account for this adaptation when looking closely at the input and output relationship of a segment like [isikira] adapted as [ðeera] which means 'part of something that is used for a decoration', a number of constraints can be posted. First the *CODA constraint which prohibits coda consonants. Though the input in this case does not have coda consonants, Bantu languages where Kitiania is included rank this constraint highly. Secondly, the alveolar fricative is unattested in Kitiania, meaning we can posit a constraint [*s] which prohibits its occurrence. Thirdly, there is obstruent voicing which takes place; thus, *OBSVOI is relevant although it is dominated by both *CODA and [*s] because there are instances where devoicing takes place. All these are markedness constraints which must always interact with faithfulness constraints to determine optimal forms. Hence, on the faithfulness constraints, MAX-IO_{SEG} and IDENT-IO_{VOI} are violated as they disallow deletion and feature change respectively. The constraints will be ranked as follows in tableau (1); *CODA, [*s] >> *OBSVOI>> MAX-IO_{SEG}, IDENT-IO_{VOI}

Table 1: [isikira] adapted as [ðeera] 'part of something that is used for a decoration'

[isikira]	*CODA	[*s]	*OBSVOI	MAX-IO_{SEG}	IDENT-IO_{VOI}
a. ☞ [ðe.e.ra]			*	**	*
b. [i.si.ki.ra]		*!			
c. [sik.ra]	*!	*		**	
d. [ði.si.ra]		*!	*	*	

Tableau (1) indicates that candidate (c) is the most disharmonic. It not only violates *CODA but also has the voiceless alveolar fricative that is unattested in Kitiania. Thus, it is eliminated. As for candidate (b) and (d) both are isoharmonic. Each violates one of the constraints that Kitiania ranks high; [*s] and *CODA respectively. Hence, both are eliminated. As for candidate (a), it is the most harmonic. Although it violates the *OBSVOI which is markedness constraint that prohibits obstruent voicing and MAX-IO_{SEG} and IDENT-IO_{VOI} which are faithfulness constraints, Kitiania ranks them low. Thus, it is the winner and the most optimal form. In this adaptation, the markedness constraints which demand structural well-formedness dominate the faithfulness constraints which demand faithfulness to the input. The data further revealed the adaptation of the voiced/voiceless bilabial plosive /b/ and /p/ respectively as the voiced bilabial fricative /β/as shown below.

Maa Input	Kitiania Output	English Gloss
Lubuasirua [lubuasirua]	Lũbuathirua [loβuaðirua]	Name of a place
Oloiboni [oloiboni]	Laibũni [laiβoni]	Name of person (seer)
Oipapalai [oipapalai]	Oi babalai [oiβaβalai]	Exclamation (for surprise)
Oloiropiji [oloiropiji]	Lairobi	A wild root resembling a carrot
Nkabutei [ᵑkabutei]	Nkabu [ᵑkaβu]	Maternal uncle
Lupetaa [lupeta:]	Lubetaa [luβeta:]	Name of an age set

From the data, it can be noted that the voiced/voiceless bilabial plosives /b/ and /p/ which are not in the Kĩtiania inventory are adapted as the voiced bilabial fricative /β/. This confirms Hashemi's (2011) argument that the recipient language phonemically replaces non-existing donor consonants with similar existing ones in this case, in terms of place of articulation as well as phonation. OT can account for this adaptation by posting the following constraints considering an input like [oloiboni] adapted as [laiβoni] which is 'a name of person (seer)'. *CODA is consistently not violated in Kitiania, as the language disallows coda consonants; therefore, it is relevant. Moreover, in Kitiania inventory, both the voiced /b/ and the voiceless /p/ bilabial plosive sounds are unattested. Constraints [*p] and [*b] constraints can be posited to militate against their occurrence in Kĩtiania. So far these are markedness constraints which have to be counterbalanced with faithfulness constraints. The relevant one which can be invoked in MAX-IO$_{SEG}$ which disallows deletion of segments. The constraints will be ranked as follows in tableau (2); *CODA, [*b] >> MAX-IO$_{SEG}$

Table 2: [oloiboni] adapted as [laiβoni] 'a name of person- seer)'

[oloiboni]	*CODA	[*b]	MAX-IO$_{SEG}$
a. [ol.o.i.bo.ni]	*!	*	
b. ☞ [la.i.βo.ni]			*
c. [la.i.βun]	*!		**
d. [lo.i.bo.ni]		*!	

According to tableau (2), candidate (b) is the optimal although it violates the low ranked MAX-IO$_{SEG}$ in the Kĩtiania language. OT stipulates that there are no perfect forms because every output will violate at least some constraint. Candidate (a) is the most disharmonic. It violates *CODA by allowing a coda consonant and [*b] which disallows the occurrence of the voiced bilabial plosive that is unattested in Kitiana. Hence, it is eliminated. Candidate (c) and (d) do not fair well either. Each violates the high ranked *CODA and [*b] constraints respectively. As a result, they do not survive.

Moreover, there is the adaptation of the voiced alveolar plosive /d/ as the voiceless alveolar plosive /t/ in Kitiania borrowing.

Maa Input	Kitiania Output	English Gloss
Saidimu [saidimu]	thaitumu [ðaitumu]	Name of a person

In this adaptation, both sounds differ only in phonation. Besides, Kitiania has the pre-nasalized alveolar plosive /ⁿd/ which is typical across Bantu languages. In the adaptation of [saidimu] as [ðaitumu] which is 'a name of a person'; the following constraints can be proposed to evaluate the outputs: *CODA that is not violated in Kĩtiania. [*s] which militates against the occurrence of the voiceless alveolar fricative. These constraints will be counterbalanced by IDENT-IO$_{VOI}$ which prohibits feature change. The constraints will be ranked as follows in tableau [3]; *CODA, [*s] >>IDENT-IO$_{VOI.}$

Table 3: [saidimu] adapted as [ðaitumu] 'a name of a person'

[saidimu]	*CODA	[*s]	IDENT-IO$_{VOI}$
a.☞ [ða.i.tu.mu]			*
b. [sa.i.di.mu]		*!	
c. [sa.i.dim]	*!	*	
d. [ða.i.tum]	*!		*

From Tableau (3), it is clear candidate (a) is the optimal form although it violates the low ranked IDENT-IO$_{VOI}$, a faithfulness constraint that disallows feature change. Conversely, candidate (c) is the most disharmonic as it violates two markedness constraints that Kitiania ranks high; *CODA constraint which prohibits coda consonants and [*s] which disallows the occurrence of the voiceless alveolar fricative that is unattested in Kitiania. Hence, it is eliminated. Candidate (b) and (d) are isoharmonic. Each one of them violates one of the high ranked markedness constraints in Kitiania; [*s] and *CODA respectively. Thus, both do not survive.

Another notable adaptation from the data is that of the voiceless post alveolar fricative /ʃ/ to the voiceless palatal plosive /c/ as indicated by the data below.

Maa Input	Kitiania Output	English Gloss
Loongishu [lo:ŋiʃu]	Thiangichu [ðiaŋicu]	Name of a person whom a person named after had many cows
Ngishuu [ŋiʃu:]	Ngichu [ŋicu]	Cows

This adaptation could be motivated by the fact that the voiceless alveolar fricative /ʃ/ is non-existent in the Kitiania inventory. Besides, both sounds are voiceless obstruents. This adaptation can be accounted for using OT's markedness and faithfulness constraints as follows. From the input output relationship of a segment like [lo:ŋiʃu] adapted as [ðiaŋicu] 'name of a person'; *CODA is relevant. Moreover, the voiceless alveolar fricative /ʃ/ is unattested in Kitiania. Hence, constraint [*ʃ] can be proposed to evaluate the outputs. It can also be noted that there is the peculiar adaptation of the lateral approximant /l/ as the voiced interdental fricative /ð/. This was quite unique considering that in most of the Maa loan words there was direct mapping of /l/ to Kitiania since both languages have it in their inventories. On faithfulness constraints IDENT-IO$_{LONG}$ which prohibits feature change in this case vowel length is relevant. The constraints will be ranked in tableau (4) as follows: *CODA, [*ʃ] >>IDENT-IO$_{LONG}$.

Table 4: [lo:ŋiʃu] adapted as [ðiaŋicu]

[lo:ŋiʃu]	*CODA	[*ʃ]	IDENT-IO$_{LONG}$
a.☞ [ði.a.ŋi.cu]			*
b. [lo:.ŋi.ʃu]		*!	
c. [lo:.ŋiʃ]	*!	*	
d. [ði.a.ŋi.ʃu]		*!	*

Tableau (4) indicates that candidate (a) is the optimal even though it violates the faithfulness constraint IDENT-IO$_{LONG}$ because Kitiania does not attach a lot importance to feature change. However, Kitiania attaches a lot importance to [*ʃ] and *CODA which it ranks highly. That is why Candidate (b), (c) and (d) do not survive because each one of them violates at least one of these constraints while candidate (c) violates both. No doubt, markedness constraints dominate faithfulness constraints in Kitiania adaptation of Maa loanwords. The findings reported in this article are very similar to Kambuziya, Hashemi, Aghagolzade and Golfam (2014) [13], Silverman (1992) [15], Miao (2005) [9], Faezeh and Zafaranlu (2013) [6], Mose (2019) [12]; that the borrowing language replaces non-existing donor sounds with those that have similar articulation features. In addition, markedness constraints which demand structural well-formedness in the borrowing language dominate faithfulness constraints in Kitiania borrowing just as it is reported in Ekegusii (Mose, Nandelenga & Ayieko, 2019) [12] which is a Bantu language.

Phonological Processes in Kitiania Borrowing

Deletion

Deletion is a phonological process whereby there is loss of segments which can be either vowels or consonants. Deletion was evident in the data as shown.

Maa Input	Kitiania Output	Gloss/ Meaning
a). Laing'oni [laiŋoni]	Laing'o [laiŋo]	Bull/ a male warrior who is strong and brave
b). Engatuny/ Olngatunyi	Ngatũnyi	Engatuny (female) olngatunyi(male) Lion
c). Nkirotet [ᵑkirotet]	Nkirote [ᵑkirote]	Name of a person whom a person named after was the favoured wife in a polygamous marriage
e). Lariak [lariak]	Laria [laria]	Name of a place (many wells)
f). Ngokon [ŋokon]	Ngũku [ŋoku]	Chicken
g). Enkamuratani [eᵑkamuratani]	Mũtaani [mota:ni]	A person who circumcises women
h). Olmurunya [olmuruŋa]	Kĩrunya [kiruŋa]	A blade used to circumcise women
i). Mangutuk [maŋutuk]	Ngutu [ŋutu]	
j). Nkabutei [ᵑkabutei]	Nkabu [ᵑkaβu]	Maternal uncle
k). Nkorontit [ŋkorontit]	Nkũruti [ŋkoru]	Diarrhoea
l). Oltuala [oltuala]	Ntuala [ntuala]	A bell put around the neck of a cow

From the data presented, it can be noted that deletion of segments is a very rampant phonological process employed by the Kitiania speakers as they adopt the Maa loanwords. In some loanwords deletion of segments occurs to make them simpler for adaptation. This can be observed in a), h), i), and j). However, in others the loanwords have closed syllables that have codas. With Kitiania's open syllabicity, the coda consonants are simply deleted. Examples of loanwords with closed syllables include: c), e), f), i), k) and l). These adaptations can be accounted for using Optimality Theory's markedness and faithfulness constraints. It is very clear for instance that the language adheres to the *CODA constraint which bans coda consonants at the end of the syllable looking at an input like *Nkirotet* [ᵑkirotet] adapted as *Nkirote* [ᵑkirote]. Otherwise, coda consonants are deleted. Thus, in this adaptation *CODA as well as MAX-IO$_{SEG}$ which disallows deletion are proposed. In Tableau (5) *CODA will dominate MAX-IO$_{SEG}$ as shown.

Table 5: [ᵑkirotet] adapted as [ᵑkirote]

[ŋkirotet]	*CODA	MAX-IO$_{SEG}$
a.☞ [ᵑkirote]		*
b. [ᵑkirotet]	*!	
c. [ŋkiro]		*!

Tableau (5) indicates that candidate (a) is the most optimal although it violates MAX-IO$_{SEG}$ which prohibits segment deletion. Nevertheless, candidate (b) is the most disharmonic because it violates *CODA that Kitiania ranks highly. Thus, it is eliminated. Candidate (c) is less favourable than the winner although it violates MAXIO$_{SEG}$ which is ranked low in the language. Hence, it is also eliminated.

Therefore, Kitiania language attaches a lot of importance to structural well-formedness of the loans than similarity to the source language.

Substitution

Sarkar (2012) [11] observes that substitution is a phonological process whereby native speakers systematically replace one sound with another. Substitution is not haphazard, latter speakers tend to substitute sounds that are most similar and natural as possible to those in the source language. In most instances, the sounds have shared features in articulation. Substitution was realized in the following loanwords.

Maa Input	Kitiania Output	English Gloss
Ngusiru [ŋusiru]	Nguthĩrũ [ŋuðero]	Name of a place
Wasumara [wasumara]	Wuathũmara [waðumara]	Name of a river
Silai[sirai]	Thilai [ðilai]	Ostrich
Sirua [sirua]	Thirua [ðirua]	Greyish blue
Isikira [isikira]	Thiira [ðiira]	Part of something used for decoration
Lubuasirua [lubuasirua]	Lũbuathirua [loβuaðirua]	Name of a place

Oloiboni [oloiboni]	Laibũni [laiβoni]	Name of person (seer)
Oipapalai [oipapalai]	Oi babalai [oiβaβalai]	Exclamation (for surprise)
Oloiropiji [oloiropiji]	Lairobi	A wild root resembling a carrot
Nkabutei [ᵑkabutei]	Nkabu [ᵑkaβu]	Maternal uncle
Lupetaa [lupeta:]	Lubetaa [luβeta:]	Name of an age set
Saidimu [saidimu]	thaitumu [ðaitumu]	Name of a person
Loongishu [lo:ŋiʃu]	Thiangichu [ðiaŋicu]	Name of a person whom a person named after had many cows
Ngishuu [ŋiʃu:]	Ngichu [ŋicu]	Cows

From the data herein, it can be noted that voiceless alveolar fricative /s/ is substituted with the voiced inter-dental fricative /ð/ in Kitiania. This is because /s/ sound is unattested in the Kitiania inventory. Secondly, the voiced/voiceless bilabial plosives /b/ and /p/ which are substituted with the voiced bilabial fricative/β/. Moreover, the Kitiania inventory lacks sounds /b/ and /p/ although it has pre-nasalized stops. Also the voiceless alveolar fricative /ʃ/ is non-existent in the Kitiania inventory. As such, it is substituted by /c/ which is an obstruent. Besides, both sounds are voiceless obstruents which are cross-linguistically preferred. Substitution in Kitiania borrowing is to a large extent due to unavailability of the source language phonemes in the borrowing language's inventory.

Voicing/ Weakening and Devoicing/Strengthening

Gussenhoven and Jacobs (2005) [1] observe that when a consonant that is normally voiceless changes to a voiced one in some context, then voicing occurs. Conversely, devoicing takes place when a segment with vocal-fold vibration changes to be voiceless. Both voicing and devoicing took place in the Kitiania borrowing as shown.

Maa Input	Kitiania Output	English Gloss
Lisumai [lisumai]	Lĩthumai [liðumali]	Name of a person
Ngusiru [ŋusiru]	Nguthĩrũ [ŋuðiru]	Name of a place
Silai [sirai]	Thilai [ðilai]	Ostrich
Sirua [sirua]	Thirua [ðirua]	Greyish blue
Isikira [isikira]	Thiira [ðiira]	Part of something used for decoration
Oipapalai [oipapalai]	Oi babalai [oiβaβalai]	Exclamation (for surprise)
Oloiropiji [oloiropiji]	Lairobi	A wild root resembling a carrot
Lupetaa [lupeta:]	Lubetaa [luβeta:]	Name of an age set
Saidimu [saidimu]	thaitumu [ðaitumu]	Name of a person

Voicing takes place where the voiceless alveolar fricative /s/ is adapted as the voiced inter-dental fricative /ð/ in Kitiania. Moreover, the voiceless bilabial plosives /p/ which is unattested in the Kitiania inventory is adapted as the voiced bilabial fricative /β/. In both instances of voicing, the motivation is lack of the particular phoneme in the borrowing language. Nonetheless, there was devoicing whereby the voiced alveolar plosive /d/ was replaced by the voiceless alveolar plosive /t/ in Kitiania borrowing. This is not a surprise because Paradis and Prunet (1991) [3] note that voiceless stops are the unmarked; therefore, preferred cross-linguistically.

Conclusion

This article sought to investigate phonological adaptations of the Maa loanwords in Kitiania. The findings revealed that Kitiania replaces consonantal sounds that are unattested in its inventory with those that are close in terms of articulation. For instance, the voiceless alveolar fricative /s/ is adapted as the voiced inter-dental fricative /ð/ in Kitiania while voiceless and voiced bilabial plosives /p/ and /b/ are adapted as the voiced bilabial fricative /β/. Further, the voiced alveolar plosive /d/ is adapted as the voiceless alveolar plosive /t/. Moreover the voiceless post alveolar fricative /ʃ/ is adapted as the voiceless palatal plosive /c/. On phonological adjustments deletion, substitution and voicing or weakening were noted. Moreover, markedness constraints dominated faithfulness constraints indicating that in Kitiania borrowing, the adaptation pays more attention to well formedness of the Kitiania's phonology than similarity to the loanwords.

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Data		
Maa Input	**Kitiania Output**	**Gloss/Meaning**
Lerai/olerai	lerra	Desert tree
Suuai/eluuai	lũũi	The crying acacia/whistling thorn
Lngurme	lukurume	A small hill with Perennial thorny grass
Laing'oni	Laing'o	Bull/ a male warrior who is strong and brave
Rongai	Rongai	Something or somebody thin/slim
Engatuny/ olngatunyi	Ngatũnyi	Male/ female Lion
Silai	Thilai	Ostrich
Ntari	Ntarĩ	Herd of Goats and sheep
Ng'eer/Eng'eer	N'geere	sheep
Ang'ata	Lang'ata	Deserted land with no habitant
Laare/olaare	Laare	Big swamp
Loontare	M'lintarĩ	Name of a person whom a person named after had many goats
Ngishuu	Ngichu	Cows
Loongishu	Thiangichu	Name of a person whom a person named after had many cows
Saidimu	Thaitumu	Name of a person (he is able)
Oloiboni	Laibũni	Name of person (seer)
Nkirotet	Nkirote	Name of a person whom a person named after was the favoured wife in a polygamous marriage
Lamuriak	Namulia	A wild fruit
Lariak	Laria	Name of a place (many wells)
Ngusiru	Nguthĩrũ	Name of a place with cotton soil
Ngaroni	Ngarũni	Name of a place with water scarcity
Loriaan	Lũria	Name of a place that is evergreen
Munichoi	Mulichũi	Name of a tree with claw thorns
Olkilenyai	Mukilinyai	Name of a tree that is very tall
Lkuloriti	Nkilũrũti	Name of a tree
Lupetaa	Lubetaa	Name of an age set
Ming'aani	Ming'aani	Deaf
Entomononi	Ntomononi	A woman who has just delivered
Kerai /enkerai	Nkerai	Child
Lchore /olchore	Muchore	A friend
Murataa	Mũrata	People circumcised at the same time
Lokere	Rũiri	Fence around the compound
Namuka	Ncabũng'a	Sandals made from old tires
Sikiria/esikiria	Ntiiri	A female donkey
Ngokon	Ngũkũ	Chicken
Ngutukuruk/ lunguut	Ntuturu	Owl
Nyiru	Nyirũ	Dark brown
Lengiro	Lanyirũ	Name of a place with dark brown soil
Sirua	Thirua	Greyish blue/ ashy soil
Lubua	Lubua	Range / plain land
Lubuasirua	Lũbuathirua	Name of a place with ashy soil
Enkare	Ngare	Water
endonyio	Ndũnyũ	Hill
endonyio oomutonyi	Ndũnyũ mũtonyi	The hill of eagles
Enkamuratani	Mũtaani	A person who circumcises women
Layioni/olayioni	Laiyũni	Uncircumcised boy
Olmurunya	Kĩrunya	A blade used to circumcise women
Isurutia	Mathuruthia	Girls' traditional decorations including necklaces
Ilmuran/ muran	Mũrani	A worrier
Isikira	Thĩĩra	Part of mathuruthia used for decoration
Ekilong'oe/orkwatiti	Kĩlong'oe	Flywhisk
Nkabutei/enkaputi	Nkabu	Maternal uncle

Oi papalai	Oi babalai	Exclamation (exclamation of surprise)
Latana kuloo	Latana kũloo	Exclamation
Yii bai	Yĩĩ baĩ	Exclamation (it's true that way)
Ncabirikii	Nchabirikii	Exclamation
Ooi nanu	ũũi nanũ	Exclamation (oh onto me)
Nkorontit	Nkũrutĩ	Diarrhoea
Saarge/osarge	Tharike	Blood
Mungur/Emugur	Mũkuri	A pool of water
Kipuri	Kĩbũri	Name of a person whose namesake is/was proud
Oltepesi	Ntabĩthi	An indigenous tree used to feet goats or sheet during the time of drought
Enkipindo	Kĩmindo	Sword
Larui	Larũi	Stomach/ poor person
Eorr	ũrrũ	A bare land
Oloiropiji	Lairobi	A wild root resembling a carrot
Olkarsis	Nkarichia	A wealthy person
Enkai	Ngai	God
Lekiriea	Lekiriea	Name of a person
iloing'ok	Laing'o	Male bull
Nchurrai	Ncũrai	Name of a thorny tree that can be used to cook herb soup
Mieru	Merũ	Name of a place where people do farming
Lempere	Lĩmbere	Name of a person who normally walks with a spear
Oltuala	Ntuala	A bell put around the neck of a cow
Emaintai	Maintai	A belt used to tie the bell of a cow