A Systematic Description of Imbrication in Nyakyusa

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Abstract

This paper offers a systematic description of imbrication in Nyakyusa (M31). The review of the literature indicates that, in Nyakyusa, imbrication, a phonological change involving the opaque difference between the input and output forms in the *-ile* suffix, has not been systematically described. Hence, the paper offers this description by identifying triggering conditions and reconstructing the phonological processes shaping imbrication. Data for this paper were collected in Kyela district through a review of written texts, narrative stories, observation and interviews. The findings indicate that the syllable structure of the verb is the main determinant of imbrication in Nyakyusa. Quite obviously, the process of imbrication involves the deletion of the consonant in the *-ile*, followed by metathesis whereby the last consonant of the stem fills the empty slot caused by the deletion of [l]. Then, various adjustments that follow, i.e., vowel coalescence, vowel deletion, vowel rising, leftward spread of vowel, and vowel lengthening, are meant to resolve hiatus. The paper concludes that, based on the review of literature, although imbrication is common in some Bantu languages, we noted some conditions and phonological processes shaping imbrication to be language specific. In this view, this paper recommends a systematic comparative description of imbrication in other Bantu languages.

1.0 Introduction

This paper provides a systematic description of imbrication in Nyakyusa, a language spoken by approximately one million people (Felberg, 1996). Geographically, the language stretches from the north Rukuru river near Kalonga in Malawi to Mbeya town in Tanzania, with the majority of speakers residing in Tanzania. Nyakyusa is coded M31 in the list of Bantu languages (Maho, 2009). According to LOT (2009), Nyakyusa is among the ten big languages in Tanzania, with 740,020 speakers. The majority of Nyakyusa speakers, approximately 682,539, live in Mbeya region, particularly in three districts, namely Kyela (with 138,869 speakers), Rungwe (with 258,441 speakers), and Mbeya Urban (with 145,007 speakers). In comparison to

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other Bantu languages in zone M, Nyakyusa has relatively many publications. Of concern for this paper, however, is that the existing description of Nyakyusa remains sketchy (Persohn, 2017). This underscores the need for further documentation of the language, specifically in the areas of phonology, morphology, syntax, historical linguistics, semantics, and pragmatics. Therefore, this paper aims to contribute to the ongoing efforts in language documentation and description.

Imbrication, the current study focuses on, is mainly associated with the attachment of the perfective *-ile*[2] to some verbs in Bantu languages. The verbs to which the *-ile* suffix triggers imbrication are technically called irregular verbs (Kula, 2001; Rugemalira, 2005) since the output forms are unpredictable when the suffix is attached and the verbs to which the suffix does not trigger imbrication are called regular. In this view, the *-ile* triggers imbrication under certain conditions, which vary from language to language. A morpheme *-il-/-ir-*, may be glossed as perfective, stative, or past fuses with the verb stem, producing relatively opaque differences between input and output forms (Givon, 1970; Bastin, 1983; Kahigi, 1989; Hyman, 1995; Kula, 2001; Robinson, 2021). In this view, the tense and/or aspect suffix *-ile* is the main candidate that triggers imbrication when attached to some verbs in many Bantu languages. Figure 1 illustrates the imbrication process.

Underlying representation (input) →*phonological rules* ⟶ *Surface representation (output)*

Figure 1. The Imbrication Process

As shown in Figure 1, the imbrication process begins with underlying representations (formation of the input form, which is the verb stem plus the *-ile* suffix); then, the input undergoes a derivational process (change) defined by a set of phonological rules (processes) to the surface representation (surface/output form).

2.0 Literature Review
The review of literature shows that, in many Bantu languages, imbrication is a common phonological change triggered by the perfective suffix when attached to some verbs. However, this phonological change has been named differently by different scholars and its triggering conditions vary from language to language. Using the data from Chibemba, Runyankore, Kirundi and Luganda, Mould (1972) points out that the suffix *-ile* induces a phonological change by modifying the base of the verb to which it is attached across many Bantu languages. He shows a set of phonological processes resulting from the suffixation of *-ile* as gliding, assimilation and reduction. In describing the phonological change induced by the *-ile* suffix,

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[2] The suffix started its life as *ida*, and kept on changing by assuming different forms such as *-ide, -ite, -ile, -ie* and *-e* (Meeussen, 1967; Mazrui, 1983; Hyman, 2007).

under what is called 'Modified Base' (MB), Mould identifies two ways of forming the modified base, which the author calls MB1 and MB2. MB1 involves regular suffixation of the *-ile* suffix, like in the verb *-gamb-* 'say' whose output form is *-gamb-ile*. However, MB2 involves attaching the *-ile* suffix to polysyllabic verbs whose stems end in [l, z], the nasal [n] and the [-ibw-] for passive and MB1 is used elsewhere. In Runyankore, MB2 does not involve fusion (coalescence) rather, gliding and vowel shortening are involved.

Kula (2001) points out that the size of the verb base cannot characterize imbrication, since both short and extended (long) verbs may imbricate in Bemba. However, Kotzé (2008) points out that, in Northern Sotho, simple verbs are regular (no imbrication) whereas complex/extended verbs are irregular (*-ile* triggers imbrication). This implies that in the Northern Sotho language, the size of the verb base matters in characterizing imbrication, contrary to Bemba. Regarding phonological processes shaping imbrication, Kula (2001) mentions three of them in Bemba, namely vowel fusion, gliding, and loss of [l], the consonant of the tense/aspect marker *-ile*. Kotzé (2008) mentions only fusion in Northern Sotho. Moreover, Morrison (2012) points out that, the properties of imbrication vary in each of Bantu languages for which it has been described concerning environments that trigger and/or block imbrication.

Despite the important roadmap and conceptual light provided by the previous works, imbrication has not been systematically described in Bantu languages, especially the Nyakyusa language. Indeed, Robinson (2015), (2019) and (2021), who focused on tense-aspect distinction, the phonetic manifestation of the *-ile* and historical evolution across the Nyasa-Tanganyika corridor, only partially described imbrication in Nyakyusa. This implies that a systematic description of imbrication remained a gap in the Nyakyusa language, which the current study set out to bridge. Hence, the current paper demonstrates how imbrication occurs step by step with the phonological rules shaping the change of the input (verb stem plus *-ile* suffix) from its underlying representation to the surface form in Nyakyusa.

3.0 Theory
This paper, being descriptive, employed the Theory of Utterance Selection (TUS) developed by Croft (2000). TUS asserts that languages do not change; instead, people change languages through their actions. One of the maxims of TUS in connection to the language change is to 'talk in such a way that you do not expend superfluous energy' (Keller, 1994). That is to say, normally speakers opt for a simpler form than the complex one so that they do not expend superfluous energy.
Generally, as speakers speak their respective languages, they impose changes and generate rules interestingly and paradoxically such that these speakers of these languages often do not notice the rules and language changes (Hayes, 2009). With imbrication, the theory helps us in the analysis of this phonological change and the rules shaping the change, as we need to reconstruct (trace) the starting point of the

change that is the underlying representation, moving step by step towards the surface form which is simpler than the input forms.

4.0   Methodology

The data for this paper were collected in Kyela district, where many Nyakyusa native speakers live. The data were collected through observation, interview, and a review of available written texts. As a native speaker of the language, the researcher managed to collect data by observing and recording speakers' conversations. Both observation and narrative stories allowed the natural flow of useful data for describing imbrication. Interviews were used for the grammaticality judgment of the acceptability of different examples and constructions presented in this paper by native speakers. Robinson (2015; 2021), and the Nyakyusa-English-Swahili & English-Nyakyusa Dictionary by Felberg (1996) were key sources of secondary data used by the study. Through the aforementioned methods, the study collected enough data to describe imbrication in Nyakyusa and analyze the triggering conditions and phonological processes shaping the opaque difference caused by the *-ile* suffixation between the change from input to output forms.

5.0 Result and Discussion

The *-ile* suffixation observed in Nyakyusa introduces two categories of verbs, namely regular and irregular (also see Kula, 2001; Rugemalira, 2005). Regular verbs, technically termed as such, exhibit a predictable and clearly visible *-ile* suffix when attached to the verb. On the other hand, irregular verbs, also technically referred to as such, do not allow for a straightforward prediction or observation of the *-ile* suffix after attachment. During the process of data collection and analysis, efforts were made to distinguish between regular and irregular verbs to establish the triggering conditions for imbrication. For irregular verbs, a systematic approach was undertaken to identify the changes involving the *-ile* suffixation from the input form (referred to as the underlying form throughout this paper) to the output form (referred to as the surface form throughout this paper). Table 1 presents examples of regular verbs, offering illustrations of the regular *-ile* suffixation in Nyakyusa.

Table 1: Verbs Allowing Regular -ile Suffixation in Nyakyusa

Verb stem/root	Gloss	*-ile* Suffixation
Verbs with CV-root		
fu-a(fwa)	die	*fwile*
li-a(lya)	eat	*liile*
gu-a	fall	*gwile*
ku-a(kwa)	pay dowry	*kwile*
pi-a	be burnt	*piile*
si-a	grind	*siile*
lu-a (lwa)	fight	*lwile*

Verb stem/root	Gloss	*-ile* Suffixation
ki-a	dawn	*kiile*
su-a	spit or forgive	*swile*
tu-a	be plenty	*twile*
Verbs with CVC-root		
lim-a	cultivate	*limile*
kom-a	beat	*komile*
jobh-a	talk	*jobhile*
som-a	read	*somile*
tum-a	send	*tumile*
sop-a	throw	*sopile*
Verbs with CVCV(NC)-root		
bheleng-a	count	*bhelengile*
bhulung-a	roll up	*bhulungile*
kasing-a	roast	*kasingile*
kalang-a	fry	*kalangile*
fulumb-a	mix water with dirt/contaminate	*fulumbile*
keng'end-a	level off	*keng'endile*
senyend-a	tremble something	*senyendile*
kanyang-a	trample	*kanyangile*

Source: Fieldwork

As presented in Table 1, the findings show that syllable structure is the main determinant of imbrication in Nyakyusa. In this view, regular verbs in Nyakyusa have the root structure CV-, CVC- and CVCV(NC). The output forms of regular verbs are predictable after attaching the *-ile* suffix. It is observed that *-ile* suffix does not induce imbrication when attached to these regular verbs. As one can see, the *-ile* suffix is the output form of the verb when the suffix is attached to mark tense and/or aspect. Similar findings have been presented by Kula (2001) in Bemba regarding the regularity of verbs with CVCV (NG) - root structure.

Since imbrication is associated with irregular verb*s,* we analysed data to identify irregular verbs to establish different conditions under which *-ile* suffix induces this phonological change in Nyakyusa. The findings show that the suffix *-ile* induces imbrication under different conditions depending on the verb root structure in Nyakyusa. The following subsections present how the *-ile* suffix induces imbrication to different irregular verbs with different root structures in Nyakyusa.

5.1 Imbrication in Verbs with CVCVC-root
As is the case with most Bantu languages, verbs with CVCVC structure have longer roots than the canonical structure. It is worth noting that most Nyakyusa verb roots have a CVC- structure, except for a few verb roots with a CV- structure. According to Rugemalira (1993), longer verbs across Bantu languages (including Nyakyusa) were formed via a process of suffixation using derivational suffixes, which

eventually ceased to be productive and the roots to which they are attached do not occur alone, or if they do occur, the meaning of root plus the suffix is not the sum of the parts.

Looking at the nucleus of the penultimate syllable, Nyakyusa verbs with CVCVC structure are of three shapes, namely verbs whose nucleus of the penultimate syllable is [o], [u] and [a]. Phonological processes shaping the change from the expected form to the surface form vary depending on the kind of nucleus of the penultimate syllable. Table 2 provides examples to illustrate imbrication induced by *the -ile* suffixation to verbs with CVCVC-root, when [u], and [o] are the nucleus of the penultimate syllable.

Table 2: Imbrication in CVCVC- with [u] and [o]as the Penultimate Syllable Nucleus [M31]

Stem	Gloss	*-ile* suffixation	Surface form
putuka	bend	*putukile	*putwike*
satuka	fall from the tree	*satukile	*satwike*
sanjula	comb	*sanjulile	*sanjwile*
sanuka	alter, turn	*sanukile	*sanwike*
sambuka	rebel, revolt	*sambukile	*sambwike*
sumuka	get up	*sumukile	*sumwike*
suluka	go down	*sulukile	*sulwike*
pangula	dismantle	*panguliile	*pangwile*
tumula	cut	*tumulile	*tumwile*
bhapula	slap	*bhapulile	*bapwile*
pendula	overturn, convert	*pindulile	*pindwile*
sangula	contribute	*sangulile	*sangwile*
bhotoka	be in ubundance	*bhotokile	*bhotwike*
gomoka	return	*gomokile	*gomwike*
sotola	piece	*sotolile	*sotwile*

Source: Fieldwork

The verbs presented in Table 2 are longer than CV- and CVC- and, in Nyakyusa. These were formed via a process of suffixation of applicative *el-/-il-* and stative *-ek-/ik,* which are no longer productive. Imbrication in these verbs involves gliding as the distinctive phonological feature when the *-ile* is attached to CVCVC-root in Nyakyusa. Based on the examples in Table 2, the change from the expected form to the surface form is shaped by a set of phonological processes, as illustrated in (1).

(1a)   Underlying form (*ile suffixation)*   /*putukile*/
              Step 2:   Deletion of [l]   /*putukie*/
              Step 3:   CV metathesis   /*putuike*/
              Step 4:   Gliding   /*putwik*e/

Surface form		[putwike]
(1b) Underlying form (*ile suffixation*)		/βotokile/
Step 1:	Deletion of [l]	/βotokie/
Step 2:	CV metathesis	/βotoike/
Step3:	Vowel raising [o-u]	/βotuike/
Step 4:	Gliding	/βotwike/
Surface form		[βotwike]

Based on the illustration in (1a & b), the *-ile* suffix will induce imbrication to verbs with this structure if the penultimate syllable of the CVCVC-root is made up of [u] and [o] as the nucleus. When *the -ile* suffix is attached to this kind of verb, such as *putuka* 'bend' and *bhotoka* 'be abundant,' the suffix creates an opaque difference between the expected input and output forms. The expected forms after adding the *-ile* suffix to the verbs *putuka* and *bhotoka* would be *putukile* and *bhotokile,* respectively. However, these expected forms (underlying) undergo a derivational process, defined by a set of phonological rules (processes) to the output (surface) form *putwike* and *bhotwike,* respectively.

The change involving the *-ile* suffixation to verbs with CVCVC-root with [u] as the nucleus of the penultimate syllable is shaped by three phonological processes. The processes are deletion of [l]; the consonant of the tense/aspect (T/A) suffix, Consonant-Vowel (CV) metathesis,[3] and gliding, the process where the high vowel [u] changes into [w] before another vowel. In contrast, the change in verbs with CVCVC- root where [o] is a nucleus of the penultimate syllable is shaped by four phonological processes, namely deletion of [l], metathesis, vowel raising [o-u] and gliding, as illustrated in (1b).

Coming to verbs where the low vowel [a] is the nucleus of a penultimate syllable, the *-ile* suffix induces imbrication with vowel coalescence as the distinctive phonological feature contrary to CVCVC- verbs whose nucleus penultimate syllable is [o] and [u]. Table 3 provides examples of imbrication in verbs with CVCVC- root whose nucleus of the penultimate syllable is [a] in Nyakyusa.

Table 3: Imbrication in CVCVC- with [a] as the Penultimate Syllable [M31]

Stem	Gloss	*-ile* suffixation	Surface form
gasama	gape	*gasamile	*gaseeme*
fugama	kneel	*fugamile	*fugeeme*
lusama	gaze	*lusamile	*luseeme*
galama	lie on your back	*galamile	*galeeme*
kupama	lay on your stomach	*kupamile	*kupeeme*

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[3] Metathesis (sometimes called transposition of the segment) is a phonological process whereby two, usually adjacent, sound segments interchange positions i.e., one segment takes the position of the other and vice versa (Massamba, 2010).

Stem	Gloss	*-ile* suffixation	Surface form
kangala	become old	*kangalile	*kangeele*
tugala	sit down	*tugalile	*tugeele*
bhagala	carry using shoulders	*bhagalile	*bhageele*
bhugala	become big/recover	*bhugalile	*bhugeele*

Source: Fieldwork

Based on examples in Table 3, the change between the expected (underlying) form and the surface form is step by step shaped by a set of phonological processes as illustrated in (2).

(2)   Underlying form (*-ile* suffixation)   /βugalile/
         Step 1:   Deletion of [l]   /βugalie/
         Step 2:   CV metathesis   /βugaile/
         Step 3:   Vowel coalescence   /βugeele/
         Surface form   [βugeele]

As an example (2) illustrates, the phonological change involving the *-ile* suffixation to verbs with CVCVC- root whose nucleus of the penultimate syllable is the low vowel [a] is shaped by deletion of [l], CV metathesis and vowel coalescence. Generally, when the *-ile* suffix is attached to this kind of verb root, as in the word *bhugala* 'recover,' the expected form would be *bhugalile*. However, this expected form changes to *bhugeele* as its output form. Comparing with data presented by Mould (1972), Runyankore modified base (MB2) would end at step 2 i.e., /βugaile/ with a diphthong [ai], which is possible in the language (compare Runyankore data *twaala* 'take' changing to *twaile*).

5.2 Imbrication in Verbs with Reciprocal Extension in Nyakyusa

Reciprocal extension *-an-* creates a condition for imbrication, and in this view, extended verbs with this extension morpheme, such as the verb kom-an-a 'beat each other,' are irregular. In Nyakyusa, for some verbs to be extended with reciprocal extension *-an-,* they should first be extended with applicative extension *-el-/-il-* as exemplified in the last two rows in the table below. Table 4 provides examples of verbs extended with the reciprocal extension to illustrate this phonological change in Nyakyusa.

Table 4: Imbrication in Verbs with the Reciprocal Extension in Nyakyusa

Verb	Gloss	*-ile* suffixation	Surface
kom-an-a	beat each other	*komanile	*komeene*
many-an-a	know each other/be friends	*manyanile	*manyeene*
sek-an-a	laugh each other	*sekanile	*sekeene*
jabh-an-a	share	*jabhanile	*jabheene*
gut-an-a	push each other	*gutanile	*guteene*
tuul-ana	help each other	*tuulanile	*tuuleene*

Verb	Gloss	*-ile* suffixation	Surface
tiil-ana	fear each other	*tiilanile	*tiileene*
eg-ana	marry each other	*eganile	*egeene*
imb-il-an-a	sing for each other	*imbilanile	*imbileene*
bhyal-il-an-a	plant for each other	*bhyalanile	*byalileene*

Source: Fieldwork

Based on the data presented in Table 4, the findings indicate that the *-ile* suffix induces imbrication to extended verbs with reciprocal morpheme *-an-,* as in *koma* 'beat' *kom-an-a* 'beat each other.' When the *-ile* suffix is attached to the verbs with reciprocal extension, it fuses with the verb stem and several phonological processes are involved in producing relatively opaque differences between input and output forms. Example (3) illustrates the phonological change involving the *-ile* suffixation to verbs with a reciprocal extension by showing steps involved in the change from the underlying form *komanile* to the surface form *komeene*.

(3) Underlying form (-ile suffixation) */komanile/*
    Step 1: Deletion of [l]   */komanie/*
    Step 2: CV metathesis   */komaine/*
    Step 3: Vowel coalescence   */komeene/*
    Surface form   [komeene]

The change that involves the *-ile* suffixation to verbs with reciprocal extension in Nyakyusa is shaped by a set of three phonological processes, namely deletion of [l]; the consonant of the suffix, consonant-vowel metathesis (between [n] and [i]), and vowel coalescence[4]. These phonological processes shaping the change in verbs with reciprocal extension are like those shaping the change to verbs with CVCVC-root whose nucleus of the penultimate syllable is [a], as presented in (3).

5.3 Imbrication in Verbs with Applicative Extension in Nyakyusa
Nyakyusa has two applicative suffixes where the vowel of the verb root harmonizes with the vowel of applicative forms. When the verb root consists of the mid vowel, it attracts the *-el-* form; otherwise *-il-* suffix is applied. When the *-ile* suffix is attached to verbs with applicative extension, it triggers imbrication. Table 5 provides examples of verbs extended with the applicative extension to illustrate this phonological change in Nyakyusa.

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[4] The phonological process involves the assimilation of two adjacent sound segments that affect each other making a juxtaposition of two vowels ([a]and [i]) to disappear and be replaced by newly compromised vowels [ee], (see Massamba, 2010).

Table 5: Imbrication in Verbs with Applicative Extension in Nyakyusa

Verb	Gloss	*-ile* suffixation	Surface
kom-el-a	beat for	*komelile	*komiile*
bhop-el-a	run for	*bhopelile	*bhopiile*
sek-el-a	rejoice for	*sekalile	*sekiile*
jabh-el-a	say for	*jabhalile	*jabhiile*
son-el-a	sew for	*sonelile	*soniile*
lim-il-a	cultivate for	*limilile	*limiile*
kin-il-a	play for	*kinilile	*kiniile*
imb-il-a	sing for	*imbilile	*imbiile*
simb-il-a	write using something	*simbilile	*simbiile*
kumb-il-a	dig for or use something to dig	*kumbilile	*kumbiile*

Source: Fieldwork

Having two applicative suffixes, the phonological processes, to some extent, differ between the extension *-il-* and extension suffix *-el* when the tense/aspect suffix *-ile* is added to verbs with these extension suffixes. Examples in (4a) and (4b) illustrate this phonological change when the *-ile* is added to verbs with extension suffix *-il-* and *-el-* respectively using the verbs *lim-il-a* 'cultivate for/use something to cultivate' and *kom-el-a* 'beat for/use something to beat.'

(4a) Underlying form (*-ile* suffixation)   /limilile/
      Step 1:   Deletion of [l]   /limilie/
      Step 2:   CV metathesis   /limiile/
      Surface form   [limiile]
(4b) Underlying form (*-ile* suffixation)   /komelile/
      Step 1:   Deletion of [l]   /komelie/
      Step 2:   CV metathesis   /komeile/
      Step 3:   Leftward spread of vowel height   /komiile/
      Surface form   [komiile]

Based on the illustration presented, the expected forms of *limila* and *komela* after adding the *-ile* would be *limilile* and *komelile*. However, in Nyakyusa, these expected forms change to *limiile* and *komiile* after being shaped by a set of phonological processes. The change involving verbs with the extension suffix *-il-* involves two phonological processes, namely deletion of the consonant of the tense/aspect suffix and consonant-vowel (CV) metathesis. However, the change involving the *-el-* form involves a set of three phonological processes, namely deletion of [l], CV metathesis, and leftward spreading of vowel height of [i]. Leftward spread of vowel height is the phonological rule in which the high vowel [i] spreads leftward to avoid the sequence of two vowels [ei], which is disallowed in Nyakyusa, as in Step 3 in example (4b) where the [ei] changes to [ii]; the long vowel.

5.4 Imbrication in Verbs with Causative, Passive and Stative Extension

The findings indicate that the *-ile* suffix induces imbrication to verbs extended with causative, passive and stative extensions. However, the phonological processes shaping changes in these verbs vary significantly. When causative (*-esi-/-isi-*), passive (*-igu-*) and stative (*-ik-/-ek-*) morphemes are added to verbs; they condition imbrication. Starting with the former, in Nyakyusa, the causative suffix *-esi-* agrees with a verb whose root consists of a mid-vowel as in the verb *kom-esi-a* 'cause to beat,' whereas the suffix *-isi-,* as in the verb *lim-isi-a* 'cause to cultivate,' is applied elsewhere. Table 6 presents examples to illustrate imbrication in verbs with causative extension in Nyakyusa.

Table 6: Imbrication in Verbs with Causative Extension in Nyakyusa

Stem	Gloss	*-ile*	Output form	Gloss
sobh-esi-a	cause something to get lost	*sobhesyile	*sobhiisye*	Has let something get lost
pon-esi-a	heal	*ponesyile	*poniisye*	Has healed
bhop-esi-a	chase	*bhopesyile	*bhopiisye*	Has chased
lim-isi-a	cause to cultivate	*limisyile	*limiisye*	Has caused to cultivate
pimb-isi-a	cause to carry up	*pimbisyile	*pimbiisye*	Has caused to carry

Source: Fieldwork

When the *-ile* suffix is attached to these verbs, the expected form would be *komesyile* and *limisyile,* respectively. However, these expected forms change to *komiisye* and *limiisye.* Examples in (5a-b) illustrate step by step the phonological change from the underlying forms *komesyile* and *limisyile* to their surface forms *komiisye* and *limiisye,* respectively.

(5a)	Underlying form (*-ile* suffixation)		*/komesyile/*
	Step 1:	Deletion of [l]	*/komesyie/*
	Step 2:	CV metathesis	*/komeisye/*
	Step 3:	Leftward spread of vowel height	*/komiisye/*
	Surface form		[komiisye]
(5b)	Underlying form		*/limisyile/*
	Step 1:	Deletion of [l]	*/limisyie/*
	Step 2:	CV metathesis	*/limiisye/*
	Surface form		[limiisye]

The two illustrations presented in (5a) and (5b) show variation in the number of phonological processes shaping the verbs with the causative form *-esi-* from that of the causative form *-isi-.* With the former, four phonological processes are involved; they include deletion of the consonant of the tense/aspect suffix, CV metathesis and leftward spread of vowel height. However, for verbs with the causative form *-isi-,* the

phonological change is shaped by only two phonological processes which are the deletion of the consonant of the tense/aspect suffix and CV metathesis.

Also, the *-ile* suffix induces imbrication to verbs extended with the passive extension *-igu-* in Nyakyusa. Table 7 provides more examples of the phonological change involving the *-ile* suffixation to verbs with the passive extension in Nyakyusa.

Table 7: Imbrication in Verbs with Passive Extension in Nyakyusa

Stem	Passive	*-ile*	Surface form	Gloss
lima	*limigwa*	*limigwile	*limiigwe*	has been cultivated
sopa	*sopigwa*	*sopegwile	*sopiigwe*	has been sown/thrown
ula	*uligwa*	*uligwile	*uliigwe*	has been bought
bhuula	*bhuuligwa*	*bhuuligwile	*bhuuliigwe*	has been told
sala	*saligwa*	*saligwile	*saliigwe*	has been chosen
ibha	*ibhigwa*	*ibhigwile	*ibhiigwe*	has been stolen
bhala	*bhaligwa*	*bhaligwile	*bhaliigwe*	has been counted

Source: Fieldwork

When the *-ile* is added to verbs with a passive suffix such as *tumigwa* 'be sent,' the expected form would be *tumigwile*. However, this expected form changes to *tumiigwe* 'has been sent/was sent.' The change from the expected form (e.g., *tumigwile*) to the surface form (e.g., *tumiigwe*) is step by step shaped by a set of phonological processes, as illustrated in (6).

(6)	Underlying form (*-ile* suffixation)	/tumigwile/
	Step1: Deletion of [l]	/tumigwie/
	Step 2: C(G)-V metathesis	/tumiigwe/
	Surface form	[tumiigwe]

This kind of change, as illustrated in (6), is shaped by two phonological processes, namely deletion of the [l] and metathesis that involves the position swap between a sequence of consonant-glide [CG] and a vowel [V].

Moreover, stative suffixes *-ek-/-ik-* create a condition for imbrication in Nyakyusa. Table 8 provides examples to illustrate the phonological change involving the *-ile* suffixation to verbs with the stative extension in Nyakyusa.

Table 8: Imbrication in Verbs with the Stative Extension (-ik-/-ek-) in Nyakyusa

Stem	Gloss	*-ile* Suffixation	Surface form
son-ek-a	be well sewn	*sonekile	*soniike*
lim-ik-a	be easily cultivated	*limikile	*limiike*
mal-ik-a	get finished	*malikile	*maliike*
im-ik-a	respect/set up	*imikile	*imiike*
many-ik-a	be known	*manyikile	*manyiike*
bhomb-ek-a	be easily done	*bhombekile	*bhombiike*

Source: Fieldwork

Table 8 presents examples to illustrate the phonological change (imbrication) induced by the *-ile* suffix when added to verbs with stative extension in Nyakyusa. For example, the expected input (underlying) forms of the words *lim-ik-a* and *son-ek-a* after attaching the *-ile* suffix would be *limikile* and *sonekile,* respectively. Instead, the expected forms (underlying) change to *limiike* 'is easily cultivated' and *soniike* 'is easily sewed,' respectively, as their surface forms. The change from the underlying form to the surface form is step by step shaped by a set of phonological processes, as illustrated in (7).

(7a)	Underlying form (*-ile* suffixation)	/*limikile*/
	Step 1: Deletion of [l]	/*limikie*/
	Step 2: CV metathesis	/*limiike*/
	Surface form	[limiike]
(7b)	Underlying form (*-ile* suffixation)	/*sonekile*/
	Step 1: Deletion of [l]	/*sonekie*/
	Step 2: CV metathesis	/*soneike*/
	Step 3: Leftward spread of [i]	/*soniike*/
	Surface form	[soniike]

The two illustrations in (7 a & b) show variation in terms of the phonological processes shaping the change between the verbs with *-ik-* and *-ek-*. The change involving verbs with stative form *-ik-* is shaped by two phonological processes, namely deletion of [l] and CV metathesis. However, the change involving the stative form *-ek-* is shaped by three phonological processes, namely deletion of [l], CV metathesis and vowel harmony, leftward spread of vowel height [i]. The phonological processes shaping imbrication in verbs with stative *-ek-/-ik-* are the same as the phonological processes shaping imbrication in verbs with applicative *-el-/-il-* and causative *-esi-/-isi-* respectively.

5.5 Imbrication in Verbs with CV:C(G)-root in Nyakyusa

Verbs with CV:C(G)-root structure are also attested in Nyakyusa and when the *-ile* suffix is added to such verbs, it induces imbrication. Table 9 provides examples of imbrication to verbs with CV:C(G)-roots in Nyakyusa.

Table 9: Imbrication in Verbs with CV:C(G)- root in Nyakyusa

Stem	Gloss	Stem+*ile*	Surface form
leefya	annoy	**leefyile*	*leefifye*
leesya	peel	**leesyile*	*leesisye*
puufya	warm (food)	**puufyile*	*puufifye*
gaasya	make one become drunkard	**gaasyile*	*gaasisye*
paasya	fear	**paasyile*	*paasisye*
teesya	mount a hen	**teesyile*	*teesisye*
soosya	remove	**soosyile*	*soosisye*
tuusya	rest	**tuusyile*	*tusiisye*

Source: Fieldwork

Table 9 has provided examples to demonstrate a phonological change (imbrication) induced by the *-ile* suffix when the suffix is attached to verbs with CV:C(G)-root in Nyakyusa. The change in these verbs from the expected form to the surface form is step by step shaped by a set of phonological processes, as illustrated in (8).

(8)   Underlying form (-ile suffixation)   */peefyile/*
         Step 1:   Deletion of [l]   */peefyie/*
         Step 2:   C-V metathesis   */peeifye/*
         Step 3:   Intervocalic Consonant insertion   */peefifye/*
         Surface form   [peefifye]

As an example (8) illustrates, when the *-ile* suffix is added to this verb to denote tense/aspect, the expected (underlying) form would be *peefyile*. However, this expected (underlying) form changes to *peefifye*, the surface form. The change from *peefyile* (underlying) to *peefifye* (surface) is shaped by three phonological processes, namely deletion of [l]; the consonant of the suffix, consonant-vowel (C-V) metathesis, and intervocalic consonant insertion [f] which normally is a copy of the last consonant in the word.

5.6   Imbrication in Verbs with C(G)VC- and CV:C-roots in Nyakyusa

The findings indicate that the *-ile* suffix induces imbrication to verbs with C(G)VC and CV:C-roots in Nyakyusa with some exceptions. Starting with the former (verbs with C(G)VC-root). Table 10 provides more examples to illustrate this phonological change (imbrication) induced by the *-ile* suffix when attached to verbs with C(G)VC-root whose syllable nucleus is made up of a low vowel [a] in Nyakyusa.

Table 10: Imbrication in Verbs with C(G)VC-root with [a] as the Syllable Nucleus (M31)

stem	Gloss	*-ile* Suffixation	Surface form
fwala	dress	*fwalile	*fweele*
fwana	resemble	*fwanile	*fweene*
twala	bring	*twalile	*tweele*
bhyala	plant	*bhyalile	*bhyeele*
syala	remain	* syalile	*syeele*

Source: Fieldwork

Table 10 illustrates the condition under which the *-ile* suffix induces a phonological change (imbrication) in Nyakyusa. It has been noted that it is the low vowel [a] constituting the nucleus of the verb root that conditions imbrication. As pointed out earlier, the *-ile* suffix induces imbrication when it is attached to some verbs whose syllable nucleus is a low vowel [a], such as *bhyala* 'plant.' When the *-ile* suffix is

attached to the word *bhyala,* the expected form would be *bhyalile*. However, this expected word changes into *bhyeele* as its surface form in Nyakyusa. The change from *bhyalile* (underlying) to *bheele* (surface) is shaped by a set of phonological processes, as illustrated in (9).

(9)   Underlying form (-ile suffixation)   /ßyalile/
        Step 1:   Deletion of [l]   /ßyalie/
        Step 2:   C-V metathesis   /ßyaile/
        Step 3:   Vowel coalescence   /ßyeele/
        Surface form   [βyeele]

This change from the underlying (expected) form to the surface (output) form is shaped by three phonological processes, namely deletion of the consonant of the tense/aspect suffix, C-V metathesis (between [l] and [i]), and vowel coalescence.
However, the findings indicate that other verbs with the same structure as the verbs presented in Table 10 are regular since the *-ile* does not trigger imbrication. Likewise, some verbs with the same structure (C(G)VC-roots) yet the *-ile* suffix does not trigger any phonological change. Table 11 provides examples to demonstrate regular the *-ile* suffixation to verbs with C(G)VC-root as an exception in Nyakyusa.

Table 11: Regular -ile Suffixation to Verbs with C(G)VC- roots in Nyakyusa (Exception)

Stem	Gloss	-ile Suffixation
fyata	tighten	*fyatile*
pyata	peel	*pyatile*
fwima	hunt	*fwimile*
fwika	dress somebody	*fwikile*
fyuka	climb	*fyukile*
syula	excavate	*syulile*
syuta	swing	*syutile*
syoka	grumble	*syokile*
syuka	rise from the dead	*syukile*

Source: Fieldwork

Table 11 has provided examples to illustrate the exception of the condition illustrated in (9). The examples of regular verbs presented in the first two rows of the table demonstrate the same structure as the irregular verbs in Table 10. Examples of verbs presented in the rows that follow the first and second in Table 11 have the same verb structure as those verbs presented in Table 9 but are slightly different. They are all verbs with C(G)VC-root but those presented in Table 10 have a low vowel as the syllable nucleus.

Moreover, findings indicate that a few verbs with CV:C-root are irregular, whereas many verbs with the said structure are regular. Table 12 provides examples to demonstrate regular and irregular verbs - with CV:C-root in Nyakyusa.

Table 12: Regular/irregular -ile Suffixation to CV:C-root in Nyakyusa
**   (Exception)**

Stem	Gloss	*-ile* suffixation	Surface form
bhaala	increase in number	*bhaal-ile*	*bheele/bhaalile*
saala	rejoice	*saal-ile*	*saalile*
gaala	become drunkard	*gaal-ile*	*gaalile*
paala	invite people to help you	*paal-ile*	*paalile*
bhoola	slaughter	*bhool-ile*	*bhoolile*
toola	get something by chance	*tool-ile*	*toolile*
tuula	help	*tuul-ile*	*tuulile*

Source: Fieldwork

In Table 12, the example in the first row is both regular and irregular, as speakers utter it with a free variation. This verb *bhaala* is regular because it follows a regular pattern, and it is irregular because the *-ile* suffix fuses and cannot be seen in the surface form. The coalescence or fusion is the main phonological process shaping the change in this word. However, other verbs with CV:C roots do not involve any phonological change (imbrication) when the *-ile* suffix is attached to these verbs and for this view the verbs are irregular.

　　　Similar exceptions regarding C(G)VC- and CV:C-roots have been noted in Chibemba (Givón, 1970), Runyankore (Mould, 1972) and Runyambo (Rugemalira, 2005). The data of the present study and that of the previous works suggest that these verbs with C(G)VC-/CV:C-roots were irregular, and this conclusion has been reached based on majority win, one of the reconstruction techniques (see Campbell, 1999). Regular forms (verbs with C(G)VC- and CV:C-roots) across Bantu languages, including Nyakyusa, are the recent changes that follow the more regular rule for imbrication, and the irregular ones are archaic and have been left behind. In other words, this implies that the regularization of the *-ile* suffixation process is marching forward and putting imbrication in danger.

6.0   Synthesis
To sum up, the *-ile* suffix, serving as a marker for either tense or aspect in Nyakyusa, emerges as the primary candidate in the description of imbrication. This suffix instigates imbrication when applied to certain verbs for tense or aspect inflection. The suffix induces imbrication in Nyakyusa depending on the syllable structure of the verbs. In this view, all longer verbs than two-syllable stems (except verbs with CVCV(NG)- root), including extended ones, characterize imbrication in Nyakyusa.

Likewise, verbs whose root structure is CV:C(G)-, CV:C, C(G)VC-) create a condition for imbrication. Table 13 provides a summary to demonstrate regular and irregular *-ile* suffixation in Nyakyusa.

Table 13: Summary of Regular and Irregular -ile Suffixation in Nyakyusa

Verb root	Example	Gloss	Input form	Output form
CV-	*fu-a (fwa)*	die	*fuile*	*fwile*
CVC-	*lim-a*	cultivate	*limile*	*limile*
CVCV(NC)-	*bheleng-a*	count	*bhelengile*	*bhelengile*
CVCVC-	*putuka*	bend	*putukile*	*putwike*
CVC+VC	*kom-an-a*	beat each other	*komanile*	*komeene*
	lim-il-a	cultivate for	*limilile*	*limiile*
	kom-el-a	beat for	*komelile*	*komiile*
	many-ik-a	be known	*manyikile*	*manyiike*
	son-ek-a	sewable	*sonekile*	*soniike*
CVC+VCV-	*kom-igu-a*	be beaten	*komigwile*	*komiigwe*
	lim-isi-a	cause to cultivate	*limisyile*	*limiisye*
	pon-esi-a	heal	*ponesyile*	*poniisye*
CV:C(G)-	*leefy-a*	cause trouble	*leefyile*	*leefiifye*
CV:C-	*bhaala*	increase	*bhaalile*	*bheele*
C(G)VC-	*fwala*	dress	*?fwalile*	*fweele*

Source: Fieldwork

Table 13 presents a summary to demonstrate regular and irregular *-ile* suffixation in Nyakyusa. The asterisk marks the input form of verbs that require changes shaped by a set of phonological processes to the surface form of verbs uttered in the language. Regarding the Theory of Utterance Selection, advocating that language change moves from complex to simple structures, the change that involves the *-ile* suffix under the umbrella of imbrication makes the imbricated words (surface forms) more simplified than the expected input forms. This simplification of the imbricated words is manifested through syllable reduction and phonological adjustments such as gliding, vowel coalescence, vowel deletion, vowel rising, leftward spread of vowels, and vowel lengthening. This reduction of syllables makes speakers use relatively less energy in the production of the output form compared to the expected input form. For instance, the word *komana* 'beat each other' (the extended verb with the reciprocal suffix), has three syllables. When the *-ile* suffix is attached, the resulting word would be expected to be *komanile* (with four syllables). However, a change has occurred where the output form ([ko]σ, [mee]σ, [ne]σ) is reduced into three syllables. This syllable reduction here is interpreted as a sort of simplification as speakers would use more energy in the production of the underlying form (*komanile*), which has four syllables, than the surface form (*komeene*) with three syllables.

7.0   Conclusion

This paper has systematically described imbrication in Nyakyusa, focusing on establishing the conditions and phonological processes that shape it. In general, extended forms, whether productive or already frozen, satisfy the basic conditions for imbrication. However, for other verbs, especially those with CV:C- and C(G)VC-roots, imbrication is in danger due to the ongoing regular *-ile* suffixation. Regarding phonological processes, quite obviously, the process of imbrication involves the deletion of the consonant in the *-ile*, followed by metathesis whereby the last consonant of the stem fills the empty slot caused by the deletion of [l]. Then various adjustments that follow i.e., vowel coalescence, vowel deletion, vowel rising, leftward spread of vowel, and vowel lengthening, are meant to resolve hiatus (e.g., dissimilar vowel sequences are not allowed). The paper concludes that, based on the literature review, although imbrication is common in some Bantu languages, the conditions and phonological processes shaping imbrication appear to be language-specific. In light of this, the paper recommends a systematic comparative description of imbrication in Bantu languages.

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