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Multimodal Pedagogical Skills of Kenyan English Secondary School Teachers

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Abstract

This study investigated morphophonological adaptation of Luganda nouns into Kupsabiny, a Nilotic language spoken in Kapchorwa District, Eastern Uganda. Although lexical borrowing is widespread in multilingual contexts, little research has examined the interaction between Luganda and Kupsabiny despite Luganda's growing linguistic influence. The study aimed to identify the morphophonological processes involved in adapting Luganda nouns into Kupsabiny, focusing on how morphological affixation interacts with phonological adjustments to align borrowed nouns with Kupsabiny's linguistic structure. A qualitative descriptive research design was employed, using semi-structured interviews and focus group discussions to collect natural speech data from twenty-one purposively selected native Kupsabiny speakers aged between 18 and 50 years. Data were analyzed within the framework of Optimality Theory. The findings revealed that Kupsabiny assimilates Luganda nouns through affixation and phonological modifications such as vowel harmony, tone adjustment, epenthesis, and consonant substitution. These processes are governed by markedness constraints that favor open syllable structures (CV) and restrict consonant clusters. The study concludes that morphological and phonological mechanisms in Kupsabiny operate interdependently in integrating borrowed forms. Overall, the findings highlight a systematic adaptation process that enables Kupsabiny to maintain structural integrity while accommodating lexical influence from a dominant language like Luganda.

Keywords: Morpho-phonological adaptation, language borrowing, Markedness constraints, language contact, Optimality Theory, nouns

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1. Introduction

In linguistics, borrowing refers to adopting a word from one language into another (Havumetsa, 2023). This process enriches vocabularies and reflects cultural interaction (Indriani & Bram, 2023). Historically rooted in studies of language change (Durkin, 2014), borrowing remains a major indicator of linguistic contact. It occurs through mechanisms such as direct adoption, phonological or morphological adaptation, and calquing (Adami & Ottolini, 2014). Among these, adaptation offers insights into how structural systems of donor and recipient languages interact. Njagi (2016) notes that the donor language's nature often determines what is borrowed and how it is adapted, a view supported by Larrimore *et al.* (2011) and Shulman (2021).

Research across languages demonstrates borrowing's transformative role. Lusekelo (2018) documents noun borrowing in Tanzania, while Karimullina *et al.* (2023) describe English loanword integration into regional sub-dialects. Similarly, Gardani (2020) and Al-Jarf (2023) show that borrowed forms can trigger morphophonological changes, creating hybrid structures. Rimikis *et al.* (2023) add that structural features strongly shape how borrowed words are processed and adapted. Despite extensive research on contact-induced change, borrowing between Luganda (Bantu) and Kupsabiny (Nilotic) remains underexplored. The two languages coexist in Eastern Uganda, where Luganda increasingly influences Kupsabiny through lexical transfer. Yet little is known about how Luganda nouns are morphophonologically adapted into Kupsabiny, leaving a gap in understanding Uganda's contact dynamics.

Kupsabiny, spoken by the Sebei people of Kapchorwa, Kween, and Bukwo districts, is a Southern Nilotic language characterized by tone, vowel harmony, and an agglutinative morphology (Kawachi, 2018; O'Brien & Cuypers, 1975). Although contact with neighboring languages has long been noted (Kawachi, 2010), studies seldom address how Kupsabiny assimilates borrowed elements. Luganda, a Bantu language and lingua franca of central Uganda, exhibits a complex noun class system and tonal distinctions (Reid, 2012; Kiyinikibi, 2021). Its morphophonological adaptation strategies such as vowel lengthening at morpheme boundaries are well-documented (Ssempuuma, 2019).

Morphophonology, as Spencer (2017) defines, examines how phonological processes shape morphological structure. Borrowed nouns often undergo epenthesis, deletion, or phoneme modification to align with native phonotactics (Rimikis, 2023). Studies by Ni and Jin (2023) and Pérez-Leroux and Chen (2024) further show that morphophonological cues govern how borrowed forms integrate into new grammatical systems. Thus, borrowing is not a simple lexical transfer but a systematic adaptation shaped by linguistic structure (Kerkhoff, 2007; Gribanova, 2015). Given Luganda's noun class complexity and Kupsabiny's flexible word order (Kawachi, 2010), this study investigates how Luganda nouns are morphophonologically adapted into Kupsabiny, shedding light on structural convergence in contact situations.

1.1 Statement of the Problem

Borrowing of nouns is a common outcome of language contact, yet the specific morphophonological changes that take place when Luganda nouns are integrated into Kupsabiny have received little scholarly attention. While earlier studies on borrowing describe general processes of lexical adaptation, they do not explain how Kupsabiny reshapes foreign nouns to fit its phonological and morphological system. This gap is significant because Kupsabiny, as a minority Nilotic language, is in continuous interaction with Luganda, a dominant Bantu language. The present study therefore investigated the morphophonological patterns and processes involved in this borrowing, with the aim of uncovering how Kupsabiny accommodates Luganda nouns and what this reveals about language contact and adaptation in Uganda's multilingual setting.

1.2 The Research Objective

To determine the morphophonological processes involved in the adaptation of borrowed nouns in *Kupsabiny* from Luganda in Kapchorwa District, Uganda.

2. Literature Review

Yeboah and Ansah (2022) examines English loanwords in Lete, identifying adaptation strategies such as vowel epenthesis and deletion to fit Lete's phonotactic rules. However, their study does not address how borrowed nouns integrate morphologically. The current research addressed this gap by focusing on the morphophonological adaptation of Luganda nouns in Kupsabiny. Similarly, Naika (2021) analyzes loanwords in Oluwanga and found systematic modifications, mainly vowel epenthesis, to match phonological constraints but does not explore morphology–phonology interaction. The present study expanded on this by examining both aspects.

Musa (2022) analyzes English loanwords in Hausa and finds consonant addition and vowel epenthesis as key adaptation strategies but generalizes across word classes. The current study, in contrast, concentrated on nouns for a detailed analysis. Consequently, Okoroji and Uchechukwu (2023) explores morphophonological processes in Igbo, such as vowel harmony and tone variation, but do not examine borrowed forms. The present research addressed this by focusing on cross-linguistic borrowing. Finally, Mudogo et al. (2024) applies Optimality Theory to English verbs in Lukabarasa, showing simplification through vowel insertion. While limited to verbs, their approach informed this study's noun-focused analysis of Luganda–Kupsabiny borrowing within the same theoretical framework.

3. Theoretical Framework

This study employed Optimality Theory (OT) as proposed by Prince and Smolensky (1993), a model explaining how surface linguistic forms emerge through the ranking of competing constraints. Later refinements by Kager (1999) and McCarthy (2001), and Kuhn's (2023) extension of OT to syntactic structures within Lexical Functional Grammar (LFG), emphasize that language systems evolve by adjusting universal constraint rankings to fit specific linguistic contexts. OT assumes that linguistic outputs result from the interaction of *violable constraints*, where the most optimal candidate best satisfies the hierarchy, even if some constraints are violated.

The two key constraint types are *faithfulness* which ensures that the output remains close to the input and *markedness*, which favors simpler, more natural structures. In this study, OT was applied to analyze how Kupsabiny adapts borrowed Luganda nouns by reorganizing phonological and morphological constraints. Markedness constraints such as ONSET (every syllable begins with a consonant), NO-CODA (syllables do not end in consonants), and COMPLEX (no consonant clusters) guided the analysis. These constraints explained how Kupsabiny modifies Luganda borrowings to maintain its phonotactic patterns. OT thus provided a coherent framework for understanding the morphophonological interaction underlying lexical borrowing and language adaptation in Kupsabiny.

4. Method and Materials

This study employed a qualitative descriptive research design to investigate the interaction between morphological and phonological processes in the adaptation of Luganda borrowed nouns into Kupsabiny. The design enabled the researcher to collect firsthand linguistic data and observe natural speech patterns within authentic communicative contexts. By engaging directly with native speakers, the study explored how morphological affixation in Kupsabiny triggers corresponding phonological adjustments such as vowel modification, consonant substitution, and syllable restructuring.

Data on borrowed nouns were gathered through semi-structured interviews and focus group discussions with adult speakers fluent in both Luganda and Kupsabiny. This approach facilitated the collection of in-depth and contextually grounded data, allowing participants to explain how and why certain sound changes accompany structural integration. A total of twenty-one informants, selected through purposive sampling, provided data on 21 borrowed nouns representing everyday speech and natural language use. The study was conducted in Kapchorwa District, Eastern Uganda, where Kupsabiny is predominantly spoken and frequent contact with Luganda speakers promotes linguistic borrowing. Participants aged between 18 and 50 years were chosen to ensure linguistic competence and active involvement in interlingual communication.

Data collection instruments included interview and discussion guides containing open-ended questions designed to elicit examples of borrowed nouns and their phonological and morphological transformations. All sessions were recorded, transcribed, and analyzed using a descriptive qualitative approach. Borrowed nouns were compared to their Luganda equivalents to identify recurring morphophonological patterns. Ethical approval was obtained from relevant authorities, and informed consent was secured from all participants. Confidentiality and anonymity were maintained throughout the research process.

5. Findings and Discussion

The study examined the morphophonological processes involved in adapting Luganda nouns into Kupsabiny, using the Markedness constraint of Optimality Theory to analyze restrictions on phonological and morphological structures. It found that these adaptations enable borrowed nouns to align with Kupsabiny's phonotactic and grammatical systems, ensuring they fit naturally within the language. The processes facilitate smooth integration and pronunciation, allowing Luganda borrowings to sound and function like native Kupsabiny words.

5.1 Syllable Structure Constraints

Kupsabiny prefers simple open syllables (CV) and avoids consonant clusters, so when borrowing from Luganda, it modifies words to match its phonotactic rules. Guided by the markedness constraints NOCODA and COMPLEXONSET, the language prevents final consonants and complex onsets. Although Luganda often uses similar (C)V structures, Kupsabiny applies these constraints more strictly, ensuring borrowed words align with its native sound patterns as shown in example 1

(1) Luganda	Kupsabiny	Gloss
Ekirabo	Kiraput	Gift

Data in example 1 shows that when Luganda words are borrowed into Kupsabiny, their syllable structures are adjusted to fit Kupsabiny’s phonotactic rules as illustrated in table 1.

Table 1. A comparative morphophonological process on syllable structure adjustment

Luganda Input	Phonemic Break down	Kupsabiny Output	Phonemic Break-down	Morphophonological Process	Markedness Constraint Affected
Ekirabo	/e.ki.ra.bo/	Kiraput	/ki.ra.put/	Initial Vowel Deletion	ONSET, MAX-IO (loss of /e/).
				Final Consonant Modification (/bo/ → /put/)	NOCODA IDENT-IO(C) (modification of /b/ → /p/ and addition of /t/).

Note: Table 1 compares the Luganda word *Ekirabo* (/e.ki.ra.bo/) with its Kupsabiny equivalent *Kiraput* (/ki.ra.put/), highlighting the morphophonological changes that occur between the two languages.

Table 1 shows that the adaptation of Luganda nouns into Kupsabiny reflects a complex interplay between morphophonological rules and the etymological restructuring of borrowed forms. When lexical items move from Luganda into Kupsabiny, their syllable structures are systematically reshaped to conform to the recipient language’s phonotactic and prosodic system. This process is guided by both markedness constraints, which govern permissible sound combinations, and faithfulness constraints, which aim to preserve the source word’s identity.

The transformation of *Ekirabo* (/e.ki.ra.bo/), meaning gift in Luganda, into *Kiraput* (/ki.ra.put/) in Kupsabiny illustrates how syllable structure constraints and morphophonological adaptation operate concurrently. Luganda typically employs an open syllable structure (C)V, yet the Kupsabiny version shows a reconfiguration that aligns with its phonological system, favoring clear syllabic onsets and controlled coda consonants. The process involves initial vowel deletion, consonant modification, and final segment substitution, each serving to optimize the borrowed word for Kupsabiny’s sound structure and morphological requirements.

The initial vowel deletion of /e-/ in *Ekirabo* (gift) is a common morphophonological adjustment when words are borrowed from Luganda into Kupsabiny. In Luganda, the prefix *e-* serves as a noun class marker, but Kupsabiny’s morphological system does not require an equivalent vowel-initial prefix for nominal classification. Consequently, the deletion satisfies the ONSET constraint, which prohibits syllables from beginning with a vowel. While this deletion violates the MAX-IO constraint (which requires all input segments to be preserved in the output), it enhances articulatory economy and aligns the word with Kupsabiny’s preference for consonant-initial syllables. The resulting form, *kirabo* (/ki.ra.bo/) reflects the first stage of phonological adaptation, in which morphological redundancy is eliminated, and syllable onset regularity is restored.

The final syllable shift from Luganda *-bo* to Kupsabiny *-put* reflects both sound substitution and morphological integration. The voiced /b/ changes to voiceless /p/ under AGREE-VOICE and IDENT-IO(C) constraints, while the added /t/ forms a closed syllable. Although Kupsabiny typically favors open syllables, it allows final consonants in contexts that aid morphological marking or rhythmic balance. The resulting structure *Kiraput* exemplifies morphophonological extension, where an added consonant enhances structural and prosodic stability.

Phonologically, the transition from /bo/ to /put/ also involves a shift in place of articulation and manner, indicating that Kupsabiny reinterprets the final syllable not merely as a phonetic substitution but as a morphologically meaningful restructuring. The insertion of /p/ and /t/ introduces a rhythmic cadence that mirrors native noun endings in Kupsabiny, where final plosives are often associated with nominal forms. This suggests that the adaptation of *Ekirabo* → *Kiraput* is both phonotactically motivated and morphologically patterned, representing a deeper level of integration beyond sound substitution.

Stress placement and syllable timing further demonstrate the prosodic adjustment that occurs during borrowing. In Luganda, primary stress falls on the penultimate syllable [rá], consistent with the Bantu stress rule. In *Kiraput*, however, Kupsabiny reassigns stress to the first syllable [kí], maintaining its typical trochaic stress pattern (strong-weak rhythm). This stress shift is a prosodic adaptation that reinforces Kupsabiny’s rhythmic regularity, aligning the loanword with native prosodic contours.

From a morphophonological standpoint, this adaptation reveals that the borrowed noun undergoes re-segmentation and morphological reinterpretation. The Kupsabiny suffix *-put* may not directly derive from Luganda but instead reflects an analogical process in which the borrowed word is remodeled using familiar Kupsabiny morphemes or phoneme combinations. This aligns with the Emergence of the Unmarked principle in Optimality Theory, where languages favor unmarked, frequent, and morphologically transparent forms over complex or foreign structures. The result is a borrowed form that is not only pronounceable within Kupsabiny phonotactics but also semantically and morphologically assimilated.

The transition from *Ekirabo* to *Kiraput* illustrates how contact between Luganda and Kupsabiny leads to both phonological simplification and morphological innovation. This change involves more than sound adjustment; it reflects grammatical reanalysis within Kupsabiny’s linguistic system. Similar processes appear in other African languages; Yeboah and Ansah (2022) note that Lete loanwords from English undergo vowel epenthesis and consonant modification to meet phonotactic rules. In *Ekirabo* → *Kiraput*, morphophonological restructuring follows systematic constraints: initial vowel deletion satisfies the ONSET constraint, final consonant modification meets NOCODA and IDENT-IO(C) requirements, and the resulting structure aligns rhythmically and morphologically with Kupsabiny phonology. These adaptations fully integrate the loanword into the Kupsabiny lexicon, demonstrating how phonological constraints and morphological creativity interact in language contact. Example 2 further illustrates this process.

(2) Luganda	Kupsabiny	Gloss
Emmwanyi	Mwaanyiinak	Coffee

In example 2 the Luganda noun *emmwanyi* includes a nasal geminate [mm], which is simplified to a single [m] in Kupsabiny, resulting in *mwaanyiinak*. The addition of suffix *-inak* at the end in Kupsabiny serves to conform to morphological and phonological requirements, such as avoiding a final vowel and ensuring a consonant-final word. To resolve impermissible consonant clusters or to break up complex clusters, Kupsabiny insert vowels in the Luganda borrowed nouns. This process, known as vowel epenthesis, ensures that the syllable structure adheres to the language’s phonotactic constraints. For instance, the Luganda word *emmwanyi* (coffee) becomes *mwaanyiinak* in Kupsabiny, where additional vowels are inserted to accommodate Kupsabiny’s syllable structure. This is in line with Naika (2021) who investigates morphophonological analysis of Oluwanga loanwords. The findings reveal that loanwords change their phonological structure to match the phonological constraints of Oluwanga. This includes modifications to phonemes, syllable structures, and stress patterns. Further, there is an introduction of coda consonants on the borrowed nouns from Luganda to Kupsabiny as indicated in the given data in example 3.

(3) Luganda	Kupsabiny	Gloss
Ekisaawe	kisaaweet	field

In example 3, the Luganda prefix *e-* is dropped in Kupsabiny, yielding “kisaaweet.” The addition of *-et* at the end introduces a coda consonant, aligning with Kupsabiny’s phonotactic constraints. This modification introduces a coda consonant, which is permissible in Kupsabiny’s syllable structure. This finding is in support of Musa (2022) who examines the morphophonological adaptation of English loanwords in Hausa. The findings indicate that some loanwords undergo consonant additions to align with the phonological constraints of Hausa. In our study, the adaptations of Luganda borrowed nouns make Kupsabiny to prioritize markedness constraints to maintain its preferred syllable structures, even at the expense of faithfulness to the Luganda forms. This results in modifications such as vowel deletion, consonant insertion, and syllable restructuring to align with Kupsabiny’s phonotactic rules.

Kupsabiny alter the syllable structure of Luganda borrowed nouns to fit its morphophonological system. This involves changing the syllable boundaries or modifying consonant-vowel sequences. For example, the Luganda word *ekisaawe* (field) becomes *kisaaweeet* in Kupsabiny, where the syllable structure is adjusted to conform to Kupsabiny’s phonotactic rules. This is further illustrated by the data in example 4 below.

(4) Luganda	Kupsabiny	Gloss
Eladiyo	Reetyeet	Radio

In example 4, the adaptation of the Luganda noun *eladiyo* (/e.la.dí.jo/), meaning *radio*, into Kupsabiny *reetyeet* (/re:.tie:t/) illustrates the complex morphophonological transformations that occur when borrowed words are restructured to fit the recipient language’s phonological and morphological system. This process reveals the interplay between universal phonological constraints such as the avoidance of complex syllable margins and language-specific phonotactic preferences, which guide the reshaping of foreign lexical material.

In Luganda, the word *eladiyo* conforms to a (C)V syllable pattern typical of Bantu languages, though it contains liquid and palatal sequences (/l/, /j/) that increase its sonority complexity. When borrowed into Kupsabiny, this form undergoes significant restructuring to align with the language’s preference for simple consonant-vowel (CV) syllables and its strict avoidance of coda consonants or complex clusters. The resultant form *reetyeet* demonstrates both segmental substitution and morphological remodeling, producing a word that is phonotactically natural and morphologically coherent within the Kupsabiny system.

The first morphophonological process evident in this adaptation is prefix deletion. The initial vowel /e-/ in *eladiyo* is removed in *reetyeet*, reflecting Kupsabiny’s restriction against vowel-initial syllables. This conforms to the ONSET constraint, which mandates that all syllables begin with a consonant. The deletion of the initial vowel also reflects the redundancy of the Luganda noun prefix *e-*, which carries class-marking functions not required in Kupsabiny morphology. This results in a more streamlined word structure that prioritizes phonological economy. While this deletion violates the MAX-IO constraint (which preserves input segments), it is permitted because ONSET is ranked higher in Kupsabiny’s constraint hierarchy.

The second major transformation involves vowel substitution and lengthening. The Luganda mid-front vowel /a/ and high-front glide /j/ are replaced by long vowels /e:/ and /e:/ in Kupsabiny, producing the sequence /re:.tie:t/. This vowel substitution aligns the borrowed word with Kupsabiny’s vowel harmony and prosodic tendencies. The long vowels contribute to rhythmic balance and maintain moraic equivalence after prefix deletion. The substitution of /a/ → /e:/ also reflects a shift in vowel quality toward a fronted, higher vowel, indicating an attempt to preserve the perceptual brightness and sonority of the original sound while fitting within Kupsabiny’s vowel inventory. The IDENT-IO(V) constraint is thus minimally violated, as the substitution preserves both vowel height and frontness while adjusting duration to meet prosodic requirements.

A further notable process is consonant substitution and palatalization. The Luganda voiced lateral /l/ is replaced by the alveolar trill or approximant /r/, a common alternation in East African Bantu and Nilotic contact zones. This change satisfies Kupsabiny’s articulatory preference for rhotics over laterals in initial syllables. Additionally, the Luganda palatal glide /j/ is realized as the palatalized stop /tʰ/ in Kupsabiny. This transformation enhances syllable symmetry by converting the glide into a full consonantal onset, thereby preserving the CV pattern and avoiding sequences that would yield high sonority plateaus. The palatalized consonant also ensures smoother transitions between high vowels and preceding consonants, aligning with the sonority sequencing principle (SSP).

The addition of the suffix *-yeet* in *reetyeet* marks a morphological adaptation that integrates the Luganda loanword into Kupsabiny’s noun system. The reduplicated vowel /e:/ and final /t/ create a disyllabic form matching Kupsabiny’s trochaic stress pattern, with stress on the penultimate syllable. The recurring suffix *-teet/-yeet* in other borrowings (e.g., *mukatyaanteet*, “bread”) suggests its role as a nominalizing or class-assimilating marker. From an Optimality Theory viewpoint, this adaptation shows that markedness constraints (ONSET, NOCODA, COMPLEXONSET) outrank faithfulness constraints (MAX-IO, IDENT-IO), prioritizing simple CV syllables and rhythmic balance. Etymologically, *eladiyo* (from English *radio*) underwent successive adaptations, English → Luganda (*eladiyo*) → Kupsabiny (*reetyeet*). Each stage restructured the form to fit local phonological and morphological systems. Kupsabiny further refined the Luganda version by removing prefixes, adjusting vowels, and adding a native suffix. The final form reflects cumulative morphophonological restructuring that balances faithfulness to the original with conformity to Kupsabiny’s phonological grammar.

5.2 Tone Adaptation

Kawachi (2018) describes the Kupsabiny language phonologically as highly tonal. When Luganda borrowed nouns are integrated in Kupsabiny, the tonal pattern is adjusted to align with Kupsabiny’s tonal rules, adhering to markedness constraints that govern permissible tonal sequences as illustrated in the given data in example 5.

(5) **Luganda**
Ensímbi

Kupsabiny
Nsímbíneek

Gloss
Money

When Luganda words are borrowed into Kupsabiny as shown in example 5, their tone patterns and syllable structures are adapted to align with Kupsabiny’s phonotactic and prosodic system. In Optimality Theory (OT), markedness constraints penalize structures that are disfavored in the target language, influencing how borrowed words are modified.

The transformation of Luganda: *Ensímbi* → Kupsabiny: *Nsímbíneek* demonstrates how tone adaptation and syllable structure constraints shape borrowed words as illustrated in table 2.

Table 2. A comparative morphophonological process on tone adaptation

Luganda Input	Phonemic Break down	Kupsabiny Output	Phonemic Break down	Morphophon-ological Process	Markedness Constraint Affected
Ensímbi	/e ⁿ .sí:.mbi/	Nsímbíneek □	/n.si:m.bi.ne:k/	Initial Vowel Deletion (/e/)	ONSET MAX-IO (loss of /e/).
				Syllable Addition →bi.neek/)	NOCODA /neek/).

Note: Table 2 shows how phonological rules and markedness constraints shape cross-linguistic variation between Luganda and Kupsabiny forms

In table 2, the adaptation of *Ensímbi* → *Nsímbíneek* in Kupsabiny demonstrates how markedness constraints influence tone and syllable structure in borrowed words. The ONSET constraint triggers vowel deletion, NOCODA motivates final vowel addition, and ALIGN-TONE-R/L explains tonal shifts aligning with Kupsabiny’s tonal system. Though both Luganda and Kupsabiny are tonal, Kupsabiny adjusts Luganda tones to match its prosodic rules. Within Optimality Theory, markedness constraints dominate faithfulness, ensuring phonotactic and tonal conformity even when the form deviates from the original. The added suffix *-neek* replaces the dropped prefix *e-* to preserve tonal balance, as illustrated in example 6.

(6) **Luganda**
Omuyembe

Kupsabiny
Muyeemcoontet

Gloss
Mango

Example 6 illustrates the dominance of markedness over faithfulness in this context. The first syllable with the sound /o/ and the syllable *embe* in Luganda noun is dropped before adding the Kupsabiny syllables *con. tet*. This analysis demonstrates that Kupsabiny’s adaptation of Luganda borrowed noun is heavily influenced by markedness constraints within its phonological system, ensuring that borrowed terms conform to native morphological patterns. This finding is in support of Larrimore *et al.* (2011), claiming that lending languages, which often have extensive vocabularies, influence the languages they come into contact with.

The analysis of the morphophonological adaptation of Luganda borrowed nouns into Kupsabiny, particularly focusing on tone and stress patterns through the lens of Optimality Theory (OT) and its markedness constraints, provides insight into how the two languages manage morphological and phonological integration as illustrated in the given data in example 7.

(7) **Luganda**
Esukaali

Kupsabiny
Sukaaruuk

Gloss
Sugar

Example 7 shows that, in adapting the Luganda noun *sukaa*, Kupsabiny retains the stem but deletes the bound morphemes *e-* and *-li* due to phonological constraints, then adds the suffix *-ruuk*, which carries the stressed syllable. While Luganda relies primarily on tone to distinguish meaning, Kupsabiny uses both tone and stress. Consequently, Luganda nouns borrowed into Kupsabiny undergo tonal and stress adjustments to fit Kupsabiny’s morphophonological system.

The two languages differ in how they prioritize markedness constraints, leading to variations in morphophonological adaptations. For instance, the Luganda noun “esukaali” changes to “sukaaruuk” in Kupsabiny. The initial vowel [e] in Luganda is dropped in Kupsabiny, simplifying the syllable structure, which aligns with markedness constraints favoring simpler onsets. The suffix *-ruuk* is appended in Kupsabiny, this is due to morphological requirements or to fit Kupsabiny’s prosodic structure, ensuring the noun conforms to permissible stress patterns. Kupsabiny places stress on the penultimate syllable. Thus, *sukaaruuk* has stress on *ruuk*, aligning with Kupsabiny’s stress assignment rules. This can be illustrated further using the given data in example 8.

(8) Luganda	Kupsabiny	Gloss
Enyanja	Nyanjet	Lake

In example 8, the transformation of Luganda *Enyanja* (lake) to Kupsabiny *nyanjet* results from morphophonological adaptation aligning with Kupsabiny’s phonotactic rules and stress patterns. Since Kupsabiny favors consonant-initial words, the initial vowel [e] is deleted, producing *nyanja*. This adjustment simplifies the onset and satisfies markedness constraints that promote consonant-initial structures in Kupsabiny.

The addition of the consonant [t] at the end serves to fit Kupsabiny’s morphological or phonotactic requirements. This is in line with Musa (2022) who posits that consonant sounds are added in specific positions to fit the syllable structure of the borrowing language. With the adapted form *nyanjet*, stress falls on the penultimate syllable “je,” consistent with Kupsabiny’s stress rules. Such modifications are essential for maintaining the phonotactic integrity and natural prosody of the language. Additionally, the data below illustrates the stress assignment rule in Kupsabiny through terminal consonants as shown in example 9.

(9) Luganda	Kupsabiny	Gloss
Ekalaamu	Kalamut	Pen

The initial vowel [e] is omitted as shown in example 9, resulting in a consonant-initial word, which is more acceptable in Kupsabiny’s morphological and phonotactic constraints. The terminal consonant [t] is added, to meet Kupsabiny’s morphological or phonotactic norms, ensuring the word ends in a consonant. In *kalamut*, stress is placed on the penultimate syllable *mu*, aligning with the common stress assignment in Kupsabiny. This adaptation process involves aligning tonal patterns with stress and high tone is mutually attracted, with stressed syllables favoring higher tones. Kupsabiny adjusts the tonal patterns to ensure that stressed syllables carry appropriate tones, maintaining prosodic harmony.

The morphophonological adaptation of Luganda nouns into Kupsabiny reflects a balance between markedness and faithfulness constraints in Optimality Theory. Kupsabiny prioritizes markedness to adjust syllable structures, tone, and stress, ensuring borrowed nouns fit naturally within its phonological system. This process illustrates the dynamic interaction between the two languages and Kupsabiny’s strategies for maintaining phonological coherence. Advertently, certain vowels in Luganda may not exist in Kupsabiny. In such cases, Kupsabiny substitutes these segments with the closest phonetic equivalents available in its inventory as illustrated in the data in example 10 below.

(10) Luganda	Kupsabiny	Gloss
Mwauro	Mwaureet	Priest

Kupsabiny’s distinct vowel system shapes how Luganda vowels are adapted as shown in example 10. The Luganda noun *mwauro* (priest) becomes *mwaureet* in Kupsabiny, with the suffix *-teet* replacing the final vowel to align with Kupsabiny’s vowel harmony and phonotactic rules. Some Luganda consonants absent in Kupsabiny’s inventory are replaced by their closest phonetic equivalents through phoneme substitution, guided by markedness constraints that favor native sounds. This ensures borrowed nouns remain pronounceable within Kupsabiny’s phonological system, as shown in example 11.

(11) Luganda	Kupsabiny	Gloss
<i>Ebendera</i>	<i>Peenteeret</i>	Flag

Example 11 shows that Kupsabiny has specific phonotactic rules that dictate how sounds can be arranged.
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When borrowing words from Luganda, Kupsabiny modifies the structure of these words to fit its syllable patterns. For instance, the Luganda [b] is replaced with the Kupsabiny [p] reflecting a preference for native consonant sounds, guided by markedness constraints that minimize phonemic complexity. This is in agreement with Mose (2021) who claims that phonetic segments of the loanwords are modified or substituted to conform to the phonological inventory and phonotactic constraints of the borrowing language. The adaptation process illustrates the dominance of markedness over faithfulness constraints in Kupsabiny. By prioritizing markedness, Kupsabiny preserves its preferred syllable structures, even when altering original Luganda forms, ensuring that borrowed nouns conform to its phonotactic rules.

5.3. Vowel Harmony and Epenthesis

Vowel harmony in Kupsabiny ensures vowels within a word share similar features, such as frontness or height. When borrowing nouns from Luganda, this harmony shapes their adaptation. Within the Optimality Theory framework, markedness constraints promote uniform vowel patterns, while faithfulness constraints aim to retain original vowel qualities. To achieve harmony, Kupsabiny may modify or insert vowels through epenthesis, aligning the borrowed forms with its native phonological structure, as illustrated in example 12.

(12) Luganda	Kupsabiny	Gloss
Ennanansi	Naanaasyaanteet	Pineapple

When Luganda words are borrowed into Kupsabiny as shown in example 12, they are modified phonologically and morphologically to fit Kupsabiny’s structure and phonotactic rules. The main processes involved are vowel harmony and epenthesis. Within Optimality Theory, markedness constraints guide these adaptations. The transformation from *Ennanansi* (Luganda) to *Naanaasyaanteet* (Kupsabiny) illustrates how such constraints shape borrowed forms, as shown in table 3.

Table 3. A comparative morphophonological process on vowel harmony and epenthesis

Luganda Input	Phone-mic Break	Kupsabiny Output	Phonemic Break	Morphophonol-ogical Process	Markedness Constraint Af-fected
En-nana-nsi	/e.n:a.ná:nsi/	Naanaas-yaanteet /	na:.na:.sya:n.te:t/	Initial Vowel Deletion (/e/ → Ø)	ONSET MAX-IO (loss of /e/).
				Vowel Harmony (Front vowels adjusted to back vowels /i/ → /e/)	ALIGN-V
				Epenthesis	DEP-IO

Note: Table 3 presents how vowels are harmonized in the borrowed nouns from Luganda into Kupsabiny.

In table 3, the adaptation of *Ennanansi* → *Naanaasyaanteet* in Kupsabiny is driven by markedness constraints favoring vowel harmony and epenthesis. The ONSET constraint leads to vowel deletion, ALIGN-V ensures uniform vowel harmony, and DEP-IO allows for epenthesis to fit Kupsabiny’s syllable structure. These phonological changes ensure that borrowed words conform to the prosodic and morphophonemic rules of Kupsabiny while maintaining a degree of resemblance to the original Luganda form.

Kupsabiny maintains vowel harmony, requiring vowels in a noun to share features like tongue position or lip rounding. To preserve this harmony, vowels are inserted or modified according to markedness constraints that promote uniformity. The Luganda noun *ennanansi* becomes *Naanaasyaanteet* through vowel addition and modification, ensuring alignment with Kupsabiny’s phonological rules. This pattern aligns with Okoroji and Uchekukwu (2023), who note that in Igbo, vowel harmony and tone also influence morphophonemic variation and allomorph realization.

In our study, the adaptation of Luganda nouns into Kupsabiny through vowel insertion and modification underscores the complexity of morphological and phonological systems. When Luganda nouns are borrowed into Kupsabiny, they undergo vowel adjustments to align with Kupsabiny’s harmonic patterns. This is further illustrated in the given data in example 13.

(13) Luganda	Kupsabiny	Gloss
Omuluka	Murukyantiit	Parish

The given data in example 13 indicates that the Luganda vowels are altered in Kupsabiny to conform to its vowel harmony system. For instance, the Luganda noun “omuluka” becomes “murukyantiit” in Kupsabiny, where the vowels are adjusted by deleting the initial vowel [o] and adding semi vowel [y] to the final vowel [a] before adding [ii] in the final syllable. This is intended to harmonize the vowels according to Kupsabiny’s phonological rules. As envisaged in OT, this is an adaptation process for resolving conflicts between markedness and faithfulness constraints. Markedness constraints in Kupsabiny enforce vowel harmony, leading to the modification of the original Luganda vowels. Faithfulness constraints prefer to retain the original vowel qualities. The dominance of markedness constraints in this scenario results in the observed vowel changes, ensuring that the borrowed nouns adhere to Kupsabiny’s phonotactic rules.

Further, epenthesis allows Kupsabiny to modify these structures, facilitating smoother integration of the borrowed nouns. This is illustrated in example 14.

(14) Luganda	Kupsabiny	Gloss
Ekikapo	Kikaput	Basket

Example 14 shows that in adapting the Luganda word *ekikapo* (basket) into Kupsabiny as *kikaput*, initial vowel [e] and final vowel [o] are deleted. A vowel [u] is then inserted to break up consonant clusters that are not permissible in Kupsabiny’s phonology. This is in support of Mudogo *et al.* (2024) on an analysis of Lukabaras borrowed verbs from English. The authors find that the English verbs with complex consonant clusters are simplified to fit the CV (consonant-vowel) syllable structure of Lukabaras. This often involves the insertion of vowels to break up clusters, ensuring compliance with Lukabaras phonotactic constraints.

Optimality Theory posits that word forms result from competing constraints. In adapting Luganda nouns, Kupsabiny prioritizes markedness constraints favoring simpler, universal phonological patterns over faithfulness constraints, which preserve original features. This leads to modifications like epenthesis to meet Kupsabiny’s phonotactic rules, reflecting its preference for unmarked, well-formed structures, as illustrated in example 15.

(15) Luganda	Kupsabiny	Gloss
Ekikopo	Cikoompeet	cup

In example 15, the Luganda noun *ekikopo* is adopted in Kupsabiny as *cikoompeet*, vowel insertion and lengthening occur at the final syllable *peet* to conform to Kupsabiny’s syllable structure preferences. This is also noticed in the initial syllable *cik*. The adaptation avoids complex clusters and ensures appropriate syllable structures by inserting vowels and adjusting consonant sequences, thereby satisfying the *COMPLEX constraint. The process of epenthesis in adapting Luganda loanwords into Kupsabiny illustrates the dynamic interplay between markedness and faithfulness constraints within Optimality Theory. By prioritizing unmarked permissible structures, Kupsabiny modifies borrowed nouns to fit its phonological system.

5.4. Consonant Substitution and Adaptation

Certain Luganda consonants may not have direct equivalents in Kupsabiny or may not fit comfortably within its phonological system. In such cases, Kupsabiny substitutes these consonants with phonetically similar one as indicated in the given data in example 16.

(16) Luganda	Kupsabiny	Gloss
Essimu	Siimut	Phone

When Luganda words are borrowed into Kupsabiny as shown in example 16, they undergo consonant substitution and adaptation to align with Kupsabiny’s phonotactic and phonological constraints. The transformation of Luganda: *Essimu* → Kupsabiny: *Siimut* illustrates how markedness constraints influence consonant modification in borrowed nouns as illustrated in table 4.

Table 4. A comparative morphophonological process on consonant substitution and Adaptation

Luganda Input	Phonemic Breakdown	Kupsabiny Output	Phonemic Breakdown	Morphophonological Process	Markedness Constraint Affected
Essimu	/e.s:i.mu/	Siimut	/si:.mut/	Deletion of the initial vowel (/e/ → Ø)	ONSET, MAX-IO (loss of /e/).
				Degemination (Reduction of geminate /s:/ → /s/)	IDENT-IO (emphatic positions).
				Final Consonant Substitution (/mu/ → /mut/)	AGREE-VOICE IDENT-IO (Place shift in final consonant).

Note: Table 4 shows consonant mutation when nouns are borrowed from Luganda into Kupsabiny.

In table 4, the adaptation of *Essimu* → *Siimut* in Kupsabiny is primarily influenced by markedness constraints that drive consonant substitution and adaptation. The ONSET constraint leads to vowel deletion, IDENT-IO (Voice and Place) explains the consonant changes, and AGREE-VOICE ensures final consonant harmonization. These modifications enable borrowed words to conform to Kupsabiny’s morphophonemic system while maintaining a recognizable resemblance to their Luganda origins.

Luganda *essimu* (phone) becomes Kupsabiny *siimut*, where the initial vowel [e] is deleted, and consonant substitution occurs by making the consonant [s] be at the initial to match Kupsabiny phonology. Following the vowel deletion, the consonant cluster “ss” in “ssimu” undergoes substitution to align with Kupsabiny’s phonemic inventory. The geminate “ss” is replaced with a single “s,” and an epenthetic vowel “i” is introduced to break up consonant clusters that are disallowed in Kupsabiny phonotactics, resulting in “siimu.” Additionally, the final vowel “u” in Luganda is substituted with “t” in Kupsabiny, possibly due to differences in permissible word-final sounds or morphological patterns between the two languages. This leads to the final form “siimut.” This is in agreement with Nnko (2023) who postulates that there is a tendency for consonant clusters to be simplified or adjusted in the phonological constraints of the borrowing language. This is further illustrated with example 17 below.

(17) Luganda	Kupsabiny	Gloss
Omubiira	Mpiireet	Ball

Example 17 shows that Luganda noun *omubiira* (ball) is adapted to Kupsabiny as *mpiireet*, involving consonant substitution and vowel adaptation. The initial vowel [o] is dropped for the noun to begin with a consonant [m]. The geminate vowel [ii] is retained before the addition of the suffix *-reet*. When Luganda nouns are borrowed into Kupsabiny, consonant substitution occurs to align with Kupsabiny’s phonological system. This process is influenced by markedness constraints that either prohibit certain consonant clusters or favor specific syllable structures as illustrated with the data below in example 18.

(18) Luganda	Kupsabiny	Gloss
Essawa	Saawet	Watch

In example 18, the Luganda word *essaawa* (watch) becomes *saawet* in Kupsabiny. Here, the initial vowel

[e] is dropped, and a final ‘t’ is added, possibly to conform to Kupsabiny’s preference for certain syllable endings. This indicates that Luganda may permit certain syllable structures whereas Kupsabiny might have restrictions that necessitate alterations to borrowed terms. The Luganda word *essaawa* begins with the vowel [e]. In adapting this word, Kupsabiny drops the initial [e] resulting in *saawa*. This deletion may align with Kupsabiny’s phonotactic preference for avoiding certain vowel-initial syllables. Kupsabiny adds a terminal consonant [t] producing *saawet*. This addition could be due to Kupsabiny’s preference to meet its syllable structure requirements. This is in support of Musa (2022) who claims that consonant sounds are added in specific positions to fit the syllable structure of the borrowing language. This is further clarified with the given data in example 19.

(19) Luganda	Kupsabiny	Gloss
Ebbasi	Paasiit	Bus

In example 19, the Luganda noun *ebbaasi* (bus) transforms into *paasiit*, in Kupsabiny where the initial vowel [e] is omitted, and the consonant [b] is substituted with [p] reflecting a shift to a voiceless bilabial plosive, which may be less marked in Kupsabiny. Markedness constraints play a pivotal role in these adaptations. They evaluate the well-formedness of output representations, penalizing structures that are complex or disfavored in the borrowing language. For example, the constraint *VOICEDOBSTRUENT might penalize voiced obstruent like [b] leading to their substitution with voiceless counterparts like [p] in the output form. Additionally, Constraints such as NOCODA, which forbids syllable-final consonants, and *COMPLEX, which prevents consonant clusters, influence how borrowed words are adapted by simplifying syllable structures. Markedness constraints push toward unmarked, simpler forms, while faithfulness constraints aim to retain original features. Their interaction determines the optimal output, as shown in example 20.

(20) Luganda	Kupsabiny	Gloss
Eggombolola	Komporyantiit	Subcounty

In example 20, the Luganda noun *eggombolola* (Subcounty) changes into *komporyantiit*, in Kupsabiny. The initial vowel [e] is dropped and the complex voiced consonant [gg] is substituted with the voiceless consonant [k]. It is also evident that the consonants [b] and [l] are rare in Kupsabiny hence get replaced with [p] and [l]. The transformation shows that markedness constraints outweigh faithfulness constraints, causing major adjustments to align with Kupsabiny’s phonotactic rules. In Optimality Theory, this reflects how constraint ranking governs acceptable adaptations. The adaptation of Luganda nouns into Kupsabiny demonstrates the language’s preference for phonological simplicity and conformity to native patterns over preserving foreign sounds, as illustrated in example 21.

(21) Luganda	Kupsabiny	Gloss
Obutunda	Mutuntanik	Fruit

In example 21, the initial vowel in the Luganda noun [o] is deleted, and the voiced consonant [b] is replaced with the voiceless consonant [m] before adding the suffix *-nik* in Kupsabiny. This modifies the syllable structure of borrowed nouns to fit Kupsabiny’s preferred syllable patterns, typically by adding or altering syllables. The consonant substitutions observed in the borrowing of Luganda nouns into Kupsabiny underscore the influence of markedness constraints within Optimality Theory. These constraints drive adaptations that align with the phonological preferences of Kupsabiny, often at the expense of faithfulness to the original form. Optimality Theory (OT) provides a framework for understanding these adaptations. This is in support of Siame *et al.* (2023) who suggest that phonological modifications align with the native phonotactic constraints of the borrowing language. For example, the English-voiced dental fricatives /ð/ and /θ/ may be substituted with /t/ or /f/, and /z/ may be replaced with /s/. in Lungu, Mambwe, and Namwanga languages.

In OT, markedness constraints evaluate output representations, penalizing certain configurations that are less preferred within a language. For example, a constraint like NOCODA forbids syllables ending in a consonant. The deletion of the initial vowel [o] may be motivated by a markedness constraint that disfavors certain vowel-initial syllables in Kupsabiny. The replacement of [b] with [m] can be seen as a response to a

markedness constraint that prefers voiceless or nasal consonants over voiced plosives in specific positions. The addition of the suffix *-nik* adjusts the syllable structure to meet Kupsabiny's phonotactic requirements, driven by markedness constraints favoring particular syllable patterns. These markedness constraints often take precedence over faithfulness constraints, which aim to preserve the original form. The result is a borrowed noun that aligns with Kupsabiny's morphological and phonological system, even at the expense of exact correspondence to the Luganda source.

5. Conclusion

This study explored how Kupsabiny adapts borrowed Luganda nouns through morphophonological processes. It found that Kupsabiny modifies borrowed words to fit its native patterns, ensuring both phonological harmony and morphological consistency. The adaptations occur through affixation and sound changes influenced by constraints that favor open syllables and discourage consonant clusters. Processes such as vowel harmony, tone adjustment, epenthesis, and consonant substitution help integrate these nouns smoothly. Overall, the findings show that morphology and phonology interact systematically in Kupsabiny, allowing it to maintain its linguistic identity while incorporating elements from Luganda, reflecting broader language contact dynamics in Uganda.

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Data Availability

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