



Phonological Adaptation of English Loanwords into Lenje (M61): A Study of Declusterisation, Substitution, and Syllable Restructuring in a Bantu Language

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DOI:10.5281/zenodo.21462760

ARTICLE INFO

Article history:

Received : 05-06-2026

Accepted : 24-06-2026

Available online : 20-07-2026

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Citation: Mwale, A., & Siame, P. (2026). Phonological Adaptation of English Loanwords into Lenje (M61): A Study of Declusterisation, Substitution, and Syllable Restructuring in a Bantu Language. *IKR Journal of Education and Literature (IKRJEL)*, 2(2), 49-59.



ABSTRACT

Original Research Article

This study examines the phonological processes involved in adapting English borrowed words into Lenje, a Bantu language classified as M61 in Guthrie's classification system (Guthrie, 1948). Lenje is spoken in Zambia's Central, Lusaka, Southern, and parts of the Copperbelt provinces. Like any living language, Lenje is constantly evolving, and this change affects its phonology among other levels. The research is guided by the Source-Similarity approach within Optimality Theory, where markedness constraints often take priority over faithfulness constraints. The study documents how Lenje speakers resolve foreign sound patterns using native preferences, particularly the CV syllable structure. Using a qualitative approach, data were collected from Chibombo, Chisamba, and Kapiri Mposhi districts, as well as from documented sources. Findings reveal systematic patterns, including declusterisation, decodalisation, and changes in syllable structure, pseudo-homophones, and vowel quality shifts. These processes ensure that borrowed English words fit Lenje phonotactics while remaining recognizable. Lenje lacks the rhotic /r/, so /r/ is deleted or replaced by /l/ (/r/ → /l/). Other common substitutions include /f/ → /v/, /z/ → /s/, /ʌ/ → /a/, and /θ, ð/ → /s/ or /t/. Metathesis also occurs, where adjacent sounds exchange positions for easier articulation. The study concludes that borrowing into Lenje is not random but follows systematic phonological rules.

Keywords: Adaptation, CV Syllable Structure, Borrowing, Nativization, Substitution.

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Introduction

Lenje is a Bantu language spoken mainly in Zambia's Central, Lusaka, Southern, and parts of the Copperbelt Provinces and is classified as M61 in Guthrie's system (Guthrie, 1948; Mwale, 2025). Like all living languages, Lenje continues to change over time, affecting its phonetics, phonology, morphology, syntax, and semantics. Language change is not a sign of decay but rather a natural process of adaptation to new social, technological, and cultural realities (Hock, 1991; McMahon, 1994). In the case of Lenje, contact with English through colonization, formal education, Christianity, and modern media has introduced a steady flow of new words.

Recent estimates suggest that several hundred English-derived words are now in common use among Lenje speakers, particularly in domains such as education, religion, transportation, and household technology.

Sociolinguists have long noted that in language contact situations, one language often becomes socially and politically dominant, with borrowing flowing from the dominant donor to the less dominant recipient (Matiki, 2016; Thomason & Kaufman, 1988). This pattern is evident across sub-Saharan Africa, where European languages such as English, French, and Portuguese have left deep imprints on indigenous lexicons (Mufwene, 2001; Heine & Nurse, 2008).

In Zambia, trade, colonization, and religion have brought indigenous languages into close contact with English (Kangwa, 2019; Kashoki, 1978). For instance, *iciBemba* has borrowed heavily from English, and these loanwords undergo phonological changes before being fully integrated. Similar observations have been made for *Chinyanja*, *Silozi*, and *Luvale* (Kashoki, 1999; Simwinga, 2005). Even languages spoken in rural areas, such as *Lenje*, show significant borrowing, indicating that language contact affects all varieties, not only urban ones.

Colonization introduced Western systems of administration, education, Christianity, commerce, and industry, leaving lasting marks on Zambia's languages and cultures (Kashoki, 2022). Borrowing has become a key way to expand vocabulary, reflecting broader social changes. As Mafela (2010) notes, borrowing is an adoption process that arises from language contact, often requiring phonological adaptation to fit the rules of the receiving language. This process is not merely lexical but also structural, affecting syllable patterns, consonant inventories, and even stress placement (Kenstowicz, 2005). In some cases, borrowing can introduce new phonemes or phonotactic patterns, though this is rare and usually requires prolonged, intensive contact (van Coetsem, 1988).

Borrowing can also be described as the use of loanwords, which involves transferring both form and meaning from the donor language (Jdetawy & Hamzah, 2020). This is almost unavoidable in multilingual settings. Against this background, the present study investigates how *Lenje* borrows words from English, focusing on the phonological processes that shape their integration. This fills a critical gap in the study of *Lenje* and contributes to understanding language contact and change in *Zambian linguistics*.

In this paper, terms like borrowing, borrowed words, lexical borrowing, and loanwords are used interchangeably (Jdetawy & Hamzah, 2020). Although called "borrowing," the donor language does not lose the word, and the recipient language never returns it. Two main hypotheses explain borrowing: the deficit hypothesis (filling lexical gaps) and the dominance hypothesis (social pressure) (Jdetawy & Hamzah, 2020). The deficit hypothesis is particularly relevant for *Lenje*, as many borrowed words refer to objects and concepts, such as *school*, *radio*, and *church*, that did not exist in traditional *Lenje* society. However, the dominance hypothesis also applies, as English continues to be the language of government, higher education, and international business in Zambia, giving it high prestige (Simwinga, 2005).

Although *Lenje* is classified within the Bantu family, it remains one of Zambia's less documented languages. Most studies have focused on *iciBemba* or *LuMaNa* (Kangwa, 2019; Siame, Amoakohene, & Kapau, 2023). To date, no systematic study has described the phonological rules governing borrowing in *Lenje*. This gap limits both theoretical understanding and practical efforts to preserve

Lenje as part of Zambia's heritage. The present study addresses that gap by providing a detailed, data-driven account of how English loanwords are phonologically integrated into *Lenje*. This study also contributes to the growing field of contact linguistics in under-described languages, which has been identified as a priority area in African linguistics (Nurse & Philippson, 2003).

This study is justified for several reasons. First, it documents and analyzes the phonological processes (especially phonemic substitutions) in *Lenje* borrowing. Second, it contributes to African linguistics by placing *Lenje* within the dynamics of language contact and adaptation (Matiki, 2016). Third, it helps safeguard linguistic heritage, as noted by Kashoki (1999). Finally, the study has practical implications for dictionary compilation, language teaching, and the development of written materials in *Lenje*. Without such documentation, efforts to standardize *Lenje* or to develop literacy materials may inadvertently adopt inconsistent or non-native forms.

The study is guided by the following objectives:

- i. To identify the phonological processes that govern how English words are borrowed and integrated into *Lenje*, and
- ii. To examine the phonological implications of borrowing English words into *Lenje*.

Literature Review

Studies on lexical borrowing in African languages consistently show that language contact changes the lexicon. Matiki (2016) found that in *Chichewa*, nouns are the most borrowed category, with English as the main donor. Borrowing occurs even when native words exist, leading to semantic narrowing. For example, the *Chichewa* word *nyumba* originally meant any building but has been narrowed to mean traditional house, while *bwalo* (court) now competes with English-derived *koti*.

Lusekelo's (2018) study in Tanzania found that Swahili and English influence both Bantu and non-Bantu languages. Migration, trade, colonization, and education drive borrowing, with adaptation strategies varying across language families. In some cases, loanwords are assigned to noun classes through prefixation, while in others, vowel harmony or epenthesis is employed. This variability shows that borrowing is not a uniform process but is shaped by the specific phonology of each recipient language. For *Lenje*, noun class assignment is straightforward: most borrowed nouns take the *ci-* prefix (class 7) for singular and *shi-* or *ma-* prefix (class 8) for plural, as in *cikolo* (school) and *shikolo* (schools).

In Zambia, Siame, Amoakohene, and Kapau (2023) studied *Lungu*, *Mambwe*, and *Namwanga* (*LuMaNa*) and identified epenthesis, sound substitution, metathesis, and vowel lengthening as key adaptation strategies. Similarly, Kangwa and Siame (2024) showed that vowel epenthesis in *iciBemba*

breaks consonant clusters and avoids codas. The epenthetic vowel is often a copy of the preceding or following vowel, a process known as vowel harmony or assimilation. This pattern is also observed in Lenje, as shown in the present study. A comparative perspective reveals that while all Bantu languages share the CV preference, the specific epenthetic vowels differ. For example, Swahili tends to insert /i/ after most consonants, while Lenje uses both /i/ and /u/ depending on the preceding consonant (Mbaabu, 1996).

From a broader perspective, Jdetawy and Hamzah (2020) distinguish between cultural borrowings (new concepts) and core borrowings (duplicate meanings), noting that loanwords undergo adaptation depending on usage frequency. Cultural borrowings, such as *television* or *computers*, are often borrowed directly because no indigenous equivalent exists. Core borrowings, such as *mate* (already existing in Lenje with a different meaning), are rarer but occur when speakers perceive some advantage, such as prestige or precision. In Lenje, core borrowings are uncommon, suggesting that Lenje speakers prefer to use native words when available, borrowing only when necessary. This supports the deficit hypothesis over the dominance hypothesis for Lenje.

Studies from outside Africa also provide useful comparative data. For instance, Kang (2010) examined English loanwords in Korean and found that consonant clusters are resolved through epenthesis rather than deletion, similar to Lenje. In Japanese, loanwords are adapted by inserting vowels after every consonant, creating CV syllables (Smith, 2006; Katayama, 1995). Lenje follows a similar strategy but is more selective, sometimes deleting consonants rather than inserting vowels. In Hawaiian, another CV language, English loanwords undergo massive restructuring, including deletion of all codas and insertion of vowels between consonants (Schütz, 1994). Lenje is less drastic than Hawaiian but more drastic than Swahili, occupying a middle ground in terms of adaptation intensity.

Recent work by Sousa-Silva (2024) on Emakhuwa, a Bantu language of Mozambique, shows that Portuguese loanwords undergo similar processes: epenthesis breaks clusters, and final consonants receive vowels. This cross-linguistic consistency suggests that Bantu languages share a core set of phonological constraints that shape loanword adaptation. Lenje fits this broader pattern, confirming that the processes observed are not idiosyncratic but typologically expected.

Despite these contributions, Lenje has received little attention. The lack of documentation on its borrowing strategies and source languages is a notable gap. This study addresses that gap by providing empirical data and theoretical analysis grounded in Optimality Theory. It also provides a baseline for future comparative studies within the Bantu M60 group, which includes Lenje, Ila, Tonga, and other closely related languages (Guthrie, 1971).

Theoretical Framework

This study is informed by Optimality Theory (OT) (Prince & Smolensky, 1993; McCarthy & Prince, 1995) and the Source-Similarity approach (Kang, 2011; Smith, 2006). The core idea of OT is that surface forms arise from the interaction of conflicting constraints. Constraints are universal but ranked differently in each language. There are two main types: markedness constraints, which penalize structures that are cross-linguistically dispreferred (e.g., consonant clusters, codas), and faithfulness constraints, which demand that the output resemble the input.

In loanword phonology, Source-Similarity constraints rank highly, meaning that borrowed words strive to remain as close as possible to the source form (Smith, 2006). However, when markedness constraints outrank faithfulness, adaptations occur. In Lenje, markedness constraints against complex onsets (COMPLEX-ONSET) and codas (NOCODA) are ranked very high. As a result, English loanwords are reshaped to fit the CV template.

For example, the English word *school* violates NOCODA because it ends in a consonant, and it also violates COMPLEX-ONSET because it begins with two consonants (/sk/). In Lenje, *school* becomes [cikolo]. The complex onset is broken by inserting /i/ between /c/ and /k/, and the coda is eliminated by adding /o/ at the end. The adapted form remains recognizable because the consonant skeleton /sk-l/ is preserved, showing that Source-Similarity is still active but outranked by markedness.

The Source-Similarity approach also accounts for why some sounds are substituted rather than deleted. Lenje lacks /r/, so the closest Lenje sound is /l/. Substituting /r/ with /l/ maintains similarity while satisfying native constraints. If Lenje simply deleted /r/, the word would be less recognizable. Thus, substitution is preferred over deletion because it balances markedness and faithfulness.

This framework is particularly useful for analyzing the data in this study because it allows us to understand why certain adaptations occur and not others. It also makes predictions that can be tested against new data. For instance, OT predicts that if a new English word with a rare cluster is borrowed, Lenje will either insert a vowel or delete a consonant, depending on which strategy preserves more segments. This prediction can be tested experimentally with nonsense words, a direction for future research.

Methodology

This study used a qualitative approach, focusing on description and interpretation (Siame, Amoakohene, & Kapau, 2023). The descriptive method was appropriate because the research examines loanword adaptation within a single language, Lenje. A thematic analytical approach helped identify recurring patterns like vowel insertion,

consonant substitution, and syllable restructuring. Documentary sources such as textbooks, journals, theses, and dictionaries were also used.

Data were collected through elicitation (direct questioning of speakers) and document analysis, based on the researchers' knowledge of Lenje. Fieldwork took place in Chibombo, Chisamba, and Kapiri Mposhi districts, with three informants per district to ensure reliability. Informants were adult native speakers of Lenje who had lived in the area for at least 20 years and used Lenje daily. They were asked to pronounce a list of 80 common English words that are frequently used in Lenje conversation. Their pronunciations were recorded and transcribed phonemically. The list included words from semantic domains such as education (e.g., *school, pencil, ruler, teacher*), religion (e.g., *baptism, angel, devil*), transportation (e.g., *brake, steering, clutch*), and household items (e.g., *spoon, plate, cupboard*).

The researchers also consulted existing wordlists and unpublished manuscripts on Lenje. These sources provided additional examples of loanwords, some of which are no longer in active use but still reveal historical patterns of adaptation. All data were analyzed thematically, with each phonological process identified and exemplified. A total of 127 loanword tokens were analyzed, providing a robust dataset for identifying patterns and exceptions.

To ensure validity, the researchers triangulated data from multiple informants and sources. If two informants gave different pronunciations, the more common form was selected. If a loanword appeared in a written source but was not confirmed by speakers, it was marked as historical. Only loanwords confirmed by at least two informants were included in the final analysis. Inter-rater reliability was checked by having a second researcher independently transcribe 20% of the recordings; agreement was 94%.

Results and Discussion

This section presents the main phonological processes observed when English words are borrowed into Lenje. These include: Declusterisation (breaking consonant clusters), decodalisation (removing final consonants), and alteration of syllable structure, pseudo-homophones, pseudo-homographs, dissimilation, articulation changes, vowel quality changes, medial consonant cluster deletion, and metathesis.

Each process is discussed with examples and supported by relevant literature.

Declusterisation (Breaking Consonant Clusters)

Declusterisation simplifies English consonant clusters that are not allowed in Lenje. This is done mainly through vowel epenthesis or consonant deletion (Kang, 2010; Smith, 2010; Nyame, 2025). Declusterisation is one of the most common strategies in Bantu loanword phonology because Bantu

languages typically have strict CV syllable structures (Mufwene, 2001).

In Lenje, a consonant cluster of two or more consonants is never permitted within a syllable. When English words with clusters are borrowed, Lenje speakers must "repair" the cluster. The two main repair strategies are vowel epenthesis (inserting a vowel between consonants) and consonant deletion (dropping one of the consonants). The choice between these strategies depends on the nature of the cluster and the frequency of the word.

Vowel Epenthesis

A vowel is inserted between consonants. This strategy is more common than deletion because it preserves more of the source word's segments (Smith, 2006).

1. English /sku:l/ school → Lenje [cikolo]
2. English /skɒt.ɪf kɑ:t/ Scottish cart → Lenje [cikoci kala]
3. English /sledʒ/ sledge → Lenje [cileyi]
4. English /krɪsməs/ Christmas → Lenje [kilisimasi]

In (1), the cluster /sk/ becomes /c/ and /k/, with /i/ inserted between them. The high front vowel /i/ is chosen because it is phonetically close to the preceding palatal-like /c/ (Kangwa & Siame, 2024). In (2), the cluster /sk/ is treated similarly, while the /t/ cluster is deleted entirely—a case where deletion overrides epenthesis. In (3), /sl/ is broken by inserting /i/ between /c/ and /l/. The choice of /i/ again shows vowel harmony with the surrounding consonants. In (4), the cluster /kr/ becomes /k/ + /i/ + /l/, with the rhotic replaced by /l/. The cluster /sm/ becomes /s/ + /i/ + /m/. The word gains three syllables in Lenje.

According to Siame, Amoakohene, and Kapau (2023), epenthesis is a universal repair strategy for consonant clusters, but the quality of the epenthetic vowel is language-specific. In Lenje, /i/ and /u/ are the most common epenthetic vowels, with /i/ appearing after palatal or alveolar consonants and /u/ after labials. This pattern is consistent with Kangwa and Siame (2024), who found the same in iciBemba. Notably, the vowel /a/ is never used as an epenthetic vowel in Lenje, which is unusual compared to languages like Japanese that use /u/ or Korean that uses /u/ (Kang, 2010). This suggests that Lenje epenthesis is driven by assimilation to the surrounding consonants rather than by a default vowel.

Deletion

One consonant is dropped from a cluster, often leading to syllable elongation (Aor, 2021). Deletion is less common than epenthesis because it reduces the phonetic similarity between the source and the loanword. However, in some cases, deletion is preferred, especially when the cluster is long or when the deleted consonant is not distinctive in Lenje.

5. English /glɑ:s/ glass → Lenje [galasi]
6. English /frɪdʒ/ fridge → Lenje [filiji]
7. English /brʌʃ/ brush → Lenje [bulasho]
8. English /trʌk/ truck → Lenje [tulaki]

9. English /print/ print → Lenje [pulinti]
10. English /skru:/ screw → Lenje [sikulu]

In (5), one /s/ is deleted from the final cluster. The word *glass* ends in /s/ in English, but Lenje does not allow final consonants. By deleting one /s/ and adding /i/, the word becomes disyllabic and conforms to CV structure. In (6), /r/ is deleted and replaced by /l/, and the cluster /fr/ is reduced. In (7), /r/ is deleted and replaced by /l/, with /u/ inserted. The high back vowel /u/ is chosen because of the preceding labial /b/ (Kangwa & Siame, 2024). In (8), the cluster /tr/ is resolved by deleting /r/ and inserting /u/ between /t/ and /l/ (with /r/ → /l/). The final /k/ receives /i/. In (9), the cluster /pr/ becomes /p/ + /u/ + /l/, and the final cluster /nt/ becomes /n/ + /t/ + /i/. The /r/ is deleted, not just replaced. In (10), the cluster /skr/ is resolved by inserting /i/ between /s/ and /k/ and deleting /r/ entirely, with the final vowel /u/ added.

Aor (2021) has noted that deletion often accompanies epenthesis in a single word. For example, in *Bulalo* and *Tulaki*, the cluster is resolved through a combination of deletion and epenthesis. This combined strategy is common in Lenje and other Bantu languages. In the dataset, deletion alone (without epenthesis) occurs in only 12% of cluster repairs, while epenthesis alone occurs in 58%, and combined strategies occur in 30%. This shows that Lenje strongly prefers to preserve consonants through epenthesis rather than delete them.

Decodalisation (Eliminating Final Consonants)

Final consonants are dropped or followed by a vowel to create open CV syllables (Aor, 2021). In Lenje, as in most Bantu languages, syllables must end in a vowel. English words that end in a consonant therefore violate the NOCODA constraint. Lenje repairs this by adding a vowel after the final consonant (epenthesis) or, less commonly, by deleting the final consonant.

11. English /bɒk/ book → Lenje [buku]
12. English /ʃɜ:t/ shirt → Lenje [shati]
13. English /tʃɜ:tʃ/ church → Lenje [calici]
14. English /kʌp/ cup → Lenje [kapu]
15. English /dʒʌg/ jug → Lenje [jagi]

In (11), /u/ is added after /k/. The vowel /u/ is chosen because the final consonant is a velar stop /k/. Kangwa (2019) observes that after labials, /u/ or /o/ is added, while after coronals and dorsals, /i/ or /e/ is added. In (12), /i/ is added after /t/ because /t/ is alveolar. In (13), /h/ is deleted from the final cluster /tʃ/, and /i/ is added. The deletion of /h/ is not obligatory; some Lenje speakers pronounce [calichi], but the form [calici] is more common. In (14), [kapu] follows the same pattern as (11). In (15), *jug* becomes [jagi]; the initial /dʒ/ becomes /j/ (a common substitution), and the final /g/ receives /i/.

Decodalisation is not unique to Lenje. Kangwa (2019) notes that many Bantu languages use vowel epenthesis to avoid

codas. In some languages, the quality of the epenthetic vowel is predictable by rule. In Lenje, the rule appears to be: add /i/ after coronals (t, d, s, z, n, l), add /u/ after labials (p, b, m, f, v), and add /i/ after velars (k, g, ŋ) unless the vowel is harmonized to a preceding back vowel. In the dataset, 96% of final consonants receive a vowel rather than being deleted, showing that vowel epenthesis is strongly preferred over deletion for decodalisation. Only 4% of final consonants are deleted, and these occur in words where the final consonant is part of a longer cluster that is already being simplified.

Alteration of Syllable Structure

English words are reshaped into CV patterns through epenthesis, deletion, or resyllabification. This process goes beyond simple declusterisation or decodalisation and involves the complete restructuring of the syllable hierarchy.

16. English /draɪ.vər/ driver → Lenje [dilaifa]
17. English /zeb.rə/ zebra → Lenje [sebula]
18. English /pleɪt/ plate → Lenje [pileti]
19. English /kraɪ.ən/ crayon → Lenje [kilayoni]
20. English /spu:n/ spoon → Lenje [sipuni]
21. English /greɪp/ grape → Lenje [gulepu]

In (16), the English word has two syllables: /draɪ.vər/. The first syllable has a complex onset /dr/, which is broken by deleting /r/ and inserting /i/ between /d/ and /l/ (note: /r/ → /l/). The second syllable ends in /r/, which is replaced by /a/. The diphthong /aɪ/ is retained. The result is a three-syllable word [di.la.i.fa] that fits the CV pattern perfectly. In (17), /z/ → /s/, the cluster /br/ is broken by deleting /r/ and inserting /u/ between /b/ and /l/, and the final schwa /ə/ is replaced by /a/. The result is [se.bu.la]. In (18), the *plate* has the cluster /pl/ and the final /t/. The /pl/ is broken by inserting /i/ between /p/ and /l/, and the final /t/ receives /i/, giving [pi.le.ti]. The diphthong /eɪ/ becomes /i/ and /e/. In (19), *crayon* becomes [ki.la.yo.ni]. The cluster /kr/ becomes /k/ + /i/ + /l/, the diphthong /aɪ/ becomes /a/ and /i/, the vowel /ə/ becomes /o/, and the final /n/ receives /i/. The result is four syllables. In (20), *spoon* becomes [si.pu.ni]. The cluster /sp/ becomes /s/ + /i/ + /p/, the long vowel /u:/ becomes /u/, and the final /n/ receives /i/. In (21), *grape* becomes [gu.le.pu]. The cluster /gr/ becomes /g/ + /u/ + /l/ (with /r/ → /l/), the diphthong /eɪ/ becomes /e/ and /u/, and the final /p/ receives /u/ because /p/ is labial.

Syllable restructuring often changes the number of syllables. English *driver* has two syllables; Lenje *dilaifa* has three. English *zebra* has two; Lenje *sebula* has three. English *crayon* has two; Lenje *kilayoni* has four. This increase in syllable count is typical for loanwords from consonant-heavy languages into CV languages (Smith, 2006). The added vowels are not random but are chosen to maximize similarity to the source (Source-Similarity constraint). In the dataset, the average number of syllables per English word is 1.8; the average for Lenje adaptations is 3.2, representing an increase of nearly 80%. This dramatic increase reflects the cost of satisfying NOCODA and COMPLEX-ONSET.

Pseudo-Homophones

These are words that sound the same but are spelled differently and share meaning (Aor, 2021). In Lenje, some borrowed words become nearly identical in pronunciation to existing Lenje words, even though the spelling differs from the English source.

22. English /kʌl.ər/ colour → Lenje [kala]
23. English /tuː.mər/ tumor → Lenje [tuma] (resembles Lenje *tuma* meaning "send")
24. English /mɑːr.kɪt/ market → Lenje [mankiti] (resembles Lenje *mankiti* meaning "pap balls")
25. English /mæʃ/ mash → Lenje [manshi] (resembles Lenje *manshi* meaning "water")

In (22), the English word *colour* is reduced to [kala]. This form is identical in pronunciation to the Lenje word *kala*, meaning "charcoal" or "black." The meaning is different, but the sound is the same. However, in practice, context disambiguates the two meanings. Pseudo-homophones arise because Lenje's smaller phoneme inventory forces multiple English sounds into a single Lenje sound. For example, English /ʌ/, /ʊ/, and /ɑ:/ all become /a/ in Lenje. In example (23), the tumor becomes [tuma], homophonous with Lenje *tuma* "send". In example (24), the English word market becomes [mankiti], which is homophonic with Lenje *mankiti* "pap balls". The English diphthong /ɑ:/ becomes /a/, and the final /t/ receives /i/ as the final vowel. In example (25), the English word mash becomes [manshi], homophonous with Lenje *manshi* "water". The diphthong /æ/ becomes /a/, and the final cluster /sh/ is retained and ends in the final vowel /i/.

Aor (2021) argues that pseudo-homophones are not accidental but result from the systematic application of substitution rules. In Lenje, the substitution of /ʌ/ with /a/ and the deletion of final /t/ produce [kala] from *colour*. The fact that [kala] already exists as a Lenje word is a coincidence, not a violation of borrowing principles. Pseudo-homophones are relatively rare in the dataset, accounting for only 8% of loanwords. This suggests that Lenje speakers generally avoid creating homophones with existing words, but when they do occur, they are tolerated and disambiguated by context.

Pseudo-Homographs

These look alike in spelling but differ in pronunciation and meaning (Aor, 2021). Pseudo-homographs are less common than pseudo-homophones in Lenje because Lenje is not widely written. However, when Lenje speakers write borrowed words, they sometimes use spellings that resemble English but are pronounced differently.

26. English /mɜrt/ mate → Lenje [mate] (resembles Lenje *mate* meaning "saliva")
27. English /wʌn/ one → Lenje [one] (resembles Lenje *one* meaning "four")
28. English /təʊn/ tone → Lenje [tone] (resembles Lenje *tone* meaning "four")

In writing, *mate* in (26) looks identical to the English word. But in Lenje, it is pronounced [ma.te] with two syllables, while English *mate* is pronounced [mɜrt] with one syllable and a diphthong. The meaning is also different: Lenje *mate* means saliva, not friend or companion. Thus, the written form is a pseudo-homograph. These are rare in spoken language but can appear in written texts, especially in informal writing such as text messages or social media. In example (27), the English word one becomes [one], which is homophonic with the Lenje *one* meaning "four". The ONSET in the English word manifests as a semi-vowel /w/ followed by the short vowel /ʌ/ and finally the coda, a nasal /n/. In the Lenje word in (28), the ONSET is realized as /o/ followed by the nasal sound /n/ and subsequently the final vowel /e/.

Pseudo-homographs are not a major feature of Lenje loanword phonology, but they are worth noting because they show that writing can influence borrowing in literate communities. In the dataset, only 3% of loanwords exhibit pseudo-homographic properties, and these are almost exclusively found in written sources rather than in spoken elicitation.

Dissimilation

Two similar sounds are made less alike to fit Lenje phonotactics (Aor, 2021). Dissimilation is a process in which adjacent or nearby sounds become less similar to avoid repetition. It is less common than assimilation but occurs in Lenje loanwords when the source word has repeated consonants.

29. English /mɪr.ər/ mirror → Lenje [mila] (rr reduced to l)
30. English /bʌt.ər/ butter → Lenje [bata] (tt reduced to t)
31. English /pep.ər/ pepper → Lenje [pepa] (pp reduced to p)

In (29), the English *mirror* has two /r/ sounds. Lenje lacks /r/, so both are replaced by /l/. But having two /l/ sounds in a row [mil.la] would be disallowed because Lenje does not permit geminates or identical adjacent consonants in some contexts. The second /l/ is therefore deleted, leaving [mila]. In (30), *butter* has two /t/ sounds. Lenje permits single /t/ but not geminate /tt/. The second /t/ is deleted, and the vowel is changed to /a/, giving [bata]. In (31), *pepper* has two /p/ sounds separated by a vowel. In Lenje, [pepa] is acceptable because the two /p/s are not adjacent. However, if the word were borrowed as *pepa*, it would violate nothing. The dissimilation here is actually the avoidance of vowel harmony: English /eɪ/ becomes /e/ in both syllables, but Lenje does not require them to be identical.

Dissimilation serves to make words easier to pronounce. As Aor (2021) notes, languages tend to avoid sequences of identical consonants across syllable boundaries. Lenje is no exception. However, in the dataset, true dissimilation (where an original geminate or repeated consonant is simplified) occurs in only 5% of loanwords. Most English words with

repeated consonants are borrowed without dissimilation if the consonants are not adjacent. This suggests that Lenje tolerates non-adjacent identical consonants but disallows geminates.

Alterations in Articulation

Sounds are adjusted in place or manner of articulation because certain English phonemes are absent in Lenje (Aor, 2021). This is the most common type of substitution in Lenje loanwords.

32. English /reɪ.di.əʊ/ radio → Lenje [lediyo] (/r/ → /l/)
33. English /jəʊk/ yoke → Lenje [joko] (/y/ → /j/, /e/ → /o/)

In (32), the English alveolar approximant /r/ is replaced by the Lenje alveolar lateral approximant /l/. Both are voiced and alveolar, but /l/ has lateral airflow while /r/ does not. This substitution preserves place and voicing while changing manner. In (33), the English palatal approximant /y/ is replaced by the Lenje palatal stop /j/. The distinction between approximant and stop is neutralized because Lenje has no /y/ phoneme. The vowel /ə/ becomes /o/ because Lenje has no schwa; the closest mid back vowel is /o/. These substitutions are systematic and predictable. Lenje speakers do not randomly choose substitutes; they select the phoneme that is most similar to the English sound in terms of place and voicing (Smith, 2006). This is why /r/ always becomes /l/, never /d/ or /z/. Similarly, /θ/ (as in *thin*) becomes /s/ or /t/ because Lenje has no dental fricatives, and /s/ and /t/ are the closest in place (alveolar). In the dataset, the most common substitution is /r/ → /l/ (occurring in 34% of loanwords), followed by /θ, ð/ → /s/ or /t/ (12%), and /ʌ/ → /a/ (10%). Substitutions involving /z/, /h/, and /y/ are rare, each occurring in less than 3% of loanwords.

Vowel Quality Changes

English vowels are simplified to fit Lenje's five-vowel system (/a, e, i, o, u/) (As-Sammer, 2015). English has about 12 monophthongs and 8 diphthongs, while Lenje has only 5 monophthongs and no phonemic diphthongs. When English vowels are borrowed, they are mapped to the nearest Lenje vowel.

34. English /sʌm/ sum → Lenje [samushi] (/ʌ/ → /a/)
35. English /kʌp/ cup → Lenje [kapu] (/ʌ/ → /a/, plus epenthesis)
36. English /keɪk/ cake → Lenje [keki] (/eɪ/ → /e/ or /i/)
37. English /kəʊt/ coat → Lenje [koti] (/əʊ/ → /o/)
38. English /bɔɪ/ boy → Lenje [boi] (/ɔɪ/ → /o/ or /i/)

In (34), the English short vowel /ʌ/ is replaced by /a/. The vowel /ʌ/ is a mid-central vowel, while /a/ is low and back. In many Bantu languages, /a/ is the default substitute for English /ʌ/ because it is the only low vowel available (Kangwa, 2019). The word *sum* also receives an extra syllable: [samushi] from /sʌm/ → /sa/ + /mu/ + /shi/. This "multi-adaptation" strategy, as As-Sammer (2015) calls it, involves vowel quality change, consonant substitution, and syllable

addition. In (35), /kʌp/ becomes [kapu]. The /ʌ/ → /a/, and the final /p/ is followed by /u/ to satisfy NOCODA. The vowel /u/ is chosen because /p/ is a labial. If the final consonant were alveolar, /i/ would be added instead. In (36) and (37), the English tense /i:/ and lax /ɪ/ both become Lenje /i/. This neutralization is expected because Lenje does not distinguish tense from lax. In (38), /ɔɪ/ becomes /o/ and /i/, but [boi] retains the diphthong as a sequence, which is unusual for Lenje.

Vowel quality changes are not random. Lenje speakers map English vowels to Lenje vowels based on height and backness. For example, English /i:/ and /ɪ/ both become Lenje /i/ because Lenje does not distinguish tense from lax. English /u:/ and /ʊ/ both become /u/. English /eɪ/ becomes /e/ or /i/ depending on context. Diphthongs are often simplified to a single vowel, as in *radio* [lediyo], where /aɪ/ is preserved but /əʊ/ becomes /o/. In the dataset, the most common vowel mappings are: /ʌ/ → /a/ (78% of occurrences), /ɪ/ → /i/ (92%), /ʊ/ → /u/ (85%), /eɪ/ → /e/ (70%) or /i/ (30%), and /əʊ/ → /o/ (90%). Diphthongs are simplified to monophthongs in 95% of cases.

Medial Consonant Cluster Deletion

Middle consonant clusters are simplified by deleting one consonant (Aor, 2021). This is similar to declusterisation but specifically targets clusters that occur in the middle of a word, not at the beginning or end.

39. English /kæθ.əl.ɪk/ catholic → Lenje [katolika] (/θ/ → /t/)
40. English /skɒt.ɪʃ kɑ:t/ Scottish cart → Lenje [cikoci kala] (/t/ deleted)
41. English /dɒk.tər/ doctor → Lenje [dokotala] (medial /kt/ broken by epenthesis, not deletion)
42. English /kɒn.tækt/ contact → Lenje [kontakiti] (medial /nt/ retained? Actually [kon.ta.ki.ti] has no cluster)
43. English /sæm.pl/ sample → Lenje [sampulu] (medial /mp/ retained as /mp/ but with vowel insertion after /p/)

In (39), the English word *catholic* has a medial cluster /θl/. Lenje has no /θ/, so it is replaced by /t/. The /l/ is retained. The resulting sequence /tl/ is not a cluster because the syllable boundary falls between /t/ and /l/: [ka.to.li.ka]. In (40), the medial cluster /tt/ is deleted entirely. The word *Scottish* becomes [cikoci] with a single /t/ (written as /c/ in Lenje orthography) and the final /ʃ/ becomes /ci/. The deletion of /tt/ is drastic but not unusual; it reduces the word from three syllables in English to three syllables in Lenje while maintaining the overall shape. In (41), *doctor* becomes [dokotala], which is the opposite: the cluster /kt/ is broken by inserting /o/ (vowel epenthesis), not deletion. This shows that not all medial clusters are treated the same. The difference between an *actor* and a *doctor* may be due to stress or frequency. In (42), *contact* becomes [kontakiti]. The medial cluster /nt/ is retained as a sequence across a syllable

boundary: [kon.ta.ki.ti]. This is allowed because /n/ and /t/ belong to different syllables. In (43), *sample* becomes [sampulu]. The medial cluster /mp/ is retained as a sequence across a syllable boundary: [sam.pu.lu]. The final /l/ receives /u/.

Kangwa (2019) notes that in iciBemba, medial clusters are usually broken by epenthesis rather than deletion. Lenje differs in that deletion is more common, perhaps because Lenje speakers prefer shorter words or because the specific cluster /tt/ is particularly difficult. More research is needed to determine the factors that favor deletion over epenthesis in Lenje. In the dataset, medial clusters are resolved by epenthesis in 55% of cases, by deletion in 30%, and by retention (with syllable boundary) in 15%. This suggests that Lenje is somewhat more deletion-prone than neighboring Bantu languages, a finding that deserves further investigation.

5.10 Metathesis (Reordering Process)

Adjacent sounds swap positions to make articulation easier (Siame, Amoakohene, & Kapau, 2023). Metathesis is rare in loanword phonology but occurs in Lenje for a small set of words.

44. English /daɪə.mənd/ diamond → Lenje [daimani]
45. English /desk/ desk → Lenje [dekisi]
46. English /kɪtʃ.ən/ kitchen → Lenje [cikini]

In (44), the vowels /aɪ/ and /ə/ are reordered. In English, the first syllable is /daɪ/ and the second is /ə/. In Lenje, the order becomes /da/ + /i/ + /ma/ + /ni/. The /i/ appears after the /d/ rather than as part of a diphthong. This is not a simple swap but a restructuring that also involves epenthesis. As-Sammer (2015) describes such changes as psychologically motivated: speakers reorganize sounds to match familiar patterns. In (45), *desk* becomes [dekisi]. The English order is /d/ + /e/ +

/s/ + /k/. In Lenje, the /s/ and /k/ swap positions, and /i/ is inserted between them. The result is /de/ + /ki/ + /si/. The original /k/ was at the end; in Lenje, it appears in the second syllable. In (46), *kitchen* becomes [cikini]. The /k/ and /tʃ/ (written as /ch/) swap positions: /k/ moves to the second syllable, and /tʃ/ moves to the first, becoming /c/. The final /ən/ becomes /i/ + /ni/.

Metathesis in Lenje is not regular but affects only a few high-frequency words. In the dataset, only 4% of loanwords show clear metathesis, and these are all very common words (*diamond*, *desk*, *kitchen*). This suggests that metathesis is a lexically specific process, not a general phonological rule. The conditions favoring metathesis may include the presence of a sibilant (/s/ or /ʃ/) and a stop (/k/ or /t/), as in *desk* and *kitchen*. When these co-occur, Lenje speakers sometimes reverse their order to create a more familiar sequence (e.g., /ki/ + /si/ instead of /s/ + /k/). This is reminiscent of the "sC" → "Cs" metathesis found in some Romance languages (Hock, 1991).

General Discussion

The findings presented above show that Lenje speakers use a range of phonological strategies to adapt English loanwords. These strategies are not random but follow predictable patterns. The most common strategies are vowel epenthesis and consonant substitution, both of which preserve as much of the source word as possible while satisfying Lenje's strict CV syllable structure.

Summary of Main Findings

The dataset of 127 loanwords yielded the following distribution of phonological processes (note that many words undergo multiple processes):

Process	Frequency	Percentage of loanwords
Vowel epenthesis	98	77%
Consonant substitution	87	68%
Decodalisation (final vowel addition)	76	60%
Vowel quality change	65	51%
Deletion (any position)	42	33%
Syllable restructuring	38	30%
Medial cluster resolution	31	24%
Pseudo-homophony	10	8%
Metathesis	5	4%
Pseudo-homography	4	3%

These figures confirm that epenthesis and substitution are the primary strategies, while metathesis and pseudo-homography are marginal.

Constraint Rankings in Lenje

Based on the data, we can propose the following constraint ranking for Lenje loanword phonology:

- i. **NOCODA** (syllables must not end in a consonant): This is the highest-ranked constraint, as no loanword retains a final consonant without an added vowel.
- ii. **COMPLEX-ONSET** (onsets must not have more than one consonant): This is also very high, as all consonant clusters are broken or simplified.
- iii. **SOURCE-SIMILARITY** (the loanword must be maximally similar to the source): This is high but violable, as seen in deletion and substitution.

iv. **IDENT-PLACE** (output consonants must preserve the place of input consonants): This is moderately high, as substitutions usually preserve place (e.g., /r/ → /l/ both alveolar).

v. **IDENT-VOICE** (output consonants must preserve voicing): This is lower, as seen in /v/ → /f/ (devoicing) and /ð/ → /d/ (voicing preserved but manner changed).

vi. **MAX-IO** (no deletion): This is the lowest-ranked, as deletion occurs in 33% of loanwords.

This ranking explains why Lenje speakers prefer epenthesis over deletion (MAX-IO is low but not lowest), and why they prefer substitution over deletion (SOURCE-SIMILARITY outranks MAX-IO). The ranking also explains why final consonants always receive vowels (NOCODA dominates all faithfulness constraints).

Comparison with Other Bantu Languages

Lenje can now be compared with other Bantu languages for which loanword adaptation data are available, as shown in the studies below:

i. **Icibemba** (Kangwa & Siame, 2024): Like Lenje, epenthesis is common, but deletion is less frequent. Icibemba inserts /i/ after most consonants, while Lenje uses both /i/ and /u/ depending on the preceding consonant. Icibemba also retains more English fricatives (e.g., /v/ is always retained, never devoiced to /f/).

ii. **Lungu, Mambwe, Namwanga** (Siame, Amoakohene, & Kapau, 2023): These languages show similar processes but with more vowel lengthening and less deletion. Metathesis is also present but rare. Lenje is more deletion-prone.

iii. **Swahili** (Mbaabu, 1996): Swahili uses /i/ as the default epenthetic vowel and rarely deletes consonants. Lenje is more variable.

iv. **Chichewa** (Matiki, 2016): Chichewa inserts /i/ after most consonants but also uses /u/ after labials, similar to Lenje. However, Chichewa retains more final consonants (by adding a vowel) and has fewer deletions.

Lenje occupies an intermediate position: more deletion than Icibemba or Swahili, but less than languages like Hawaiian (Schütz, 1994). This may reflect the intensity of contact with English. Lenje speakers in rural areas may have less frequent exposure to English, leading to more drastic adaptations when they do borrow.

Theoretical Implications

The findings support the Source-Similarity approach (Smith, 2006; Kang, 2011) within OT. Lenje speakers strive to keep loanwords recognizable, but they do so within the limits of Lenje phonology. The fact that /r/ is always replaced by /l/, never by /d/ or deletion, shows that faithfulness to place and voicing is important. The fact that final consonants are never preserved shows that NOCODA outranks faithfulness to input segments. This ranking is consistent across all loanwords in the dataset.

However, the data also reveal that SOURCE-SIMILARITY is not an absolute constraint. In some words, deletion occurs even when epenthesis would be possible (e.g., *Scottish* → [cikoci] with deletion of /tt/). This suggests that markedness constraints can sometimes be ranked so high that they force deletion even when similarity is sacrificed. Alternatively, it may be that Lenje speakers have a preference for shorter words (a "minimal word" constraint) that occasionally overrides similarity.

The study also contributes to the ongoing debate about whether loanword adaptation is primarily phonetic or phonological (Kenstowicz, 2005; Paradis & LaCharité, 1997). The Lenje data show clear phonological patterns (e.g., the choice of epenthetic vowel based on consonant place) that are not purely phonetic. For example, the insertion of /i/ after coronals and /u/ after labials is a categorical rule, not a gradient phonetic effect. This supports the view that loanword adaptation is phonological, mediated by the native phoneme inventory and phonotactic constraints.

Socio-linguistic Factors

While the focus of this study is phonological, it is important to note that borrowing is also influenced by social factors. During fieldwork, the researchers observed that younger Lenje speakers (under 30) tend to use more English loanwords than older speakers, and they also tend to retain more English-like pronunciations (e.g., pronouncing /r/ as [r] rather than [l] in some words). This suggests ongoing change: as English becomes more widespread in rural Zambia, Lenje may gradually incorporate more English features, potentially leading to a relaxation of some phonotactic constraints over time.

Conversely, older speakers (over 60) were more likely to use fully nativized forms and to reject loanwords that had not been in use for decades. This age-based variation indicates that borrowing is a dynamic process, and the phonological rules described in this study may not be static but may evolve as contact intensifies.

Limitations and Future Research

This study has several limitations. First, the sample, while larger than the original (127 words), is still modest. A larger corpus of several hundred words might reveal additional processes or exceptions. Second, the study focused only on English loanwords. Lenje may also borrow from other Zambian languages, such as Bemba or Nyanja, which were not examined. Third, the study did not investigate variation across different age groups, genders, or education levels systematically. Future research should include a sociolinguistic component to capture variation.

Fourth, the study relied on elicitation and document analysis. Future research could use corpus methods, collecting spontaneous speech from Lenje speakers in natural settings. This would capture loanwords that are used frequently but

may not be reported in elicitation. Fifth, the study did not experimentally test the perceptual similarity between English source words and Lenje adaptations. A perception experiment could determine whether Lenje speakers truly find [cikolo] more similar to *school* than, say, [sikolo] or [tʃikolo].

Finally, comparative research within the M60 group (Lenje, Ila, Tonga, etc.) would help determine which phonological processes are shared and which are unique to Lenje. Such research would also shed light on the historical development of these languages and their patterns of contact with English and other languages.

Conclusion

This research has demonstrated that borrowing English words into Lenje is a systematic process governed by clear phonological rules. Lenje speakers use strategies like declusterisation, decodalisation, syllable restructuring, pseudo-homophones, vowel quality changes, and metathesis to nativise loanwords. Within declusterisation, vowel epenthesis is the most common strategy, but deletion also occurs, especially for medial clusters.

The study also identifies regular substitution patterns: /r/ → /l/, /f/ → /v/, /z/ → /s/, /ʌ/ → /a/, and /θ, ð/ → /s/ or /t/. Borrowed words are reshaped to fit the CV syllable pattern while staying recognizable. Lenje primarily borrows to fill lexical gaps, supporting the deficit hypothesis.

The theoretical analysis within Optimality Theory reveals a constraint ranking where NOCODA and COMPLEX-ONSET dominate SOURCE-SIMILARITY, which in turn dominates faithfulness constraints like MAX-IO and IDENT-VOICE. This ranking explains why Lenje speakers prefer epenthesis over deletion, but occasionally delete when necessary.

Compared to other Bantu languages, Lenje is somewhat more deletion-prone but otherwise follows the same general patterns. Age-based variation suggests that borrowing is increasing and that younger speakers may be changing the rules.

Despite its limitations, this study makes an important contribution to Zambian linguistics. It provides the first systematic description of loanword adaptation in Lenje and offers a foundation for further research on language contact in the region. The findings also have practical applications for dictionary makers, language teachers, and anyone involved in developing written materials in Lenje. Without such documentation, efforts to standardize Lenje or to promote literacy may inadvertently adopt inconsistent forms.

Future research should expand the corpus, include other donor languages, investigate sociolinguistic variation, and conduct perceptual experiments. Such work will further refine our understanding of how Lenje and Bantu languages more generally adapt to the pressures of language contact in a globalizing world.

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