| **RESEARCH ARTICLE**

Phonological Processes Triggered by Means of Verbs Conjugation in Bantu Languages

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| **ABSTRACT**

This study explores the complex relationship between phonological processes and verb extensions, focusing on the concept of word elasticity, which describes the transformations words undergo based on linguistic contexts. Anchored in the Generative Phonology Theory, which postulates a transition from underlying representation to surface structure, the research aims to understand the phonological outcomes stemming from verb extension morphology, particularly in Bantu languages. Employing a qualitative approach through a documentary systematic review of peer-reviewed literature and academic articles across diverse languages, findings reveal multiple phonological processes, such as elision, assimilation, and palatalization, demonstrating the dynamic shifts induced by verb conjugations. The study concludes that understanding the interplay between morphology and phonology is fundamental, emphasizing the transformative nature of verb extensions in shaping phonological processes across languages.

1. Introduction

Words are elastic in nature; they can expand or well either morphologically or phonologically or both. Such manifestations can be framed either from deep to surface structure or surface structure only; this depends on the phenomenon under consideration. To be specific, the morphological of verb extensions have been discussed in several literature scoped under word elasticity. Some of these conjugations are operated by means of phonological processes and vice versa. Thus, in literature, there are a number of phonological processes in the world that are insinuated in the natural languages we speak, such as assimilatory and non-assimilatory processes. This paper describes phonological processes triggered by the means of verb conjugations in our natural languages we use to communicate in our daily life.

2. Literature

There are various phonologists and morphologists who have researched verb extensions, as Batibo (1985, pp. 165-181) discussed the phonology and morphology of the Kemunasukuma language. He presented sound inventory and the way they appear with tones; in the case of the morphology of verbal conjugation, he outlined thirteen verbal extensions in Kemunasukuma, a dialect of the Kisukuma language. The verb extensions in this dialect include inversive *-ol-*, neuter/stative *-ek-*, *-ik-*, repetitive *-agol-*, reflexive *-i-*, intensive reciprocal *-an-*, causative complex *-isy-*, applicative *-el-*, *-il-*, causative simple *-y-*, benefactive-directive *-e-el-*, passive *-w-*, *-iw-*, fotitive *-agan-*, contactive *-ot-*and inversive neuter *-ok-*. Despite Batibo's investigation pertinent to phonology and morphology in Kisukuma, and verb extension in particular, he did not account for phonological processes as the result of verb extensions, which the current study desires.

Yuka (2008) investigated Lamnso' verbal extensions; Lamnso is the language spoken in the North West Province of the Republic of Cameroon; it is also spoken in Nigeria in Taraba state (Welmers, 1973, p. 159). Yuka's investigation found different morphemes

of verb extensions in this language, along with other things; he found that -nin- is reciprocal, -kir- or -kfən- 'repetitive' or doing it again, -ri- 'iterative, -ti- 'applicative, -si- 'causative, -sìn- or -sín- 'contactive', -ir- or -er- augmentative, -é/è-, -ó/ò-, -a- extensive (durative) and -ám-, -óm- or -éy or -óy-, -áy- intensive. With regard to these morphemes, most are phonological, in the sense that when verbal morpheme extends from the verb root or stem, its manifestation is operated phonological (Cf, pp.164-166), though the author did not explain how Lamso verbs conjugation triggers phonological processes, it is the current study that desires such analysis to show hoe verb extensions are operated via phonological processes.

In her investigation, Caroline (2011) investigated morph ordering of verbal extensions in the Runyankole, a language spoken in south eastern Uganda. In her finding, she describes five verb morphemes extended from the verbs, namely applicative *-ir-*, *-er-*, causative *-is-*, *-es-*, *-sy*, reciprocal *-an-*, *-angan-*, stative *-ek-*, *-ik-* and passive *-w-*, *-ebw-*, *-ibw-* morphemes. The author brings lo to live the possibility of the co-occerence of the morphemes with several restrictions. She argues, for instance, applicative morph cannot co-occur with causative morph, and causative morph cannot co-occur with stative morph. Despite her good presentation, she neglected phonological processes by means of verb extension, which the current study wants to investigate.

Muhdhar (2006) investigated the five verbal extensions in Kemunakiyadialect of Kisukuma. The author identifies the following morphemes applicative *-il-/-el-*, causative *-ij-* (-ej-), *-ish-/-ish-*, reciprocal *-i-*, Passive-*w-/-iw-/-ng'w-*, *-nv-* and reduplicative. Moreover, she concluded that four pairs – applicative-causative, applicative-passive., reciprocal-causative, and reciprocal-applicative can be lined up together. She also observes that other co-occurrences, such as applicative-applicative, are questionable. Muhdhar's investigation on Kemunakiya verb extensions did not account for phonological phenomena resulting from Kemunakiya verb conjugation; it is this study that investigates phonological processes triggered by means of verb extensions in our natural languages.

Langa (2007) investigated and analyzed the system of verbal extensions in Changana, a Bantu language spoken in Mozambique, in the Sothern Province of Gaza, Inhambane and Maputo. The author identified the following: -is- causative, -isis- intensive causative, -el- applicative, -an- reciprocal, -iw- passive, -ul- reversive, -et- contactive, -eke- pseudo-passive, -elel- persistive. Langa explained in detail verb extensions in Changana, ih his data, it appears phonological phenomena being triggered by extended verbs (Cf.p12), but because Langa's study was not phonological, he did not explain these processes of which the current study desires investigation.

Maganga and Schadeberg (1992) presented a bare outline of Kinyamwezi grammar and lexicon within 9 months from September 1986 to June 1987. Let it be noted that Kinyamwezi is a daughter language of Kisukuma, and they used Jidakama dialect of Kisukuma language. Along with other things, they presented six causative morphs: *y-*, *-ch-*, *-j-* and *-ish-*. We appreciate Maganga and Schadeberg's 9 months' work as they presented causatives; some are similar to those documented in this work; thus, the current study goes beyond making an analysis of phonological processes triggered by verb extension in our natural languages.

Fernando (2004, p.128) investigated verbal affixes in Kikongo with special emphasis on form and functions. The author found that *-il-*, *-el-* are applicative morphemes, *-is-*, *-es-* are causative morphemes, -ki- the reflexive morpheme, -w-, -iw-, -ew- passive morphemes, an-, -azyan- reciprocal morphemes and -ik-, -ek- stative morphemes. With regard to verb extensions in Kikongo, the author gave us good information on the way the Kikongo language manifests verb extension; the current study uses another approach to see how these extensions trigger phonological processes.

In his PhD research, Matondo (2003) investigated Tonal transfer in Kisukuma and Kemunakiya dialects, in particular under Optimality Theory (Cf.pp.198-202). The author mentioned some Kisukuma verbal morphemes extended from verbs' stems causative morph *-y-*, passive morph *-iw-*, applicative morph *-il-*, *-el-*, inversive morph *-ul-*, reciprocal morph, *-an-*, stative morph -*ik-*, *-ek-* and persistive inversive morph *-ol-*. In his study, Matondo did not account for the phonological process as the result of the verb extensions he outlined, though they were observed in his presentations.

Kanijo (2012) investigated the f*ormatives of tense and aspects in the verbal construction of KiNyamwezi* spoken in *Uyui* district in Tabora region of Tanzania. In his discussion of verb construction, he mentioned verbal extension in passing, as in *seka* 'laugh' and *secha*' cause to laugh' and others (Cf. Kanijo, 2012, p.28). With this sample of data, there is phonological process that needs to establish its rules of formation under the theory of generative phonology. Thus, the current investigation illustrates the phonological processes triggered by verbs conjugations in the languages we speak and establish their phonological formal and informal rules.

Philippson and Nurse (2002, pp. 14-17) investigated several topics on Gweno language (E65), a little known Bantu language of Northern Tanzania; the language is spoken by several thousand people in the North Pare Mountains of north-eastern Tanzania. These authors presented tense and aspects, sound inventory, word formation, noun classes and verb extensions in Gweno. For them 'Extensions are derivational suffixes which are added to a verbal radical to modify its syntactic valency or its lexical meaning', thus they identified six such extensions denoting: /-u-/ reversive, /-ek-, -ik-/ stative, /-(l)e-, -(l)i-, -er-, -ir-/ applicative, /-an-/

reciprocal, /-w-/ passive and /-r-/, /-ʃ-/ /-éϴ-/, /-ṭ-/causative morphemes. These extensions have resulted in various phonological phenomena, as in *seka* 'laugh' and *seṭa* 'make to laugh', *ßaba* and *ßaʃa* to mention just but a few shows that their extension is manifested phonological processes of which the current study investigates by establishing the rules of these processes.

Lothi (2002, pp. 5-25) investigated 'verb extensions in Bantu with reference from Swahili and Nyamwezi languages. The author found eleven verbal extensions in Nyamwezi and Kiswahili, namely subtractive, e.g. reduplication, static morph *ma*, *mana*, contactive morph *-ta-*, conversive morph *-ul-*, causative morph *-y-*, *-ch-,-j-*, applicative morph {*-il-*, stative morph *-ik-,-ka-*, passive morph *-w-* and reciprocal morph *-an-* augmentative morph *ul-*, *-il-*, *-ug-* and inceptive extension (e.g. *-pa-* in Kiswahili and *-ha-*, in Kinyamwezi. Lothi's analysis of Nyamwezi and Swahili morphemes of verb extension reveals numerous phonological processes, though they were not touched on in their explanations (Cf.p.15). However, the current investigation appeals to presenting phonological phenomena as the result of verb extensions in both Bantu and other languages of the world.

The study of phonological processes triggered by means of verb conjugation was guided by the Generative Phonology Theory (Chomsky & Halle1968). In this theory, principles that govern the association of phonological and phonetic representations are referred to as rules or algorithms. It holds the view that all utterances (and the morphemes which make them up) have an underlying and phonetic representation. The two forms are linked by one or more phonological rules (or no rules at all if the two forms seem to be identical). This theory is important since it provides the tools to discover how underlying representation can be mapped into surface representation and how the two levels are mapped onto the other as proposed by (Chomsky & Halle, 1968).

On top of that, GP theory proposes that there is a need to incorporate phonological rules in linguistic description in order to describe alternations in the shape that a morpheme undergoes in various environments. These rules show the predictable features of pronunciation found in the phonetic representation of each morpheme. However, Generative Phonology (GP) calls for the explicit notational system in describing the sound structure of language; it insists on the formal features of phonological and phonetic representations (Massamba, 2010). GP provides operational procedures for mapping one representation onto another; in this mapping, the theory explicitly shows underlying and surface forms or structures. Therefore, this theory has been of great help in determining the environment in which segments undergo the phonological process, as the current study is concerned.

The Generative Phonology Theory has four tenets. One is generative Phonology Theory, which is aimed at developing fully explicit or algorithmic phonologies that generate the surface forms of a language. Two, the Generative Phonology Theory expresses that the developed explicit phonologies should employ derivational means (which is sequential and procedural analysis) so as to generate the forms of a language. Three, in Generative Phonology Theory, the phonological representations used were in linear sequences of matrices of feature values. Segment of sounds were to be represented as bundles of binary features. The selection of this theory is because it provides a clear understanding of the relationship between the underlying and a phonetic representation and that the two forms are linked by one or more phonological rules.

3. Data Collection Method
This study was qualitative in nature whereas it used words, phrases and sentences in describing and illustrating phonological processes triggered by the means of verb extensions. The work used one instrument of data collection, it 'unobtrusive measure'. Unobtrusive measures, however, involve the use of non-reactive sources, independent of the presence of the researcher, and include documentary evidence, physical evidence and archive analysis (Gray, 2014, p. 498, 502). Thus, for the current study, the work used documentary systematic review and, sometimes referred to as 'secondary data (Cf. Webb et al. 2000). This is the process of identification, verification and evaluation of documents which are related to the topic under discussion. The main function is to contextualize facts, situations or points in time and to lead to the adoption of new panoramas in other environments; it should take an objective reflection from the original source and allow localization, identification, organization and evaluation of information contained in the document, thus comprising the systematic process of the collection, treatment and analysis of information (Robson, 2002). From this base, the study used a systematic review of peer-reviewed literature and evaluation from the text books and articles of different languages researched and written in verb extensions. The electronic database from the Internet and the World Wide Web (www) allowed the researcher to access materials on verb extensions; other sources like Taylor & Francis publications, Sage publications and Google academic journals were researched.

It must be noted that only books or articles addressing verb extensions were considered for review. The paper used a library research review of peer-reviewed journals and publications. The rationale for carrying out this technique of data collection was due to the fact that many scholars who have written on phonological processes have less investigated the processes triggered by verb conjugation, though there are many of them being written in written books and other academic documents.
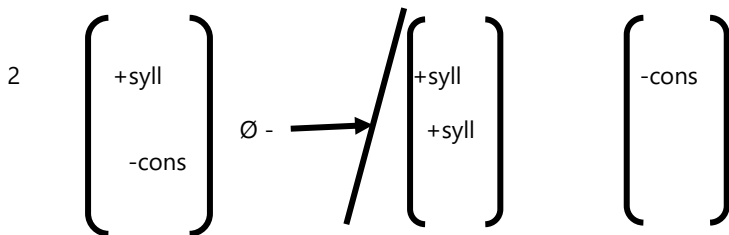
4. Findings and discussion
4.1 Elision
When sounds are not only silent but also deleted in connected speech as one of the repair strategies in natural languages, such phenomenon is known as elision. In other words, elision refers to the linguistics term used in phonology and phonetics that implies 'to the process of not pronouncing a sound which is present in deliberately careful pronunciation of the word in isolation' (Yule, 2006, p. 49). However, such a process has been evidenced (basing on the current study) as being triggered verb extensions. Consider the Chichewa examples in 1 below:

1. (a) Umb **a**-**i**dwa   umb**i**dwa   'be moulded'
   (b) Omb **a**-**e**dwa   omb**e**dwa   'be slapped
   (c) Pit**a**-**i**tsa   pit**i**tsa   'cause to surpass'

   (d) Pet**a**-**e**tsa   pet**e**tsa   'cause to sieve'   (Mtenje, 1980, p.50)

The data in 1(a-b) shows /-idwa/ and /-edwa-/ forms are allomorphs of the same passive suffix and that /-itsa/ and /-etsa-/ forms are allomorphs of a causative suffix in 1(c-d). with reference to this data, we observe that V_1 deletes and V_2 remains. However, since GP Theory has systematic procedures, the elision process can be illustrated from its deep to surface structure below using the notional system in describing the sound structure. The phonetic and phonological rule of elision is taxonomically shown in rule 2 below:

$$2 \quad \begin{bmatrix} +\text{syll} \\ \\ -\text{cons} \end{bmatrix} \quad \emptyset - \longrightarrow / \begin{bmatrix} +\text{syll} \\ \\ +\text{syll} \end{bmatrix} \quad \begin{bmatrix} -\text{cons} \end{bmatrix}$$

Therefore, as the data indicates, the V1 is being deleted when being proceeded by another vowel. Chichewa native speakers delete in their speech as one of the repair strategies for their language.
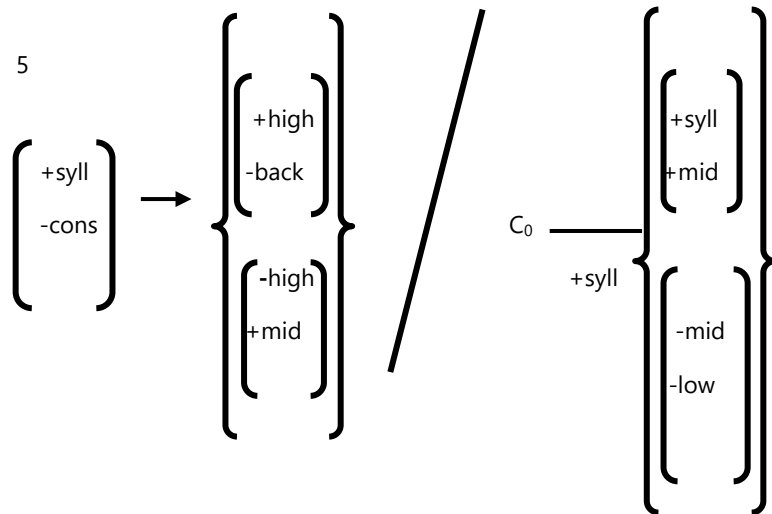
4.2 Vowel assimilation
This is one of the assimilatory processes whereby vowels assimilate to each other. In other words, a vowel of one syllable may become more like the vowel of another syllable (Massamba Massamba, 2010, pp. 109-110). However, the study found that vowel harmony can be evidenced in applicative verb extension and others. Consider the following data in the Igiha and Kiswahili languages of Tanzania 3 below:

3. (a) Hera   herera   'finish at'
   (b) Kora   korera   'do for'
   (c) Rira   ririra   'cry for'
   (d) Gaba   gabira   'give for'   (e)
   Tura   turira   'hit for' (Betrina, 2023)

4. (a) Pigia   pig-i-a   'beat with/for'
   (b) Letea   let-e-a   'bring with/for'
   (c) Fanyia   fany-i-a   'do with/for'
   (d) Chezea   chez-e-a   'play with/for'
   (e) Amualia   amul-i-a   'judge for/with'
   (f) Tolea   tol-e-a   'remove with/for' (Massamba, 2020, p.110)

The data in 3-4 shows applicative verb extension in Igiha and Kiswahili languages, both spoken in Tanzania. Such an applicative process evidences the assimilation phenomenon, one of the phonological processes in our natural languages. It is observed that the suffix vowel is sometimes as [i] and sometimes [e]. That is to say, [i] occur when the root vowel immediately preceding it is[i], [u] or [a]; while this is true, the manifestation of the vowel [e] occurs when the vowel immediately preceding the applicative suffix is either [e] or [o].

Having seen different features of the formalism of the phonological process above in pertinent to applicative verb extension in Bantu languages, the data in 3 and 4 can be formally represented in the following formal rules in 5:

$$5 \quad \begin{bmatrix} +syll \\ -cons \end{bmatrix} \rightarrow \left\{ \begin{bmatrix} +high \\ -back \end{bmatrix} \middle/ \begin{bmatrix} -high \\ +mid \end{bmatrix} \right\} \quad C_0 \underset{+syll}{\rule{2cm}{0.4pt}} \left\{ \begin{bmatrix} +syll \\ +mid \end{bmatrix} \middle/ \begin{bmatrix} -mid \\ -low \end{bmatrix} \right\}$$

The rule in 5 states that the presence of {a, i and e} vowels in the stem harmonizes to the vowel {i} and the presence of {o} vowel in the stem harmonizes to mid vowel {e}. in other words, the syllabic vowel becomes high and mid in applicative derivation when precedes consonant in their verb stem.
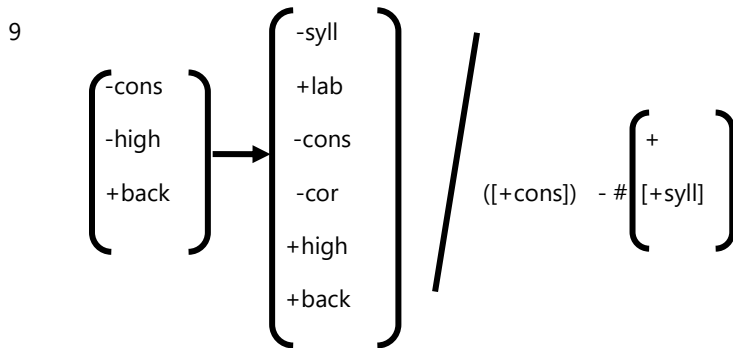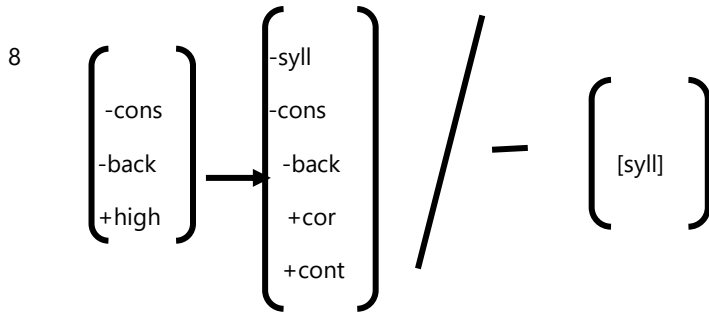
4.3 Glide formation

Glide formation is formed in the context that [+high] vowel as v_1 and v_2 as a [-high] or a non-homorganic [+high] vowel are preceded. The study identified that it is he passive and causative extensions that manifested glide formation as one of the phonological processes in Bantu languages. It was observed that the unrounded front high [i] and the rounded back high [u] will cause gliding of two glides. In other words, the voiced glide [w] appears when the rounded back high vowel [u] is followed by a non-high or non-homorganic high vowel, while a semi vowel [y] occurs when a [+high] vowel is followed by a non-high vowels. The former is known as the back glide, and the later is the front glide. Massamba (2010) added that front glide formation is derived when a high front vowel [i] changes into its correspondence glide [y] if it is followed by any vowel except a high front vowel. Consider the data in 6-7 from the Kisukuma language of Tanzania.

6. (a) Lemb-i+-alembya   'cause to chest'   (b)
    Lem-i-a   lemya   'make to refuse' (Simon, 2018)

7. (a) ßonj-u+-a ßonjwa   'be tested'
    (b) Punj-u-+a   punjwa   'Be given incomplete' (Mutebi, 2017, p.41)

The data in 6 shows that the causative [y] is formed by the combination of [i] and [a] vowels; while this is true, the formation of back glide [w] is formed when the back vowel [u] and the lower vowel [a] are combined together. The phonological processes in 6-7 can be formally presented formally in 8 and 9 rules, respectively.

8
$$
\begin{bmatrix} -cons \\ -back \\ +high \end{bmatrix} \rightarrow \begin{bmatrix} -syll \\ -cons \\ -back \\ +cor \\ +cont \end{bmatrix} \Big/ - \begin{bmatrix} [syll] \end{bmatrix}
$$

9
$$
\begin{bmatrix} -cons \\ -high \\ +back \end{bmatrix} \rightarrow \begin{bmatrix} -syll \\ +lab \\ -cons \\ -cor \\ +high \\ +back \end{bmatrix} \Big/ ([+cons]) \ - \# \begin{bmatrix} + \\ [+syll] \end{bmatrix}
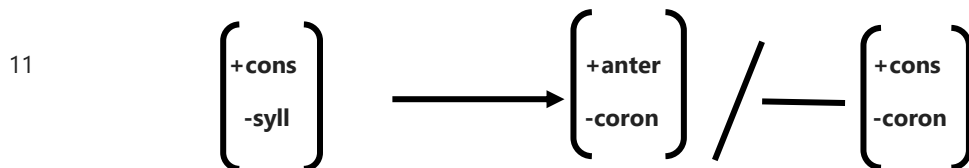$$

The rule in 8 and 9 shows glide formation in Igiha language of Tanzania. To be specific, the rule in 8 shows the changing of the back rounded [u] into the back glide [w]. Again, the rule in 9 shows the change of the front high vowel [i] into semi vowel [y] in Kisukuma language. Thus, the former is back glide while the latter is front glide formation.

4.4 Affrication

Affrication comes from the term affricates. Thus, affricates are sounds produced with the brief stoppage of the air stream and an obstructed release, which sometimes causes *frication* (McCully 2009). Therefore, affrication is the phonological process in the languages we speak whereby a non affricate sound is changed to affricate. In other words, it is the process in which a sound that either stops or affricates is changed and articulated to the position of affricated sounds. This is evidenced in velar plosives as in /k/ /g / of the stem, which changes to affricates /tʃ/ and /dʒ/. This means that when the stem contains alveolar lateral /l/ initially, the causative phoneme /tʃ/ results into account (Simon, 2022); when the stem initially contains velar /g/, the causative /dʒ/ phoneme happens. Consider the following process as the result of verb extension found in the two dialects of Kemunasukuma dialect of Kisukuma (Simon, 2022), Jidakama (Kanijo, 2012) and Echilongo dialect of Échizinza language (Simon, 2021) 10 below:

10. (a) Seka   'laugh'   Secha   'make to laugh'   Kanijo,   (2012, p. 28)

    (b) Hika '   hicha   make to arrive'   Simon, (2021, p. 23)

    (c) Luka 'vomit'   Lucha   'make to vomit'   Simon, (2018, p. 54)

The data in 10 shows that the voiceless stop velar sound /k/ Kisukuma basic verbs changes to affricate /č/ or /tʃ/ in causative verb extensions. However, the data in (10) can be represented in the following formal rule:

11
$$
\begin{bmatrix} +cons \\ -syll \end{bmatrix} \longrightarrow \begin{bmatrix} +anter \\ -coron \end{bmatrix} \Big/ - \begin{bmatrix} +cons \\ -coron \end{bmatrix}
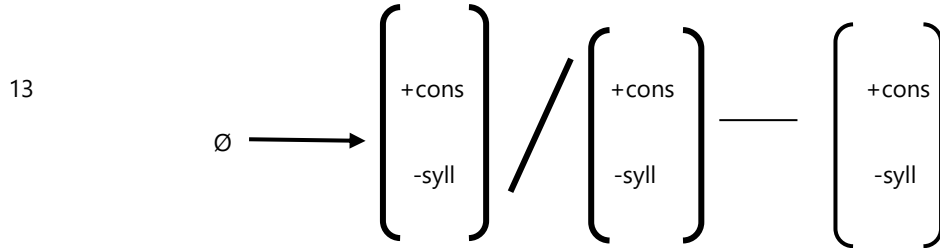$$

With reference to 11 illustration, the rule for this process shows that the non-syllabic consonants becomes affricates consonants when making causative formation in the three languages mentioned above.

4.5 Epenthesis

Epenthesis is one of the phonological processes whereby a segment is inserted within the word. The data available shows that the segments are inserted inside the word when making causative derivations. Let us see causative derivation in Tiene [tiini] or Tende, a Bantu language spoken in the Democratic Republic of Congo.

> **12**. (a) laba 'walk'   la**s**aba 'make to wal'
>
>   (b) Loka 'vomit'   Lo**s**eka 'make to vomit'   Hyman, (2006)

The data in Tiene shows that the voiceless sound [s] is inserted within the word when deriving causative formation. Such a process is known as epenthesis in linguistics phonology (Cf. Massamba, 2010, p.115). The data in 12 can be formally represented in the following formal rule in 13:

13
$$\varnothing \longrightarrow \begin{bmatrix} +cons \\ \\ -syll \end{bmatrix} \Big/ \begin{bmatrix} +cons \\ \\ -syll \end{bmatrix} \underline{\quad\quad} \begin{bmatrix} +cons \\ \\ -syll \end{bmatrix}$$
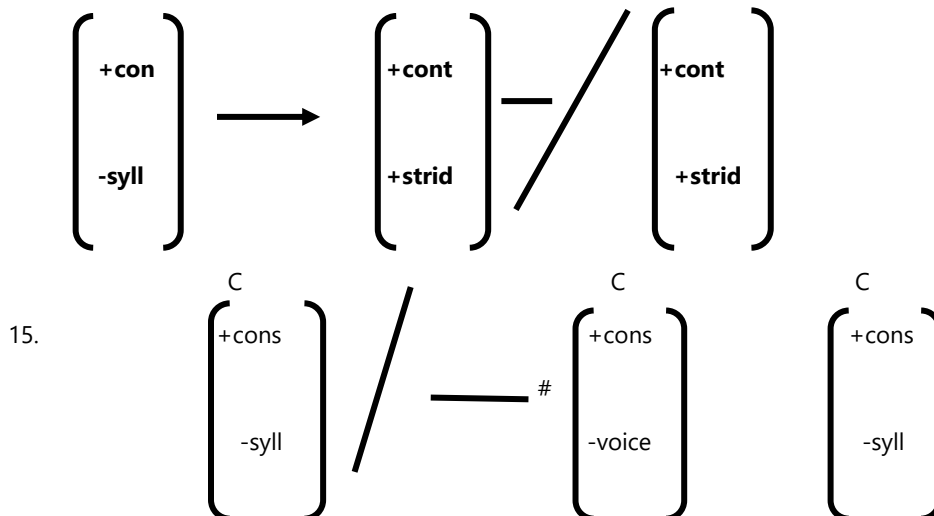
The rule of anaptyxis states that a non syllabic consonant /s/ is inserted between two consonants in the environment that the sound is followed and preceded by a consonant sound in making causative derivation in the Tiene language of Congo.

4.6 Fricativisation

Fricativisation comes from the word 'fricative'. Thus, before tackling the process, let us define what fricatives sounds are? Thus, fricatives are sounds produced with friction in the vocal cords. Gimson (1980) stressed that these sounds are produced with two organs being brought together and held sufficiently close together for escaping airstream to be produced. However, Fricativisation is the phonological process whereby sounds (stops or stop spirant) are changed into fricatives. The study identified some non fricatives sounds in different languages change into some fricatives sounds. Consider the following data in 14 below:

> 14. (a) Mila   'swallow' miza 'make to swallow'   Échizinza language   (b) Mela
>   'sprout'   meza 'make to sprout'   échizinza language
>
>   (c) Mata   'go'   maasa 'cause to go'   Tiene language
>   (d) Kala   'be'   kaasa 'cause to be'   Tiene language
>   (e) Taana   'get thin' taasa 'cause to get thin'   Tiene language
>
>   (f) Lala   'sleep'   laza   'cause to sleep'   Swahili language

The data in the three languages above (Cf. 14) shows that the non fricatives sound become fricatives, which are produced by blocking almost the air stream and having the air push through the narrow opening.

$$\begin{bmatrix} +con \\ \\ -syll \end{bmatrix} \longrightarrow \begin{bmatrix} +cont \\ \\ +strid \end{bmatrix} \underline{\quad}\Big/ \begin{bmatrix} +cont \\ \\ +strid \end{bmatrix}$$

$$\overset{C}{} \qquad\qquad\qquad \overset{C}{} \qquad\qquad \overset{C}{}$$

15. $$\begin{bmatrix} +cons \\ \\ -syll \end{bmatrix} \Big/ \underline{\quad} \# \begin{bmatrix} +cons \\ \\ -voice \end{bmatrix} \begin{bmatrix} +cons \\ \\ -syll \end{bmatrix}$$

4.7 Palatalization

This is another phonological process which is triggered by a causative extension (for the current data). Palatalization is the process in which a non- palatal consonant sound acquires some palatal features. The study found that spirantization of the root-final consonant accounts for the mentioned phenomenon. The data in 17-18 exemplify:

17. (a) pit-a   'pass'   pish-a   'make pass'
    (b) pook-a   'bust'   poo-sh-a   'make bust'

    (c) kos-a   'be hard' kosh-a   'make hardr'   (d)
    lung-a   'hunt'   lunsh-a   'make hunt'   (Kula, 2002, pp. 109-110)

18. (a) shok-a   'turn'   sho-sh-a   'make to turn'
    (b) shik-a   'arrive'   sh-ish-a   'make to arrive'

    (c) shek-a   'slim'   sh-esh-a   'make slim'
    (d) luk-a   'jumb'   lu-sh-a   'make to jump'   (Simon, 2018)

The data in 17-18 shows palatalization process by the means of causative formation. That is to say, the non-palatal consonant has acquired palatal features or has been palatalized. The process can be formally represented in the following rule:

19
$$\begin{bmatrix} +cons \\ -syll \end{bmatrix} \longrightarrow \begin{bmatrix} +anter \\ -coron \end{bmatrix} / \underline{\hspace{1cm}} \begin{bmatrix} +cons \\ -coron \end{bmatrix}$$

The rule states that the non syllabic consonants have acquired palatal features, hence the palatalization process.

5. Conclusion

The shows the general summary of the study, drawing attention from the objective of the study, a summary of the findings, interpretation and discussion, study limitations and suggestions for future investigations. The section starts with the objective of the study.

5.1 Objective

The aim of the paper was to examine phonological processes being triggered by verb extensions anchored in the Generative Phonology Theory, which postulates a transition from underlying representation to surface structure; the research aims to understand the phonological outcomes stemming from verb extension morphology, particularly in Bantu languages

5.2 Results Summary

This study reveals phonological processes which have been influenced by verb conjugations in Bantu languages in their form, type and numbers. The findings reveal multiple phonological processes, including palatalization, elision, vowel assimilation, glide formation, ffrication epenthesis and fricativisation, demonstrating the dynamic shifts induced by verb conjugations. The phenomenon of word elasticity, as presented, shows how words can morphologically or phonologically transform depending on the linguistic context. It is evident from the study that the morphology of verbs, especially in Bantu languages, plays a fundamental role in shaping phonological outcomes. Several researchers, while extensively covering the morphology of verb extensions, have occasionally overlooked the phonological processes that stem from these extensions. This paper contributes to bridging that gap by deeply analyzing these phonological complexities. Through processes such as glide formation, affrication, epenthesis, and others, we observe the dynamic nature of phonological shifts that are a result of verb conjugations. Therefore, this comprehensive examination of phonological processes instigated by verb conjugations illuminates the elaborate relationship between morphology and phonology. It highlights the need for a deeper understanding of verb extensions to comprehend the phonological distinctions in various languages.

5.3 Interpretation and Discussion

The findings of this study designate how phonological phenomena being triggeres by verb extensions are inter related in the two disciplines, being phonology and morphology. The deletions phenomena are triggered by simplifications, while the insertions are triggered by the nature and behavior of Bantu languages. Theoretically, the Generative Phonology Theory provides a foundational framework for understanding the transition from underlying representation to surface structure in language. This

theory is instrumental in highlighting how morphemes manifest in different phonetic environments and how certain phonological algorithms influence their ultimate representation. Furthermore, the qualitative approach of data collection through unobtrusive measures enriched the depth of this research. By employing documentary systematic reviews and analyses, the study encapsulated a broad spectrum of verb extensions across various languages and dialects.

5.4 Study limitations

The limitation that the study faced was the nature of Bantu language characteristics, including the ability to possess tones. It is very difficult for tone to be expressed in phonological rules simply because the study was specifically on phonology and morphology, unlike suprasegmentals. This appears to be the proposition of new elegancy under discussion, which the next subsection recapitulates.

5.5 Areas for Future Research

The study cannot claim to have captured all phenomena on phonological issues in relation to verb extensions in Bantu languages. In turn, there is a need for further investigation on the envisioning of tone and tonal transfer on Bantu verbs and the way such transfer triggers two contexts: semantic meaning and morphological changes. It seems that most of the Bantu languages are tonal languages and that tone triggers pitch movement on the syllable, which results in either insertation or substraction of the phoneme.

Conflicts of Interest: The author of this article declares no conflict of interest."
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