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The Evidence of Autosegmental Approach in Kisukuma: A Non Concatinative Analysis

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Abstract

This paper sets out the evidence of nonlinear theory in Kisukuma language F21. Kisukuma is an agglutinative language in which most of its word formation phenomena are offered by Item-and-Arrangement Theory. However, there are few prototypical words elasticity, as in glidization and infixation that cannot be handled linearly, linguists have not yet presented them within the framework of a nonlinear approach. Therefore, it is on this basis the paper provides analysis of the topic under discussion. Methodologically, the paper used documentary techniques for data collection and Autosegmental phonology was the tool for data analysis. It was found that Glide formation and infixation prototypical forms of word formation in Kisukuma are well handled by Autosegmental theory other than Item-and-Arrangement theory and other configuration rules like Leipzig glossing rules. It is expected that the analyses being done in this study will have practical pedagogical implications in the teaching of segmental aspects of the Kisukuma language and other related languages.

Keywords: Non concatenative; Autosegmental; Gliding; Infixation; Lengthening

1. Introduction

Prototypical word formation processes have been linearly treated especially for agglutinative languages. For that matter morphological theory as in Item-and-Arrangement ideal hence forth (IA) has attracted many morphologists before the mid-1970s for explaining word formation processes in linear fashion. However, following the fact that some of word formation processes cannot be handled by IA theory, it has made the introduction of Nonlinear fashion or approach for handling such phenomena. This is opposite to Semitic languages ever since they offer a strong challenge to linear models of word formation because they form words through other processes like infixation being it non concatenative mode (McCarthy, 1982a).

In Bantu languages however, processes like infixation, gliding and compensatory lengthening are prototypical phenomena which are handled with Nonlinear approach being it Autosegmental phonology theory within the framework of Non concatenative morphology (Katamba, 1993). Kisukuma, a Bantu language has all these forms of word formation though no linguist or written document which has proposed how Non concatenative theory can be envisaged in such prototypical phenomena. Literatures on glidization and infixation in Bantu languages are offered by linear approach which makes inadequacy explanations. Let us see a presentation of the morphophonemic of vowel compensatory lengthening in Ekegusii language spoken in East Africa particular in Kenya.

1. /Omuana/ > [omwana] 'child' (Komenda et al, 2013: 4).

According to Komenda, with the formation of a glide /w/, the lengthening of the vowel /a/ is done to compensate for the

loss or shortening of /u/. Such a representation enabled us to identify and describe the vowels that are lengthened in the data. However, the descriptions given by Komenda seem to be inadequate compared to Autosegmental phonology if applied. My argument is that the introduction of Multilinear fashion together with the Well Formedness condition hence forth (WFC) empowers: stage one, two, three and four via one-to-one association of lines. This make us explicitly understand why, what and how a certain sound is deleted or replaced by another sound to compensate for the loss other than the way linearity is operated like in 1 above.

Under the level of analysis, non concatenative morphology like infixation process which is fashioned in Kisukuma language cannot be handled well within IA theory and other linear approaches as stated elsewhere in this paper. Therefore, infixes again cannot provide explicitly understanding when are figured linearly. Consider the following Kisukuma data:

1. (a) *Ku-tuj-a*
Inf-cross-Fv
'To cross'
- (b) *Ku-tu-gr-j-a*
*Inf-cross-Fv
'To cross for/to' (adapted from (Goodman, 1960))

Given the data in 1(b) above, an infix -gr- has not been presented in the literal translation level of glossing rule, that is to say the lexeme *tuja* 'cross' and *tugija* which means 'cross for or to' shows that an infix cannot be glossed following the fact that it is conjoined within the stem, thus the lexeme *tuja* cannot be separated in its semantic scope as in *tu* and *ja*. Note that the source of this problem is a belief that Bantu languages have no infixes since are agglutinative in nature Johnson, quoted in (Doke 1950) as the result no study that has been exhausted on

the topic under discussion due to the lack of understanding. Given this problematic challenge or inaccurate infixal presentation nearly, it is evident that linear approach in pertinent to infixes and other morphological processes like glide formation give us incomplete knowledge or flawed understanding of which to solve it needs another approach being it nonlinear approach that would be a better and proper theoretical phenomenon in presenting prototypical word formation of this nature.

Autosegmental Phonology Theory was the tool of analysis which was proposed by (Goldsmith, 1976) whose initially was introduced to handle tones though latter it was extended to cover other morphological phenomena. In Autosegmental phonology, phonological representations consist of segments as in stress, tones, vowel and consonants appear on autonomous tiers. It must be noted that on their *tiers* phonological elements behave as though they were segments and that they cannot occupy the same space (Katamba, 1993:156).

However, as it is said that the original impetus of AP was to handle tone, therefore, unlike tone presentation in different ways to tone-bearing units, segments may also be linked in a variety of ways in tiers e.g., skeletal tier. However, within AP, phonological and phonetic representation are conceived of consisting of Multilinear sequences of segments and auto segments in form of tiers. The forms of tiers are organized by the use of association of lines as well as condition known as Well Formedness Condition hence forth (WFC). The WFC states as follows:

1. Each vowel must be associated with (at least) one tone;
2. Each tone must be associated with (at least) one vowel;
3. Association lines do not cross. (Goldsmith, 1976)

Given the WFC, it must be noted that Multilinear sequences of segments and auto segments are organized in forms of tiers which are Segmental tier, skeletal tier and tonal tier. However, for current analysis in this paper, tone tier will not be discussed following the fact that the paper in on prosodic morphological prelude and not purely in phonology.

It is from this juncture I adopt McCarthy (1982)'s modification of approaching in presenting WFC by ignoring tone. That is to say, the place of tone should be ignored instead melody takes place in forms of C and V slots. Thus, a given melody is attached in one to C slots in on- to -one- fashion from the left to the right, respecting to WFC with which it is simplified as follows:

- a. Every CV skeletal must be associated with at least one melody element
- b. Every melody element must be associated at least one appropriate C or V slot
- c. Association of lines must not cross to each other (Spencer, 1991:137)

This means that since tone will not be considered, it is just C and V which will be presented melodically in this paper. Therefore, this paper intends to account the insinuation of nonlinear approach being it a concatenative theory in presenting Kisukuma infixation and glidization data.

2. Material and Methods

The data of this paper came from written sources of Kisukuma language of Tanzania (Cf, Matondo, (2003); Goodman, (1960); Chipanda (2021) and Mihayo, (1966). It must be noted that these authors did not present the selected data autosegmentally but the author of the current paper

presents autosegmentally by showing what and how linear model or theory had problem in presenting infixation and glidization data. Sources were read one by one to determine non concatenative phenomena as in gliding, compensatory lengthening as well as infixation process. It is from these data of which autosegmental phonological apparatus were figured within them.

3. Discussion of Results

This subsection presents data from literatures and discusses them thoroughly following the objective of the paper. The paper aimed at presenting the evidences of nonlinear approach being it Auto segmental theory in Kisukuma language. However, in arriving to answers, Sukuma literatures were consulted as it has been stated elsewhere in this article. Thus, two forms of data that were discussed namely: glidization and infixation that seem to be configured in the theory under discussion. We start with gliding:

3.1 Glidization Data

This is nothing but a phonological process in natural languages in which two vowels are coalesced in juxtaposition together and results into either [w] or [y] glide. However, this definition is specific for Bantu languages ever since other language do not form glide from such rule of juxtaposition for example the Japanese language juxtapose /i/ and /u/ and coalesce to form [yu:] from through a rule of Glide Formation that (Poser, 1982). Therefore, despite the fact that there are styles of forming glide, it is not a debate for the current study, and the current analysis presents how autosegmental phenomenon handles the result being resulted from juxtaposition of these vowel sounds. In this paper I present a derived data from selected sources and make analysis by showing how nonlinear approach co-figures these phenomena. I start with glide formation data adapted from Mihayo.

2. (a) /tu-e-la/ → [twe:la] 'we are clean' (Mihayo, 1966).

The data in 2 shows the formation of glide [w] and the process is known as gliding process. Such process follows the rule of glide formation in which the front vowel [u] juxtaposes and coalesces in forming back glide [w] However; therefore, such process can be presented by using the notation of nonlinear dichotomy.

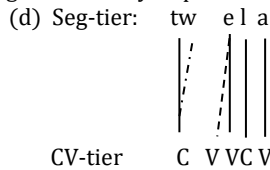
(b) Seg-tier: t u e l a
 | | | |
CV-tier C V V C V

The data in 2 (b) shows *CV-tier* means skeletal tier and *Seg-tier* means segmental tier. The former represents the canonical shape of the particular language. In accordance to segmental phonology, the first step should present segmental tier and skeletal tier. However, referring to our data in 2(a) shows a certain process being it gliding process of which makes us to write step two in accordance to non linear approach as follows:

(c) Seg-tier: t (u) e l a
 | | | |
 | | | |
CV-tier C V V C V

In data 2 (c) it is seen that the circle around the vowel indicates deletion, that is to say such sound [u] will not be deleted because it is high, instead its vacant will be taken by a glide. This takes us to the third stage with which we observe that the derived [w] is formed from /ue/ through a rule of glide formation. Thus, such rule shows the movement of /u/ feature

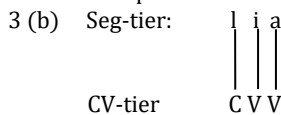
into the position of [w] via vacated feature of [u]. Therefore, the Autosegmental analysis presents as follows:



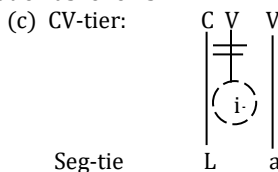
The data in 2 (d) the vowel [u] is high then it is not deleted, that is to say its formalism is associated with C slot to its left and becomes to be surfaced as non-syllabic glide. In the other hand vowel or V-slot which is has been replaced by a glide is taken over the second vowel which is lengthened in compensatory. The glide formation seen above is right word spread, this differs with Fukui’s (1986) analysis of glides in Japanese in which the nature of glide formation in Japanese is Leftward Spread, spreads a bundle of features from the segment to which it is linked leftward to an unspecified segment. In the language under discussion, the form of glide formation is a rightward formation, the data in 3 that is adapted from Richardson illustrates:

3 (a) *li-a* → *lya* ‘eat’ (Richardson, 1959).

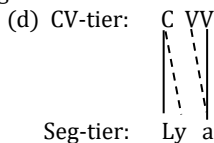
The data in 3(a) shows another phenomenon of glidization in which Kisukuma language does not allow the diphthongs /ia/ or /ua/. Thus, /i/ and /u/ change into their respective glides /j/ or /w/. However, the above data can be figured out within Autosegmental approach via multilinear fashion as shown below in step one:



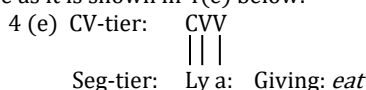
The data in 3(a) show us segmental tier which represents the segments of a lexeme and skeletal tier which represents the shape of the give segments. The next step is the dichotomy in which phonological process starts to be indicated e.g. gliding process in which a front long vowel [i] and the back front low vowel [a] juxtaposes together and [y] front glide is formed; such formation triggers us to capture the next step of configuration as follows:



In data 3(c) it is seen that the circle around the vowel indicates deletion as stated elsewhere above, that is to say the segment [i] will not be deleted because it is high, instead its vacant will be taken by the front glide [y]. This takes us to the third stage.



The data in 3(d) shows how the vowel or V-slot which is has been replaced by a glide is taken over the second vowel which is lengthened in compensation. In other words, the compensation takes place to replace the duration which has been take place in pronouncing [i] sound before being replaced by the front glide [y]. Thus, we get different structure which differentiates deep structure (Cf, 2a,3a) above to surface structure as it is shown in 4(e) below:



The data in 3(e) shows the surface structure of glide formation in Kisukuma. It is a rightward direction of forming a front glide [y] after the juxtaposition of front close vowel /i/ and the front low /a/ vowel. Such behavior of right ward differs with languages whose glide formation is leftward. Latin language is a classic example of leftward glide formation /uenio/ [we.ni.o] ‘I come’ and /iecur/ [je.kur] ‘liver’ (Steriade, 1984). With this data, it indicates that languages like this show predictable behavior of the phenomenon.

3.2 Infixation data

Before presenting how infixes are being figured nonlinearly, it is better to know the sense and nature of infixes in linguistics inquiry. This is following the fact that some scholars define infixes politically and even their examples do not harvest tangible (Cf, Prentice, (1971)) in his study of Amis, an Austronesian language spoken in Taiwan, presented reduplicated data from singular to plural claiming to be infixation as in *baso* ‘glass’ and *babaso* ‘glasses’ (Ibid, 1971:99). From this base, it is better to put it clear the meaning of infix and its process.

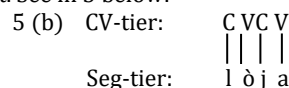
Subsequently, scholars have made different ponderous on infixes’ definition. Yu (2006) defined that a modifying element inserted in the body of a word, instead of being prefixed or suffixed to the stem. Russell Ultan in his pioneering study of the typology of infixation (1975) noted that infixes are rare compared to the frequency of other affixes. He added that the presence of infixes in any language implies the presence of suffixes and/or prefixes, and no languages employ infixation exclusively (Greenberg, 1966, p. 92). The process in which affixes are incorporated inside another word is called infixation (Yule, 2006, p.58).

Within the same line of definition Payne says that an affix is considered an infix when it “occur (s) within stem” (Payne, 1997, p.30). However, the definition of the last two scholars is not quite adequate following the fact that many instances of discontinuous morphology may fall under this definition e.g., the issue of marking tense and aspect in the verbal system of Semitic languages is “interdigitated” (Plag, 2002) with the consonantal root (e.g., Egyptian Arabic **ktb* ‘write’, *kita.b* ‘book’, *katab* ‘he wrote’, *yektub* ‘he is writing’; (Nida, 1949, p. 68)). This disqualifies the last two scholars’ definition.

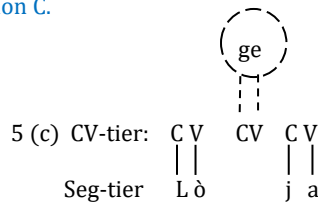
However, in this paper, I define infix as an affix which is inserted at the middle of the root or stem and not just within the stem. This means if the root or stem is XX, then the infix e.g. -t- should appear at the middle of XX as in XtX. Thus, if XX is ‘eat’ then XtX is either eaten or eater. This is hypothetical and theoretical data which houses impetus approach to this paper.

5. (a) *Loja* ‘taste’ → *logéja* ‘taste for’ (Chipanda, 2020)

The data in 5 shows the way infix has been hypothetically suggested above, in other words, the infix *-ge-* has been inserted at the middle of element *lo* and *ja* which makes the lexeme *loja* in Kisukuma language. According to our theoretical approach being nonlinear approach, such process can be represented starting with the first stage of writing the lexeme as it. See in 5 below:

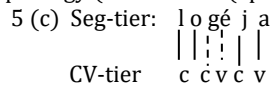


The data in 5(b) indicates segmental tier and skeletal tier. That is to say the segmental tier signs the lexeme as in *loja* which means *taste* and the skeletal tier is *CVCV* which signs the shape of segmental lexeme. After presenting the first stage, we present second stage with indicates the sign of infixing affixes in the middle of the root as it is shown in 5(c) below:



The data in 5(c) indicates the addition of CV templates which represents the canonical shape of infixes in the language under discussion. That is to say Kisukuma infixes are signed by consonant and vowel as opposite to other languages as in Arabic ones whose infixes are mostly signed by vowels in the root words. Infix is very complex to interpret following the fact that the position or direction of infix differs from language to language e.g., the Timgon dialect of Sabah Murut (Austronesian), data like *mato* > *ma-mato* and is infix to be *minamoto* which means 'eye' (Prentice, 197, p. 126-139). This is like reduplicants prefix in which it is difficult to be accounted as purely infix in linguistics.

Under the level of analysis, the infix mentioned above is in form of CV slot as it has consonant and vowel which are written above the CV template. That is to say, they have been written above the CV template for automatic spreading to the stem of the given lexeme. It must be also noted that, the dotted lines above is the style of association suggested in non concatenative morphology (see more in (Spencer, 1982, p.139)).



The data in 5(c) indicates that, there is an addition infixes at the middle of the word root *loja* which means 'taste', such infixes are in form of -CV- template as in *ge* which changes from *loja* 'taste' to an applicative sense 'logeja' which means 'taste for or taste with'. Therefore, after the addition infixes, the modified lexeme can be presented as in 5(d) below:

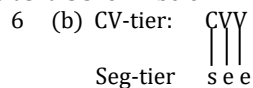


Therefore, the data in 5 (d) shows the fashioned typological representation of non concatenative morphology in Kisukuma data. It must be noted that such infixation process cannot be well represented in IA theory as it has been said elsewhere in this article.

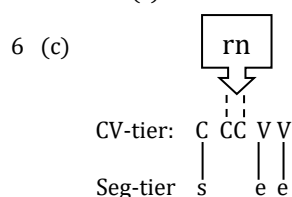
Within the same line of thinking, such presentation can attest in languages which have infixes as in Kamhmu, a language spoken in South-East Asia. Consider the following example in 6 data:

6 (a) see 'to drill' > srnee 'a drill' (Merrifield *et al* in Yule, 2006, p.58)

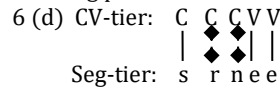
The data in 6 above shows that *-rn-* is the form of infix in Kamhmu language. It is a verb infix which changes a noun to a verb. The non concatenative or linear approach presents such data as it is shown below:



The data in 6(b) shows skeletal tier which represented by CV-slot as well as segmental tier which represents the lexeme structure. Therefore, as per nonlinear treatments infix *-rn-* will be presented above the CV-slot read for automatic spreading. See the data in 6(c) below:



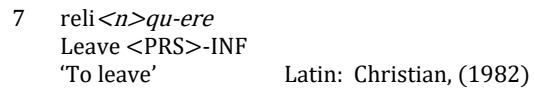
The data in 6(c) indicates the addition of infix being represented in form of *-rn-* segments. The infix is in form of CC ever since it is consonant-consonant. However, after automatic spreading of *-rn-* infix, dotted lines are crucial for the next stage which indicates association with the original lexeme. Consider the following presentation in 6 (d) below:



The data in 6(d) shows that the association lines have linked together the stem and the semantic scope of the lexeme has changed from verb 'to drill' to noun 'a drill'. However, therefore after treating such association lines in the lexeme, the final stage is to associate the well-formed word with non-dotted lines as it is indicated in 6(e) below:



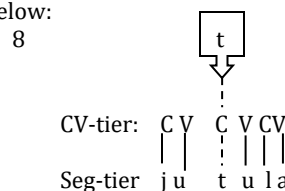
Such presentations of infixes differ with the version of Leipzig glossing rule of infix analysis in linguistics literature. The *Leipzig Glossing Rule* adapted from (Christian, 1982) constitutes three levels of string representations namely: word order or/and parsing, the literal translation and free translation level. Consider the following data from Latin in 7 below:



The data in 7 shows three levels of glossing: one is word order, second is literal translation and the third is free translation level of glossing. The Leipzig glossing above is abstract because of the fact that: the symbol used [*< >*] have no theoretical impetus ever since it has its own phonological representation like a change of a certain sound to another sound and that the semantic scope shown by Leipzig glossing rule is not explicitly clear because the stage before infixation is not shown but again the inclusion of functor as in pronoun while the translation level reports to be infinitive verb is another confusing issue to the Leipzig glossing (Ibid, 1982). This proves that the selection of nonlinear approach (non concatenative morphology) in the current paper is tangible under.

6. Conclusion

It can be concluded that, non concatenative approach to prosodic morphology is an impetus approach to either gliding process, compensatory lengthening as well as infixation process in linguistics morphology, the Kisukuma data as in *juula* which means 'take' and *jutula* which means 'forceful taking or taking something with force' cannot be well presented other than nonlinear approach to morphology (Cf, 7). That is to say the nonlinear approach as in 8 below associate well the infix above the skeletal tier via dotted lines as it is proposed by McCarthy (1982). Thus, derived lexeme as in *juula* to *jutula* has good theoretical presentation in accordance to nonlinear approach. This can be schematized s in 8 below:



The infix *t* is associated with dotted lines which does not confuse the semantics interpretation of the derived lexeme compared to 7 data above. That is why the introduction

multilinear fashion being associated with dotted lines by (Goldsmith, 1976) brought significance and theoretical implications in prosodic morphology of both Bantu and non-Bantu languages of the world. These findings call for more extensive research on other morphological or phonological phenomena in Kisukuma and across Bantu languages and the way are accounted within the framework of non concatenative morphology.

7. Recommendation

It can be recommended that other studies should be conducted on the effects of vowel compensatory lengthening on other Suprasegmentals features in Ekegusii such as intonation.

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Conflicts of Interest

The author declares that there are no conflicts of interest regarding the publication of this article.

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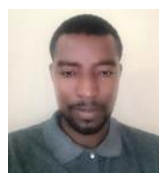
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Author's Biography



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