

A Complexity of Kiswahili Pairwise of Verbal Extensions: Algorithmic Approach

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ABSTRACT

The paper describes semantics architecture of morph pairwise in Kiswahili verbal extensions. Kiswahili morphology is well documented, though semantic descriptions of these morphs are ignored and the theory for handling them. For instance some verb morphs are silent semantically though morphologically exhibit i:e the verb wa-sh-i-k-a 'burnable' in Swahili language is difficult to explain the sense and its constituents, and most of the speakers and writers generalize such verbalizers senses and ignoring each constituent's sense such behavior needs to be described at length and the way of handling them theoretically. Cognitive Grammar was the theory applied for data analysis. The theory describes that meaning can be figured out basing on not only by word constituencies but context and experiences of the language users. The technique for data collection was documentary reviews of which 5 sources were reviewed to see how such derivations have been generalized semantically against algorithm architecture then depicting the generalized data for more algorithm analysis. It was found that, a step by stem derivations may make us understand the silent semantics of verbal morphs and their implicit senses other than generalizing them. Thus since Kiswahili is becoming a global language and East African in specific, its grammar should be well identified.

Keywords: Kiswahili, verbal extensions, pairwise, algorithm, semantic architecture

INTRODUCTION

This paper aims at describing of morphological algorithm of Kiswahili pairwise of verbal extensions in the scope of semantics. Kiswahili language has been well documented in term of verbal extensions (Doke, 1943; Ashton, 1944 and Khamis, 2008), though in terms of semantic variability there are areas in research which need to be well clarified in this language, and this is nothing but semantic algorithm of some derivations.

Literatures have been documented in pertinent to Swahili Verbal Extensions as in Khamis (2008, Kihole, 2008, Lothi, 2002, Mdee *eta al*, 2013 have discussed a lot in pertinent to Kiswahili Verbal morphs' pairwise though they did not adhere to semantic step by step algorithm¹. The data in 1

¹The term *algorithm* is used in this paper unlike the way it is applied computationally, here it is used mechanically being it each morph reflects its own semantics hence morpho-semantics

below illustrates the phenomena²:

1.a) <i>Sumbu-a</i> FV	Annoy- 'Annoy'
b) <i>Sumbu-k-a</i> STAT-FV able/disturbed'	Annoy- 'Annoy
c) <i>Sumbu-k-i-a</i> STAT-APPL-FV for/to'	Disturb- 'Annoy
d) <i>Sumbu-k-i-an-a</i> STAT-APPL-REC-FV for each other' (Khamis, 2008:172)	Disturb- 'Annoy

The data in 1a) has no derivation, whereby in 1b) there is derived stative morph *-k-* which is known as a valence decreasing argument in Bantu. In 1c) we observe the ordering of two morphs: stative *-k-* and applicative *-i-*. In 1d), three morphs are being ordered in a single root, these are stative, applicative and reciprocal. The ordering of the two morphs (*cf, 1c*) and three morphs (*cf, 1d*) indicate contextually that, most of Swahili speakers inhibit the semantic content of stative morph, that is why the semantic realm does not exhibit stative logical form (LF) as it is shown above. However, I peel to saying, this area of exhibition morphs in pertinent to their semantic content has not been taken into account despite the claim that Kiswahili has been much documented.

The pairwise of applicative *-li-* and passive *-w-* from the verb *sumbua* 'annoy' brings another tantamount claim in relation to semantic interpretations. This means that the two morphs do not explicitly show their sense and even the native speakers themselves generalize their semantic content. The data in 2 below illustrates the phenomena:

1.a) <i>Sumbu-a</i> FV	Annoy- 'Annoy'
b) <i>Sumbu-li-a</i> APPL-FV for/with'	Annoy- 'Annoy
c) <i>Sumbu-li-w-a</i> APPL-PASS-FV	Annoy- 'Be

²The following are abbreviations used in this paper:

STAT= Stative
FV = Final Vowel
PASS= Passive
CAUS= Causative
Cf = cross reference
APPL- Applicative
SP =Subject Prefix agreement
P = Preposition
TNS =Tense

annoyed (for/with)'

The data in 2b) shows that applicative morph *-li-* is ordered together with passive morph *-w-* but each sub categorization frame's sense does not account its semantic independences. When Swahili speakers are in conversation (consider 2c) the first sense in their schema is passive and not applicative. This can be justified from 3 Swahili structure below:

3. *Juma a me sumbu-li-w-a na Mwizi* Juma-
SP-TNS-annoy-APPL-PASS-FV-P.2thief Juma
has been annoyed (by the thief)

Taking the meaning (cf 2b) of applicative morph when alone, it is confusing the fact that the sense of applicative when ordered together with passive is reduced, it shows as if such morph is latent or is not activated by speakers of the language. The data in 3 shows applicative sense is reduced or inactivated. However, new approach of Swahili pairwise analysis is required to contributing to linguistics theoretical morphology. The step by step analysis is important in the sense that each morph may be understood it's either morphological or semantic content in any word formation process.

This behavior of opacity is displayed to other Bantu languages including Kisukuma, (Chípanda, 2017 and Citumnuka, Chavula, 2016). Kisukuma is the language spoken in North western part in the United Republic of Tanzania and Citumbuka is the language spoken in Northern region of Malawi and also in the Lundazi district of Zambia. The data in Citumbuka illustrates semantic opacity in 4 below:

4. *Timb-an-il-an-a pa*
Hit -REC-APPL-REC-field
'Hit each other at the farm/crop field.' (Chavula, 2016:208)

The data in (4) shows that there are three ordered morphs together namely: reciprocal, applicative and reciprocal. The semantics of the sentence does not reflect the sum of its parts as it is in other lexical words. Therefore, a fully description is needed to capture this behavior and that new theoretical paradigm is needed to explain such kind of semantic scope of each morph where applicable other than generalization from the written literature. As Corbin and Strauss (2008:21) who are of the opinion that the problem can be drawn from non & technical literatures.

Therefore, the current study in pertinent to Kiswahili complexity verbal extension pairwise will shed light to understanding explicitly the important of semantic algorithm –which is a step by step technique of analyzing linguistics sub categorization frames.

Mdee *et al*, (2013) have shown the data from Kiswahili dictionary of twenty one century, the derivation of the verb *iga* which means 'imitate' ignores the ordering of applicative passive pairwise as if is ungrammatical or absent in its lexicon. The data in 5 below illustrates the phenomenon:

5. *Ig-iw-a* Imitate-
FV 'Be
imitated'

The data in (5) shows that the passive morph *-iw-* has been attached to the verb *iga* which means imitate and form *igiwa* imitated. Under the level of analysis most of Swahili speakers and writers have been generalizing the phenomenon. Since the diction has an applicative *-i-* attached to the verb entry *iga* as it is indicated below:

6. *Ig-i-a* Imitate-
APPL-FV 'imitated
for/with' (Mdee *et al*, 2013:150)

Therefore it is not appealing to have the derived verb *Igiwa* (*cf*, 5) and claim to have only one morph which is nothing but other than two morphs as in applicative *-i-* and passive *-w-*, as 7 data illustrates:

7. *Ig-i-w-a* Imitate-
APPL-PASS-FV 'Be
imitated (for/with)'

The data in (7) shows that two morphs namely: applicative and passive have been ordered together simultaneously in a single verb *Iga*, and each morph has its own semantics despite the generalization of meaning which has been operationalized by Swahili writers and the speakers as it has been shown elsewhere (*cf*, 5) in this paper.

However, the literatures and the data available (*cf* 7) shows that there is a less/incomplete knowledge in Swahili pairwise of verbal extension other than generalization. As Booth, (2003:59) argues, 'research problem is motivated not by palpable unhappiness but incomplete knowledge or flawed understanding, thus we can solve it not by changing the world but by understanding it'. Therefore, such incompleteness of the knowledge in Swahili data above needs re-analysis.

METHODS OF DATA COLLECTION

The technique used in data collection was documentary review, 4 Swahili books including Swahili dictionary of 21th century were purposively selected and reviewed. These sources were read one by one basing on the topicalized morphs under discussion to see how Swahili data are being treated Vs their semantic scopes. Content analysis was used during data analysis; the data were analyzed verb morph by verb morph and assigning each morph's semantics basing on the study objective.

FINDINGS

This sub section discusses the findings on complexity of Kiswahili pairwise of verbal extension. As we stated elsewhere in this paper, the data are from written Swahili literatures and documents in general. In arriving to data, the researchers started by taking one lexical verb which is already derived in literatures, the making morphological passing following the glossing rule. From this base the meaning being obtained from each attached morph was considered literary and non literary to avoid generalizations. The paper found that most of Swahili morphs ordering have been well documented morphologically, though semantically are not well analyzed. Meaning of the

ordered morphs has not been glossed provided that such morphologization have been spoken or written by writers or speakers of the language. The data in 8 below illustrates some complexity:

8. *Ach -i -an -i -a* Stop
 -PPL-REC-APPL-FV 'Stop
 for each other' (Kihore *et al*, 2008:60)

In (8), it is observed that the verb *acha* 'stop/leave' has been ordered with three morphs namely: applicative, *-i-*, reciprocal, *-an-* and applicative *-i-*. The semantics of each morph ordered morph has not been shown, other than the general meaning of the two morphs —applicative and reciprocal morphs. Kihore *et al* did not provide glossing of these ordered morphs in hand. This kind of generalization is inextricably to understanding the semantics of each allomorph of the language, though such contextual sense is concomitantly virtue in pertinent to the scope of cognitive theory (Taylor, 2002) who is of the opinion that the derived word has both peripheral and core senses. Thus, the current discussion, the generalized sense is nothing but peripheral sense. It must be noted that the gloss given above is from author's experience to other writer and speakers of the language.

However, following algorithmic approach—a step by step procedure of solving a problem, the structure of the language has morphs which are ordered not accidentally, it is the matter of analysis which would house semantics of step by step morphs as in 9 data below:

9. a) *Ach* *-i-a* Stop-APPLI-FV
 'Stop for'
 b) *Ach -i-an-a* Stop-
 APPL-REC-FV 'Stop
 for each other'
 c) *Ach -i -an -i -a* Stop-
 APPL-REC-APPL-FV 'Stop
 for each other for/with'

The data in 9 a), b) and c) shows that each morph has its own semantics, in other words for instance, step three of 19c) shows that there are three individuals following the fact that, the two applicative allomorphs represent two arguments. The sentence in 10 below gives more detail explanations:

10. a) *Juma a-me mw-ach -i-a mtoto*
 Juma-SP-TNS-OB-quit-APPL-FV
 'Juma has quitted for the child'
 b) *Juma na Masanja wa-me ach -i-an-a mtoto* Juma-C-Masanja-SP-TNS-quit-APPL-AREC-FV-
 child 'Juma
 and Masanja have quitted each other for the child'
 c) *Juma na Masanja wa-me ach -i-an-i-a mtoto*
 Juma-C-Masanja-SP-TNS-quit-APPLA-REC-APPL--FV-child
 'Juma and Masanja have quitted for each other for the child'

The sentence in 10a) shows that there are two arguments namely: the external argument *Juma* and the internal argument *Mtoto* 'child'. Semantically, the external argument has done the action of

quitting for the child. The sentence in 10b), there are also two participants following the fact that the addition of reciprocal morph (valence decreasing) reduces one case—the internal argument. Therefore, the meaning shows only the function of the external argument — being the subject and the internal argument being objective case in syntax. As a matter of facts, in 10c) there are three arguments the first two arguments are triggered by the first (applicative) and reciprocal morph while the third is triggered by the second applicative morph. This form of ordering in Bantu languages has been difficult to process as the result of linguistics generalization. The data in the table below shows how step by step derivations accounts for Swahili verbs ordering: *achiania*:

Table 1: The input word: *achiania*

Root	<i>	<ii>	<iii>	Features
<i>Ach-</i>	<i>-i-</i>			+v
		<i>-an-</i>		-v
			<i>-i-</i>	+v

The derivation in the above table shows that each step of derivation accounts both morphology and syntax in pertinent to the meaning of the derived element being it a morph. The sign of <+v> implies productive suffix or valence increasing argument and the <-v> implies non productive suffix or valence decreasing argument to the predicate structure. The number of arguments depends on the kind of suffixes being ordered to the verb. That is why (cf, <ii>) the derivation of the reciprocal *-an-* has the same number of arguments with the derivation (cf, <i>) of the applicative *-i-*. This is because the reciprocal is the valence decreasing and it reduces one argument in the predicate structure. The second applicative morph (cf, <iii>) has added the number of arguments up to three since it is the valence increasing as it is in the first step. It must be noted that the number of steps depends on the limit of the ordered morphs in the language under discussion, and that in Kiswahili, the maximum number of verbs morph ordering is four (see Kihore, *et al* , 2008) unless otherwise stated.

The other discussion can be drawn from the Swahili verb *waka* ‘burn’ whose stem is *wa-*, that is to say the stem *wa-* in pertinent to verb derivation is often used with stative *-k-* which is inactivated or latent morph, as in *wa-(ka)* ‘burnable/able to burn’. Moreover, as it may, if this is taken as it is (word verb) *waka* —its derivation ends to two steps as it is shown in 11 data below:

11. a) <i>Wak-a</i> (STAT)-FV	Burn ‘Burn/Burnable’
b) <i>Wak-i-a</i> (STAT)-APPL-FV to/in’	Burn ‘Burn
c) <i>Wak-ik-a</i> (STAT)-STAT-FV to burn’	Burn ‘Able
d) <i>Wak-iw-a</i> (STAT)-PASS-FV burnt’	Burn ‘Be

The data in 11 shows that the Swahili word *waka* ‘burn’ is taken as a full word whose stative morph *-k-* is inactive in use. That is why the meaning being derived shows as if such stative does not work following the fact that the meaning is not the sum of its parts. The blacked indicates that *-k-* is stative

However, when *wa-* is taken as the stem of the word *waka*—its derivation takes other form of ordering morphs e.g. causative morph in which other morphs like stative, passive, reciprocal appears far from the stem. It is from this account, a step by step analysis of the stem *wa-* is re-analyzed in the table below:

Table 2: The input stem: *wa-* (*sh-i-an-/-wa-/-ik-a*)

Root	<i>	<ii>	<iii>	Features
<i>wa-</i>	<i>-sh-</i>			+v(alence)
		<i>-i-</i>		~v(valence)
			<i>-w-/-k-/-an-</i>	~v(valence)

The stem *wa-* as we see in the above table, has been derived up to three morphs maximally. It must be noted that at step three, any of the listed morphs can be ordered from the stem alone and not simultaneously. See in 12 data below:

12. a) <i>Wa-sh-i-w-a</i> CAUS-APPL-PASS-FV made to burn for’	Burn- ‘Be
b) <i>Wa-sh-i-an-a</i> CAUS-APPL-REC-FV to burn each other’	Burn- ‘Cause
c) <i>Wa-sh-i-a</i> CAUS-APPL-FV to burn for/in/to/with’	Burn- ‘Cause
d) <i>Wa-sh-i-k-a</i> CAUS-APPL-STA-FV to burn (make be able to burn for)’	Burn- ‘Able

The data in 12 evidenced that *wa-* is the stem of the word *waka* ‘burnable’ in Kiswahili language and its derivation can start soon after the stem. For that matter the morph *-k* from the stem *wa* (*ka*) is the stative morph and its semantic scope would be the ability of something to burn/be burnt. This is a complexity of Swahili pairwise of verb ordering because most of the Swahili speakers and writers do not consider such deepness understanding other than making generalization both morphologically and semantic scopes. This can be seen in 12d) data *washika* where the meaning of the derived verb is complex to process following the fact that stative has proceeded causative as the result causative reduces its conceptual power.

The ordering of causative allomorphs as in *-ez-* and *-esh-* also gives evidence on how Swahili verbs ordering of verbal extensions must be treated carefully. Although it is obvious for the

causative being productive, in some contexts its productivity cannot be in all verbs of Kiswahili language. The data in 13 below illustrates the phenomenon of its complexity ordering:

13. *Pend-ez-esh-a* Love-
CAUS-CAUS-FV 'Cause
to appear good'

The data in 13 shows that the verb *penda* 'love' has been followed by two causative allomorphs, though the semantics of each morph is not derived. This means that, the speakers of Kiswahili language make generalization as it has been stated elsewhere. The causative *-ez-* acts as instrumental morph—it adds material condition which leads to good or something/somebody to appear well/smart and good physically. Consider the sentence in 14 below:

14. *Juma hu-pend-ez-a Nguo* Juma-
ASP-love-CAUS-FV-Clothes 'Juma
appears good (because of clothes)'

The structure in 14 data shows that Juma becomes good/smart when he wears clothes. This means that there is no argument being added other than something (material) which triggers his smartness. As a matter of facts, when such structure is ordered together with other causative *-esh-*, only one argument is added as it is shown in 15 data:

15. *Juma hu-m-pend-ez-esh-a Mke-o*
Juma-ASP-OM-love-CAUS-CAUS-wife-OM
'Juma makes your wife appear smart'.

The derivation shows that, the causative *-esh-* morph has explicit argument whose position is covered by prefix object marker *-m-* and the final object marker *-o-* in the word *mkeo* 'your wife'. The causative *-ez-* morph is a logical form (LF) which has objective function in the sense that a person can make himself/herself appear smart. The other phenomena can be drawn from the ordering of applicative *-e-/i-* and *-le-/li-* allomorphs, the ordering of these allomorphs appears in succession, thus, the former is ordered first then the latter. The data in 16-17 below illustrates the process of deriving the verb *piga* 'beat' and *choma* which means hit:

16. a) *pig-i-a* Beat
-APPL-FV 'Beat
for'
b) *pig-i-li-a* Beat-
APPL-APPL-FV 'Pass
(something) to'

Different explanations can be taken into account between applicative allomorphs *e-/i-* and *le-/li-*, the data in 14a) shows the action of beating has been done for somebody—hence one argument predicate. The applicative morph *-li-*, has meaning of its own entity, and that it has immersed the meaning of the morph proceeded. This means that such applicative morph is used in the context of playing football. In this contention, it is evident that when applicative *-i-* proceed *-li-* the neat sense changes to the contextual sense as it is encoded in (Kövecses and Radden, 1998) who of the opinion that put that the element in a word may metonymically be manifested in

(applicative) is argumentative morph while the second applicative morph represents *reason* for doing such action.

The data from (Khamis, 2008) gives us another complexity of Swahili pairwise of verbal extensions, in the sense that not all morphs are transparent especially, non reproductive morphs in Kiswahili language. The data in 20 below explain the phenomenon:

20. a) <i>Fung-an-ish-an-a</i>	Close-
REC-CAUSE-REC-FV	'Make
to close for each other'	
b) <i>Fung-ish-an-ish-a</i>	Close-
REC-CAUSE-REC-FV	'Make
to caue to close for each other'	

(Khamis, 2008:102)

The data in 20a) has three morphs and the meaning reflects the two morphs, this is due to the fact the reciprocal is a valence decreasing argument. Therefore, whoever, the reciprocal morph repeats does not add θ -roles. Note that the gloss above is my own and not for the author cited, ever since Khamis did not provide glossing. However, the data in 20b) shows two causative morphs and one reciprocal morph. The gloss shows that each morph has its own figuration semantically. Therefore, the three morphs emanate the three arguments. Unlike the data (cf, 15) that show the ordering of two causative morphs of different form, the data in 20b) has a different conception with which the intervening of reciprocal has created environment for semantic dis opacity.

However, from the above base, the Swahili verb *funga* may be extended up to five morphs ordered together. The table in 3 below shows such form of ordering:

Table 3: The input word *fungishanishiwa* 'Be made to caue to close for each other at'

	<i>	<ii>	<iii>	<iv>	<v>	
<i>Fung-</i>						
<i>-ish-</i>						+v(alence)
		<i>-an-</i>				-v(alence)
			<i>-ish-</i>			+v(alence)
				<i>-i-</i>		+v(alence)
					<i>-w-</i>	-v(alence)

The five allomorphs shown above, shows that Kiswahili language verbs can order allomorphs up to five maximally apart from the general claim which shows that only four morphs are possible to be ordered in a single Kiswahili verb. Therefore, the step by step ordering shown in the above table shows that each morph plays its own semantics although it is difficult to process.

CONCLUSION

The pairwise of Kiswahili morph ordering of verbal extension play a great role in communication system in pertinent to its logical representations. As Kiswahili now is becoming a global communicative tool and in East African in particular, its grammar should not be generalized where inapplicable — either in written or spoken forms. Let written Kiswahili be differentiated from spoken Kiswahili for avoiding generalizations.

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