Analyzing Complex Predicates in Swahili

JOSHUA MARTIN
University of Florida
joshua.martin@ufl.edu

Abstract: This article will offer an examination of complex predicates in Swahili, an aspect of the language that few have explored in depth. Utilizing a corpus of Swahili complex predicate data compiled using the *Helenski Corpus of Swahili 2.0*, Tuki's *Kamusi ya Kiswahili – Kiingereza, Swahili – English Dictionary*, and online Swahili discussion forums, I will discuss how Swahili complex predicate forms reveal a number of interesting syntactic phenomena. I will then compare two frameworks for analyzing complex predicates in Swahili: 1) a complex head analysis, which is commonly utilized in analyses of complex predicates in other languages, and 2) a DP complement analysis. These two frameworks will be tested against their ability to account for three unique characteristics of Swahili complex predicates: agreement, adjacency, and passivation. The discussion will reveal how the DP complement analysis is better equipped to explain the syntactic phenomena of Swahili complex predicates.

1. Introduction

This article centers around an examination of complex predicates in Swahili and offers a novel approach to analyzing this syntactic phenomenon. To begin with, the structure of complex predicates cross-linguistically will be defined, offering a few data points as examples. Then, the qualities of Swahili complex predicates will be discussed through a mention of previous literature, a presentation of the data collected, and an identification of three syntactic features to be accounted for. Two analyses, a complex head analysis and a DP complement analysis, will then be examined in an attempt to establish a syntactic framework through which to explain the three syntactic features cited earlier.

1.1. Complex Predicates Introduced

Miriam Butt, who has done extensive research with complex predicates, particularly in Urdu, defines complex predicates as, "a construction that involves two or more predicational elements (such as nouns, verbs, and adjectives) which predicate as a single element, i.e., their arguments map onto a monoclausal syntactic structure" (Butt 2010: 49). These predicational structures occur commonly in a wide array of langauges such as Persian (Megerdoomain 2002, Folli, Harley, & Karimi 2005), Hindi (Mohanan 1994), Japanese (Grimshaw & Mester 1988), Tibeto-Burma (Wichmann & Wohlgemuth 2007), Turkish (Wichmann & Wohlgemuth 2007), Catalan (Alsina 1997), Urdu (Butt 1997), and English (Briton & Akimoto 1999) and are comprised of various combinations such as

verb-verb, verb-noun, verb-adjective, or verb-preposition. Table 1 offers a number of examples from Persian, Hindi and English to illustrate this point.

Table 1: Complex Predicate Examples in Persian, Hindi & English

Persian	**Hindi**	**English**
ab šodæn water become (N+V) *'to melt'*	krod^{h} aayaa anger come (N+V) *'got angry'*	let go (V+V)
bidâr kard awake make (A+V) *'to awaken'*	b^{h}arosaa kiyaa reliance do (N+V) *'relied'*	take a walk[1] (V + N)

Swahili complex predicates also follow a similar pattern of constructing complex predicates using a diversity of predicational elements (though this production is mostly limited to verb-noun combinations as we will see below).

Table 2: Complex Predicate Examples in Swahili

V + N	**V + A**
-fanya kazi do work *'to work'*	-kaa buheri stay with.happiness *'to be in good condition'*
-funga ndoa close marriage *'to marry'*	-enda kombo go crooked *'to go astray'*

1.2. Complex Predicates vs. Idioms

Discussions of complex predicates often raise questions of whether complex predicate structures should simply be considered to be idiomatic structures rather than creating an ontological distinction between the two. Linguists investigating complex predicates have developed a number of robust syntactic and semantic tests to assist in the delineation between complex predicates and idiomatic structures (see Olejarnik 2009: 171-180). However, for Swahili, many of the syntactic tests are incapable of reliably distinguishing the two as Olejarnik points out,

> "…the border line between idioms and complex predicates of the type V + N may be drawn mainly on the basis of semantics and the predictability of meaning of their constituents, whereas syntactical behaviour of both, idioms and complex predicates, does not always speak in favour of one category or the other, and not in every case does it serve as a credible criterion (cf. passivization facts)." (2009: 180)

[1] Persian examples (Megerdoomain 2005: 2, Folli, Harely & Karimi 2005: 1375), Hindi examples (Mohanan 1994: 199-200, 206-207), English examples: (Olejarnik 2009: 52)

This leaves us with semantic tests, the primary and foremost being a test of compositionality. By compositionality, we mean there exists a relatively transparent, one-to-one relationship between the lexical elements of the complex predicate and their combined meaning—i.e., the parts make up the whole. Where the relationship between the structure and its meaning is of this nature, we deem the construction a compositional complex predicate; where the relationship is much more opaque, we deem the construction a non-compositional, idiomatic structure.

Table 3: Compositional vs. Non-compositional

Complex Predicate	**Idiom**
-piga pasi hit flatiron *'to iron'*	-piga moyo konde hit heart fist *'to have courage'*
-vunja ndoa break marriage *'to divorce'*	-vunja ungo break winnowing.basket *'to have a first menstruation'*

1.3. Previous Research on Swahili Complex Predicates

While the research on complex predicates cross-linguistically has produced a trove of literature on the subject, Swahili complex predicates have gone largely overlooked. Mainly, Olejarnik has written a dissertation on the topic and gone on to publish a distilled version of her research in a book chapter (see Olejarnik 2009 & Olejarnik 2011, respectively). Olejarnik's dissertation lays a meticulous foundation for the examination of Swahili complex predicates, and my study owes much to her groundwork. We differ in one main way, however, in that Olejarnik approaches the question of how to analyze these structures from a Lexical Fuctional Grammar (LFG) framework while I utilize a more Distributed Morphology (DM) framework. This discussion will not contrast these two approaches, but for a detailed account of how an LFG framework might analyze these complex predicates please see Olejarnik 2009.

2. Data

2.1. Sources of Data

To capture a comprehensive picture of complex predicates in Swahili, a number of sources were utilized to collect data. Two primary sources provided the bulk of the data. The first was the *Helensinki Corpus of Swahili 2.0 Annotated Version*, an online corpus consisting of over 25 million words from passages pulled from books, news articles, and Hansards of the Tanzanian Parliament (transcripts of parliamentary debates). The second was the *Kamusi ya Kiswahili-Kingereza Toleo ya Pili* (Swahili-English Dictionary, 2nd Edition) which is published by the University of Dar es Salaam and contains lists of complex predicates and idiomatic structures within the entries for verbs that produce these structures. Further, in an effort to include current usage, *Jamii Forums*, an online Swahili message forum analogous to Reddit and widely used in East Africa, was consulted, along with Facebook and Instagram posts, tweets, blogs, and news sites. Finally, to round out

the study, Swahili reference grammars and the Neno 2014 translation of the Swahili Bible were also referenced.

2.2. Resulting Database

After collecting the data, a database was created consisting of 487 unique combinations of verbal and non-verbal predicates. Around 94% of these combinations were a pairing of a verb and a noun. Interestingly, for the majority of languages that contain verb-noun complex predicates, the verb for *do* or *make* is by far most often deployed. While Swahili does contain a high number of complex predicates containing *-fanya* ('to do') at 42 instances, the most utilized verb for a combination of verbal and non-verbal elements in Swahili is *-piga* ('to hit') at whopping 112 instances (around 23% of the database).

Table 4 offers a picture of the broad versatility of *-piga* and its ability to incorporate a wide range of nouns into complex predicate structures.

Table 4: V+N Complex Predicates in Swahili

Swahili	**Literal Translation**	**English**
(a) -piga brashi	hit + brush	to brush
(b) -piga bismallahi	hit + bismallah	to give thanks to God
(c) -piga bunduki	hit + gun	to shoot
(d) -piga chafya	hit + sneeze	to sneeze
(e) -piga goti/magoti	hit + knee(s)	to kneel
(f) -piga kigelegele	hit + ululation	to ululate
(g) -piga kofi	hit + slap	to slap
(h) -piga mguu/miguu	hit + foot/feet	to walk

Examples (a)-(c) contain nouns borrowed from other languages (*brashi* from English, *bismallahi* from Arabic, and *bunduki* from Hindi). Examples (d)-(h) contain Swahili original nouns that are classified in different noun classes (*chafya* in class 9, *goti/magoti* class 5/6, *kigelegele* class 7, *kofi* class 5, and *mguu/miguu* class 3/4). For the remainder of this article, the examples provided will be combinations of *-piga* and a noun.

3. Characteristics of Swahili Complex Predicates

Swahili complex predicates exhibit three distinct and interesting characteristics: agreement, adjacency, and passivization. Each of these present a unique challenge to the task of determining the syntactic structure of complex predicates.

3.1. Agreement

In a typical Swahili verbal complex, the object of a verb may trigger morphological object agreement. In (1), we see that animate, human objects of verbs must trigger an object agreement marker within the verbal complex; whereas, when the object is inanimate (or

in some cases animate, non-human), the object agreement marker is optional, hinging on whether the object is indefinite (as in (2)) or definite (as in (3)):

(1) A-li-**wa**-leta **watoto**
1.3sg.SA-PAST-**2.3pl.OM**-bring **2.children**
'She/He brought the children.' (Facebook)

(2) A-li-leta **zawadi**
1.3sg.SA-PAST-bring **9.gift**
'She/He brought a gift.' (Neno: Biblia Takatifu 2014)

(3) A-li-**i**-leta **zawadi**
1.3sg.SA-PAST-**9.OM**-bring **9.gift**
'She/He brought the gift.' (constructed example)[2]

In the case that a complex predicate contains an object, it is possible for that object to trigger the object agreement marker as in (4). Interestingly, however, it is not possible for the non-verbal predicate to trigger object marker agreement in the same manner even when the nominal non-verbal predicate precedes the object (as in (5)) and holds a more closely governed syntactic position which should afford it precedence in the determination of agreement:

(4) Mahakama hiyo i-li-**m**-piga faini **raia**
9.court 9.DEM 9.SA-PAST-**1.3sg.OM**-hit 9.fine **1.citizen**
'That court fined the citizen.' (HSC_rai)

(5) * Mahakama hiyo i-li-**i**-piga **faini** raia
9.court 9.DEM 9.SA-PAST-**9.OM**-hit **9.fine** 1.citizen
'That court fined the citizen.' (constructed example)

3.2. Adjacency

Another striking feature of Swahili complex predicates is that the non-verbal predicate need not be adjacent to the verbal element that it predicates with. Both (6) and (7) are perfectly grammatical and portray the same meaning:

(6) a-li-m-piga **mke-we** **risasi** kifua-ni
1.3sg.SA-PAST-1.3sg.OM-hit **1.wife-POSS** **9.bullet** 7/16.chest-LOC
'She/He shot her/his wife in the chest' (HSC_rai)

(7) a-li-m-piga **risasi** **mke-we** kifua-ni
1.3sg.SA-PAST-1.3sg.OM-hit **9.bullet** **1.wife-POSS** 7/16.chest-LOC
'She/He shot her/his wife in the chest' (constructed example)

[2] All constructed examples were checked with native Swahili speakers.

3.3. Passivization

The third characteristic that must be accounted for is the process of passivization for complex predicates. It is possible for the non-verbal predicate to raise in a passive structure and trigger subject marker agreement, as illustrated in (8) and (9). If an object is present, however, while it is possible for the object to raise and trigger subject marker agreement (as in (10) and (11)), the non-verbal predicate is prohibited from raising (as in (12)).

(8) Mama huyo a-li-**piga** **mayowe** ku-omba msaada
1.mama 1.3sg.DEM 1.3sg.SA-PAST-**hit** **5.shouts** INF-beg 3.help
'That mother shouted begging for help.' (HSC_alasiri)

(9) **Mayowe** **ya**-li-**pig-wa** kwa sauti kubwa
5.shouts **5.SA**-PAST-**hit**-**PASS** with 9.voice large
'Shouts were given loudly.' (RFI)

(10) Wakusanya kodi wa-li-**piga** **mnada** **mifugo**
2.collectors 9.tax 2.3pl.SA-PAST-**hit** **3.auction** **4.livestock**
'The tax collectors auctioned off the livestock.' (HSC_majira)

(11) **Mifugo** **i**-li-**pig-wa** **mnada** na wakusanya kodi
4.livestock **4.SA**-PAST-**hit**-**PASS** **3.auction** by 2.collectors 9.tax
'The livestock were auctioned off by the tax collectors' (constructed example)

(12) * **Mnada** **u**-li-**pig-wa** **mifugo** na wakusanya kodi
3.auction **3.SA**-PAST-**hit**-**PASS** **4.livestock** by 2.collectors 9.tax
'The livestock were auctioned off by the tax collectors' (constructed example)

4. Finding an Analysis

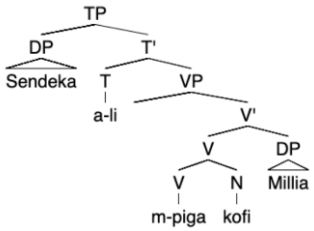
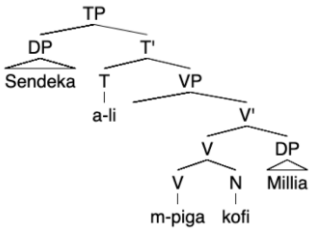
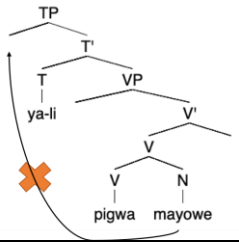
A working analysis of these complex predicates must therefore account for the fact that the non-verbal predicate may not trigger agreement on the verb (agreement), need not be adjacent to the verb (adjacency), and may passivize and trigger subject agreement iff an object is not present (passivization). Two analyses will be offered and examined in the following section to determine which is a more capable framework for explaining the data at hand.

4.1. Analysis 1: Complex Head Analysis

A complex head analysis claims that complex predicates should be analyzed as complex heads within the syntactic structure. Other researchers have utilized this theory in analyzing complex predicates in other languages (see Butt & Geuder 2001, Sells 1998, Wumbrand 2007). Under this analysis, the nominal non-verbal predicate in our complex predicate structures would be analyzed as an N head combined with a V head to constitute one complex V head. For this analysis to be deemed superior, it must account for the three characteristics mentioned above.

For agreement, the complex head analysis works well as the merging of the V and N heads into one complex head eliminates the non-verbal predicate's ability to trigger agreement and allows the non-verbal predicate to separate the verb and object (see (13)). The complex head is incapable, however, of accounting for the non-verbal predicate's ability to disregard adjacency to the verb as the merging of the complex head constrains the N head and prohibits movement out of the merged structure (see (14)). Further, the complex head analysis fails to account for passivization for the same reason—because the non-verbal predicate may not move from the complex head, it may not be raised in passivization (see (15)). Therefore, we may conclude that though the complex head analysis has been shown to be viable for other languages, it appears to fall short for Swahili.

Table 5: Complex Head Analysis and the Three Characteristics

(13) Agreement	**(14) Adjacency**	**(15) Passivization**
Sendeka alimpiga kofi Millia *"Sendeka slapped Millia"* 	Sendeka alimpiga kofi Millia *"Sendeka slapped Millia"* 	Mayowe yalipigwa *Shouts were given* 

4.2. Analysis 2: DP Complement Analysis

A DP complement analysis claims that Swahili complex predicates should be analyzed in the same way as Swahili simplex transitives. That is, the nominal non-verbal predicate should be analyzed as a full DP object within the syntactic structure. Because we propose here that these non-verbal predicates should be considered as full DPs, we are at some level claiming that they must function in the same manner as the objects of transitive verbs. Thus, we must first learn how our three characteristics work in simplex transitive structures to understand whether or not the objects of simplex transitives and the non-verbal elements of complex predicates behave in an analogous manner.

With object agreement in Swahili simplex transitives, human-animate objects or definite objects can trigger object agreement on the verb (as shown in (16), (17), and (18)). Indefinite or inanimate objects, on the other hand, may not trigger agreement, regardless of their position in the syntactic hierarchy (as seen in (19) and (20), (21), and (22)).

(16) A-li-**wa**-leta **watoto**
1.3sg.SA-PAST-**2.3pl.OM**-bring **2.children**
'She/He brought the children.' (Facebook)

(17) A-li-leta **zawadi**
1.3sg.SA-PAST-bring **9.gift**
'She/He brought a gift' (Neno: Biblia Takatifu 2014)

(18) A-li-**i**-leta **zawadi**
1.3sg.SA-PAST-**9.OM**-bring **9.gift**
'She/He brought the gift.' (constructed example)

(19) A-li-**wa**-let-ea **watoto** **zawadi**
1.3sg.SA-PAST-**2.3pl.OM**-bring-APPL **2.children** **9.gift**
'She/He brought the children a gift.' (Ngoyani 1998: 85)

(20) A-li-**wa**-let-ea **zawadi** **watoto**
1.3sg.SA-PAST-**2.3pl.OM**-bring-APPL **9.gift** **2.children**
'She/He brought the children a gift.' (Ngoyani 1998: 85)

(21) * A-li-**i**-let-ea **zawadi** **watoto**
1.3sg.SA-PAST-**9.OM**-bring-APPL **9.gift** **2.children**
'She/He brought the children a gift' (constructed example)

For adjacency in simplex transitives, direct objects need not be adjacent to the verb as in (22) where an indirect object separates the verb and direct object, (23) where an adverb separates the two, and (24) where the direct object has been fronted yet still agrees with the object marker in the verbal complex.

(22) A-li-wa-let-ea **watoto** **zawadi**
1.3sg.SA-PAST-2.3pl.OM-bring-APPL **2.children** **9.gift**
'She/He brought the children a gift.' (Ngoyani 1998: 85)

(23) Watoto wa-li-pita **kimya** **chumba** cha wazazi
2.children 2.3pl.SA-PAST-pass **quietly** **7.room** 7.LINK 2.parents
'The children passed the parent's room quietly' (Thompson & Schleicher 2001: 353)

(24) **Shamba** lile na-taka ku-**li**-uza leo
5.field 5.DEM 1.1sg.PRES-want INF-**5.OM**-sell today
'I want to sell that field today' (Loogman 1965: 334)

Finally, direct objects in simplex transitives may be passivized and trigger subject agreement on the verb (as shown in (25)) iff an indirect is not present, in which case, only the indirect object may raise (as seen in (26) and (27)).

(25) **Barua** **i**-li-andik-wa na Juma
9.letter **1.3sg.SA**-PAST-write-APPL-PASS by Juma
'A letter was written by Juma' (Vitale 1981: 131)

(26) **Ahmed** **a**-li-andik-i-wa **barua** na Juma
Ahmed **1.3sg.SA**-PAST-write-APPL-PASS **9.letter** by Juma
'Ahmed was written a letter by Juma' (Vitale 1981: 130)

(27) * **Barua** i-li-andik-i-wa **Ahmed** na Juma
9.letter **9.SA**-PAST-write-APPL-PASS **Ahmed** by Juma
'A letter was written to Ahmed by Juma.' (Vitale 1981: 130)

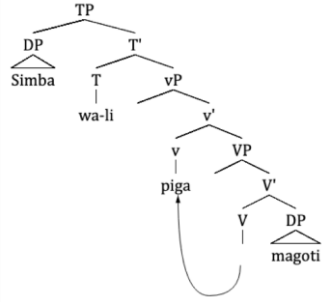
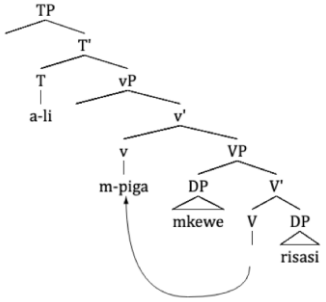
Thus, we find that direct objects in simplex transitives behave in a parallel manner to the nominal non-verbal element in complex predicates. Table 6 illustrates these parallels in detail.

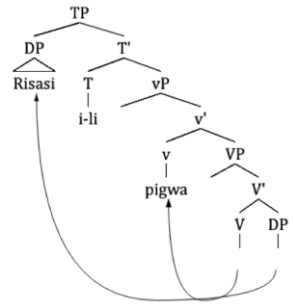
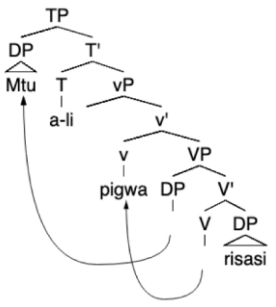
Table 6: Simplex Transitive Objects and Non-verbal Predicates

	Simplex Transitive Objects	**Complex Predicates NVP**
Agreement	cannot trigger object agreement (inanimate, indefinite)	cannot trigger object agreement (inanimate, indefinite, non-referential)
Adjacency	need not be adjacent to the verb	need not be adjacent to the verb
Passivization	can passivize and trigger subject agreement if no indirect object present	can passivize and trigger subject agreement if no object present

Having shown these parallels to be true, we may now test our DP complement analysis against our three criteria to discover whether our theory is able to account for these phenomena.

Table 7: DP Complement Analysis and the Three Characteristics

(28) Agreement	**(29) Adjacency**
Simba walipiga magoti *"The lions kneeled"* 	Alimpiga mkewe risasi *"She/He shot her/his wife"* 

(30) Passivization (NVP)	**(31) Passivization (DO)**
Risasi ilipigwa *"A shot was fired"* 	Mtu alipigwa risasi *"A person was shot"* 

In (28), we see that while the non-verbal predicate is a full DP, it is inanimate, indefinite, and nonreferential and thus cannot trigger object agreement on the verb.[3] Next, in (29), we see that because the non-verbal predicate is syntactically independent of the verbal predicate, it frees the verbal predicate to raise to a higher position, leaving the object intervening between the verbal and non-verbal predicates without causing the sentence to become ungrammatical. Thus, the non-verbal predicate need not be adjacent to the verbal predicate. Finally, in (30) we see that the non-verbal predicate may be raised in a passive structure, but only when an object is not present. In the case of the presence of an object, the object may raise, but the non-verbal predicate may not, as is the case in (31).

4.3. A Final Correct Prediction: Non-verbal Predicate Modification

It seems, therefore, that the DP complement analysis is the superior analysis to account for the characteristics in question and that these nominal non-verbal predicates should be considered full DPs. Yet, if the evidence offered above is true, then it should also be true that these non-verbal predicate DPs should exhibit other typical characteristics of DPs as well. One simple example would be modification. If these non-verbal predicates are truly full DPs, then they should be able to be modified by categories such as adjectives.

A search through the database produces examples where it can be seen that these non-verbal predicates can, in fact, be modified, as in (32) and (33):

(32)	Bondo	a-li-piga	**chafya**	**n-zito**
	Bondo	1.3sg.SA-PAST-hit	**9.sneeze**	**9.heavy**
	'*Bondo sneezed harshly*.'			(HCS_books)

[3] This classification of nominal non-verbal predicates in Swahili as inanimate, indefinite, and nonreferential holds across the database. Additionally, this inability to trigger agreement aligns well with Chomsky's Activity Condition (set out in Chomsky 2000: 122).

(33) ili kwa jina la Yesu **kila** **goti**
in.order with 5.name 5.LINK Jesus **every** **5.knee**
li-pig-w-e
5.SA-PAST-hit-PASS-SBJV
'*That at the name of Jesus every knee should bow*' (Neno: Biblia Takatifu 2014)

This final piece of evidence further solidifies that we should accept this DP complement analysis as the theory through which we explain Swahili complex predicates of the verb-noun nature.

5. Conclusion and Future Research

As we have seen, Swahili complex predicates seem to involve a DP complement analysis as this analysis can account for agreement, adjacency, passivization and, additionally, modification. These findings may contribute further to the investigation of complex predicates as not all verb-noun complex predicates have the same syntactic analysis cross-linguistically.

Future research may involve investigating a number of questions still left unanswered here. One important question is if these non-verbal predicates are to be considered full DPs, why do simplex verbal structures need applicative morphology to introduce more than one object while complex predicates do not in order to introduce an object alongside the non-verbal predicate. Similarly, how should applicativized complex predicates, such as the example in (34), be analyzed? Answers for these questions could lead to a much richer and robust understanding of the syntactic behavior of complex predicates cross-linguistically.

(34) A-li-**m**-pig-ia **pasi** **mtoto** **nguo**
1.3sg.SA-PAST-**1.3sg.OM**-hit-APPL **9.iron** **1.child** **9.nguo**
'*She/he ironed the child's clothes for her/him.*'

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