

The Relative Marker and Long Distance Dependencies in the L2 Acquisition of Swahili Relative Clauses

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1. Introduction

Of the several African languages that have become regularly offered at U.S. colleges and universities, Swahili consistently garners the highest enrollments, and is the second most widely taught after Arabic, with the greatest variety of instructional materials compared to its Sub-Saharan African counterparts. According to the Modern Language Association, the number of Swahili-language learners in the U.S. jumped by nearly 36% between 2002 and 2006 (Furman, Goldberg, and Lusin 2007).¹ These greater enrollments have led to increased opportunities for investigations of how Swahili is learned by adult learners. The present study represents an initial investigation of how linguistic factors interact with proficiency in the second language (L2) acquisition of relative clauses in Swahili by native speakers of English. An eastern African Bantu language spoken from northern Mozambique to the south of Sudan, and through much of the eastern Democratic Republic of the Congo, Swahili (G42) exhibits the agglutinative verb structure typical of Bantu languages (e.g., Guthrie 1967-71). This verb structure, as it is implicated in relative clause formation, is the subject of the present study, which seeks to extend the discussion of relative clause acquisition to include this understudied language that is so widely taught.

Thus far, linguistic analysis of the relationship between a null element (gap) and its lexically specified antecedent (filler) has proven useful in predicting processing difficulty of relative clauses for second language (L2) learners of languages like English (e.g., Eckman, Bell, and Nelson 1988, Gass and Ard 1980, Izumi 2003), French (e.g., Hawkins 1989), and Korean (O'Grady, Lee, and Choo 2003). These studies consistently demonstrate that L2 learners comprehend and produce subject and direct object relative clauses in a manner that largely parallels the noun phrase accessibility hierarchy (NPAH) outlined by Keenan and Comrie (1977). This hierarchy builds upon evidence in a number of languages and shows subject relatives to be the most dominant relative clause type, followed by direct object relatives, and others. Though studies on the L2 acquisition of relative clauses have largely demonstrated subject relatives to be the best comprehended², this research also acknowledges that mechanisms for this hierarchy are not thoroughly understood.

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¹ Greater enrollments in Swahili language courses in U.S. colleges and universities have also been noted in the Web Book of African Languages (2006) where 101 American universities and colleges are described as having instructional programs in Swahili. This is a dramatic increase from the 35 U.S. institutions observed by Bokamba (2002).

² Results of recent studies by Kanno (2007) and Ozeki and Shirai (2007) on L2 Japanese find a somewhat different order in the ease of the relativization with Chinese-speaking learners.

Recent commentaries on research in this area have acknowledged a need for closer investigations of the roles of structural factors in the acquisition of relatives across a wider variety of languages (Eckman 2007, Gass and Lee 2007, Hawkins 2007). Additionally, Juffs (2007) suggests that principles motivating the hierarchy may be best interpreted as processing difficulties dependent on morphology, head direction, *pro*-drop, and long-distance dependencies. Such factors are likely to interact with one another in a language where specialized morphemes in the form of bi-morphemic elements or relative markers are integral to the construction of the relative clause. Swahili presents a particular challenge to learners, as there are three strategies for relativization of the subject or direct object, each varying in the position of the relative marker, and the availability of *pro*.

In attempting to predict learner preference for subject and direct object relative clause types, the present research takes its cue from the 2003 study by O’Grady, Lee, and Choo. The argument first proceeds by revisiting the diverging accounts of the linear distance and structural distance hypotheses in Korean. These hypotheses are next applied to Swahili, and lead to the description of a morphologically based account of relativization. This more elaborate structural account forms the basis of predictions of learner preference for the three forms of the relative clause in Swahili.

2. Research Overview

2.1. Measuring the length of long distance

L2 learner preference for subject relative clauses in English has been explained as the result of a longer linear distance between the direct object gap and the direct object, as opposed to the shorter distance between the subject gap and the subject. An example of the English restrictive relative clause (1) shows how linear distance is measured as the number of intervening words between the gap and the filler.³

- (1) a. Subject relative:
the man [_{CP} that ___ likes the woman]
Linear distance between gap and head noun = 1 word
- b. Direct object relative:
the man [_{CP} that the woman likes ___]
Linear distance between gap and head noun = 4 words

The longer the distance between the gap and the relativized element, the more difficult comprehension of the relative clause is presumed to be. First outlined by Tarallo and Myhill (1983), this approach is referred to as the linear distance hypothesis by O’Grady, Lee, and Choo (2003) who apply the linear measure to Korean. In this head-final language, however, linear measures of long distance are inverted, and incorrectly predict subject relatives to be more difficult to comprehend. In response to this shortcoming, O’Grady et al. (2003) offer their structural distance hypothesis as a means of measuring the depth of embedding of the gap, and quantify the distance between the gap and the head noun as the number of intervening maximal projections. This proves to be a more accurate predictor for L2 Korean, as shown in (2).⁴

³ Abbreviations used in this paper.

1	Class 1 noun (singular)	ACC	Accusative case	REL	Relative marker
2	Class 2 noun (plural)	FV	Final vowel	SM	Subject marker
1st	First person	NOM	Nominative case	OM	Object marker
3rd	Third person	PRS	Present tense	DO	Direct object
NS	Native speaker				

⁴ O’Grady, Lee, and Choo (2003) present a simplified description of the Korean relative clause that implicitly includes argument drop and assumes no movement. This is also in line with Choo’s (1994) analysis, which additionally assumes a null operator. See Kwon (2008) for a more complete description of competing theoretical analyses of Korean relatives.

- (2) a. Subject relative:
 [CP ___ *namca-lul cohaha-nun*] *yeca*
 man-ACC like-REL.PRS woman
 ‘the woman who likes the man’
 Structural distance = 1 node (CP)
 Linear distance = 2 words
- b. Direct object relative:
 [CP *namca-ka* [VP ___ *cohaha-nun*]] *yeca*
 man-NOM like-REL.PRS woman
 ‘the woman who the man likes’
 Structural distance = 2 nodes (VP, CP)
 Linear distance = 1 word

Results of a picture-based comprehension task by O’Grady et al. (2003) confirm these predicted results, as learners correctly understood subject relatives more than 50% better than direct object relatives.

2.2. Overview of relativization in Swahili

Swahili employs three different strategies for relativization, each of which is frequently used throughout modern literature and speech (Knappert 1999, Russell and Rajabu 1995). Relativization of the subject or direct object in Swahili requires an affix to the verbal complex, or the overt complementizer *amba-*, such that the affix, a bi-morphemic element more commonly referred to as a relative marker (REL), is indispensable to the expression of meaning (e.g., Barrett-Keach 1985, Ngonyani 2006a, Vitale 1981). In other words, subject or direct object relatives can each take three separate formats: the *amba-* relative, tensed relative, or tenseless relative.

Grammatically, the relative marker is a bound morpheme concordant with the head of the relativized phrase. In this way, a different relative marker corresponds to nouns of each of the twelve lexical noun classes in Swahili.⁵ In fact, this one-to-one correspondence fits into a greater agreement scheme, where nouns grouped according their phonological and/or semantic features form classes or grammatical genders that trigger agreement features on adjectives, possessives, verbs, associatives and referents like the relative marker (Katamba 2003, Moxley 1998). Unlike in many European languages, no distinction between male or female gender is made in noun marking.

Each semantic pair of noun classes, such as class 1 and class 2, which are restricted to animates, has a singular and plural constituent. For animate classes 1 and 2, singular nouns are grouped into class 1 (e.g., *mwanamke* or ‘woman’) with plural counterparts in class 2 (e.g., *wanawake* or ‘women’). These noun classes are common across all Bantu languages. Noun class number is used in the glosses of example Swahili phrases in this paper.

Swahili is an agglutinating *pro*-drop language, and canonically SVO, except in the case of direct object relativization where the direct object fronts the relative clause and instigates OVS (e.g., Maw 1969). In the absence of relativization OVS is ungrammatical. Thus, the English phrase ‘the woman who likes the man’ has different structural forms in Swahili, as illustrated in (3). The examples in (3) also demonstrate that object markers are obligatory with animate objects (e.g., Barrett-Keach 1985). The example in (3d), a direct object relative, would also take the forms of (3b) and (3c), respectively: *mwanamke anayependwa na mwanaume*, and *apendwaye*.

It should also be noted that the examples in (3) include a nominal subject and object represented on the verb by markers from the same noun class. Whereas speakers might use the difference in subject and object markers to help them identify the subject or object of the phrase, this ambiguity

⁵ Noun classes 1-14 are referred to here as ‘lexical noun classes’ as opposed to class 15, which is infinitival, and classes 16, 17, and 18, which are locative. Noun classes 15-18 have corresponding relative markers, but are not noun classes containing animate or inanimate objects.

forces comprehension of the markers and their antecedents. Use of this ambiguity in test items is particularly helpful in ensuring that comprehension of all verbal components is necessary for a grammatical judgment, and the examples in (3) relate to phrases used in the picture-selection task below. The examples in (3) present third-person singular subjects and objects ('woman' or 'man') to aid our comparison of Swahili and Korean relative clause structure. These are the same exact phrases used with learners of Korean in the study by O'Grady, Lee, and Choo (2003), and these phrases, translated to Swahili, are used with learners in this replication study (see Appendix A). Had singular and plural nouns been combined in the same phrase, this would have offered a clue to learners of which noun in the phrase is the subject or object, given a different subject/direct object marker 'wa-'.

- (3) a. *Amba-* relative:
 [CP *mw-anamke* [C *amba-ye* *a-na-m-pend-a* *mw-anaume*]]
 1-woman amba-1REL 1SM-PRS-1OM-like-FV 1-man
 'the woman who likes the man'
- b. Tensed relative:
 [CP *pro* [C *a-na-ye-m-pend-a* *pro*]]
 1SM-PRS-1REL-1OM-like-FV
 's/he who likes him/her'
- c. Tenseless relative:
 [CP *pro* [C *a-m-pend-a-ye* *pro*]]
 1SM-1OM-like-FV-1REL
 's/he who (usually) likes him/her'
- d. *Amba-* relative:
 [CP *mw-anamke* [C *amba-ye* *mw-anaume* *a-na-m-pend-a*]]
 1-woman amba-1REL 1-man 1SM-PRS-1OM-like-FV
 'the woman who the man likes'

All relatives in Swahili make use of the relative marker, and are head-external or post-nominal (e.g., de Vries 2001). The relative marker has been described as a resumptive element because it indicates information already marked on the verb in the subject or object marker (Ngonyani 2006b). This phenomenon is also recognized in dialects of Dutch, German, and Frisian as 'double agreement' (Zwart 1997), and alternatively, as 'clitic doubling' in French and Spanish (Kayne 2002).

In (3a) the relative marker is suffixed onto the overt complementizer *amba-*, forming *amba-ye*, and allowing the verbal complex to retain its canonical structure. Use of *amba-REL* requires that the antecedent be overtly specified, and produces a surface word order not unlike the English *wh*-phrase. It is not possible to use the *amba-REL* construction without explicitly naming the relativized subject or object of the phrase. While the meanings of the *amba-* relative and tensed relative are consistent with the tense of the phrase, as in (3a) and (3b) where present tense (PRS) is used, the tenseless relative carries a more habitual meaning, and consequently has a more restricted use, though it is roughly equivalent (to the meaning achieved by the other relatives in the present tense). *Pro*-drop is optionally enabled in (3b) and (3c). In (3b), the relative marker is incorporated into the verbal complex to the right of the tense marker as a result of movement. In (3c), the relative marker appears as a suffix to the verb stem, and the tense marker is dropped.

Table 1 summarizes the different distributions of the relative marker (REL), showing the relationships to the marking of tense (TNS), and the optionality of *pro*. This is of particular consequence, as variation in the positioning of the relative marker has significant impact on the structural picture of the relative clause as a whole.

	<i>pro</i>	<i>amba-</i>	Inflection (I)	Verb stem	Verb complex
<i>amba</i> -REL	-	<i>amba</i> -REL	T	Stem	SM-T-(OM)-Stem
Tensed relative	+	--	T-REL	Stem	SM-T-REL-(OM)-Stem
Tenseless relative	+	--	--	Stem-REL	SM-(OM)-Stem-REL

Table 1. Distribution of REL in Swahili, adapted from Ngonyani 2006a.

Vitale (1981) refers to the tenseless relative as a ‘reduced’ relative type, because Swahili also allows the present tense marker to be dropped in matrix clauses, forming a reduced or condensed present tense, which is frequently used in speech and writing, and regularly taught in L2 classrooms in the United States. Examples of this reduced present tense in first and third person are presented in (4):

- (4) a. *Ni-na-m-pend-a*
1SM.1st-PRS-1OM-like-FV
‘I like her/him’
- b. *Na-m-pend-a*
1SM.1st-1OM-like-FV
‘I like her/him’
- c. *A-na-m-pend-a*
1SM.3rd-PRS-1OM-like-FV
‘He likes her/him’
- d. *A-m-pend-a*
1SM.3rd-1OM-like-FV
‘He likes her/him’

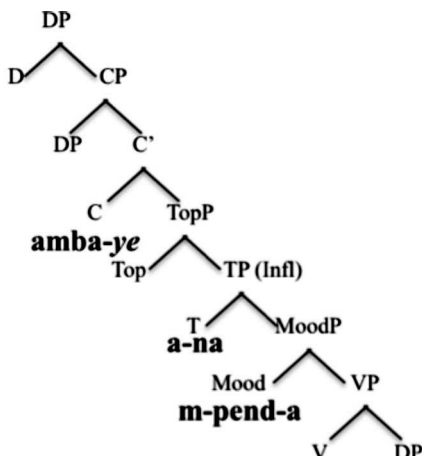
This is an important detail, as native speakers of Swahili are readily able to accommodate the absence of the typical tense marker to comprehend and produce these reduced forms. While the tenseless relative may not be structurally equivalent to the reduced present tense it does bear a strong surface resemblance to the reduced form that may be salient to an L2 learner, and is therefore worthy of mention.

On the surface, the morphemic sequences in (4b) and (4d) are essentially the same as in the phrase in (3c), except they are missing the relative marker. This establishes a point of comparison, in addition to the contrast between present tense phrases with and without a tense marker, which can be investigated in L2 learners, to understand how the morphosyntax of the Swahili verb plays a role in the acquisition of relative clauses.

2.3. Long Distance in Swahili Relative Clauses

In O’Grady et al. (2003) the structure-based account of relativization was selected over a linear account, because it more accurately mirrored learner and native speaker preference for subject relatives over direct object relatives. However, it remains to be seen if either analytic approach can account for preferences in Swahili. Such an analysis is complicated by the three different relativization strategies available in Swahili, each of which can be characterized by a unique distribution of the relative marker. Indeed, there may be a need to expand the structural distance hypothesis to account for the morphological structure of the Swahili verb. We begin by taking a closer look at the structure of Swahili subject and direct object relatives formulated with the complementizer *amba-*, as in (5).

- (5) a. Determiner-complement analysis of *amba*-REL:



- b. Subject *amba*- relative:

[_{CP} *mw-anamke amba-ye* ____ [_{TopP} [_{TP} [_T *a-na*- [_{MoodP} *m-pend-a* [_{VP} *mw-anaume*]]]]]]]]
 1-woman amba-1REL 1SM-PRS-1OM-like-FV 1-man
 ‘the woman who likes the man’
 Structural distance = 0 nodes
 Linear distance = 1 word

- c. Direct object *amba*- relative:

[_{CP} *mw-anamke amba-ye* [_{TopP} [_{TP} *mw-anaume* [_T *a-na*- [_{MoodP} *m-pend-a* [_{VP} ____]]]]]]]]]
 1-woman amba-1REL 1-man 1SM-PRS-1OM-like-FV
 ‘the woman who the man likes’
 Structural distance = 4 nodes (VP, MoodP, TP, TopP)
 Linear distance = 3 words

While it is standard to account for the structure of English restrictive relatives as CP complements of the head noun (Hawkins 2001), recent analyses of Bantu relatives (Demuth and Harford 1999, Ngonyani 2001, 2006b, Ud Deen 2005) have pointed to evidence for head raising, and base-generation of the head noun from within the relative clause. As a result, the determiner-complement analysis of Swahili relatives (Ngonyani 2006a) is employed here.

For the *amba*- relative, measures of both linear distance and structural distance predict the subject relative to be easier to comprehend. At first glance, we appear to have arrived at a sufficiently probable analysis. As Swahili is head-initial, with SVO order, like English, both the linear and structural accounts produce similar predictions with the overt complementizer *amba*-. Descriptions of the noun phrase accessibility hierarchy include evidence from Luganda and Shona, both of which are also SVO Bantu languages (Keenan and Comrie 1979, Maxwell 1979), and so we might expect that subject relatives are predictably easier in Swahili. However, when comparing *amba*- relatives to the tensed and tenseless relatives, respectively, we are compelled to consider more closely the distribution of the relative marker within the relative clause.

As Ngonyani (2006a) explains, the inflectional head (T) is a conglomerate of the subject and tense markers. In (6a), the *amba*- subject relative, T remains in its place. However, in (6b) T is compelled to move to C, due to attract features of the head of CP, resulting in the left-adjoining of T to the relative marker. The tenseless relative, on the other hand, has a weak T, as there is no tense marker, resulting in the affixing of the subject marker to the verb stem. Together, T+V are attracted to C, resulting in the morphemic sequence in (6c).

- (6) a. *Amba*- subject relative:
 [CP *mw-anamke amba-ye* ____ [TopP [TP [T *a-na-* [MoodP *m-pend-a* [VP *mw-anaume*]]]]]]]
 1-woman amba-1REL 1SM-PRS-1OM-like-FV 1-man
 ‘the woman who likes the man’
 Structural distance = 0 nodes
 Linear distance = 1 word
- b. Tensed subject relative:
 [CP *mw-anamke* ____ [C [T *a-na-*]-*ye* [TopP [TP [MoodP *m-pend-a* [VP *mw-anaume*]]]]]]]
 1-woman 1SM-PRS-1REL-1OM-like-FV 1-man
 Structural distance = 0 nodes
 Linear distance = 0 words
- c. Tenseless subject relative:
 [CP *mw-anamke* ____ [C [T *a-*] [Mood *m-pend-a*]-*ye* [TopP [TP [MoodP [VP *mw-anaume*]]]]]]]
 1-woman 1SM-1OM-like-FV-1REL 1-man
 Structural distance = 0 nodes
 Linear distance = 0 words

As (6) shows, measures of the structural and linear distance between the gap and the head noun are unable to distinguish the relativization strategies of Swahili. This is because the argument gap of the subject or direct object does not vary between these three forms. In search of a more appropriate way of contrasting these forms in terms of the difficulty they might present to L2 learners, we turn to cataloguing more specific contrasts between the three forms of the Swahili relative clause.

2.4. Towards a Morphologically-based Account

In order to develop a structural account that can be tested by applying it to results obtained from learners and native speakers, a closer examination of contrasts between each of the relativizing strategies is needed. As noted earlier, these strategies can be distinguished by three major features. The presence of the tense marker, the use of *amba*-REL as an overt complementizer, and the inclusion of null subjects are each the hallmarks of a particular relativizing strategy. If learners can be directed to make judgments based upon comparisons of a controlled set of features during an assessment task, then preferences might emerge that could help to revise the current structural account, and demonstrate which linguistic factors play the largest role in distinguishing the relative clause from main clauses in the learner’s perspective.

2.5. Summary and Research Questions

To sum, this investigative approach attempts to expand upon previous structural accounts of relative clause acquisition to account for additional complexities by expanding the inflectional categories of the verb in the model to accommodate the rich morphology of the Swahili verb. To test the cumulative predictions arising from this analytic approach, experimental tasks were designed to address the following research questions:

- RQ1 Are subject relative clauses in Swahili easier to comprehend than object relatives for native speakers and learners of varying proficiency?
- RQ2 Is there a preference for any of the three relativization strategies by learners and native speakers of Swahili?
- RQ3 Can these preferences (if any) be adequately predicted by a revised structural account?

3. Research Method

3.1. Data collection procedure

In order to address the research questions outlined above, participants were directed to complete tasks which focused on establishing whether learners of Swahili harbor a preference for subject or direct object relatives, and whether *pro* and the tense marker are interacting factors in a preference for one relativizing strategy over another. It was an additional goal to determine whether learners pattern similarly with native speakers. The data elicitation procedure was led by a background questionnaire, and further consisted of an acceptability judgment task followed by a picture-selection task, as a comprehension measure. The acceptability judgment task was administered before the comprehension measure so that exposure to grammatical phrase types had no bearing on acceptability. All test items on these latter tasks (including main clauses) maintained a forced ambiguity by having both a subject and object of the same noun class (both number and gender). This ensured that comprehension of these clauses was dependent on an understanding and familiarity with the target structure.

3.2. Participants

Participants in the study were a total of 23 learners, consisting of 8 in their second semester at Michigan State University, 6 in their fourth semester, 6 advanced learners in their sixth semester or beyond, and 3 native speakers of Swahili. All learners were native speakers of English, regularly enrolled in Swahili courses at the same university, while native speakers were each multilinguals from Kenya fluent in another Bantu language (Ekegusii or Lubukusu) in addition to Swahili and English. Of the learners, only 3 had spent time in Swahili-speaking East Africa, in Kenya, Tanzania, or Uganda. Only 1 learner (advanced-level) had been exposed to other Bantu languages prior to the study (ChiTumbuka and Chichewa). Participants were also directed to rate themselves in Swahili reading, speaking, listening and writing according to a 4-point scale (1-very good/quick, 4-poor/I use the dictionary often). These by group self-rated proficiency scores are briefly described in the results section. Participants in their second semester had recently been exposed to relative clauses, and had knowledge of the relative marker and all three forms of the Swahili relative clause.

3.3. Picture-selection task

Comprehension of subject and direct object relative clauses was assessed by O'Grady et al. (2003) through the use of a picture-selection task, including 5 items addressing subject relatives, 5 addressing direct object relatives, and 9 distracter noun phrases. With permission from the authors, this same task was adapted from Korean to Swahili, making use of the same multiple-choice picture format. Participants received packets of the same randomized order wherein each test page included three pictures, each with a different orientation of two animates, a man and woman, or a dog and pig. One of the pictures had a neutral orientation of the two animates, while the other two pictures presented a correct subject relative and object orientation, respectively. All participants heard the same order of recorded sentences. After hearing a stimulus phrase twice, participants were instructed to circle the person or animal described in the sentence, rather than the entire picture box as an answer choice. Such a stimulus phrase was *nguruwe ambaye mbwa anampenda* or 'the pig who the dog likes', and corresponded to a picture box in which a dog was oriented toward the pig, showing love interest, as in **Figure 1** below. Any response outside of a correct answer, or reverse interpretation of the stimulus phrase in which, for example, the true subject was understood as the direct object, were regarded as 'other' in the scoring of test booklets.

3.4. Acceptability judgment task

In this task, participants were directed to compare phrase pairs and determine which of the two was more acceptable. Seven phrase comparisons were presented in randomized phrase pairs (and randomized phrase orders within pairs) on six verbs each, creating 42 test pairs. Relative clauses were composed of relativized subjects only (no relativized objects), to prevent the task from becoming too

lengthy. These phrase pairs were designed to elicit judgments on the presence of the tense marker, overt complementizer *amba-*, null subjects, and relative marker as embedded within the verb (see Table 3 for sample phrase pairs). Verbs were chosen to allow for a range of phonological adjustments that occur in the attachment of the relative and object markers to the verb stem, and included *kufuata* ‘to follow’, *kusikiliza* ‘to listen to’, *kupiga* ‘to hit’, *kuuliza* ‘to ask’, *kusaidia* ‘to help’, *kuambia* ‘to tell’.

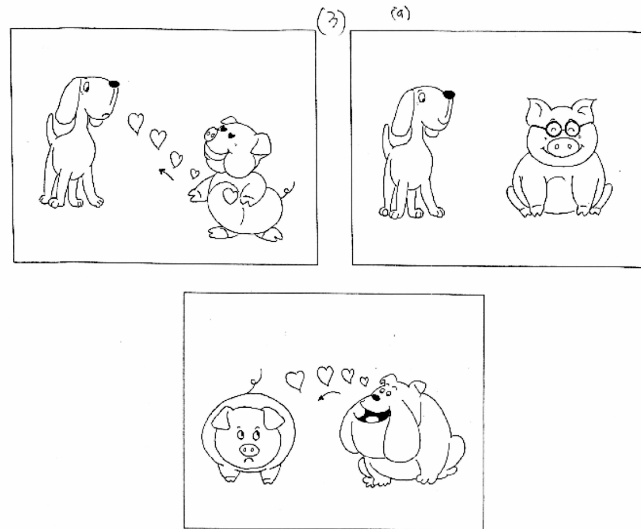


Figure 1. Sample page from test booklet for picture-selection task used in this study, as designed by O’Grady et al. 2003. Learners participating in the study listened twice to a recorded stimulus phrase in the target language and circled the entire box of the correct orientation as their answer choice.

4. Results and Preliminary Discussion

4.1. Analysis

A by-items analysis was conducted on responses to multiple-choice test items in the picture-selection task, and scores on the acceptability judgment task. As group sample sizes were somewhat uneven and not normally distributed, between-groups differences were investigated by means of a nonparametric Kruskal-Wallis test.

4.2. Self-rated proficiency

The self-rated proficiency scores of participants were consistent by level. Advanced learners and native speakers consistently rated themselves highest in each of the four skills.

4.3. Picture-selection task

Responses by Swahili NSs demonstrate that subject relatives are the easier of the two relative clause types, as no reverse interpretations of subject relatives were made. The by-items analysis also reveals that learners with greater proficiency were more accurate in comprehending subject relatives, such that advanced learners patterned similarly with native speakers. These clear trends in comprehension scores by group can be observed in **Figure 2**.

As the Kruskal-Wallis test revealed no significant between-group differences, group scores were combined for further analytical purposes. **Table 2** summarizes these findings. Across proficiency levels, learners correctly comprehended subject relative clauses 91% of the time, compared to a much lower accuracy with direct object relatives, where only 65% of test items were correctly understood. A Friedman’s ANOVA shows this contrast to be statistically significant, $\chi^2(1) = 8.33, p = .004$, with a substantial effect size, $r = -.45$. Additionally, the number of subject relatives misunderstood as direct

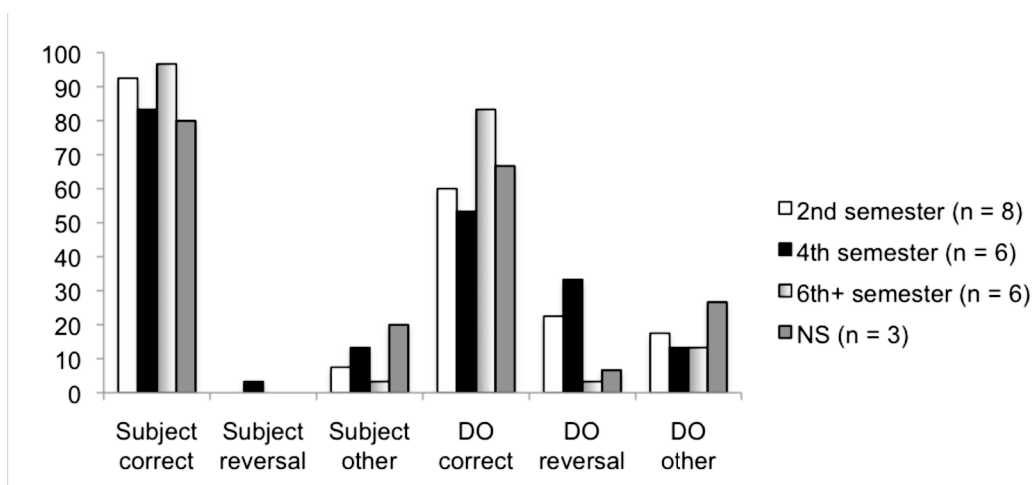


Figure 2. Bar graph of comprehension scores in percentages of total responses by proficiency group.

Relative clause type	Correct	Reversals	Other
Subject	91 (91%)	1 (1%)	8 (8%)
Direct object	65 (65%)	20 (20%)	15 (15%)

Table 2. Comprehension scores in percentages of total responses by all 20 learners on the picture-selection task.

object relatives by learners was significantly lower than the number of reversals of direct object relatives, $\chi^2(1) = 9.00, p = .003, r = -.43$. On the whole, these results parallel findings by O'Grady et al. 2003 with learners and NSs of Korean, and demonstrate that learners of these typologically different languages meet subject relatives with significantly greater success when compared to their performance on direct object relatives.

4.4. Acceptability judgment test

Results of the acceptability judgment test show that lower proficiency learners prefer the tense marker to be present in both relativized and non-relativized phrases. A Kruskal-Wallis test revealed significant differences between groups in this category of comparison, $\chi^2(3) = 7.88, p = .049$. Mann-Whitney U-Tests were used as pair-wise comparisons to follow up on this finding and determine between which groups the significant difference existed.⁶ Second semester learners preferred to have the tense marker in relativized phrases significantly more than advanced learners, $U = 8.00, p = .01, r = .49$, but not participants in their fourth semester, $U = 20.00, p = .248, r = .28$, or native speakers, $U = 8.00, p = .102, r = .378$. **Table 3** presents group mean judgments in each of the seven categories of comparison. As each category was tested in phrase pairs on six different verbs each, the maximum possible score for each category is six.

What are more difficult to interpret, however, are learners' judgments of phrases with null subjects. Though results in this category are mixed, group mean judgments translate into slightly stronger rejections of relativized phrases without overt subjects (all tensed and tenseless relatives were tested without overt subjects). This indicates that when presented with *amba-*, *Mama ambaye anampiga Baba* or 'Mother who hits father' and a phrase with an embedded relative marker *Anayempiga* or 'S/he hits her/him', learners are more comfortable with using *amba-* relatives. As this acceptability judgment task showed a fairly strong reliability on learner responses, Cronbach's alpha,

⁶ A Bonferroni correction was applied to reduce the statistical error from multiple comparisons, limiting the alpha level to $p = .017$.

Category of Comparison	2nd semester (n = 8)		4th semester (n = 6)		6th semester+ (n = 6)		NS (n = 3)	
	M	SD	M	SD	M	SD	M	SD
<i>1. Preference for Tense Marker</i>								
Anampiga vs. Apiga	5.88	.35	6.00	.00	5.83	.41	6.00	.00
Ampigaye vs. Anampiga	6.00	.00	5.67	.82	5.17	1.60	4.67	2.31
Anayempiga vs. Ampigaye	6.00*	.00	5.83	.41	4.50*	1.87	4.33	2.89
<i>2. Preference for Overt Complementizer</i>								
Anayempiga vs. Mama ambaye anampiga	3.62	2.45	3.50	2.17	2.83	2.86	2.67	3.06
Mama anampiga vs. Mama ambaye anampiga	.13	.35	1.00	2.00	1.83	1.94	.33	.58
<i>3. Preference for Overt Subject</i>								
Mama anampiga Baba vs. Anampiga	4.38	2.72	5.33	1.63	2.83	2.23	5.33	.58
<i>4. Relative Marker (embedded)</i>								
Anampiga vs. Anayempiga	1.50	2.00	1.83	2.23	1.33	1.97	2.00	2.65

Table 3. Group mean judgment scores in each of the categories of comparison on the acceptability judgment task. Asterisk (*) indicates significant between-group differences for beginning and advanced-level learners, $p = .01$.

$\alpha = .83$, the mixed results demonstrate that while learners might prefer one or more of the three relativizing strategies in Swahili, their choices are not substantially detected by an experimental task of this type.

Nonetheless, the preference for the tense marker in relativized phrases by lower proficiency learners suggests that the presence of the tense marker may play a larger role in determining learner's preferences for any of the relativization strategies in Swahili. Work by Barrett-Keach (1986) demonstrates strong evidence for two distinct components of the Swahili verb based on the penultimate stress of the language and the consistent appearance of resumptive pronominal clitics (e.g., relative marker) on the right side of words as a suffix. In this inflectional stem hypothesis, the Swahili verb is defined as the sum of two parts: an auxiliary or inflectional component (which carries the subject marker, tense marker, and relative marker) and a verb macro-stem (a composite of the object marker, verb stem, and final vowel). Structural analyses of the relative clause have since built upon this work (e.g., Ngonyani 2006a), and it has also been noted that native speakers (NS) frequently write the auxiliary and verb macro-stem as separate words (7), contrary to standard orthography.

- (7) *ki-tabu ni-li-cho ki-som-a*
 7-book 1SM.1st-PST-7REL 7-read-FV
 'book which I read' (from Buell, 2002)

The examples in (7) suggest that native speakers process the Swahili verb in two parts. Assuming the auxiliary and the verb macro-stem are the two domains of the Swahili verb, the question still remains as to whether learners are just as able as native speakers to accommodate the dropping of the tense marker from the auxiliary to form the tenseless relative, as are native speakers. **Table 4** summarizes the implications of the inflectional stem hypothesis on the comprehension of the relative clause.

In the *amba-* relative, the auxiliary is comprised of the subject and tense markers, and no T-to-C movement occurs. This contrasts with the tensed relative, in which the auxiliary moves to C to attach to the relative marker. Of utmost interest, however, is that in the tenseless relative the tense marker is dropped, forcing the subject marker to stand alone. For learners, this may create an environment in

Relative Clause Type ‘The woman who likes the man’		Auxiliary and Verb Macrostem
<i>Amba-</i> relative	<i>Mwanamke ambaye anampenda</i>	<i>amba</i> -REL [_{Aux} a-na-] [_V m-pend-a]
Tensed relative	<i>Anayempenda</i>	[_{Aux} a-na-REL-] [_V m-pend-a]
Tenseless relative	<i>Ampendaye</i>	[_{Aux?} a-] [_V m-pend-a] -REL

Table 4. Auxiliary and verb macro-stem boundaries in the relative clause.

which there is no true auxiliary, making for a less comprehensible or acceptable sentence. This may be so particularly as learners’ first formal contact with Swahili verb structure is through the canonical inclusion of the tense marker. In other words, while for native speakers the auxiliary includes the tense marker as an optional element, this may not be the case for learners, pointing to a possible preference for *amba-* and tensed relatives. In this way, the inflectional stem hypothesis suggests a new direction for this investigation. To pursue this new route of inquiry, a second experiment, described in the next section, was devised wherein an untimed grammaticality judgment test consisting of 32 randomized items (20 correct sentences, 12 incorrect) which tested all three types of relatives on subject relative clauses (all test items are presented in **Appendix B**).⁷ Results of this secondary experiment with a separate group of 27 learners are presented in **Table 5** below.

5. General discussion

As results from the picture-selection task strongly indicate, L2 learners of Swahili find subject relative clauses easier to comprehend than direct object relatives. These results connect Swahili with similar findings in other typologically diverse languages, with identifiable trends showing that ability to correctly pinpoint the relativized element in a head-initial language improves with proficiency.

Even as results of the acceptability judgment task were mixed, and not as robust as was hoped, there may indeed be some indication that learners’ motivations for one or more of the forms of the relative clause in Swahili are linked to related linguistic factors. This evidence comes from a subsequent factor analysis performed to ascertain whether underlying factors linked preferences for overt subjects, the tense marker, or the complementizer *amba-*. Each of the seven categories of comparison in the acceptability judgment task was entered into the analysis as an individual variable. The factor analysis was achieved by means of a principal components analysis, using direct oblmin, or an oblique method of rotation with Kaiser normalization, as two variables were closely correlated, $r = .871, p < .001$. Rotation of factors converged within 5 iterations, within a two-factor solution.

The emergence of these two factors demonstrates that the optionality of *pro*-drop in tensed and tenseless relatives is not a significantly competing linguistic factor for learners. Factor 1 ‘related preference for tense marker in both relativized and non-relativized phrases’ reveals that learners have an overt preference for the tense marker in the verbal complex whether the phrase is relativized or not. This same finding emerges in results from the grammaticality judgment test where learners across proficiency levels mostly failed to judge as grammatical sentences without the tense marker (i.e., reduced present tense).

At the same time, factor 2 ‘related preference for *amba-* and tense marker’ suggests that learners encountered with a relativized phrase largely combine their priority for the tense marker with a preference for *amba-* as well. This result is also confirmed by results of the grammaticality judgment

⁷ Participants in Experiment Two were 16 learners of Swahili at Michigan State University, 3 learners at University of Michigan, Ann Arbor, and 8 learners at Washington University in St. Louis. Of the 27 participants, 6 were at the advanced level (fifth semester and beyond), 7 were intermediate learners in their third semester, and 14 had just completed their first semester (advanced-level learners consistently rated themselves higher than their counterparts in each self-rated proficiency category). A by-items analysis on responses to target items on the grammaticality judgment test reveals that across all levels *amba-* relatives are best accepted, followed by tensed relatives, and tenseless relatives. As results from the previous investigation tentatively indicated, learners across levels primarily reject sentences where the tense marker is absent; though they are slightly better when it comes to tenseless relatives (see Table 5). False tense markers are mostly rejected across all levels.

Proficiency	Grammatical				Ungrammatical	
	<i>Amba</i> -relative	Tensed relative	Tenseless relative	Reduced present tense	Tense marker & REL suffix	False tense marker
1st semester (<i>n</i> = 14)	46 (82.1%)	36 (64.3%)	25 (44.6%)	13 (23.2%)	28 (50.0%)	44 (78.6%)
3rd semester (<i>n</i> = 7)	25 (89.3%)	19 (67.9%)	10 (35.7%)	3 (10.7%)	11 (39.3%)	25 (89.3%)
5th semester+ (<i>n</i> = 6)	22 (91.7%)	19 (79.2%)	11 (45.8%)	0 (0.0%)	15 (62.5%)	20 (83.3%)

Table 5. Correct judgments by the 27 participants on the grammaticality judgment test in Experiment Two.

test where learners overwhelmingly selected *amba*- relatives as the most grammatical relative clause type. The preference for *amba*- by English-speaking learners may also be the result of transfer, where learners prioritize a *wh*-type equivalent word in Swahili to accommodate the frequent use of ‘who’ and ‘which’ in English. This explanation is akin to the line of reasoning explored by Diessel and Tomasello (2005) in their investigation of the child acquisition of relative clauses. Essentially, their conclusion is that relative clause types (subject, direct object relatives, etc.) most structurally similar to main clauses are the easiest to acquire. Further investigations on L2 Swahili conducted with a wider variety of L1s could explore this account through cross-linguistic evidence.

Another surprising finding is that learners are more apt to accept as grammatical relative clauses that incorrectly include both the relative marker suffix and tense marker, than true tenseless relatives (see **Table 5**). This is worthy to note because learners would not have been exposed to this ungrammatical variant of the relative clause in classroom input or through any other means. This result seems to indicate that the inclusion of the tense marker in the auxiliary is central to a learner’s construction of the Swahili verb. Learners do not seem to move past this stage, as even advanced learners preferred verbs wherein tense is overtly marked. This suggests that future research on the acquisition of Swahili might further investigate the negotiation and manipulation of verbal morphology by L2 learners.

5.1. Directions for further research

Finally, there are some additional areas of interest that this investigation can hopefully help to jumpstart. The first of these is to take advantage of the extensive noun class system of Swahili to thoroughly explore animacy as a potential factor in relativization. With only the first two noun classes in the agreement scheme as animate, there remain another six, at least, which might be effectively evaluated through investigations of this kind. If the phonological characteristics of one or more inanimate noun classes have implications in the ease of relativization, then this would add another aspect to the developing picture. Also, small sample size was a limitation in this study. It is hoped that growing awareness of L2 acquisition research in African languages will open up more access to learners as participants in these studies. The final frontier, of course, is to pull all of these variables together into a more comprehensive processing account of relative clause acquisition in Swahili, which can be extended to other Bantu languages on the whole.

6. Conclusion

In presenting data on the comprehension of both subject and direct object relative clauses, this study has extended the conversation on language universals in L2 acquisition to African languages.

These data additionally demonstrate the value of examining structural factors, and morphology in particular, in the study of relative clause acquisition. In this case, the distribution of the relative marker challenged the structural measurement of long distance. While the head-initial structure of Swahili allowed for the correct prediction of a preference for subject relative clauses by learners and NSs by way of the structural distance hypothesis, the structural account was necessarily expanded through a consideration of movement and inflectional boundaries within the verb. Ultimately, it was found that the primary factors distinguishing the L2 acquisition of the three forms of the Swahili relative clause are not related to long distance. Rather, preference for overt subjects and the tense marker in the verb auxiliary regulate ease of relativization between these three structural forms, which are distinguished by their variable incorporation of resumptive pronominal clitics. The optionality of *pro*-drop does not appear to be a strong factor.

Overall, this investigation demonstrates the potential for continued use of current linguistic theory in the study of the L2 acquisition of African languages, and specifically Bantu languages, for many of the morphosyntactic features of the Swahili relative clause are shared by a number of other Bantu languages. The fact that what Comrie (2007) refers to as an ‘NPAH effect’ can be found in a language that is genetically unrelated to European or Asian languages is an exciting prospect for research in this area. As African languages such as Swahili continue to be more frequently studied as foreign languages by learners of a diverse range of L1s, systematic investigations like this one are sure to become even more useful to the rapidly expanding field of African-language pedagogy.

Appendix A

Target test items: Picture-selection task

Subject Relative Clauses

1. *mwanamke ambaye anamwona mwanaume*
‘the woman who sees the man’
2. *mwanaume ambaye anampenda mwanamke*
‘the man who likes the woman’
3. *mwanamke ambaye hampendi mwanaume*
‘the woman who dislikes the man’
4. *mbwa ambaye anamwona nguruwe*
‘the dog who sees the pig’
5. *nguruwe ambaye anampenda mbwa*
‘the pig who likes the dog’

Direct Object Relative Clauses

1. *mwanamke ambaye mwanaume hampendi*
‘the woman who the man dislikes’
2. *nguruwe ambaye mbwa anampenda*
‘the pig who the dog likes’
3. *mwanamke ambaye mwanaume anamwona*
‘the woman who the man sees’
4. *mbwa ambaye nguruwe anamwona*
‘the dog who the pig sees’
5. *nguruwe ambaye anampenda mbwa*
‘the pig who likes the dog’

Appendix B

Target test items: Grammaticality judgment test

1. *Imani ana rafiki anayeandika vitabu.*
‘Imani has a friend who writes books.’
2. **Mbwa ayampenda Paka.*

3. **Imani aenda shule kwa basi kila siku.*
4. *Mtu ambaye anauza vitu ni muuzaji.*
'A person who sells things is a seller.'
5. *Disemba, Amina apendaye Krismasi.*
'(Each) December, it is Amina who loves Christmas.'
6. **Ninapenda watu walacheza muziki.*
7. **Mama anasomaye vitabu viwili.*
8. *Mtu asomaye kitabu ni mwanafunzi.*
'A person who reads a book is a student.'
9. *Kila usiku, mama asema hadithi.*
'Every night, mother says a story.'
10. *Nyumbani, Baba anapikaye keki.*
'At home, it is Father who typically prepares a cake.'
11. *Mtoto asomaye anajifunza shuleni.*
'A child who reads learns in school.'
12. *Mzee ni mtu ambaye ana miaka sabini.*
'An elder is a person who is 70-years-old.'
13. *Nina rafiki anayependa kucheza michezo.*
'I have a friend who likes to play games.'
14. **Juma akofanya kazi ya nyumbani.*
15. *Jumamosi Amina alala nyumbani.*
'Saturday, Amina sleeps at home.'
16. **Watu wanapendaye shule, ni wanafunzi wazuri.*
17. *Mtu ambaye anafundisha ni mwalimu.*
'A person who teaches is a teacher.'
18. **Msichana atojifunza Kiswahili shuleni.*
19. *Mama apendaye chai asubuhi.*
'It is mother who prepares tea in the morning.'
20. *Mwalimu ni mtu anayefundisha wanafunzi.*
'A teacher is a person who teaches students.'
21. *Mama apiga picha na kamera yake.*
'Mother takes pictures with her camera.'
22. **Mwalimu ni mtu anafundishaye wanafunzi.*
23. *Ninataka mbwa ambaye anapenda chakula.*
'I want a dog who like food.'
24. *Mwalimu ana mwanafunzi anayependa kusoma.*
'The teacher has a student who likes to read.'

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