

Chapter 23

On the derivation of Swahili *amba* relative clauses: Evidence for movement

Isaac Gould

Ewha Womans University

Tessa Scott

University of California, Berkeley

This paper brings together two disparate strands of research in the literature on relative clauses (RCs) in Swahili. Our focus is to provide a unified analysis of various data involving a particular kind of head-external RC, namely *amba*-RCs. Our interest is in whether these RCs involve movement of the head from inside the RC to its external position (i.e. head raising). To investigate this, we look at scope interactions between a quantified RC-head and some other quantifier. We propose a diagnostic test using constraints on long-distance QR (LDQR) from Fox (2000) to provide evidence for the following claims: *amba*-RCs involve head raising, and *amba*-RCs are not islands for overt syntactic movement.

1 Introduction

In this paper we discuss a previously undiscussed puzzle that emerges from the literature on the derivation of relative clauses (RCs) in Swahili. Two conflicting analyses have been proposed: one that involves syntactic movement of the RC-head (i.e. head raising) and one that does not. On the one hand, there is Nkonyani's (2001; 2006) movement analysis, which is largely based on inverse scope data involving pronoun binding or multiple quantifiers. On the other hand, there is Barrett-Keach's (1985) and Keach's (2004) non-movement analysis, which is based primarily on data related to relative clause islands. The apparent incompatibility of these two arguments necessitates a more detailed view of the data



with the aim of developing a uniform analysis of all the data. Our focus in this paper is to do so with a particular kind of relative clause in Swahili, namely *amba* relative clauses, which are RCs that contain the relativizing morpheme *amba*.

In this paper, we propose such a uniform analysis of *amba*-RCs that relies on syntactic movement. In addition to confirming grammaticality judgments for some of the data from the literature, we conducted a more careful investigation of the inverse scope interpretation of quantifiers in multiply-embedded *amba*-RCs, which are putatively islands for movement. As we discuss, the kind of inverse scope we consider in *amba*-RCs could be tied to either movement of a quantificational RC-head or to long-distance Quantifier Raising (QR) of some other quantifier out of an RC, in which case the RC-head need not move. We then consider when general constraints on QR would and would not allow for long-distance QR out of an RC to be licensed. In part by controlling for when QR should not be possible, we are led to expect that the relevant inverse scope interpretation will be possible if there is movement of the relative's head, but impossible if relativization does not involve movement of the head. As the data we present indicate that inverse scope is indeed possible, we conclude (a) that *amba*-RCs involve movement of the relative's head, and (b) that *amba*-RCs are not islands for overt movement. Possible supporting evidence, which we discuss, comes from looking at another long-distance dependency that is also possible across *amba* relative clause boundaries.

In using constraints on QR to establish an argument as to whether a movement dependency exists elsewhere in the syntactic structure, we are inspired by Fox (2000) with regard to both the constraints themselves, and how they are used to establish an argument for or against movement. Our focus is somewhat different from Fox's, though, in that we use constraints on long-distance QR out of an RC to test for whether that RC's head has undergone movement for relativization purposes. As far as we know, this is a novel attempt at (a) considering when long-distance QR out of an RC would be licensed, as well as (b) using such QR as part of a test for whether the RC-head undergoes movement.

On a more general level, this paper can be seen as an experiment in rigorously investigating one particular kind of evidence with an eye toward reconciling other, potentially disparate strands of evidence. To the extent that this experiment succeeds, our hope is that it can serve as a kind of blueprint for investigating additional phenomena involving displacement that at first glance suggest multiple contrasting analyses.

The judgments we report in this paper (some of which confirm earlier judgments from the literature) represent a unified, speaker-internal set of data from a

Kenyan speaker of the standard Kenya-Tanzania variety of Swahili. Our hope is that these judgments can be replicated in future work with further speakers. The data were gathered via elicitation sessions using constructed examples. The set of examples provided in §2 and §3 is based on existing examples from the literature, whereas the set of examples in §4 and §5 was constructed for the purpose of this paper. As indicated above, data involving quantifier scope are of particular importance for the argument being developed in this paper. For each quantifier scope relation between two quantifiers that we tested, the following procedure was used. The speaker was presented with some illustration and was instructed on what was being depicted in that illustration. The illustration depicted a scenario that would be true under one scope relation between two quantifiers for some Swahili sentence (which had not been presented to the speaker), but false under the other scope relation. The speaker was then presented with the relevant Swahili example and asked to evaluate the well-formedness of such an example given the scenario depicted in the illustration. These evaluations are what we report with scope judgments in the relevant examples.

The structure of this paper is as follows. In §2 we introduce the form of *amba*-RCs. §3 briefly reviews two existing analyses of *amba*-RCs and some of the core data that have been discussed in support of these analyses. We then propose a test in §4.1 that can help us adjudicate between these analyses, and §4.2 provides an illustration of this test and some discussion of its implications. §5 contains an additional data point from a further long-distance dependency that is consistent with our proposal, and §6 concludes the paper.

2 The form of *amba* relatives

Swahili has a number of different types of relative clause constructions (cf. Ngonyani 2001), but in this paper we restrict our attention to what we call *amba* relatives. These are relative clauses that contain the relativizing morpheme *amba*, as illustrated in (1).

- (1) Ni-li-nunu-a vi-tabu amba-vyo Juma a-li-vi-som-a.
 1ST.SG-PST-buy-FV 8-book amba-8AGR Juma 1S-PST-8O-read-FV
 ‘I bought the books that Juma read.’

(1) shows that these are head-external RCs, with the head (here *vi-tabu* ‘books’) preceding first *amba*, then an agreement marker ending in *-o* or *-e* (which we gloss as AGR), and then the relative clause proper. We use the term agreement

marker here descriptively, simply to indicate that its morphology corresponds with the noun class of the head of the relative.¹ In examples throughout, we will indicate the head of an *amba*-RC in boldface.

Other relative clause constructions in Swahili have different forms and do not contain the morpheme *amba*. In some research, such as Ngonyani (2001; 2006), both *amba*-RCs and non-*amba*-RCs are used interchangeably in constructing a theoretical analysis and are given the same analytical treatment. However, we believe this approach introduces a potential confound, as it has been proposed (e.g. Barrett-Keach 1985) that the different types of Swahili relatives involve different syntactic structures. To avoid this potential confound, each type of RC can be investigated systematically and independently of the other RC types. This is the approach we take here by focusing on *amba*-RCs; future research can look at extending this approach to the other RC types in Swahili.

3 The puzzle of previous approaches

In this section we review two competing analyses of *amba*-RCs, one with and one without syntactic movement of the RC-head. The disparity of these analyses leaves us with a puzzle as to how to analytically approach these relatives. It should be noted, though, that the different analyses are not based on the same core set of data. In this paper, we address this shortcoming by investigating a more comprehensive data set, which we then use as the foundation for our analysis of *amba*-RCs.

We begin with Barrett-Keach's (1985) and Keach's (2004) non-movement analysis. As regards an implementation of such a non-movement approach, we will follow Keach (2004) in our discussion here, but the approach in Barrett-Keach (1985) is highly parallel. A schematic structure for the head-external relative in (1) is given in (2), which is based on Keach (2004: 126). Keach treats the agreement marker suffixed to *amba* as a relative pronoun, which we represent here as AGR. For Keach, this relative pronoun is co-indexed with a null pronoun (*pro*) in the gap position and also, presumably, the external head (e.g. 'books' in (1)):

¹There are various analytical possibilities for what this agreement marker might be. For instance, it could be the reflex of agreement between some syntactic head (perhaps C) and the head of the relative, or it could be, as Henderson (2006) suggests, a resumptive pronoun. As far as we can tell, either of these analyses is in principle a viable one, and both are compatible with the overall discussion in this paper (see also note 4). Yet another possibility, which we do not consider any further is Keach's (2004) own claim, which we discuss in the following section, that it is a relative pronoun.

- (2) Non-movement analysis of *amba*-RCs (cf. Keach 2004)
 Head_i [*amba*-AGR_i [... *pro*_i ...]]

Note that the long-distance dependency in (2) is established via co-indexation and by binding of *pro* by the relative pronoun. Whether the agreement marker should be treated as a relative pronoun or as simply being the realization of phi-feature agreement is not crucial to our concerns here (which have to do with the presence or absence of movement), and we will thus abstract away from this point. However, we believe that a more semantically transparent representation of (2) involves something along the lines of inserting an appropriately co-indexed null operator at the edge of the embedded clause. In line with this, we will not treat the agreement marker as denoting an individual, and in fact will treat the entire *amba*+AGR complex as a formative of RCs that is semantically vacuous (cf. the treatment found in Heim & Kratzer (1998) for the complementizer *that* of English relative clauses).²

Crucially, according to the analysis in (2) or any such similar analysis (including Barrett-Keach 1985), the external head 'books' is not extracted via movement from the gap position within the relative; instead, this analysis proposes that the head is base-generated in its external position outside of the relative. Indeed, relativization according to this kind of analysis does not involve any movement at all (such as, for example, null operator movement).

Barrett-Keach/Keach's primary evidence to support (2) comes from the absence of relative clause island effects.³ We can see this, for instance, with grammatical examples that involve relativizing two elements from an *amba*-RC. We will call these constructions doubly-embedded RCs, as they involve embedding one *amba*-RC inside of another. Further, in examples of what we call doubly-embedded RCs, the sites of the gaps for the two relativized elements occur within the most deeply embedded *amba*-RC. We will use the notation *e* and co-indexation as a neutral way of representing the site of the gaps and the relationship

²And should AGR turn out to be a resumptive pronoun (which is interpreted as a variable ranging over individuals) under the movement analysis that we consider later in this section, this will not affect the discussion in §4 of Quantifier Raising with regard to violations of scope economy.

³Keach (2004) offers, in passing, another type of data as evidence against movement, but given Keach's limited discussion it is not currently clear to us that the data indeed provide a strong argument against movement. Keach observes that parasitic gaps do not appear to be licensed by *amba*-RCs. We have not been able to thoroughly investigate this construction, but we note that the conditions on parasitic gaps (e.g. the structural position of the parasitic gap and the non-parasitic gap with respect to each other) might independently not be met in *amba*-RCs even if they do involve movement.

between these gaps and the relativized elements. We were able to confirm Barrett-Keach's basic observations by constructing the doubly-embedded *amba*-RCs in (3) and (4); these examples were judged grammatical. (3) illustrates this with nested filler-gap dependencies, whereas (4) does so with crossing ones. In (3) and (4) we can call *ki-tabu* 'book' and *m-tu* 'person' the highest RC head, as they are the heads of the superordinate *amba*-RCs.

- (3) Doubly-embedded *amba*-RC: nested dependency

Nick a-li-ki-nunu-a **ki-tabu_j** amba-cho ni-li-wa-on-a **wa-toto_i**
 Nick 1s-PST-7O-buy-FV 7-book_j amba-7AGR 1ST.SG-PST-2O-see-FV 2-child_i
 amba-o [e_i wa-li-ki-som-a e_j].
 amba-2AGR [e_i 2s-PST-7O-read-FV e_j]

'Nick bought the book that I saw the children who read (it).'

- (4) Doubly-embedded *amba*-RC: crossing dependency

Ni-li-mw-it-a **m-tu_i** amba-ye u-li-wa-on-a **wa-toto_j**
 1ST.SG-PST-1O-call-FV 1-person_i amba-1AGR 2ND.SG-PST-2O-see-FV 2-child_j
 amba-o [e_i a-na-wa-pend-a e_j].
 amba-2AGR [e_i 1s-PRS-2O-like-FV e_j]

'I called the person who you saw the children who (he) likes (them).'

Barrett-Keach/Keach's argument is that if examples like (3) and (4) involved syntactic movement, then they should be ungrammatical, as they would incur a subjacency violation. As no island effect occurs, Barrett-Keach/Keach's conclusion is that these RCs must be derived without movement. As already mentioned, the non-movement derivation Keach proposes is given in (2) above. Note that Barrett-Keach/Keach's argument crucially hinges on the assumption that doubly-embedded RCs should be islands to movement. RCs can indeed be islands in languages such as English, however in §4 we dispute the claim that *amba*-RCs are necessarily islands in Swahili.

Next, we consider the movement analysis of Ngonyani (2001; 2006). In contrast to Barrett-Keach/Keach, Ngonyani proposes a head raising analysis (cf. Kayne 1994). According to this analysis, the head of the relative (again, 'books' in (1)) moves from the gap position to its relative clause-external position. This is shown schematically in (5), where we assume movement dependencies are instantiated by copies in a copy-chain (Chomsky 1995); we use a strikethrough to indicate the positions of unpronounced copies. (5) illustrates this dependency by representing

simply two (of a potentially larger number of) copies of the dependency: the pronounced external head and the lowest copy of the head in the gap position.⁴

- (5) Movement analysis of *amba*-RCs (cf. Ngonyani 2006)

Head_i [*amba*-AGR_i [... Head_i ...]]

Ngonyani's core evidence for movement comes from the possibility of inverse scope involving (a) scope relations between multiple quantifiers and (b) binding data. First, the example in (6) is based on Ngonyani (2001: 66) – but note that Ngonyani's actual example involves a type of RC that is not an *amba*-RC – and supports Ngonyani's basic finding regarding inverse scope of quantifiers. In (6), the external head contains the numeral *-wili* 'two', and the relative contains the universal quantifier *kila* 'each'. Nevertheless, inverse scope is possible: the embedded universal can take scope over the numeral, resulting in a distributed reading.

- (6) Inverse scope with two quantifiers possible: ✓ $\forall > 2$

Ni-li-wa-it-a [wa-le wa-gonjwa wa-wili]_i amba-o [kila
1ST.SG-PST-2O-call-FV [2-DEM 2-patient 2-two]_i amba-2AGR [each
daktari a-ta-wa-pim-a e_i].
doctor 1S-FUT-2O-examine-FV e_i]

'I called those two patients that each doctor will treat.'

Second, (7) repeats Ngonyani's (2001: 65) example and replicates Ngonyani's judgment that the possessive pronoun *-ake* in the external head can be bound by the universal *kila* 'each' in the relative, again resulting in a distributed reading.

- (7) Inverse binding of pronouns possible

[Ki-tabu ch-ake_i ch-a kwanza]_j amba-cho [[kila mw-andishi]_i
[7-book 7-3RD.SG.POSS_i 7-of first]_j amba-7AGR [[every 1-writer]_i
hu-ji-vun-i-a e_j] hu-w-a ki-zuri sana.
HAB-REFL-be.proud-APPL-FV e_j] HAB-be-FV 7-good very

'His first book that every writer is proud of is very good.'

⁴We note that the possibility of analyzing *amba*-RCs as involving resumptive pronouns, which was mentioned in note 1, does not preclude the possibility of their being derived via raising of the RC-head. Support for this view comes from work such as Aoun & Li (2003), which illustrates that movement of a particular constituent is still possible with a resumptive pronoun corresponding to that constituent.

The thrust of Ngonyani's argument is as follows. In order for the readings in (6) and (7) to be possible, we assume that the position where the universal quantifier is interpreted must be in a structurally higher position than the position where the RC-head is interpreted (cf. Heim & Kratzer 1998). Assuming that the universal is interpreted in the RC (but see §4 for an alternative view), then it follows that the head is also interpreted in a lower position internal to the RC. A movement dependency with multiple copies of the head can capture this: in (6) and (7) the higher copy of the head is *pronounced* external to the relative, whereas the quantificational/pronominal material of the head is *interpreted* in a lower copy internal to the relative (and structurally lower than the embedded universal). Note that under a non-movement approach, these interpretive facts are not accounted for with the analysis in (2) by itself (cf. §4 for further discussion of this point). Given (2) alone, the quantificational force of relative's head in (6) would be interpreted outside the RC in a position that is structurally higher than the embedded universal. Further, the pronominal variable of the relative's head in (7) would also be interpreted outside the RC in the same high structural position.⁵

Given the contrasting analyses by Barrett-Keach/Keach and Ngonyani, we are now faced with the following puzzle. How can we make sense of the interpretive facts in (6) and (7), which suggest that the head originates within the RC, while at the same time allowing for relativization of heads from doubly-embedded RCs? The interpretations put forward in the literature of the kinds of data presented above have so far pulled us in two different directions. On the one hand, it has been assumed that *amba*-RCs are syntactic islands, which pushes us away from a movement analysis. On the other hand, the interpretive facts have pushed us toward a movement dependency between the external head and the gap position.

In this paper, we attempt to resolve this tension by investigating a more comprehensive set of data, as well as a more refined set of analytical hypotheses.

⁵Ngonyani (2001) considers two other phenomena as evidence for a head raising analysis. The first involves connectivity effects with idioms: certain phrasal idioms in Swahili allow for an idiomatic interpretation when part of the idiom is relativized as the RC-head, with the remainder of the idiom occurring inside the relative. However, we are not aware of any theory of semantics that would preclude an idiomatic interpretation given the non-movement analysis in (2). Second, Ngonyani observes that the agreement marker following *amba* must agree with the head of the relative. Again, it is not clear to us that a theory of agreement a priori prevents such agreement from occurring given the analysis in (2). Consequently, we do not think these phenomena present compelling arguments for or against movement, and we will not consider them further.

Crucially, neither Barrett-Keach/Keach nor Ngonyani considers the same set of core data. Thus Barrett-Keach/Keach does not consider the interpretative facts in (6) and (7), and Ngonyani does not look at doubly-embedded RCs. So far, we have gone beyond the existing literature by presenting a speaker-internal set of judgments involving both types of data. But we will go further. A natural next step would be to consider the interpretive possibilities of doubly-embedded RCs, i.e. a synthesis of the phenomena in (3–4 and (6–7)). This is essentially how in §4 we approach the tension mentioned above, although the discussion will be limited to considering inverse scope involving multiple quantifiers (and not pronominal binding), and as mentioned in the following section, our general approach is not specific to doubly-embedded RCs. By presenting novel data, we will show that the balance of evidence is in favor of a movement approach to *amba*-RCs. We will give a uniform analysis that accounts for all the data we have seen so far. A consequence of this analysis is that it will force us to reject the assumption that *amba*-RCs are islands for overt movement in Swahili. This is perhaps a desirable outcome, as it dovetails with a further long-distance dependency fact in the language, as we show in §5.

4 A closer look at inverse scope

4.1 Introducing the hypotheses

As a way of better understanding *amba*-RCs, in §4 we take a closer look at inverse scope data such as (6) and their relation to doubly-embedded constructions such as in (3) and (4). In particular, we investigate whether inverse scope is possible with doubly-embedded RCs. That is, we test to see whether, when there are doubly-embedded RCs, a quantifier pronounced inside one of the RCs can take inverse scope over the highest RC head. The initial motivation behind looking more carefully at doubly-embedded RCs is to see whether this inverse scope, which we associated with a movement analysis of the RC-head in previous section, is also found with doubly-embedded RCs, which are putatively islands for movement. If such inverse scope is possible, then we might conclude that there is always movement in *amba*-RCs, and that these RCs are not in fact islands for movement. However, as we discuss, we will need to be careful in constructing examples of this sort, in order to control for another potential way in which inverse scope could be derived (i.e. one with Quantifier Raising, but without movement of the RC-head). Ultimately, the test that we end up with is not specific to doubly-embedded RCs, although we find that the relevant examples with these RCs pro-

vide an especially clear way of seeing both (a) that inverse scope is possible, and (b) an argument in favor of *amba*-RCs involving movement of the head.⁶ Consequently, we will focus on these examples of doubly-embedded RCs, and will frame the discussion below around them. To understand this argument and thus the significance of these novel data, we first present a set of hypotheses regarding *amba*-RCs in §4.1, before presenting our core data and testing these hypotheses in §4.2.

Our discussion and the hypotheses we introduce here hinge on the question of whether *amba*-RCs are in fact islands for overt movement. As we discuss below, this question bears directly on the issue of analyzing *amba*-RCs as involving raising of the head. Our goal is not to strictly falsify one of these hypotheses, but to use these hypotheses as a jumping off point for (a) the question of a movement/non-movement analysis of the derivation of *amba*-RCs, and (b) an account of all the data we have seen so far. The hypotheses we introduce refer to overt movement, by which we mean movement that must occur before Spell-Out (and thus not at LF) and that feeds PF in that a higher copy of the movement dependency is pronounced (cf. Chomsky 1995). Ngonyani's analysis of RCs would thus be an example of overt movement, as the highest copy of the head is pronounced at PF. We contrast this with Quantifier Raising, or QR, (cf. May 1977; 1985), which may be covert in that it occurs only at LF and has no detectable effects on PF.

The two core hypotheses we investigate are given in (8).⁷ Note that in the discussion below we will follow the null hypothesis in assuming that all *amba*-RCs are derived uniformly, i.e. either uniformly via non-movement, as in (2), or uniformly via movement, as in (5).

- (8) a. Hypothesis 1 (H1): *amba*-RCs are not islands for overt movement.
b. Hypothesis 2 (H2): *amba*-RCs are islands for overt movement.

We now consider the implications of these two hypotheses, starting with H2. To begin with, we can observe that doubly-embedded RCs play an important role in helping to see the relation between the hypotheses in (8) and whether there is head raising in the relatives. According to H2, doubly-embedded RCs as in ((3)-(4)) can only be possible by base-generating the highest RC-head outside its RC

⁶Strictly speaking, then, the test we consider and the argument we propose could be reconstructed using examples of non-doubly-embedded *amba*-RCs, similar to the one in (6). However, we find that the doubly-embedded RCs provide a straightforward and clear way of illustrating both the test and argument.

⁷To be precise, within the context of the hypotheses in (8), by “*amba*-RC” we mean the constituent formed by the RC-head and the RC (including *amba*+AGR).

as in the non-movement analysis in (2). As the embedded *amba*-RC, once built, would constitute an island, it would not be possible to overtly extract another RC-head from within it via head raising. Thus, if we follow H2, then the movement analysis cannot be adopted for *amba*-RCs.

A further consequence of following H2 regards interpretation. As the highest RC-head must be generated outside its RC, this highest RC head cannot be interpreted inside an *amba*-RC for purposes of inverse scope. This does not mean, however, that H2 predicts that there cannot be inverse scope. Inverse scope could be possible on the assumption that covert movement is possible out of the relative. In doubly-embedded RCs, for example, it could be the case that QR of a universal quantifier from an *amba*-RC is possible, thereby allowing the universal to take scope over the highest RC head. This kind of QR is also in principle possible to derive inverse scope in (6–7).⁸ This analysis is along the lines of what Hulsey & Sauerland (2006) propose for QR out of RCs in English. We go beyond Hulsey and Sauerland, though, by embedding this proposal in some more general theory, namely Fox's (2000) theory of QR. In §4.2 we adopt Fox's approach in investigating what conditions might allow this kind of non-clause-bounded, or long-distance, QR to be possible. Fox suggests that QR can sometimes be possible out of embedded clauses (although he does not consider relative clauses) if these conditions are met.

Crucially, when we conduct the test for inverse scope mentioned at the beginning of this section, we will do so in doubly-embedded RCs in which these conditions on long-distance QR are *not* met. Under the assumption that these conditions are operational in Swahili, if inverse scope is still possible when these conditions are not met, then everything else being equal, we have evidence against H2. In other words, if we find that inverse scope is possible in an environment where under a non-movement analysis we would not expect it to be possible (because by hypothesis the relevant QR is not possible), then we have evidence against H2 and a non-movement analysis. (This raises the question of how such inverse scope might be possible, a question that we take up below in considering a movement analysis of the relatives under H1.) But if it turns out that such inverse scope is impossible, then we have evidence in support of H2 and a non-movement analysis. This is because such inverse scope is expected to be impossible under a non-movement approach, as the relevant conditions on QR are not met.

⁸This QR analysis assumes that Weak Crossover Effects would not obtain for pronoun binding in (7). Further research can investigate whether such effects exist more broadly in Swahili.

We now consider H1. Under H1, with everything else being equal, a movement analysis as in (5) should be in principle possible for all *amba*-RCs, and such an analysis can account for all our data. First, multiple cases of relativization as in the doubly-embedded RCs in (3–4) are expected to be grammatical because *amba*-RCs, not being islands for overt movement, will not block this kind of overt extraction. Second, the inverse scope facts of (6–7) can also be accounted for with a full lower copy of the RC-head being interpreted inside the RC. Third, we also expect inverse scope to be possible in cases of doubly-embedded RCs because a full lower copy of an extracted head can in principle be interpreted in the most deeply embedded RC. (In ⁹, we mention a slight qualification of the expectation that a full lower copy in a copy-chain can be interpreted, but for the discussion at hand, the general expectation that a full lower copy can be interpreted is sufficient.) As mentioned above, in the following section we will test for inverse scope with doubly-embedded RCs. Recall we proposed that under H2, QR is necessary to account for inverse scope, and that there must be a non-movement analysis of *amba*-RCs under H2. Similarly, for a non-movement analysis under H1, QR is necessary to account for inverse scope. As the RCs we test will be doubly-embedded RCs that are not expected to allow inverse scope via QR, we do not expect inverse scope with a non-movement analysis under H1. In contrast we expect such inverse scope to be generally possible with doubly-embedded RCs given H1 and the possibility of interpreting full lower copies under a movement analysis. Thus if we find that such inverse scope is indeed possible, then we have support for H1 and a movement analysis of *amba*-RCs. But if such inverse scope turns out to not be possible with doubly-embedded RCs, then everything else being equal, we (a) have a reason to reject a movement analysis under H1, and (b) have evidence in support of a non-movement analysis under H1.

In sum, we want to construct examples of doubly-embedded *amba*-RCs in which we expect long-distance QR to be impossible given the conditions in Fox (2000). If inverse scope is possible, then we have support *for* H1 and a movement analysis (because QR is not relevant, with inverse scope being possible via interpreting a full lower copy of the moved RC-head), and *against* H2 and a non-movement analysis, which relies on QR being possible. In contrast, if inverse scope is impossible, then we have support *for* a non-movement analysis under either H1 or H2, and *against* H1 and a movement analysis. Thus, testing for inverse scope becomes a way of testing for raising or base-generating the head in *amba*-RCs. Again, our goal is ultimately not to decide between H1 and H2, but

to use these hypotheses as a tool for identifying head raising and accounting for our data set. Anticipating the discussion below, though, we will see evidence for head raising, and thus evidence for H1 and against H2.

Methodologically, our approach here builds on that in Fox (2000), which also uses the absence/presence of some QR dependencies as part of a test for diagnosing other QR dependencies. We broaden the empirical focus of this approach with the aim of implicating the potential of QR out of an RC in a test for whether the RC-head has itself moved out of the RC. Again, we are not aware of any previous literature that has applied this treatment to long-distance QR out of RCs.

In §4.2, we review the conditions on QR given the discussion in Fox (2000), and then test our hypotheses with the relevant examples of doubly-embedded RCs.

4.2 Testing the hypotheses

In this section we consider novel data from Swahili in order to implement the test mentioned in the previous section, which involves inverse scope in doubly-embedded RCs. Recall that the test involves seeing whether inverse scope is possible in a structure where we do not expect long-distance QR (LDQR) to be possible as per Fox (2000). Such a test can be used to argue for or against a movement analysis of *amba*-RCs, and we will see in this section that our test pushes us toward adopting the analysis in (5), namely that there is head raising in all *amba*-RCs. Before presenting the test results, we begin with a review of the conditions in Fox (2000) under which LDQR is possible. Again, we are interested in testing examples in which LDQR should not be possible, as the non-movement analysis of inverse scope would crucially rely on this kind of QR. Reviewing these conditions is thus crucial for laying the groundwork for and understanding the test itself. Then after discussing the test results, we consider and reject an alternative analysis of the results, according to which Swahili simply does not follow all the constraints on LDQR.

A second constraint on QR is a locality constraint. Fox (2000: 23, 63) suggests that each iteration of QR of a quantified expression Q must adjoin Q to the closest clause-denoting constituent that dominates Q before QR. We understand a clause-denoting constituent to be a closed proposition that is a maximal projection (i.e. a projection that is maximal in all regards other than the adjunction involved in QR). An example of such a clause-denoting constituent that could be

adjoined to would be the maximal projection of TP, which is a saturated predicate before adjunction.⁹

Let us now consider schematically in (9) what QR from a relative clause would look like and how it could satisfy these constraints. In (9), the RC-head is Q_1 , which corresponds to the gap in the object position of the relative. Next, Q_2 in (9) is the subject inside the RC. Q_2 then undergoes QR (indicated by a strikethrough) to adjoin to a clause-denoting constituent outside the relative that is structurally higher than the RC-head Q_1 .

- (9) Proposal for Quantifier Raising from an *amba*-RC: ✓ $Q_2 > Q_1$
 $Q_2\text{-Subj}$ [$Q_1\text{-Obj}$ *amba*-AGR [~~$Q_2\text{-Subj}$~~ ... e_{Obj}]]

This QR will be licensed as follows. First, the new scope relation $Q_2 > Q_1$ must establish a new meaning (scope economy). Second, there must be no clause-denoting maximal projection between the position Q_2 undergoes QR from and the position of the RC-head (locality). This locality constraint can be satisfied if we assume subjects in Swahili occupy a high structural position within the clause, say at the TP level (cf. Ngonyani 2006), such that no clause-denoting intervening maximal projection of this sort occurs between the embedded subject and the RC-head. We will indeed assume that a configuration such as (9) licenses LDQR in Swahili as per the discussion in Fox (2000).¹⁰

Note that the configuration in (9) is precisely the sort of analysis that would allow for inverse scope in (6), which involves a single *amba*-RC.

In our test related to our hypotheses in (8), though, we will consider the possibility of inverse scope in examples that involve two manipulations to the schema in (9). First, we will have Q_1 in (9) be the highest RC-head of a doubly-embedded RC construction. As discussed in §4.1, under a non-movement analysis, turning (9) into a doubly-embedded RC construction would force Q_2 in (9), if it is merged in the most deeply embedded RC, to undergo QR in order to take scope over

⁹A related point is whether scope economy and the locality constraint apply to interpreting a full lower copy of movement. Based on Fox (2000: p. 23; n. 6, p. 23), we can say that scope economy does apply, but that the locality constraint does not. Thus semantic equivalence must not hold between the relevant scope relations with regard to interpreting a higher copy in a copy-chain or a full lower copy in that copy-chain. This lack of semantic equivalence is found in all the examples in this paper where we propose a full lower copy is interpreted. So long as scope economy holds, though, a full lower copy can be interpreted without regard to what kinds of projections intervene between the higher and lower copies of a copy-chain.

¹⁰Recall that we assume *amba*+AGR is semantically vacuous, in which case the CP of the RC is simply an open proposition (cf. Heim & Kratzer 1998). Consequently, the CP level of the RC is not an intervening clause-denoting constituent.

Q₁. Second, we will manipulate (9) such that QR of Q₂ would be possible only by violating the locality constraint. This manipulation is an attempt to eliminate base generation of the RC-head as a possible analysis. If inverse scope is still possible, but if locality is violated, then we have reason to think that LDQR is not taking place. Our conclusion, then, would be in favor of H1 and a movement analysis, according to which inverse scope is possible by raising the RC-head and interpreting a full lower copy of that head.

The crucial data are given in (10), which contain doubly-embedded *amba*-RCs (but see note 12 below for a potential complication with (10b)). We see that the embedded universal can take scope over the numeral in the RC-head, resulting in a distributed reading.

(10) Inverse scope possible in doubly-embedded *amba*-RC: ✓ $\forall > 2$

- a. Ni-li-wa-it-a [wa-gonjwa wa-wili]_j amba-o duka la
 1ST.SG-PST-2O-call-FV [2-patient 2-two]_j amba-2AGR store of
 dawa hi-li li-li-m-p-a vi-donge [kila daktari]_i
 medicine DEM-5 5-PST-1IO-give-FV 8-pill [every doctor]_i
 amba-ye [e_i a-li-wa-pim-a e_j].
 amba-1AGR [e_i 1S-PST-2O-examine-FV e_j]

‘I called the two patients that this pharmacy gave pills to every doctor that treated (them).’

- b. Ni-li-wa-it-a [wa-gonjwa wa-wili]_j amba-o
 1ST.SG-PST-2O-call-FV [2-patient 2-two]_j amba-2AGR
 ni-na-m-fahamu [kila daktari]_i amba-ye [e_i
 1ST.SG-PRS-1O-know [every doctor]_i amba-1AGR [e_i
 a-li-wa-pim-a e_j].
 1S-PST-2O-examine-FV e_j]

‘I called the two patients that I know every doctor who treated (them).’

Importantly, we claim that for QR to result in inverse scope in (10), the QR would necessarily involve violating a constraint on QR. To see this, first note that the universal quantifier is now the indirect object of the verb ‘give’ in the higher *amba*-RC in (10a), and the direct object of the verb ‘know’ in the higher *amba*-RC in (10b). This contrasts with (6–9), where the universal is in an embedded subject position. Crucially, the subject of ‘give’ is a definite description, and the subject of ‘know’ is an indexical. We assume that the subject of ‘know’ in (10b) is represented in the syntax with a *pro* that occupies the same structural

position as the overt DP subject of ‘give’ in (10a), making these two examples highly parallel. We further assume that in the Swahili data here, QR over a definite description or a pronoun does not establish a new meaning and that QR over such an element would not by itself satisfy scope economy. Now, in order for the various iterations of QR to proceed locally in (10), QR of the universal would have to first move from an interpretable position (by hypothesis, the *vP* edge) and adjoin above the subject ‘this pharmacy’ or *pro* at the TP layer (a clause-denoting constituent) of the ‘give’-clause or ‘know’-clause, before subsequently adjoining to a position higher than the RC-head with the numeral. This is shown schematically in (11), where adjunction positions for QR are underlined and indexed. However, adjoining in this lower position (i.e. adjunction in position α), as required by locality, would not establish a new meaning, and thus would violate scope economy.¹¹ Conversely, if QR skipped over position α (thereby satisfying scope economy with the new scope relation established at position β), locality would be violated.

(11) Local QR violating scope economy:

- a. $\underline{\beta}$... [two patients [*amba*-AGR [_{TP} $\underline{\alpha}$ this pharmacy [... every doctor ...]]]] (cf. (10a))
- b. $\underline{\beta}$... [two patients [*amba*-AGR [_{TP} $\underline{\alpha}$ *pro* [... every doctor ...]]]] (cf. (10b))

Consequently, the data in (10) constitute evidence against LDQR from *amba*-RCs: inverse scope appears to be possible even when the constraints on QR are violated. Accordingly, (10) is evidence against H2 in (8b) and the non-movement analysis (under either H1 or H2) in (2). According to (8b) and (2), we predict inverse scope to be impossible, contrary to (10).

¹¹There is a potential complication in (10b) involving the position of the verb ‘know’. As Fox (2000: 65) discusses, QR over a verb such as ‘know’ can satisfy scope economy by establishing a new scopal relation with the intensional verb. For our purposes, this is only relevant if the verb in Swahili raises to a relatively high position. For example, if the verb ‘know’ in (10b–11b) raises to T, then scope economy via QR and adjunction to TP would be satisfied because even though the universal quantifier would not establish a new meaning with respect to *pro*, it could do so with respect to ‘know’. However, if the verb in Swahili raises only to some lower position, such as *v* or some aspectual head (cf. Ngonyani 2006), then the discussion in the main text remains unaffected. Regardless of the height of verb movement in Swahili, though, the argument presented here based on (10a), which involves the non-intensional verb ‘give’, still stands.

In contrast, (10) is possible under H1 in (8a) and the movement analysis in (5). Recall that for inverse scope to be possible under a head raising account we simply need to interpret a full lower copy of the RC-head with the numeral in the lower *amba*-RC, which is in a position below the universal in the higher *amba*-RC. This analysis follows if movement is possible out of doubly-embedded *amba*-RCs. If this line of reasoning is on the track, and it is indeed supported by the empirical finding in (10), then we are forced to conclude in favor of H1, namely that *amba*-RCs are not islands for overt movement.

Before concluding this section, we discuss one final alternative to the movement analysis under H1. For this final alternative we consider relaxing the constraints on QR. Suppose that there is cross-linguistic variation such that in some languages (e.g. English, as per Fox 2000) the locality constraint is operative for QR, whereas in other languages, such as possibly Swahili, the locality constraint on QR is *not* operative. What this would mean is that scope economy would not be violated as in (11), because no intermediate step of QR is forced by locality: this putative grammar for Swahili would allow for QR to adjoin directly to the higher QR position β in (11), without first adjoining to QR position α .

However, we reject this parametric view of locality for the following reason. Under the null hypothesis, we would expect locality to not be operative in other embedding constructions in Swahili.¹² We can test for this with regular sentential complements to see whether a universal quantifier can QR from the embedded to

¹²A reviewer asks whether it might be the case that there is also variation across syntactic constructions with regard to the locality constraint. This view would hold that the null hypothesis mentioned in the main text is false because according to this view, the locality constraint could be inoperative for QR out of, say RCs, but might be operative for QR out of other kinds of embedded clauses. As a way of countering this view, the reviewer suggests providing some independent evidence that QR out of RCs is sensitive to the locality constraint. We believe that such independent evidence can be found, in part, by looking at RCs in English. Consider the example in (i) below.

- (i) I called the two journalists that described the award that Obama gave every soldier.
(* $\forall > 2$)

Inverse scope of the universal over the numeral appears to be impossible. This is unexpected if the locality constraint did not apply to RCs. Indeed, the only kind of embedded clause that the universal would have to QR out of is an RC. If the locality constraint did not apply, the universal quantifier could QR to a position higher than the numeral, where it could take scope over the numeral and satisfy scope economy. However, the lack of inverse scope is expected given a locality constraint on QR. With such a constraint, the universal quantifier would have to adjoin to the TP that immediately dominates *Obama*. Such a step of QR, though, would violate scope economy, as no new meaning results from the universal taking scope over a name. Consequently any further QR in (i) is ruled out, and inverse scope becomes impossible.

the matrix clause.¹³ As a baseline, we first give a simple matrix transitive example in (12) to show that an object can indeed take scope over a subject in Swahili independent of RC constructions. We assume that inverse scope is possible in (12) via QR. This QR respects scope economy and is local (from, say, the νP to the TP level).

- (12) Inverse scope of quantifiers possible in simple transitives: $\checkmark \forall > 2$
 Wa-vulana wa-wili wa-na-m-pend-a kila m-sichana.
 2-boy 2-two 2S-PRS-1O-like-FV every 1-girl
 ‘Two boys like every girl.’

The crucial data point is (13). There the universal is embedded as an applied object inside a sentential complement.¹⁴ Importantly, the universal cannot take scope over the numeral subject in the matrix clause (which is base generated there, as there is no embedded gap), and a distributed reading is not possible.

- (13) Inverse scope of quantifiers not possible from complement clause: $*\forall > 2$
 Wana-funzi wa-wili wa-li-dai kwamba Juma a-li-m-fok-e-a
 2-student 2-two 2S-PST-claim that Juma 1S-PST-1O-scold-APPL-FV
 kila mw-alimu.
 every 1-teacher
 ‘Two students claimed that Juma scolded every teacher.’

Note that such a distributed reading would be possible if there were no locality constraint on QR: this unconstrained QR would obey scope economy (giving rise to the distributed reading) but would not have to proceed cyclically in a local manner by adjoining at the TP level (above the subject) in the ‘scold’-clause.

The fact that inverse scope is not possible in (13) supports the conclusion that locality is an operative constraint on QR in Swahili. Locality forces local QR above *Juma* within the embedded clause, but as *Juma* is simply a name, no new meaning is established and scope economy is violated. Consequently, it is not possible to have further QR of the universal above the matrix subject.

¹³We test this by looking at whether QR is possible with a universally quantified direct object in (12), and with a universally quantified applied object in (13). In applying this test, and in drawing conclusions from the test data, we assume that there is no relevant difference involving the possibility of QR with respect to these two types of objects. Further research can look more carefully at whether there are any relevant differences between the object types with regard to QR that might act as a potential confound in our application of the test here.

¹⁴In a manuscript version of this paper, we had transcribed the embedded verb without an applicative suffix, but we suspect that this was a typo. We thank a reviewer for pointing this out.

In sum, what (13) suggests with regard to this final alternative analysis is that what this alternative would call LDQR in (10) is not really QR at all. Accordingly, QR in Swahili (as in English) would be constrained by scope economy and locality. Further, the inverse scope relation in (10) is established by interpreting a full lower copy of the RC-head within the relative. This interpretive option is possible because movement of the RC-head involves leaving a copy of the head that can be interpreted within the relative. Thus on the basis of the detailed scope data considered in this section we conclude that *amba*-RCs involve head raising and are consequently not islands for overt movement (cf. Sichel 2014 for a similar claim regarding certain relative clause constructions beyond Swahili). In the following section we provide an additional data point involving another long-distance dependency that provides potential support for the claim that *amba*-RCs are not islands for overt movement.

5 Another long-distance dependency

In the previous section we provided an argument in favor of a movement analysis of *amba*-RCs along the lines of (5). We also claimed that *amba*-RCs are not islands for overt movement. Consequently, it is possible to relativize another RC-head by moving it past an RC-head+*amba* boundary, as in the case of doubly-embedded *amba*-RCs. The null hypothesis is that all instances of overt movement can move past this boundary (i.e. not just in cases of relativization). To the extent that we find such evidence, it supports our analysis of *amba*-RCs and their status as non-islands. In this brief section, we present preliminary data suggesting this null hypothesis is on the right track. What we see here is that another type of long-distance dependency that involves displacement is also possible across an *amba*-RC boundary. Our example of this involves the case of long-distance topicalization in (14), where we see topicalization of an argument past the RC-head+*amba* boundary.

- (14) Topicalization out of an *amba*-RC is possible
 [Ki-tabu hi-ki]_j, ni-na-m-fahamu m-tu_i amba-ye [e_i
 [7-book DEM-7]_j 1ST.SG-PRS-1O-know 1-person_i amba-1AGR [e_j
 a-li-ki-andik-a e_j].
 1S-PST-7O-write-FV e_j].
 ‘This book, I know the person who wrote (it).’

It remains to be shown that topicalization in Swahili does in fact involve movement. This could involve, for example, repeating the argument of inverse scope

from the previous section with appropriately modified versions of (14). At this point we have no further data that would shed light on this issue, but given that the dependency in (14) involves displacement, it is a likely candidate for overt movement. Thus (14) is consistent with our claim that *amba*-RCs are not islands, and this would be a welcome finding should topicalization indeed involve movement in Swahili. Given our current data limitations, though, we will leave this as a topic for future research.

6 Final remarks

The literature on Swahili has offered contrasting accounts of relative clauses with *amba* that are based on separate types of evidence. In this paper, we took seriously the challenge of attempting to integrate these different sources of evidence into a unified analysis of these RCs. Our investigation hinged on a detailed look at novel data involving inverse scope relationships between quantifiers. Based on these data, we concluded that *amba*-RCs involve moving the RC-head from a position inside the relative to a position outside it, and that *amba*-RCs are not islands for overt movement.

To be sure, the discussion here should be seen as just an initial step of much broader and more far-reaching potential investigations of RCs in Swahili. For instance, as regards *amba*-RCs, the binding fact we illustrated in (7) can be explored in the same rigorous way as was done in §4.2. A more analytical question that we have not considered concerns the internal structure of *amba*-RCs. In particular, can the absence of island effects in Swahili versus the presence of island effects in English RCs be tied to some structural difference of the RC itself? More generally, we have not looked at the other types of RC constructions in Swahili (i.e. non-*amba*-RCs; cf. Ngonyani 2001), and it remains to be seen to what extent they can be assimilated to our overall analysis presented here. Our hope is that the systematic, empirical and analytical tack we have followed here can be used fruitfully for the future study of Swahili RCs, as well as those found in other languages.

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Abbreviations

1-8	noun classes	HAB	habitual
1 st	first person	IO	indirect object
2 nd	second person	O	object
3 rd	third person	PRS	present
AGR	agreement	PST	past
APPL	applicative	REFL	reflexive
DEM	demonstrative	S	subject
FUT	future	SG	singular
FV	final vowel		

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