

# Stem Structure in Eegimaa

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In any account of agglutinative constructions, such as the Joola Eegimaa verb stems studied here, as many as four key features of description and explanation play a role: linear order, the isolation of morphological units, syntactic structure, and interpretation. Linear order in pronunciation is directly perceived, but morphological units, in the best case, are recognized by processes that selectively apply to contiguous stem units, rather than to linearly discontinuous pieces of stems. A completely harmonic system would be one where the affix linearly closest to the root is most deeply embedded structurally and is compositionally interpreted before subsequent affixes are added on. The Joola Eegimaa system is not completely harmonic in this way, in that (a) linear order is insufficient to predict semantic composition or what counts as a structural unit, (b) processes that isolate morphological units permit some structural relations to be posited, while others are underdetermined, and (c) neither linear order nor the isolation of morphological units suffice on their own to explain how interpretations are composed. We argue that an analysis of the verb stem in syntactic terms, where the syntax mediates the relation between interpretation and the rearrangement of morphological units, permits an explanation of several otherwise baffling generalizations - generalizations that capture robust and highly regular features of Eegimaa stem form and interpretation. If our analysis is correct, deep generalizations about verb stem structure posited for other languages play essentially the same role in Eegimaa, once certain syntactic displacements are posited. We demonstrate that the structure and the displacements we propose are independently motivated and supported by both linear and interpretive outcomes that do not appear explicable under any other approach.

The rich verb stem morphology can include subject agreement marking (SM), causative (CAUS), inherent reflexive marking (IRM), reflexive marking (RFM), reciprocal marking (RCM), a series of adverbial markers such as ‘former(ly)’ (FMR) and habitual (HAB) (amongst others), negation (NEG), perfective (PFV) and passive (PASS), as well as potentially multiple object markers (OM). Benefactive arguments in the form of OMs can appear on the stem with the other OMs and do not involve any visible applicative marker. Whether the OMs are benefactive, direct objects, causativized subjects, or indirect objects, they all appear stem finally. Most verb stems with compatible semantics can be nominalized by several nominalizing affixes, though the only one that will be mentioned here is agentive (AGT). We demonstrate that certain sequences of affixes on the stem act as units and that every such unit is a proper subpart of a larger one according to the schema produced below (with several affixes left out for the purposes of presentation).

1) [[SM [[[root] IRM/CAUS]<sub>inmost</sub> RCM/RFM]<sub>inner</sub> FMR...PASS~PFV]<sub>outer</sub> (SM)]<sub>outmost</sub> OM]  
We will show that the IRM and CAUS affixes can only attach to the root and not to each other and that all other affixes follow these members of the ‘innermost stem’. The RFM and RCM are next and can appear in either order, but since the affix we call RCM because it can provide reciprocal meaning has several other (aspectual or adverbial) meanings, there can be more than one, and if there is a benefactive argument in addition to a direct object, there can also be more than one. The RFM, which also has an emphatic meaning, can co-occur with the RCM, more than one RCM and with another RFM, as long as meanings for all of them are computable and appropriate to context. All other affixes follow RFM/RCM in a fixed order when they are present. Some affixes are incompatible with others, e.g., PFV and OM cannot co-occur and if a

stem is nominalized by AGT then SM cannot appear (but OMs can). The inner stem is identifiable also because in one form of verb reduplication, only the sequence of affixes in the inner stem is reduplicated (and the duplicate appears to the right of the whole stem). Some of the SMs are circumfixes and when they appear the rightmost portion of the circumfix attaches to the outer stem. OMs attach to the outermost stem. When there are only two suffixes, the order is thus predictable in every instance, except in the case of RCM/OM and in certain cases where there is more than one OM.

One issue that arises is why this particular ordering of suffixes should be the one that we see on the surface. Cinque (1999) has argued that there are universal orderings of affixes in terms of proximity to the root and in that account, the innermost stem of Eegimaa is unsurprising, but Cinque's schema predicts that PASS should be closer to the root than the adverbial affixes that precede PASS in (1). In order to make the Eegimaa structure conform to Cinque's generalization, the inner stem (allowing for the fact that the RCM and RFM are along for the ride with the inner stem) should originate embedded under PASS, in a structure like (2).

2)  $[[[SM [FMR...PASS\sim PFV [[\text{root}] \text{IRM/CAUS}]_{\text{innermost}} \text{RCM/RFM}]_{\text{inner}} ]_{\text{outer}} (SM)]_{\text{outmost}} \text{OM}]$

If this is the underlying structure, consistent with Cinque's schema, then (1) must arise by displacement of the inner stem to the left boundary of the outer stem, as in (3)



The movement illustrated in (3), however, would not only suffice to account for the deviation from Cinque's schema, but it also provides a direct model for verb reduplication. When certain historical present readings are being avoided or when the action of the verb is emphatic, the inner stem is reduplicated in Eegimaa, as in (4b,d).

- 4a) W-aare wawu gu-sal-en-oro-or-e  
 CL-Women the.3<sup>rd</sup>.PL SM.3<sup>rd</sup>.PL-praise-CAUS-RFM-RCM-PFV  
 'The women made themselves praise each other.'
- b) W-aare wawu gu-sal-en-oro-or-e-sal-en-oro-or  
 CL-Women the.3<sup>rd</sup>.PL SM.3<sup>rd</sup>.PL-praise-CAUS-RFM-RCM-HAB- praise-CAUS-RFM-RCM  
 'The women really made themselves habitually praise each other.'  
 'The women made themselves really habitually praise each other.'
- c) W-aare wawu gu-sal-or-i'  
 CL-Women the.3<sup>rd</sup>.PL SM.3<sup>rd</sup>.PL-praise-RCM-PASS  
 The women were praised for each other
- d) W-aare wawu gu-sal-or-i'-sal-or  
 CL-Women the.3<sup>rd</sup>.PL SM.3<sup>rd</sup>.PL-praise-RCM-PASS- praise-RCM  
 'The women were really praised for each other.'

Once again, note that the HAB is not reduplicated in (4b) and PASS is not reduplicated in (4d). If the movement in (3) is modeled in strict minimalist terms, there are no traces, but only copies that may or may not be pronounced, depending on other factors. The reduplicated verbs are just cases where  $[\text{t}]_{\text{inner}}$  is the pronounced copy of the inner stem.

Although the movement analysis unifies the accounts why affix ordering departs from Cinque's generalizations, on the one hand, and the position and origin of the reduplication, on the other, there is another set of puzzles posed by Eegimaa verb stem structures which still needs to

be addressed. Notice first that when the stem includes both RCM and RFM corresponding to direct object and benefactive arguments, the affix on the left must be the benefactive one.

5a) gu-sal-oro-or-e

SM.3<sup>rd</sup>.pl-praise-RFM-RCM-PFV

\*‘They praised themselves for each other.’

’They praised each other for themselves.’

b) gu-sal-or-oro-e

SM.3<sup>rd</sup>.pl-praise-RCM-RFM-PFV

’They praised themselves for each other.’

\*’They praised each other for themselves.’

When there is both an OM and an RFM or RCM, then either affix can correspond to the benefactive.

6a) gu-sal-oro-ol

SM.3<sup>rd</sup>.pl-praise-RFM-OM.3<sup>rd</sup>.sg

’They praised themselves for him/her.’

’They praised him/her for themselves.’

b) gu-sal-or-ol

’They praised each other for him/her.’

’They praised him/her for each other.’

When there is more than one OM, they appear adjacent to each other, but there are ordering effects based on a person>human>nonhuman and plural>singular hierarchies, such that the highest ranked OM on the first hierarchy precedes the other OM, and if there is a tie then the second hierarchy applies and plural precedes singular. However, it is possible for there to be plural 1<sup>st</sup> and 2<sup>nd</sup> person human OMs, and in such cases, either order is possible.

7a) gu-xur-óli-ul

SM.3<sup>rd</sup>.pl-praise-OM.1<sup>st</sup>.pl-OM.2<sup>nd</sup>.pl

’They nurtured you for us.’

\*’They nurtured us for you.’

b) gu-xur-ul-óli

SM.3<sup>rd</sup>.pl-praise-OM.2<sup>nd</sup>.pl-OM.1<sup>st</sup>.pl

’They nurtured us for you.’

\*’They nurtured you for us.’

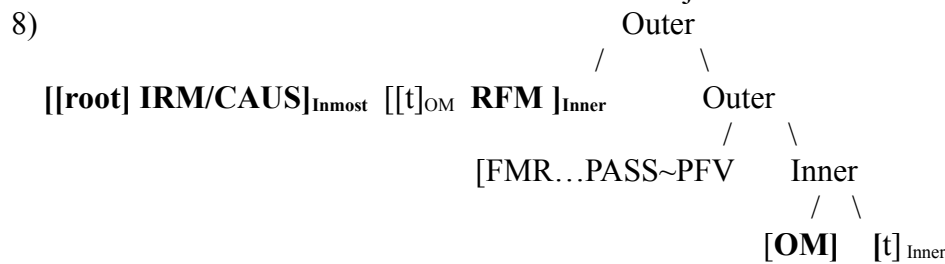
When either order is possible, the leftmost OM must be benefactive, but when the OMs are strictly ordered according to the hierarchy, either one can be the benefactive argument.

The pattern is essentially as follows: Ordering relations between morphemes A and B that are fixed typically allow for ambiguous interpretations consistent with either of two orders of underlying semantic composition (either A>B or B>A), but if surface ordering of A and B is optional, then surface A-B requires A>B interpretation and surface B-A requires B>A interpretation. A plausible pragmatic approach might argue that the optional order has rigid interpretation because the speaker’s choice can signal the intended interpretation, but where the order is rigid, the intended interpretation cannot be distinguished by morpheme order, so the listener must continue to entertain two possible interpretations that the speaker may have intended. On this approach, structural relations are beside the point – all that matters is what morphology makes optional or obligatory with respect to stem affix ordering.

As attractive as the pragmatic account may appear to be at first, the assumptions that are required are more complicated than they appear once the pattern observed is further elaborated.

As noted for (6), when the stem includes either an RCM or RFM and an OM, the order is rigid and once again, the sentence is ambiguous between a reading where the RCM/RFM is benefactive and one where the OM is benefactive. Under the assumption that the OM is structurally outside of the RCM if the RCM closer to the verb root than the OM, the question arises as to how any compositional theory could allow for the RCM to be interpreted ‘outside’ the OM if the OM is structurally outside of the RCM. Although the pragmatic account makes the right prediction, about which interpretations are available, it does not address this apparent problem for compositional interpretation.

A different sort of answer is possible if we entertain the possibility that another instance of movement is involved. Recall that we assume the inner stem contains the RCM and RFM which can represent argument positions. Suppose that the verb complement argument positions are where the OM(s) originate. Now suppose that OMs move out of the inner stem and then get stranded when the inner stem moves leftward and adjoins to the outer stem, as in (8).



Now recall that direct objects and benefactives are essentially symmetric in Eegimaa and that there is no overt applicative affix. Thus in (8) there is no way to know if the OM has been extracted from a direct object position or a benefactive position, nor can we tell anything similar about the RFM. Thus in these constructions, we correctly expect ambiguity about which of the arguments is the benefactive. (We will also address examples where the SM.2<sup>nd</sup>.pl circumfix is to the left of the OM and show there is reason to reject it as an argument against our proposal).

This explains the ambiguous interpretations when RFM/RCM co-occurs with an OM, but so far it does not extend to the ordering of OMs when more than one of them is visible or the ordering of RCM and RFM when both are visible. We are still working on this portion of the analysis, but our preliminary analysis is based on Shortest Move as proposed in Richards (2001). Richards argues that in cases of multiple wh-fronting in some Slavic languages, the order of fronted wh-phrases preserves the order (c-command hierarchy) of the extracted arguments. We propose to treat the multiple fronting of OMs the same way. If oblique arguments are structurally higher than direct objects, and if OMs must escape the inner stem (for whatever reason), then the oblique complement argument will move first to left-adjoin to the inner stem and the direct object, which is further away from the edge, will move second to a position ‘tucking in’, as proposed in Richards (2001), to the left than the oblique argument. Rigid interpretation for optional ordering of OMs arises only when the OMs in a given case tie on the morphological precedence hierarchy. The stranding of the OMs after leftward inner stem movement leaves them in their order of extraction, such that the oblique, extracted first, is higher and to the left of the direct object because the direct object is extracted second and tucked in below the oblique OM. Where morphological ordering trumps syntax (where the hierarchy applies) structurally adjacent affixes can be reordered (by language specific rules of morphophonology) to conform to the person-human-animal and plural-singular hierarchies. These cases obscure the order of extraction, so the result is ambiguous. (We abstract away from a different account of person-animacy hierarchies that could be syntactic, as in Baker, Safir and

Sikuku, 2013).

Finally we come to the optional ordering of RFM and RCM and the rigidity of interpretation. Again, this is work in progress, but the leading idea we have right now is that the RFM and RCM are extracted from their complement positions and adjoined to the innermost stem, respecting the same Shortest Move restrictions that determine that the first of two RCM/RFM affixes in surface linear order will be the benefactive. The rest of the innermost stem adjoins just above where the RFM/RCMs are attached and that adjunction forms the inner stem. Thus the RFM and OM are ordered by the history of their extraction and then stranded at the end of the inner stem by movement of the (remnant) innermost stem to yield the order in (9) for the inner stem (where only the bolded elements are pronounced).

9) [ **[root-(CAUS/IRM)-[t]<sub>RFM</sub>-[t]<sub>RCM</sub>] [RFM [ RCM [root-(CAUS/IRM)-[t]<sub>RFM</sub>-[t]<sub>RCM</sub>]]] ]** ]

The details aside, the basic idea is that optional ordering of two argument affixes in Eegimaa reflects the order of extraction from vP as determined by Shortest Move. The interpretation can be read off the structure as unambiguous – the first of the two affixes is benefactive - unless there are morphological animacy and plurality hierarchies that obscure the order of extraction, in which case the interpretation is ambiguous as to which of the two affixes corresponds to the benefactive argument (setting aside the other meanings that the RCM is associated with).

Thus the ambiguous readings for the rigid orders have two different sources. The rigid orders for RFM/RCM vs. OM arise because the landing sites for RFM/RCM are always lower than those for OMs. The result is ambiguous because we cannot tell for sentences with an OM and an RFM, for example, which of them was the object and which the indirect object, given double object symmetry in Eegimaa. The rigid linear orders of OMs induced by the animacy and plurality hierarchies also results in ambiguity, since the orders of extraction are obscured.

In our presentation we will show how each structural manipulation achieves the desired result and how each step is supported by independent evidence (insofar as that is possible). The result is a system that better predicts the apparent correlation between rigid ordering and ambiguous interpretation while at the same time recovering the right underlying compositional structure and accounting for the distribution of reduplication in Eegimaa. If there is time, we will draw parallels between the results of inner stem movement in Eegimaa and the purported CARP template in Bantu (Hyman, 2003) (CAUS-APPL-RCM-PASS). For example, we will draw attention to the position of [V-CAUS-APPL] to the left of certain adverbial/aspectual verb extensions and passive and we will show that inner stem movement may also be responsible for at least the relative order of Bantu CAUS-APPL-PASS.