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THE INTERSECTION OF SYNTAX, SEMANTICS
AND PHONOLOGY IN KIKONGO

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This paper looks at tonal alternations in the Kimanyanga dialect of Kikongo, which bear on the theory of how phonology, syntax, and semantics interact, and focuses on the question of what kinds of syntactic and semantic properties can be relevant to phonology. We will see that phonology can indeed be sensitive to properties of the semantic representation, a result which is not predicted from models of grammatical organization that derive phonological and semantic representations as separate paths descending from syntactic surface structure.

Space limitations preclude a complete analysis of tone in nouns, so we will just sketch the tonology of the noun, forgoing an in-depth analysis until later. Most nouns in Kikongo fall into one of three tone classes. In the first class (muteté) there is one H, always on the final vowel. In the second (dókotólo), there is one H on the initial stem mora, and one on the penult. In the third (mafúngúnúnú), there is a plateau of H's across the stem.

(1) mu-teté "box" kokotí "coconut"
dókotólo "doctor" mfúlutútu "tortoise"
ma-gháálá "branch" ma-fúngúnúnú "bee (sp.)"

Underlyingly, nouns have one or two H tones. If there is one H it is final. If there are two H’s, the first is on the initial stem vowel. The second may unpredictably appear on the final or the penult. Thus, surface mafúngúnúnú is underlying mafúngununú.

The surface form of nouns like mafúngúnúnú comes from applying the rule Plateauing (2).
(2) Plateauing

\[
\begin{array}{c|c}
\text{H} & \text{H} \\
V & V \\
\end{array}
\]

Finally, if a stem has two adjacent H's (bikúni “farmers”), they fuse into one multiply-attached H. Bearing all these facts in mind, we now consider the phonological effect of H Effacement, which applies to nouns in subject position inter alia. Effacement deletes the leftmost stem H. In nouns with one H (mankondé), this is the only H. In nouns of the initial and penult class (dókotólo), this is the first H. In the H plateauing nouns (mafúngúnúnú), Effacement seems to delete the initial string of H’s; recall that the underlying form of this noun is mafúngununú. In dimoraic nouns like bikúni, the two adjacent stem H’s undergo tonal fusion (unlike mafúngununú), so the H is linked to two vowels, and on the surface both vowels lose their tone.

(3) ma- nkondé, mabódídi “the bananas rotted”
ma-dokotólo, mafwíídí “the doctors died”
ma-fungununú, mantátíkídí “the bees bit me”
bi-kunci, bifwíídí “the farmers died”

Nouns are marked with a subscript e if they undergo Effacement.

A further phrase level complication must be considered. In (4) we see nouns which are direct objects standing after the verb. This too is one of the contexts where Effacement applies, so the final H of mankondé, or the initial string of H’s in mafúngununú are missing. We also find H on the word initial vowel or vowels.

(4) ma- nkondé mboongídí má- nkóndé “I took bananas”
bi-kúni tumweení bi-kuni “we saw farmers”
ma-láálá díídí má- laalá “he ate oranges”

This H comes from a later rule which assigns H to the left edge of a phrase preceded by some word. These H’s are a later complication, which renders Effacement opaque.
With this background, we turn to the conditions on the two rules of $H$ deletion. The first rule deletes the first $H$ of nouns in isolated NP's containing a universal quantifier. Consider the data in (5). Here, nouns have the same tone pattern in isolation as they have when followed by various modifiers.

(5) bikúní byabíngi
    bikúní byábáduundu
    bikúní byabínéné
    binyónya byámbóte
    binyónya byamuloongí
    binyónya bitatú
    binyónya byánání
    “many farmers”
    “farmers of B.”
    “large farmers”
    “good termites”
    “the teacher’s termites”
    “three termites”
    “whose farmers?”

These examples contrast with those in (6), which are nouns followed by universal quantifiers. Here the first stem $H$ deletes.

(6) mankonde mámansó
    binyónya byábínsó
    mado kokótoólo máwóoonsono
    bikuni byábínsó
    “all bananas”
    “all termites”
    “all doctors”
    “all the farmers”

This can be accounted for by a rule which deletes the first $H$ if a universal quantifier follows. Additional data show that listing the lexical items which trigger the rule is not sufficient. There is a construction in Kikongo used for “All X things”, where $X$ is some number. The construction is formed by prefixing the associative prefix (e.g. bya) to the numeral (e.g. bitatú).

(7) bikuni byábányóóle
    bikuni byábíbatú
    malaalá mánsámbwáádi
    malaalá mákumí ná matató
    “all two farmers”
    “all three farmers”
    “all seven oranges”
    “all 13 oranges”

As the examples of (5) show, deletion of $H$ is not triggered by the associative bya– alone, nor by the numeral alone. What triggers deletion of $H$ is the semantic property of the construction.
We cannot attribute this behavior to a special constituent relationship between quantifiers and the noun. Such an approach might be plausible if the order of universal quantifiers and other modifiers were circumscribed, but as seen in (8), quantifiers and other modifiers co-mingle freely, and there is no difference between universal and non-universal quantifiers in this respect. The stem H is still deleted from the head noun whenever there is a universal quantifier, no matter where it stands.

(8) bikúní byabíngi byáBánduundu “many farmers of B.”
    bikúní byáBánduundu byabíngi =
    bikuni_e byábínsó byáBánduundu “all farmers of B.”
    bikuni_e byáBánduundu byábínsó =

Since there is no reconstruction of the property “modified by a universal quantifier” in syntax, we need rule (9), which refers to a property of semantic representations.

(9) Universal Effacement \( H \rightarrow \emptyset / [\text{NP} [N \ldots ] \forall \ldots ] \)

We now turn from the semantically conditioned rule to the rule Argument Effacement which deletes H from heads of phrases in certain sentential positions. In (10) we see examples of the noun bikúní and the time adverb lüm büki, which can be treated as a noun, undergoing deletion of H. (The left edge of the VP is marked with a bracket as an aid to parsing sentences.)

(10) bikuni_e [bifwíídí
      farmers  they-died

      [mweení bikuni_e
      I-saw  farmers

      “the farmers died”

      “I saw the farmers”
bikuni [tubavoondidí  "we killed the farmers"
farmers  we-them-killed
[kátukidí lúmbukí  "he left today"
e-left  today
lumbukí [tudiidí  "we ate today"
etoday  we-ate

In (11) is a list of contexts where nouns lose their H.

(11) Subject (before VP).
Immediately postverbal object, indirect object or adverb. Any
object, indirect object or adverb preceded by an object,
indirect object or adverb.
Preposed object, indirect object or adverb immediately before
VP.
Preposed object, indirect object or adverb separated from VP
by subject or by another preposed object, indirect object
or adverb.

We have seen examples of single preverbal adverbs, NP subjects, and
NP objects in (10). In (12) we see examples of Effacement applying to
two postverbal NP's.

(12) [ndaambidí kíkuni mádéesó  "I cooked the farmer beans"
I-cooked-for  farmer  beans
mfumu [wunámfilá mbóngó lúmbukí  "the chief will give me money today"
chief  he-will-me-give  money  today

Argument Effacement can apply to three phrases in a row, as
shown by the double object constructions with an adverb in (13).
(13) [ndaambidí kíkuní mópéésqú lúmbukíqú
I-cook-for farmer beans today
"I cooked the farmer beans today"
[twanyiisa bákeentó máláfu mázoonó
we-cause-drink women wine yesterday
"we had the women drink wine yesterday"

In short, we find that all postverbal phrases within the VP are subject to Argument Effacement.

Argument Effacement applies to preposed objects and adverbs, and will apply to these phrases across a full NP subject. In (14) the preposed adverb lúmbúkíqú precedes the subject baana, and undergoes Argument Effacement.

(14) lúmbukíq úbana [ka bádíídí mó pééésqú kó
today children not they-ate beans not
"Today, the children didn't eat beans"

Effacement applies to multiple preverbal objects and adverbs in (15).

(15) mázoonó máláaló [twasuumbidí
yesterday oranges we-bought
"yesterday we bought oranges"

At this stage, there seems to be only one context where Argument Effacement does not apply, and that is to the citation form. This brings us to the focus position for Kikongo: nouns in that position also do not undergo Effacement. What is special about the focus position is that it is still within the VP. To see this, we must consider certain facts about word order and morphology.

The leftmost element in the VP is usually the verb. Two things can come before the verb in the VP. The first is the negative ka, and the second is an object pronoun such as ya, which happens to be focused. When both ka and a pronoun are present, ka precedes the pronoun. This construction also reveals another morphosyntactic property: the Class 1 subject prefix has a syntactically conditioned allomorph. When preceded by something within the VP, the prefix
takes the form *ka* or its phonetic variants. Otherwise, the prefix is *wu* or Ø as is appropriate for the verb tense.

(16)  
\[
\begin{align*}
\text{[twéti tékísá] } & \text{ we-be sell} \\
\text{[ka twéti tékísá kó] } & \text{ not we-be sell not} \\
\text{[yá twéti tékísá] } & \text{ it we-be sell} \\
\text{[ka yá twéti tékísá kó] } & \text{ not it we-be sell not} \\
\end{align*}
\]

“we are selling”
“we are not selling”
“we are selling *it*”
“we are not selling *it*”

\[
\begin{align*}
\text{[wéti tékísá] } & \text{ “he is selling”} \\
\text{[ka kéti tékísá kó] } & \text{ “he is not selling”} \\
\text{[yá kéti tékísá] } & \text{ “he is selling *it*”} \\
\text{[ka yá kéti tékísá kó] } & \text{ “he is not selling *it*”} \\
\end{align*}
\]

The contrast *mwaana [ wéti tékísá “the child is selling”* versus *mwaana [ yá kéti tékísá “the child is selling *it*”* shows that it is initiality in the VP, not initiality in the S, which determines the choice of *ka* versus *wu*.

The negative and the slot for the pronoun need a special constituent relationship with the VP, to make them distinct from the subject NP, which also precedes the verb. There are many structures which could capture this relation, so I will somewhat arbitrarily select the one in (17).
A full phrase can stand in the focus position, in which case the Class 1 subject prefix takes the VP-medial variant marked "med". Furthermore, a phrase in the focus position does not undergo Argument Effacement.

(18) mwaana\textsubscript{e} [vóóndídí bítúni\textsubscript{e}] "the child killed the farmers"  
child he-killed farmers  

circle mwaana\textsubscript{e} [bítúni kavóóndídí]  
child farmers (med)he-killed  
"the child killed the farmers" 

To summarize, Argument Effacement applies to a noun which is the head of a phrase in any of the boxed positions in (19), but not when the phrase is in the focused slot, which is circled, nor does the rule apply to phrases in isolation.
There is a generalization to be captured here, and that is that the head of an NP undergoes Argument Effacement if it is immediately dominated by S or VP. If we give a feature analysis of S and VP such that both are [+V,−N] and differ only in the feature [SUBJ], we can state the rule as applying to NP's immediately dominated by maximal projections of [+V,−N].

(20) **Argument Effacement**

\[
H \rightarrow \emptyset / \quad [ [+V,-N]_{\text{max}} \ldots [\text{NP} \quad [N \quad \ldots \quad \ldots \quad \ldots \quad \ldots ] \quad \ldots ] ]
\]

Although it isn't clear what X is, it is clear that it isn't a VP or an S, so nouns in the focus position do not undergo Effacement because they are not immediately dominated by the proper category.

So far we have only considered nouns which are the sole word in their phrase. We now consider the presence of other modifiers. We see in (21) that the rule generally applies if modifiers follow the noun within the phrase.

(21) bikuni byámbóte bifvíídí "good farmers died"  
    farmers good they-died  

mweení bikuni byábánduundu "I saw farmers of B."  
    I-saw farmers of Bandundu

If the phrase contains a non-universal quantifier, Argument Effacement is blocked. Consider first the postverbal examples in (22). Objects after the verb normally undergo Effacement, but if the
phrase contains quantifiers, there is no deletion of H.

(22) tubweení bikúní bítaanú
    we-saw farmers five
    “we saw five farmers”

tubweení bikúní byánkáka
we-saw farmers other
    “we saw other farmers”

tubweení bikúní byabírngi
we-saw farmers many
    “we saw many farmers”

Others examples show that the blocking effect of a quantifier affects only the phrase containing the quantifier, and that blocking holds whether the quantifier immediately follows the head noun or is separated from the head by another modifier.

(23) “we saw many teachers of Kinshasa today”
    tubweení miloongí myamíngi myáKinshasa lúmbukí e
    we-saw teachers many of Kinshasa today

tubweení miloongí myáKinshasa myamíngi lúmbukí e
we-saw teachers of Kinshasa many today

“yesterday three children went to school”
mazooné bááná bátatú báyle lé kúlkoolo
yesterday children three they-went(RC) to school

In (24) we see examples of preverbal subjects which contain quantifiers, which are also immune to Effacement. The verb following a finitely quantified subject is in the relative clause form, indicated in the examples as “RC”.

(24) bikúní bítatú bikinini “three farmers danced”
farmers three they-danced(RC)

bikúní byafríyóotí bikinini “some farmers danced”
farmers few they-danced(RC)

In addition to the obvious quantifiers, WH-words in the phrase block Effacement.
Finally, we see examples of object NP’s with WH words in (26). WH objects are moved from postverbal position to the preverbal focus position, and then move to the front of the sentence, leaving a trace in the focus position which triggers the selection of the VP-medial subject marker ka. We see that (fronted) objects containing WH words do not undergo Argument Effacement.

(26) bikúní bíkwa mwaanae kamwééní
    farmers how many child (med)he-saw
    “how many farmers did the child see?”

bikúní bíkwa byábánduundu múlóongi kazóónsidí yébyó
farmers how many of B. teacher (med)he-speak with-them
“how many farmers of Bandundu did the teacher speak with?”

There is another line of evidence showing that the presence of a semantic quantifier in the phrase blocks Argument Effacement. In (27) we see examples of two kinds of associative construction. In the first examples, we find the associative construction used to indicate a quantity of the substance in question, where Effacement is blocked. In the second examples, with the possessive genitive, Effacement is not blocked.

(27) nsuumbidí muteté wabyááási
    “I bought a box of palm fruits”
mweeni mbwaatá yamalafú
    “I found a bottle of wine”
ntekisi mútete, wampángyáámí
    “I sold my brother’s box”
nziimbísí mbwáata, yakíkúni
    “I lost the farmer’s bottle”

This distribution is predicted by the hypothesis that Argument Effacement is blocked by a quantifier in the phrase.

It is clear that we must also refer to the presence of a
quantifier to state where Argument Effacement is blocked. We symbolize the class of quantifiers with $Q$ in this rule.

(28)  \textit{Argument Effacement} (revised)

$$H \rightarrow \emptyset / \left[ +V_{-N} \right]_{\text{max}}^{\text{max}} \ldots \left[ +N \right] \left[ +V \right] \left[ -Q \right] \ldots \right] \ldots$$

We have seen that sentence level phonological rules of Kikongo can be sensitive to the feature representation of syntactic nodes, as well as to semantic properties, in particular the presence of quantifiers. This latter conclusion is no doubt the more startling one, and it raises the question of what other semantic properties phonological rules might be sensitive to. It is obviously too early to speculate about what kinds of other cases there might be, so I will leave the answer to this question to future research.

Notes

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