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Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistics Society: Special Session on African Language Structures
(1991), pp. 188-199

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The Annual Proceedings of the Berkeley Linguistics Society is published online via eLanguage, the Linguistic Society of America's digital publishing platform.

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 (*dókotóólo*), 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"
dókotóólo	"doctor"	mfúlutútu	"tortoise"
ma-ghááálá	"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*

Finally, if a stem has two adjacent H's (*bikúní* "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 (*dókotóólo*), 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 *bikúní*, 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-nkonde$_e$	mabódidi	"the bananas rotted"
	ma-dokotóólo$_e$	mafwíídí	"the doctors died"
	ma-fungununú$_e$	mantátíkídí	"the bees bit me"
	bi-kuni$_e$	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 *mafúngúnúnú* are missing. We also find H on the word initial vowel or vowels.

(4)	ma-nkondé	mboongidí má-nkónde$_e$	"I took bananas"
	bi-kúní	tumweení bí-kuni$_e$	"we saw farmers"
	ma-láálá	díídí má-laalá$_e$	"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 byabíingi	"many farmers"
	bikúní byáBánduundu	"farmers of B."
	bikúní byabínéne	"large farmers"
	binyónya byámbóte	"good termites"
	binyónya byamuloongí	"the teacher's termites"
	binyónya bitatú	"three termites"
	binyónya byánáni	"whose farmers?"

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

(6)	mankonde$_e$ mámánsó	"all bananas"
	binyonya$_e$ byábínsó	"all termites"
	madokotóólo$_e$ máwóonsono	"all doctors"
	bikuni$_e$ byábínsó	"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. *bítatú*).

(7)	bikuni$_e$ byáabyóóle	"all two farmers"
	bikuni$_e$ byábítatú	"all three farmers"
	malaalá$_e$ mánsámbwáádi	"all seven oranges"
	malaalá$_e$ makumí ná matatú	"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 byabííngi byáBánduundu	"many farmers of B."
	bikúní byáBánduundu byabííngi	=
	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* $H \rightarrow \emptyset \,/\, [_{NP} [_{N} \text{ — }] \ldots \forall \ldots]$

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 *lúmbúkí*, 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 — "the farmers died"
farmers they-died

[mweení bíkuni_e — "I saw the farmers"
I-saw farmers

bikuni$_e$ [tubavoondidí — "we killed the farmers"
farmers we-them-killed

[kátukidí lúmbukí$_e$ — "he left today"
he-left today

lumbukí$_e$ [tudiidí — "we ate today"
today 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 precededed 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$_e$ mádéeso$_e$
I-cooked-for farmer beans
"I cooked the farmer beans"
mfumu$_e$ [wunámfíla mbóongo$_e$ lúmbukí$_e$
chief he-will-me-give money today
"the chief will give me 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 kíkuni$_e$ mádéeso$_e$ lúmbukí$_e$
I-cook-for farmer beans today
"I cooked the farmer beans today"

[twanywiisa bákeentó$_e$ máláfu$_e$ mázoono$_e$
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 *lúmbúkí* precedes the subject *baana*, and undergoes Argument Effacement.

(14) lumbukí$_e$ báana$_e$ [ka badíídi mádéeso$_e$ 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) mazoono$_e$ málaalá$_e$ [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 ∅ as is appropriate for the verb tense.

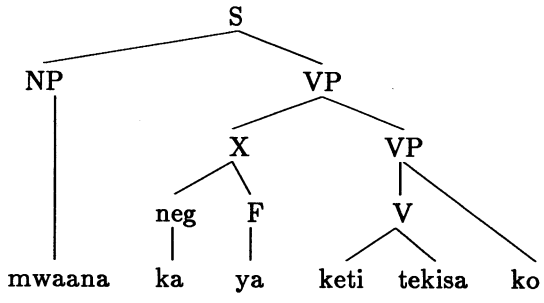
(16)

[twéti tékísá we-be sell	"we are selling"
[ka twéti tékísá kó not we-be sell not	"we are not selling"
[yá twéti tékísá it we-be sell	"we are selling *it*"
[ka yá twéti tékísá kó not it we-be sell not	"we are not selling *it*"
[wéti tékísá	"he is selling"
[ka kéti tékísá kó	"he is not selling"
[yá kéti tékísá	"he is selling *it*"
[ka yá kéti tékísá kó	"he is not selling *it*"

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).

(17)



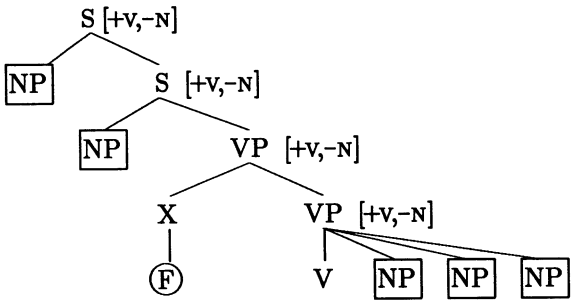
A full phrase can stand in the focus position, in which case the Class 1 subject prefix takes the VP-medial variant marked "med". Furthermore, a phrase in the focus position does not undergo Argument Effacement.

(18) mwaana$_e$ [vóóndídí bíkuni$_e$ "the child killed the farmers"
child he-killed farmers

mwaana$_e$ [bíkúní 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.

(19)



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*

$$H \rightarrow \emptyset \; / \quad [_{[+V,-N]^{max}} \ldots [_{NP} [_{N} \ldots \underline{\quad} \ldots] \ldots] \ldots]$$

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$_e$ byámbóte bifwíídí "good farmers died"
farmers good they-died

mweení bíkuni$_e$ 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 five farmers"
we-saw farmers five

tubweení bikúní byánkáka "we saw other farmers"
we-saw farmers other

tubweení bikúní byabíingi "we saw many farmers"
we-saw farmers many

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 myamíingi myáKínshasa lúmbukí$_e$
we-saw teachers many of Kinshasa today

tubweení miloongí myáKínshasa myamíingi lúmbukí$_e$
we-saw teachers of Kinshasa many today

"yesterday three children went to school"
mazoono$_e$ báaná bátatú báyelé kúlúkoolo
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 bíkinini "three farmers danced"
farmers three they-danced(RC)

bikúní byafyóotí bíkinini "some farmers danced"
farmers few they-danced(RC)

In addition to the obvious quantifiers, WH-words in the phrase block Effacement.

(25) bikúní bíkwa bíkinini "how many farmers danced?"
farmers how many they-danced(RC)

bikúní byánáni bíkinini "whose farmers danced?"
farmers of-who they-danced(RC)

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 mwaana$_e$ __t__ kamwééní ____
farmers how many child (med)he-saw
"how many farmers did the child see?"

bikúní bíkwa byáBánduundu múlóongi$_e$ 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 wabyáási	"I bought a box of palm fruits"
mweeni mbwaatá yamalafú	"I found a bottle of wine"
ntekisí mútéte$_e$ wampángyáámí	"I sold my brother's box"
nziimbisí mbwáata$_e$ 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 $\mathcal{Q}$ in this rule.

(28) *Argument Effacement* (revised)

$$H \rightarrow \emptyset \,/\, [_{[+V,-N]^{max}} \ldots [_{NP} [_{N} \ldots \underline{\quad} \sim \mathcal{Q} \ldots] \ldots] \ldots]$$

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

* I would like to thank Kufimfutu Bakelana for the data on Kikongo, and Peter Culicover, Larry Hyman, Bob Levine, Shigeru Miyagawa, Carl Pollard, Craige Roberts, and Thilo Schadeberg for helpful suggestions and questions.