The Linker in the Khoisan Languages
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Abstract: The linker introduces ("links") a variety of expressions into the verb phrase: locatives, the second object of a double object construction and a causative, instruments, subject matter arguments and adverbs. It is present in all non-central Khoisan languages (e.g., ǂHoã, N|uu, Ju|'hoan, !Xóõ and |Xam). The linker is also found outside of Khoisan across the continent, in languages such as Yoruba, Baoule and Kinande. This paper summarizes the basic properties of the linker in Khoisan.

1. Introduction

The Khoisan languages are the non-Bantu click languages of eastern and southern Africa. There are three main groups: northern (also called Kx'a: Ju|'hoan, ǂHoã, Sasi, etc.), central (Khoekhoe, Naro, G|ui, Tsua, etc.) and southern (!Xoõ, |Xam, N|uu, etc.), and two unclassified languages (Sandawe and Hadza spoken in Tanzania).

Syntactically, the central Khoisan languages are distinct from the northern and southern groups. For example, the central Khoisan languages have SOV word order and grammatical gender. Non-central Khoisan languages have SVO word order and no grammatical gender.

The linker introduces ("links") a variety of expressions into the verb phrase: locatives, the second object of a double object construction and a causative, instruments, subject matter arguments and adverbs. It is present in all non-central Khoisan languages (e.g., ǂHoã, N|uu, Ju|'hoan, !Xoõ, |Xam) that have been investigated so far. The linker is also found outside of Khoisan across the continent, in languages such as Yoruba, Baoule and Kinande (see Baker and Collins 2006 on Kinande). No full survey of the linker in African languages has been done so far.

In this paper, I will present the basic facts about the linker in a number of non-central Khoisan languages: ǂHoã, Ju|'hoan, N|uu, !Xoõ and |Xam. I start with ǂHoã not only because historically I worked on ǂHoã first, but also because it is the simplest linker system in some ways. Ju|'hoan, N|uu and !Xoõ all involve various complications that perturb the basic ǂHoã system. For example, Ju|'hoan has a transitivity suffix and inversion, N|uu has a dative case marker and !Xoõ has the transitivity linker.

A note on terminology: in descriptive grammars, the linker would be called a preposition or an oblique case marker. Such labels would not be inaccurate, but they hardly exhaust the interesting phenomena to be described below (e.g., inversion). So I will stick to the label linker, which carries with it fewer presuppositions.

The orthography used for the various languages below follows the original sources. For example, all the ǂHoã examples use the orthography of Collins and Gruber (to appear).

2. The Linker in ǂHoã

ǂHoã is a Kx'a language spoken south of the Khutse park in Botswana in Khekhenye, Tshwaane, Dutlwe, Salajwe, Shorilatholo, etc. There are approximately 50-100 remaining speakers, widely scattered in villages and cattle posts (making any estimate of the number of

speakers difficult). Sasi is a closely related, mutually intelligible language with 10 remaining fluent speakers.

In the following list, I give the major constructions where the linker is found in ǂHoã, parallel examples can be given for Sasi (all examples are from Collins and Gruber forthcoming). First, the linker is found in locative constructions, both following intransitive and transitive verbs.

(1) a. cì ’a kyxái kì !kôa na
3PL PROG dance Lk house in
“They are dancing in the house.”

b. gyá“m-sì̃ ’a ǂná“m Jefo kì !kôa na
child-DIM PROG hit Jeff Lk house in
“The child is hitting Jeff in the house.”

As example (2) shows, it is not possible for the locative to precede the linker:

(2) *gyá“m-sì̃ ’a ǂná“m !kôa na kì Jefo
child-DIM PROG hit house in Lk Jeff

In other words, linker constructions in ǂHoã have a fixed word order. This fact distinguishes ǂHoã (and N|uu) from Ju|’hoan, where inverted word orders like (2) are possible. I will return to this cross-linguistic difference in section 5.

The linker is used in double object constructions, appearing between the goal and the theme. In (3), the linker does not express any locative relation. In fact, it seems to make no semantic contribution at all.

(3) ma ’a šú Jefo kì setinkane
1SG PROG give Jeff Lk hand-harp
“I am giving Jeff the hand-harp.”

The linker is used in causatives, between the causee and theme:

(4) ma ’a kí-čʊ gyá“m-sì̃ kì ǰò
1SG PROG CAUSE-drink child-DIM Lk water
“I am making the child drink water.”

The linker is used to introduce instruments and materials:

(5) ma ’a ’ám kì ǐ-ǂàm
1SG PROG eat Lk spoon
“I am eating with a spoon.”

(6) yà i !hai yà !kôa kì |qhŭi-qà
3SG PST thatch 3SG house Lk grass-PL
“He thatched his house with grass.”

Lastly, the linker is used to introduce the subject matter argument:

(7) n!ka'e 'a n|nobo kì yà šĭ |'í
1PL PROG talk Lk 3SG POSS money
"We are talking about his money."

(8) ma 'a kí-cã ǂ'àmkȍe kì čo'a
1SG PROG CAUSE-hear person Lk rain
"I ask the person about the rain."

Even though the linker is used to introduce a wide variety of expressions following the verb, it does not introduce direct objects:

(9) a. *koloi ǁgȍõ-'a Jefo kì
truck hit-PFV Jeff Lk
"The truck hit Jeff."

b. *koloi ǁgȍõ-'a kì Jefo
truck hit-PFV Lk Jeff

In summary, here are the basic properties of the linker: First, it introduces post-verbal constituents (with a rigid order). Second, it occurs with a wide variety of VP complements and adjuncts. Third, it does not contribute semantically to the VP (it is "semantically vacuous"). Fourth, it does not occur with the direct object of a transitive verb.

In many examples, the linker introduces a DP (the second object of a double object construction, the theme of a causative, the subject matter argument). Furthermore, locatives in Khoisan are nominal in nature (nominal adpositions, see Collins 2001, 2005, Dickens 2005: 69). Therefore, a natural suggestion is that the linker is a Case assigner, illustrated in (10). In (10) the verb "give" assigns Case to the goal DP, and the linker *ki* assigns Case to the theme DP:

(10) ….. šú Jefo kì setinkane
….. give Jeff Lk hand-harp
Case Case

Some evidence which supports this analysis is that the linker never appears preceding the preposition *ke* "with":

(11) yà o n|nobo ke yà ču
3SG FUT talk with 3SG father
"He will talk with his father."

No linker precedes the preposition *ke* "with", as predicted under the Case assignment theory of linkers (since PPs do not need Case, unlike DPs). In the other Khoisan languages as well, the linker never appears before a preposition.

However a problem with the Case assignment theory is the distribution of linkers with adverbs. An example of the use of the linker with adverbs is given in (12):

(12) a. gyè-sa n|nobo
slow-ADV talk
"Speak slowly!"

b. n|nobo kì gyè-sa
talk Lk slow-ADV
"Speak slowly!"

As can be seen from (12), a manner adverb may either appear pre-verbally or post-verbally. When the adverb appears pre-verbally, there is no linker. But when the adverb appears post-verbally, the linker must appear.

More examples of manner adverbs are given in (13) and (14):

(13) a. ma ǁhá"a -sa ʼa ʼám ǁkà"e
1SG fast-ADV PROG eat meat
"I am eating the meat quickly."

b. ma ʼa ʼám ǁkà"e kì ǁhá"a-sa
1SG PROG eat meat Lk fast-ADV
"I am eating meat quickly."

(14) a. koloi ǁqʼo-sa ǁgȍõ-ʼa ǂʼàmkȍe
truck hard-ADV hit -PFV person
"The truck hit the person hard."

b. koloi ǁgȍõ-ʼa ǂʼàmkȍe kì ǁqʼo-sa
truck hit-PFV person Lk hard-ADV
"The truck hit the person hard."

The same distribution holds of temporal adverbs, illustrated in (15):

(15) a. n|nobo-nǁgà"e hà"ma i ča
n|nobo-nǁgà"e afternoon PST come
"N|nobo-nǁga"e came in the afternoon."

b. n|nobo-nǁgà"e i ča kì hà"ma
n|nobo-nǁgà"e PST come Lk afternoon
"N|nobo-nǁga"e came in the afternoon."

The generalization governing these examples is the following (which appears to hold for all non-central Khoisan languages):

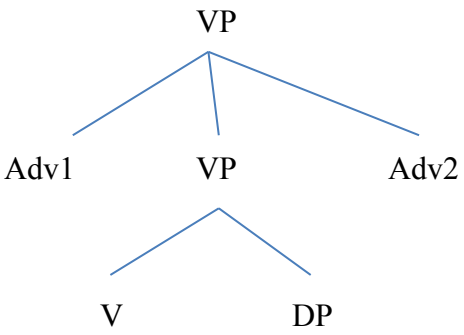
(16) Linker-Adverb Generalization
If an adverb appears post-verbally, it is preceded by a linker. If an adverb appears pre-verbally (between the subject and the verb, or preceding the subject), no linker appears.

Consider now the Case assignment analysis of the linker in light of (16). Consider (12b). On the assumption that *gyè-sa* "slowly" needs to be assigned Case, the presence of the linker is accounted for (since by hypothesis, the linker assigns Case). However, no linker appears in (12a). So the question is why is (12a) grammatical, since the adverb is not assigned Case by the linker there.

Another issue relates to adverbs in English. In the Principles and Parameters framework, DPs are taken to need Case. Adverbs, clauses and PPs do not need Case. This assumption has wide ranging implications for the distribution of DPs and the other categories. So assuming that adverbs need to be assigned Case in non-central Khoisan would imply a fundamental distinction between adverbs in English and adverbs in non-central Khoisan. I will not attempt to resolve these issues here.

One immediate implication of (16) is that the distribution of linkers with adverbs in ǂHoã and other Khoisan languages is inconsistent with the adjunction analysis of adverbs. There is no reason, on the adjunction analysis, why there should only be linkers for post-verbal adverbs. On the adjunction analysis of adverbs, they can either be adjoined to the left or to the right of the VP:

(17) Adjunction Analysis of Adverbs



But the adjunction analysis does not sufficiently distinguish Adv1 from Adv2. It is not clear on the adjunction analysis why Adv2 is preceded by a linker but Adv1 is not. I conclude that the adjunction analysis is incorrect, and that more syntactic structure is needed to account for (16). I will return to adverb order in section 5.

3. The Linker in Ju|'hoan

Ju|'hoan is a Kx'a language spoken in the northwest of Botswana and the northeast of Namibia. The linker in Ju|'hoan serves the same roles as the linker in ǂHoã (all examples are from Collins 2003, unless otherwise indicated).

The linker is used to introduce locatives following a transitive verb as shown in (18) (see (26) below on intransitives):

(18) Uto dchuun-a IKaece ko n!ama n!ang
car hit-TRANS IKaece Lk road in
"A car hit IKaece in the road."

The linker appears between the goal and the theme in a double object construction (|| *'ama-*|*'an* "buy-give" is a verbal compound):

(19) Besa komm ||'ama-|'an Oba ko tcisi
Besa EMPH buy-give Oba Lk things
"Besa bought Oba some things."

The linker appears in causative constructions between the causee and theme:

(20) dshau n‡ai 'm-a ha da'abi ko mari
woman cause eat-TRANS her child Lk mealie meal
"The woman fed her child mealie meal." (Dickens 2005: 84)

The linker is also used to introduce instruments:

(21) mi ba ||ohm-a !aihn ko |'ai
my father chop-TRANS tree Lk axe
"My father chopped the tree with an axe."

I have no information on how subject-matter arguments ("about") phrases are realized in Ju|'hoan.

Just as in ǂHoã, adverbs obey (16), the Linker-Adverb generalization (example from Dickens 2005: 38-39):

(22) a. Ha ku ǁohm-a !aihn ko |ama he
3SG IPFV chop-TRANS tree LK today
"He was chopping the tree today."

b. Ha |ama he ku ǁohm-a !aihn
3SG today IPFV chop-TRANS tree
"He was chopping the tree today."

Linker constructions in Ju|'hoan allow inversion, unlike linker constructions in ǂHoã:

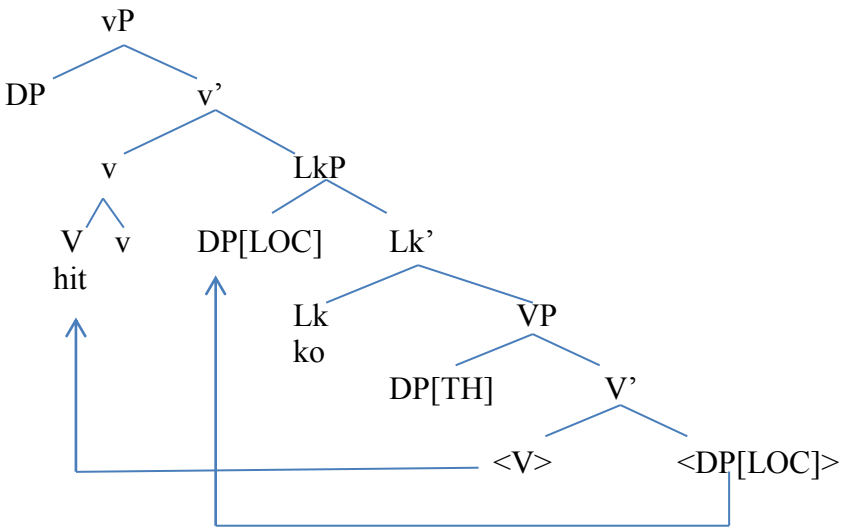
(23) a. Uto dchuun-a |Kaece ko n!ama n!ang
car hit-TRANS |Kaece Lk road in
"A car hit |Kaece in the road."

b. Uto dchuun-a n!ama n!ang ko ǀKaece
car hit-TRANS road in Lk ǀKaece
"A car hit ǀKaece in the road."

In (23a), the order of post-verbal constituents is: theme > Lk > locative. Whereas in (23b), the order of post-verbal constitutes is: locative > Lk > theme. Since the only possible order in ǂHoã and N|uu is (23a), I will assume that (23b) is a derived, inverted order.

The basic analysis (from Collins 2003) is that in (23b) the locative moves into Spec LkP, which is vP internal, as shown in (24). The background assumptions for this analysis are that the external argument is externally merged in Spec vP. LkP is the complement of vP, and VP is the complement of LkP. VP contains both the theme and the locative. The theme is in Spec VP, and the locative is the complement of VP (see Baker and Collins 2006 on why movement of the verb to v does not violate a locality constraint).

(24)



In (24), v assigns Case to the locative DP. Lk assigns Case to the theme, which does not undergo movement in the inverted structure. The non-inverted order would be derived by moving the theme to Spec LkP, and leaving the locative in-situ in the complement position of the VP.

As discussed in Baker and Collins (2006), evidence supporting the analysis of inversion in (24) can be found in Kinande (a Bantu language). Kinande also allows inversion. (25a) illustrates the non-inverted order, and (25b) illustrates the inverted order.

(25) a. Mo-n-a-hir-ire okugulu k' omo-kihuna
Aff-1sS-T-put-Ext leg.15 Lk.15 Loc.18-hole.7
"I put the leg in the hole."

b. Mo-n-a-hir-ire omo-kihuna m' okugulu
Aff-1sS-T-put-Ext Loc.18-hole.7 Lk.18 leg.15
"I put the leg in the hole." (Baker and Collins 2006: 308)

Interestingly, the linker in Kinande agrees with the constituent that precedes it. Baker and Collins (2006) propose that the linker heads an LkP in Kinande, and that if XP moves into Spec LkP, Lk agrees with XP. This simple analysis accounts for the agreement facts in (25). In (25a), "leg" is in Spec LkP, so the agreement on the linker is for gender class 15. In (25b), the locative is in Spec LkP, so the agreement on the linker is for gender class 18.

An important question for comparative syntax is why Ju|'hoan and Kinande allow inversion, but ǂHoã and N|uu do not. I return to this question in section 5 below.

A striking difference between ǂHoã and Ju|'hoan concerns how locatives are expressed following intransitive verbs:

(26) a. Lena koh djxani-*(a) tju n!ang (Ju|'hoan)
Lena PST dance-TRANS house in
"Lena danced in the house."

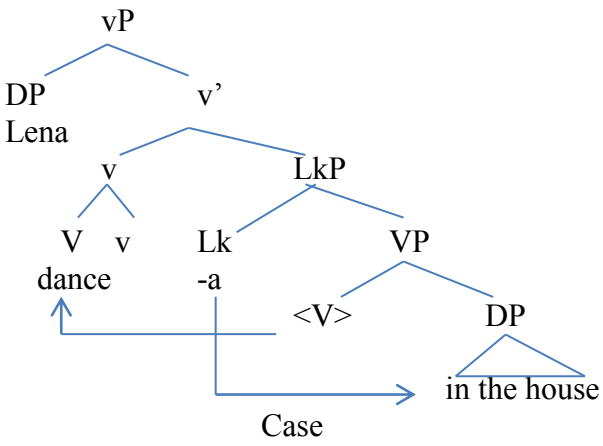
b. cì 'a kyxái kì !kôa na (ǂHoã)
3PL PROG dance Lk house in
"They are dancing in the house."

In ǂHoã, the linker *ki i*ntroduces a locative following an intransitive verb. In Ju|'hoan, the linker *ko* is not used in this case. Rather, the verb must appear with the transitivity suffix *–a* (ǂHoã does not have a transitivity suffix). This alternation suggests that *ko* and *–a* in Ju|'hoan are just two realizations of the linker, determined by the following condition:

(27) Lk → ko, if Spec LkP is filled.
-a, if LkP has no Spec. (transitivity suffix)

In the example in (26a), nothing raises to Spec LkP, so that Lk is realized as the transitivity suffix –a. I assume that in (26a), the transitivity suffix assigns Case to the post-verbal locative. A partial structure of (26a) is given below:

(28)



An immediate problem with this analysis is that both the linker and the transitivity suffix can appear in certain examples, as shown in (29). I will defer an analysis of this pattern until after I discuss the !Xoõ data in section 6.

(29) a. Uto dchuun-a IKaece *(ko) n!ama n!ang
car hit-TRANS IKaece Lk road in
"A car hit IKaece in the road."

b. Mi ba ||ohm-a !aihn *(ko) |'ai
my father chop-TRANS tree Lk axe
"My father chopped the tree with an axe."

In section 2 of the paper, I showed how the linker played a role in Case assignment. In this section, I have shown that LkP plays a crucial role in inversion in Ju|'hoan and Kinande. This suggests that the linker has two syntactic functions:

(30) a. Lk is a Case assigner.
b. Spec Lk provides a landing site for movement (e.g., inversion).

A table in the appendix summarizes the differences between ǂHoã and Ju|'hoan (as well as the other languages discussed below).

4. The linker in N|uu

N|uu is a !Ui language spoken around Upington in South Africa. There are around 10 remaining speakers.

Overall, the distribution of the linker is similar in N|uu and ǂHoã. Differences include: (a) manner constructions, (b) double object constructions and (c) click pronouns. Before discussing the differences, I will review the contexts where the linker is found in N|uu.

As in ǂHoã, the linker introduces locatives after both transitive and intransitive verbs (there is no transitivity suffix, unlike Ju|'hoan) (Collins and Namaseb 2011: 45):

(31) a. ku -a ǂqheke ŋ ku ŋǁŋ ǁãʔẽ
3SG DECL sing Lk 3SG house in
"He is singing in his house."

b. ku-a si hoo ku aŋki ŋ g!ari
3SG-DECL FUT find 3SG father Lk Upington
"He will find his father in Upington."

Just like in ǂHoã, there is no inversion (Collins and Namaseb 2004):

(32) *ku-a si hoo g!ari ŋ ku aŋki (cf. (31b))
3SG-DECL FUT find Upintgon Lk 3SG father

The linker is also used in causative constructions, appearing between the causee and the theme:

(33) a. n-a kx'u-|x'õa-a ku ŋ ǂqhee
1SG-DECL make-hunt-PFV 3SG Lk duiker
"I made him hunt a duiker."

b. n-a xa kx'u-ʔãa ku ŋ ku ãaki
1SG-DECL PST make-eat 3SG Lk 3SG food
"I made him eat his food."

Instruments follow the preposition *ŋ|a*, and no linker is used (this seems to be a difference between N|uu on the one hand, and ǂHoã and Ju|'hoan on the other, where instruments can be introduced with the linker) (Collins and Namseb 2011: 25). Note that in (34) no linker appears before the instrumental preposition, in conformity with the generalizations given in section 1 (see (11)).

(34) na si |aa Θoe ŋ|a ŋǂona
1SG-DECL IRR cut meat with knife
"I will cut the meat with a knife."

Subject matter arguments are introduced with the linker (Collins and Namaseb 2011: 25):

(35) a ku neti ǂʔĩĩ ŋ gao a
and 3SG only think LK thing this
"and he just thinks about this thing."

The following example shows the Linker-Adverb Generalization (16) also holds in N|uu. (36a) shows that when the temporal adverb follows the verb, it is introduced by the linker. (36b) shows that when the temporal adverb precedes the verb there is no linker.

(36) a. ku -a si |qhõˀ ŋ !haeka
3SG DECL FUT dance Lk tomorrow
"He will dance tomorrow."

b. ku -a si !haeka |qhõˀ
3SG DECL FUT tomorrow dance
"He will dance tomorrow."

A difference between ǂHoã and N|uu is that the linker is used in manner constructions in N|uu (but not in ǂHoã) , as illustrated in (37) and (38) below. In (37) and (38), the linker precedes the direct object (see Collins 2004). Another element, homophonous with the linker (and glossed MANN), precedes the verb.

(37) a. ku si ɟee ŋ ||x'oo ŋ ʘoo-ke
3SG FUT how MANN chop Lk wood-PL
"How will he chop the wood?"

b. ku si ɟee ŋ ɦoo ŋ ku aŋki
3SG FUT how MANN find Lk 3SG father
"How will he find his father?"

(38) ku xa ŋ ||x'oo ŋ ʘoo-ke
3SG PST MANN chop Lk wood-PL
"He chopped the wood thus."

Manner constructions violate the generalization, presented in section 1, that the linker never introduces the direct object of a transitive verb. One speculative way of accounting for the data in (37) and (38) is to suppose the manner adverb (*ɟee* in (37) and null in (38)) moves through Spec LkP into the preverbal position, leaving the direct object to follow Lk.

Strikingly, in Ju|'hoan manner constructions use the transitivity suffix, as shown in (39) below:

(39) ju re naun kuru-a tchi
person Q do.how make-TRANS arrow
"How does a person make an arrow?" (Dickens 1992)

Such examples provide independent support for the conclusion in section 3 that the transitivity suffix is a form of the linker. Otherwise, it is unclear why the transitivity suffix in Ju|'hoan is used in manner constructions in the same way as the linker in N|uu.

Another difference between ǂHoã and N|uu is that the linker does not appear between the objects of a double object construction in N|uu, unlike in ǂHoã and Ju|'hoan, as illustrated below:

(40) a. ku -a si ãa ku aŋki-a kea maari
3SG DECL IRR give 3SG father-DAT that money
"He will give his father that money."

b. Griet ke si kaɟama ku-a doŋki-si
Griet DECL IRR show 3SG-DAT donkey
"Griet will show him the donkey."

As shown by these examples, the indirect object of a double object construction in N|uu is marked by a dative clitic -a. Furthermore, no linker appears between the two objects. Collins 2004 proposes to analyze the absence of linkers in double object constructions in N|uu in terms of Case assignment. The analysis goes as follows. First, the verb assigns Case to at most one DP. Second, Lk assigns Case to the following DP. Third, the dative *–a* assigns Case to the indirect object. From these assumptions it follows that the linker not needed for assigning Case to the direct object of a double object construction.

The analysis is illustrated below:

(41) .... ãa ku aŋki-a kea maari
…. give 3SG father-DAT that money

Case

Here the verb assigns Case to "that money" and the DAT marker assigns Case to "father". There is no extra DP that a linker needs to assign Case to. If the DAT marker were not present (as in ǂHoã and Ju|'hoan), the verb would assign Case to the goal and the linker would be needed to assign Case to the theme.

The last difference between ǂHoã and N|uu concerns the pronominal system. In N|uu there is a special series of pronouns that is used following the linker. I call these pronouns click pronouns, since they all begin with a click. The relevant portion of the N|uu pronominal system is given below. There is also a first person exclusive pronoun which I have not yet investigated in linker contexts.

(42)

Pronouns	Simple Form	Click Form
1SG	ŋ	ŋ|ŋ
2SG	a	g|a
3SG		
human	ku	
non-human	ki	
1PL (incl)	i	g|i
2PL	u	g|u
3PL		
general	kɪn	
object	kike	

As can be seen from this table, only first and second person pronouns have click forms. All the third person forms start with a [k], and do not have click forms.

The rules for the use of the click pronouns are given below:

(43) a. If a first or second person pronoun immediately follows a linker, the pronoun takes the click form.
b. If a question starts with a first or second person pronoun, the pronoun takes the click form.

I will illustrate the generalizations with a few examples. For more extensive discussion see Collins 2014.

(44a) shows that when the 1PL pronoun follows a transitive verb, the simple form of the pronoun is used. In (44b), when a 1PL pronoun follows the linker, the click form is used.

(44) a. ǁaǁaˤe ke !ʔai i
ǁAǁaqe DECL call 1PL
"ǁAǁaqe is calling us."

b. ku-a ǂʔii ŋ g|i
3SG-DECL think Lk 1PL
"He is thinking about us."

Even if the pronoun following the linker is a possessor, the click form is used:

(45) n-a ǂʔii ŋ g|a xaŋki
1SG-DECL think Lk 2SG mother
"I am thinking about your mother."

In the manner constructions discussed in (37) and (38), when the direct object is a first or second person pronoun, the click form must be used (providing independent evidence that the post-verbal ŋ in manner constructions is a linker):

(46) Simon si ǰee ŋ ɦoo ŋ ŋ|ŋ
Simon FUT how MANN find Lk 1SG
"How will Simon find me?"

The following example illustrates the generalization in (43b). In (47a), there is a declarative clause marker *–a* which combines with the pronoun *n*. In (47b), the declarative clause marker disappears and the subject pronoun takes the click form.

(47) a. n-a si ǁʔae
1SG-DECL IRR go
"I will go."

b. ŋ|ŋ si ǁʔae
1SG IRR go
"Will I go?"

Collins (2014) proposes that matrix questions are introduced by a linker, which is phonologically deleted. The presence of the linker preceding the question triggers the click pronoun.

Although the linker is phonologically deleted in (47b), it is not obligatorily deleted in embedded questions, as shown in (48). Since the subject pronoun follows the linker, it takes the click form:

(48) ŋ ||u ||hae-a ŋ g|a ts'aʔa ŋ
1SG NEG know-PFV Lk 2SG like 1SG
"I don't know if you like me."

5. Inversion Revisited

The data in sections 2-4 show that there are two groups of Khoisan languages with respect to inversion. In ǂHoã and N|uu, inversion is not allowed. In Ju|'hoan inversion is allowed.

We can also add Kinande (non-Khoisan) as a language that allows inversion. So we have the following typology:

(49) a. Inversion: Ju|'hoan, Kinande
b. No Inversion: ǂHoã, N|uu

Does the property of allowing inversion correlate with any other property? As it turns out it correlates with the ability of the linker to introduce a locative expression following an intransitive verb, which is possible in ǂHoã and N|uu, but not in Ju|'hoansi (or Kinande, see Baker and Collins 2006). Recall that in Ju|'hoansi, the transitivity suffix –a, not the linker *ko*, introduces a locative after an intransitive verb. The facts are repeated below:

(50) a. cì 'a kyxái kì !kôa na (ǂHoã)
3PL PROG dance Lk house in
"They are dancing in the house."

b. ku -a ǂqheke ŋ ku ŋǁŋ ǁãʔẽ (N|uu)
3SG DECL sing Lk 3SG house in
"He is singing in his house."

c. Lena koh djxani-*(a) tju n!ang (Ju|'hoan)
Lena PST dance-TRANS house in
"Lena danced in the house."

(51) a. *V Lk Loc: Ju|'hoan (ko), Kinande
b. V Lk Loc: ǂHoã, N|uu

In (50a,b), Spec Lk is not filled. If Spec Lk were filled by the locative, the locative would appear to the left of the linker. Therefore, the facts in (50) show that Spec Lk does not have to be filled in ǂHoã and N|uu, whereas Spec LkP must be filled in Ju|'hoan and Kinande.

I propose that there are two kinds of linkers. The first kind allows inversion and requires a filled Spec (Ju|'hoan and Kinande). The second kind disallows inversion and does not require a filled Spec (ǂHoã and N|uu). Of course, this does not answer the question of why one does not have other kinds of linkers (e.g., one not requiring a filled Spec, but allowing inversion). I will not pursue this issue here.

The lack of inversion in N|uu and ǂHoan raises the question of whether it might be possible to analyze LkP in these languages as taking a locative complement (instead of a VP complement). In other words, these languages would have the following structure:

(52) $[_{VP}$ V $[_{LkP}$ Lk Locative]]

This structure would immediately account for the lack of inversion in ǂHoã. Since LkP does not dominate VP, it would be impossible to obtain the inverted order by movement of the locative over the theme. However, I will give evidence that (52) is wrong for ǂHoã. While ǂHoã does not show inversion in the same way that Kinande and Ju|'hoansi do, it does allow a limited kind of inversion that is dependent on A'-movement. Consider the following paradigm:

(53) a. koloi ǁgʊ̀ʊ̃-'a ǂ'àmkoe kì gyèo na (ǂHoã)
truck hit-PFV person Lk road in
"The truck hit a person in the road"

b. *koloi ǁgʊ̀ʊ̃-'a gyèo na kì ǂ'àmkoe
truck hit-PFV road in Lk person

c. gyèo na koloi ǁgʊ̀ʊ̃-'a *(kì) ǂ'àmkoe
road in truck hit-PFV Lk person

(53a) shows that the theme precedes the Lk which precedes the locative. (53b) shows that the inverted word order is not allowed. (53c) shows that when the locative is extracted (topicalized to the left periphery) the linker must precede the direct object. This is unexpected because normally the linker follows the direct object, as in (53a). I will refer to this as quasi-inversion.

When the direct object is extracted, the linker precedes the locative, as expected.

(54) ǂ'amkoe koloi ǁgʊ̀ʊ̃-'a kì gyèo na
person truck hit-PFV Lk road in
"the person, the truck hit in the road"

Furthermore, when the locative is extracted, the linker cannot be stranded.

(55) *gyeo na koloi ǁgʊ̀ʊ̃-'a ǂ'amkoe ki (cf., (54))
road in truck hit-PFV person Lk

I propose that inversion is allowed ǂHoã, but only when there is extraction. In other words, we have the following representation:

(56) gyeo na [$_{IP}$ koloi g||on –'a [$_{LkP}$ <gyeo na> *(ki) ǂ'amkoe <gyeo na>]]
road in truck hit-perf Lk person

A'-movement inversion

In (56), the locative moves to Spec LkP, but only when further A'-movement (e.g., topicalization) occurs. Since the locative moves to Spec LkP, the theme remains in Spec VP, following Lk.

N|uu does not have quasi-inversion. I will not speculate on the absence of quasi-inversion in N|uu here.

Returning now to the correlation in (49) and (51). At least for ǂHoã, it is not possible to explain this correlation by saying that the locative is projected as the complement of Lk (see (52)), since then it would not be possible to account for quasi-inversion. In other words, if the structure were [$_{VP}$ V [$_{LkP}$ Lk Locative]], no quasi-inversion derivation like (56) would be

possible, since there would be no position for the theme after the linker. Therefore, for ǂHoã, I continue to assume that VP is the complement of Lk: [Lk VP].

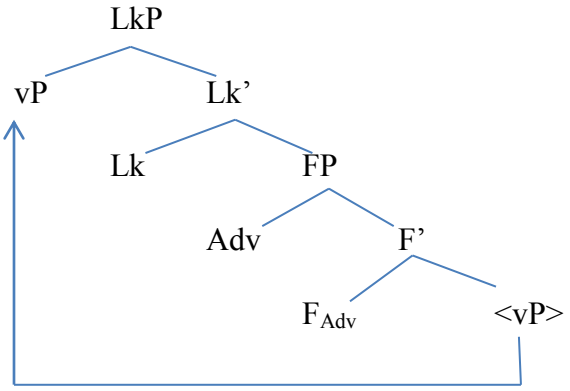
The analysis of inversion in ǂHoã and Ju|'hoan presented in this section and in section 3 may also shed light on the Linker-Adverb generalization in (16). Recall that if an adverb appears post-verbally, it is preceded by a linker. If an adverb appears pre-verbally, no linker appears. An example is given in (57) below (repeated from (12) above):

(57) a. gyè-sa n|nobo
slow-ADV talk
"Speak slowly!"

b. n|nobo kì gyè-sa
talk Lk slow-ADV
"Speak slowly!"

As noted in (30b), one of the functions of the linker is to provide a landing site for vP internal movement. I speculate that (57b) is a derived order, where the vP has moved into Spec LkP, as illustrated below:

(58)



In this structure, the adverb is externally merged in Spec FP, a functional projection introducing adverbs. The complement of FP is vP, which undergoes movement to Spec LkP to give the post-verbal adverb order in (57b). The preverbal order in (57a) is generated when there is no LkP dominating FP, and there is no movement of vP into Spec LkP.

The analysis of post-verbal adverbs in (58) raises the question of why vP may raise to Spec LkP and be spelled out there, but DP may not (see (56)). I will not pursue this issue here.

In the following two sections, I discuss !Xoõ and |Xam, for which I do not have data concerning inversion.

6. The Linker in !Xõ

!Xoõ is spoken in south western Botswana (and south eastern Namibia) east and west of Hukuntsi. It is a Taa language of the Southern group of Khoisan languages. All the data in this section come from the works of Tony Traill. The following section follows closely the presentation in Collins and Honken 2012b.

!Xoõ has the full range of linker uses described above for the other non-central Khoisan languages. Locative expressions are introduced by the linker, as shown in (59):

(59) !gám kē Ɵàje kè ’Ɵnàje
put.up Lk.3 meat.3 Lk.3 tree.3
“put the meat up into the tree” (Traill 2009: 79)

The linker introduces the locative DP “tree”. But there is also a homophonous particle immediately following the verb. I call this the transitivity linker. The transitivity linker is described for !Xóõ in the passage below (Traill 1985: 17):

(60) “The productive pattern for transitive verbs is an invariant stem followed by the particle kV (V is a cover symbol, adopted for convenience, for the concordially varying segment), and the few verb loanwords like fáu kV (fold, from Afrikanans *vou*), kòla kV (write, from Setswana *kwala*) bear this out. Non-productive patterns of a similar kind are invariant stem + sV, and invariant stem + tV. Over half the transitive verbs in !Xoo are of the form invariant stem + particle. The particles are lexically determined in the sense that they are not predictable from any details of the stem, and concordial agreement affects them…”

I propose that the transitivity particles kV, sV and tV are linkers. Furthemore, I propose that the kV linker is cognate to the other non-central Khoisan linkers (*ki* in ǂHoã and *ko* in Ju|’hoan). But note that ǂHoã does not have such transitivity particles (a particle obligatorily appearing between a transitive verb and its object). In general, there is a split in non-central Khoisan between the Taa languages and the others (the Kx’a and the !Ui languages). I characterize this split by first defining two types of linker:

(61) a. General Linker
A morpheme whose function is to introduce non-direct objects into the verb phrase. It appears before locatives, the second object of a double object construction, the second object of a causative, instruments, about-phrases, and adverbs.

b. Transitivity Linker
A morpheme whose function is to introduce direct objects into the verb phrase.

The reason that it is important to make this distinction is that there is a clear typological generalization about the Khoisan languages:

(62) a. Kx’a and !Ui have a general linker, but no transitivity linker.
b. Taa has a general linker and a transitivity linker.

In the remainder of this section, we show that !Xoõ has a general linker, like the one found in Kx’a and !Ui. The kV linker always agrees in class with the following noun phrase. The concords are given below:

(63)

Class	Concord
1	-i
2	-ã
3	-e
4	-u
5	-n

I gloss the agreeing forms of the linker as Lk.1, Lk.2, Lk.3, etc. to show which agreement concord it takes. Furthermore, the noun class of the following noun is also indicated (e.g., "fire.2") to show that agreement is taking place between the linker and the noun phrases.

Other examples where a linker introduces a locative are given below. In (64), the linker introduces the locative "fire", and in (65) the linker introduces the locative source "hole".

(64)

ñ	bà	kâ	ǀ'ūje	bãhle	ká	ǀ'àã
1SG	ASP	??	straighten	arrowshaft	Lk.2	fire.2

"I straighten the arrowshaft in the fire." (Traill 2009: 72)

(65)

ǁhóbe	kā	ǂkx'ûm	kē	dzūhe
take.out	Lk.2	sand.2	Lk.3	hole.3

"Take sand from the hole." (Traill 2009: 121)

Materials are expressed with a linker. There is an instrumental preposition (Traill 2009: 291), but I have no information on whether instruments can also be introduced by the linker:

(66)

ñ	ń	bà	ǂqàa	ká	tu̯m	ká	!ca̱ã
1SG	TNS	ASP	rub	Lk.2	skin	Lk.2	brains.2

"I rub the skin with brains (to soften it)." (Traill 2009: 86)

Ditransitives have a linker between the two post-verbal noun phrases. Examples with "lend" and "teach" are given below:

(67) a.

!gōa	kān	kā	!ōo
lend	Lk.1SG	Lk.2	knife.2

"Lend me a knife!" (Traill 2009: 81)

b.

!qhôo	kē	ǂābe	kē	tâa	ǂàã
teach	Lk.3	black.man.3	Lk.3	person.3	language.2

"teach the black man person's language" (Traill 2009: 88)

But not all ditransitives have a similar structure. For "show", the dative preposition is used, but no linker appears between the two objects (consistent with the generalization in section 1 that PPs are not introduced by linkers). An example with "show" is given below:

(68)

ǁqhāa	kān	ǀnān
show	Lk.1SG	to.1SG

"Show it to me." (Traill 2009: 117)

Subject matter "about" phrases are also introduced by the linker:

(69) ñ ń bà ʘôõ ǂnǘã kú tùu
1SG TNS ASP dream Lk.4 people.4
"I dream about people." (Traill 2009: 47)

Even though the linker in (69) is adjacent to the verb, I assume that it is not the transitivity linker, but rather the general linker. One reason for this is that such "about" phrases are found in Kx'a where there is no transitivity linker. A second reason is that "dream" in (69) seems bi-morphemic, where *ǂnǘã* is possibily an idiomatic nominal part of the verb phrase.

There is some evidence that !Xóõ obeys the Linker-Adverb generalization in (16) above. Traill (2009: 18) states "Basic adverbs precede the verb they qualify. But adverbial constructions may be formed with the particle *té*, and these follow the verb."

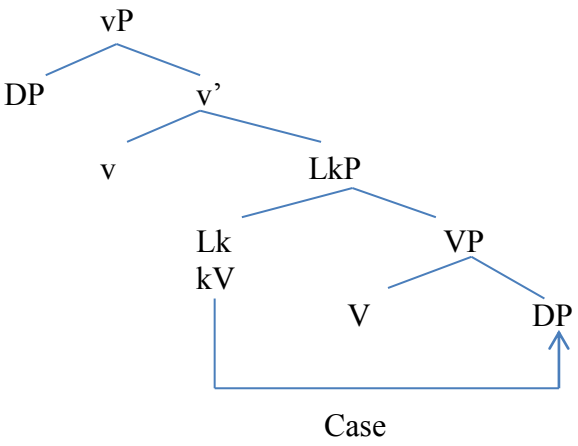
(70) a. tsōhũ sâa
fast go
"Go fast!"

b. sâa té tsōhũ
go Lk fast
"Go fast!"

Recall that as a transitivity linker, tV is a non-productive variant of kV. Therefore, I suggest that the *té* adverb particle is a variant of the linker that has become frozen in the function of introducting adverbs. I do not have any account for why the adverbial particle is té instead of tá (which would be the default vowel in !Xóõ).

I propose to extend the analysis of linkers given in sections 2 and 3 to the transitivity linker in !Xóõ. In the structure, [V+kV DP] (V a transitive verb), kV heads a LkP which checks the accusative Case of the direct object DP. Crucially, I assume that in !Xóõ "little v" does not check Case, this function being delegated to the transitivity linker. The analysis is illustrated in (71):

(71)



Now consider examples like (59) involving both the transitivity linker and the general linker. These must have the following structure in (72) where one LkP (associated with the general linker) is embedded in another LkP (associated with the transitivity linker):

(72) $[_{vP}$ v $[_{LkP}$ Lk $[_{LkP}$ DP[TH] $[_{Lk'}$ Lk $[_{VP}$ <DP[TH]> V DP[LOC]]]]]]

The transitivity linker, unlike the general linker, does not allow for movement to Spec LkP. That is why the transitivity linker is always adjacent to the verb. So the transitivity linker has the Case assignment function of (30a) but not the landing site function of (30b). In this, the transitivity linker in !Xóõ bears a resemblance to the transitivity suffix in Ju|'hoan (see (29)), which also acts as a Case assigner, without introducing a landing site. For this reason, I suggest that examples like (29) should be given the analysis in (72).

7. The Linker in |Xam

|Xam is an extinct South African language. Although I have not looked into it extensively, it is clear that |Xam had a robust and clearly recognizable linker system (see Hastings 2001). As Bleek (1928: 97) states: "There is really only one preposition in Bushman au or o, which can mean 'to, for, at, in, with, on account of.' It directly precedes the noun it governs."

The linker introduces locative expressions:

(73)	ha	ǁko:aken	ǀki	ǀe:	ǁkha:	ǀna:	au	!koa
	3SG	all.together	put	put.in	lion	head	Lk	pot
	"He altogether put the lion's head into the pot."							(Bleek 1929: 172)

(74)	ŋ	ǀkum	u	!hau	au	ha	tx'axau
	1SG	take	away	thong	Lk	3SG	eye
	"I take away the thong from his eye."						(Bleek 1929: 162)

The linker also introduces instruments:

(75)	!kauken	se	ǀa:	ha	au	ǁkuru
	children	FUT	cut	3SG	Lk	knife
	"The children will cut it with a knife."					(Bleek 1928: 97)

In addition to these uses, the linker also marks subordinate "as" and "when" clauses. I leave it to further research to find out if |Xam has a linker in double object constructions and caustives, with subject matter arguments and with adverbs.

8. Historical Implications

Putting aside Hadza and Sandawe (spoken in Tanzania), there are three groups of Khoisan languages, summarized below:

(76) a. Northern (Kx'a): Ju|'hoan, ǂHoã, Sasi
b. Central: Khoekhoe, Naro, G|ui
c. Southern: Taa: !Xoõ, |Auni, Ku|ha:si
!Ui: |Xam, N|uu, ǁXegwi,

Comparing the shape of the linker in the non-central Khoisan languages, Collins and Hoken (2012) give the following table:

(77)

Kx'a		!Ui		Taa		
ǂHoã	Ju|'hoan	N|uu	|Xam	|Auni	Ku|ha:si	!Xóõ
kì	ko	ŋ	o (au)	ki/ke	ki/ka	kV

The phonological form and the syntactic function of the linker establishes a link between Northern Khoisan (Kx'a) and one group of Southern Khoisan (Taa). The commonality is either due to borrowing or a common ancestor. However, since the linker is central to the whole grammar of the language, it is unclear how both the form and the function of the linker could have been borrowed from one language into the other. On the common ancestor scenario, the reconstructed form of the linker for proto-Kx'a-!Ui-Taa would be kV. !Ui and |Xam would then have undergone subsequent independent changes. This argument that northern and southern Khoisan languages form a family is given independent support by the distribution of plural prefixes (see Collins and Honken 2012a).

Another scenario that should be considered is that at some point in time t, Kx'a, !Ui and Taa each had a linker with roughly the same functions, but with a different phonological form: X, Y Z. Then after t, either Kx'a borrowed the phonological form of the Taa linker, or vice versa. This scenario is more plausible than full scale borrowing, since the grammar of the borrowing language would not have been restructured to accommodate the linker. Only the phonological form of the linker would have changed. On this scenario, no claim is made as to whether southern and northern Khoisan are genetically related, although some account would still have to be given of how all three groups came to possess a linker system.

9. Conclusion

The work in this paper was carried out in order to figure out how the linker fits into current syntactic theories (see in particular, Collins 2003, 2004 and Baker and Collins 2006). The conclusion is that the linker heads a vP internal functional projection LkP, with two different functions (repeated from (30) above):

(78) a. Lk is a Case assigner.
b. Spec Lk provides a landing site for movement (e.g., inversion).

This research opens the way to looking at vP internal syntax (Case assignment, word order, argument projection) in other languages in terms of LkP.

I outline some empirical questions that arise from this research that Africanists looking at other languages could address:

(79) Research Questions

a. Which other African languages have a particle that appears obligatorily between the two objects of a double object construction (and cannot be identified as a dative case marker)? Which other constituents does this particle occur with? Are there reasons to believe the particle is a Case assigner?
b. Are there other African languages that allow both pre- and post-verbal adverbs, where the post-verbal adverb is marked distinctly from the preverbal adverb?
c. Which other African languages allow free order amongst their complements? Could this free order be explained in terms of the presence of a LkP (which may have a null head) and inversion?
d. Are there other languages in Africa that mark the direct object of a manner construction in a unique way (e.g., with a preposition or oblique case marking)?
e. Are there other African languages where embedded questions are obligatorily marked as oblique or introduced by a preposition?
f. Are there other African languages where the subject pronoun of a question takes a distinctive form?
g. Which other African languages use special morphemes to designate transitivity? Is it possible to analyze these as the head of LkP?

Appendix:

The following chart summarizes the main properties of the linker and the variation between languages for ǂHoã, Ju|'hoan and N|uu, the three languages for which I have the most data. A future research project will be to fill out this table for the other non-central Khoisan languages. ?? means that no data is available yet.

	Property	**ǂHoã**	**Ju|'hoan**	**N|uu**
1.	Lk	yes (ki)	yes (-a/ko)	yes (ŋ)
2.	sem. vacuous	yes	yes	yes
3.	Lk with DO	no	no	no
4.	Lk with PP	no	no	no
5.	V Lk Loc	yes	yes (-a)	yes
6.	V Loc Lk	no	no	no
7.	V DP Lk Loc	yes	yes (ko)	yes
8.	V DP Loc Lk	no	no	no
9.	V Lk DP Loc	no	no	no
10.	DOCs	yes	yes	no
11.	causative	yes	yes	yes
12.	instrument	yes	yes	no
13.	subject matter	yes	??	yes
14.	(*Lk) Adv V	yes	yes	yes
15.	V *(Lk) Adv	yes	yes	yes
16.	manner constr.	no	yes (-a)	yes
17.	trans. suffix	no	yes (-a)	no
18.	inversion	no	yes	no
19.	dative marker	no	no	yes(-a)

20.	extraction form of Lk	no	no	yes(ŋ‖a)

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