

Questions, Relatives, and Minimal Projection

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This article examines the acquisition of *wh*-questions and relative clauses in Sesotho, a language with no *wh*-movement in either questions or relatives, and in which *wh*-questioned subjects must be clefted. It shows that, even though children use and understand relative and cleft constructions between the ages of 2 and 3, relative complementizers are frequently missing or they surface in a form that is ambiguously either a subject agreement marker or a head-noun modifier. This raises the possibility that children are treating relative clauses as IP rather than CP structures until sufficient learning of lexical features has taken place. The article concludes with a discussion of Grimshaw's notion of extended projection and minimal projection, showing how it might be adapted to account for the Sesotho findings and extended to acquisition theory more generally.

1. INTRODUCTION

Much of the recent literature on the acquisition of syntactic structure has centered around the development of both lexical and functional projections. Various proposals have been made, with some arguing for the early impoverishment of functional projections (e.g., Guilfoyle and Noonan (1988), Lebeaux (1988), and Radford (1990)), and others arguing for the full instantiation of functional projections, even when left lexically unfilled (e.g., Demuth (1992; 1994), Hyams (1992)). In this article I argue that a phrase will not be projected unless children have learned the grammatical features of its lexical/functional head (cf. Clahsen and Penke (1992), Clahsen, Eisenbeiss, and Penke (1994)).

Of particular import here is the acquisition of CP structure, with specific

reference to the acquisition of relative clauses, cleft constructions, and the relative complementizer (Rel). Researchers have long debated over how and when relative clauses are acquired: Some have argued that, cross linguistically, children's use of relative clauses is well developed from an early age, and that children are cognizant of the structural properties of the construction (e.g., English—Goodluck and Tavakolian (1982), Solan and Roeper (1978); Korean—Lee, Lust, and Whitman (1990); Italian—Crain, McKee, and Emiliani (1990), Lust (1994)). Others, however, have emphasized the incomplete nature of English-speaking children's use of relative clauses before the age of 6, arguing that these are conjoined or flat rather than embedded structures (e.g., de Villiers, Tager-Flusberg, Hakuta, and Cohen (1979), Flynn and Lust (1980), and Tavakolian (1981)). In this article I examine Sesotho-speaking children's spontaneous use of relative constructions, showing that, although not entirely adultlike in structure, these are nonetheless fully functioning relative clauses.

Recent studies of question formation in languages like English indicate that English-speaking children have access to CP structure even while IP remains unarticulated (Radford (1994)). Evidence for CP structure becomes more problematic, however, in languages with neither *wh*-movement nor subject-auxiliary inversion—languages like Chinese and Japanese, or Bantu languages, where *wh*-questions only occur *in situ*. In Bantu languages like Sesotho, evidence for CP structure must come from relative clauses and cleft constructions, or from embedded CP complements. Although Sesotho-speaking children between the ages of 2 and 3 years productively use relative clauses and clefts, including cleft questions, I show that relative complementizers are generally ambiguous in form or missing, raising the possibility that these may be IP rather than CP structures. The study raises several issues regarding the mechanisms behind the building of syntactic projections in early grammars including possible implications of Grimshaw's (1991; 1993; 1994) work on *extended projection* and *minimal projection* for understanding how phrase structure develops. In particular, it explores the notion that a functional projection can only be projected if there is lexical material to fill its head, where the lexical material can be realized by either an overt lexical item, appropriate features, or a trace.

The article proceeds as follows: Section 2 outlines the basic structure of Sesotho yes-no questions, *wh*-questions, relatives, and clefts. Section 3 examines the acquisition of Sesotho relative constructions in children's spontaneous speech, focusing specifically on the use of relative complementizers, then looking briefly at embedded complements and infinitives. Section 4 includes a theoretical discussion of the findings and some specific proposals for understanding the development of phrase structure, with concluding remarks in section 5.

2. SESOTHO QUESTIONS AND RELATIVES

2.1. Basic Sesotho Phrase Structure

Sesotho is a Bantu language with basic SVO word order and Null Subjects. An obligatory subject Agr cliticizes to the verb, as shown in (1).¹

- (1) (Thabo) *o-pheth-ile* *dijo*. (S) V O
 (1T) 1Agr-cook-Perf 8food
 'Thabo) cooked the food.'

Following Belletti (1990), Chomsky (1989), and Sportiche (1988), Demuth and Gruber (1995) posited the following articulated structure for Sesotho IPs: Subject Agr is a function head which undergoes Spec-Head agreement with the lexical subject that has raised from VP-internal position. The verb also raises from the head of VP to Tense and then to Agr. Base and surface structures are provided in (2a) and (2b), respectively.

- 2a.
$$\begin{array}{c} \text{AGR} \\ / \quad \backslash \\ \text{DP} \quad \text{AGR} \\ / \quad \backslash \\ \text{AGR} \quad \text{TP} \\ \text{0-} \quad \backslash \\ \quad \quad \text{T} \\ \quad \quad / \quad \backslash \\ \quad \quad \text{T} \quad \text{VP} \\ \text{Thabo} \quad / \quad \backslash \\ \quad \quad \text{V} \quad \text{DP} \\ \text{-pheth-} \quad \text{dijo} \end{array}$$
- b.
$$\begin{array}{c} \text{AGR} \\ / \quad \backslash \\ \text{DP} \quad \text{AGR} \\ / \quad \backslash \\ \text{Thabo}_i \quad \text{TP} \\ \text{AGR} \quad \backslash \\ \text{0-pheth-ile} \quad \backslash \\ \quad \quad \text{T} \\ \quad \quad / \quad \backslash \\ \quad \quad \text{T} \quad \text{VP} \\ \quad \quad / \quad \backslash \\ \quad \quad \text{t}_i \quad \text{V} \\ \quad \quad / \quad \backslash \\ \quad \quad \text{V} \quad \text{DP} \\ \quad \quad \text{t}_j \quad \text{dijo} \end{array}$$

¹Glosses are as follows: Agr = subject clitic; Apl = applicative; Caus = causative; Comp = complementizer; Conj = conjunction; Cop = copula; Dem = demonstrative pronoun; Dim = diminutive; Fut = future; Infin = infinitive; Loc = locative; Neg = negation; Pass = passive; Perf = perfective; PN = incorporated or stressed pronominal; Poss = possessive; Pot = potential; Prep = preposition; Pst/Cont = past continuous; Q = question marker; Rel = relative marker; RL = verbal relative suffix; Wh = *wh*-question word. Also included are gender/number classes (e.g., 8), 1Sg for first-person singular, and acute accent (') for high tones, with low tones unmarked. Tone is not marked on children's utterances. A modified version of Lesotho orthography has been used.

For the purposes of this article, I refer to AgrP and TP as an unarticulated IP and treat the surface realization of simple sentences as having the structure in (3).

- (3) [IP (Thabo_i) o-pheh_j-ile [VP t_i t_j dijo]]

2.2. Yes-No Questions

The word order in Sesotho yes-no questions is the same as that of declaratives; only prosodic phenomena serve to distinguish the two.² However, yes-no questions optionally take a question formative *náa* either preceding or following the IP. Consider the yes-no question in (4).

- (4) (Náa) Thabo ó-pheh-ile dijó (náa)? (Q) S V O (Q)
(Q) IT 1Agr-cook-Perf 8food (Q)
'Did Thabo cook the food?'

If the question marker (Q) were in C, and children productively used it, this might provide evidence for a CP in Sesotho. However, Q also appears in embedded questions preceded by the complementizer *hore*.

- (5) Ha ké-tsebé hore náa di-beh-il-wé káe
Neg 1SgAgr-know Comp Q 10Agr-put-Perf-Pass where
'I don't know where they have been put.'

The embedding complementizer *hore* is presumably in the head of a CP. This means that Q could be in one of two positions – either in the head of a second (lower) CP or adjoined to the embedded IP. Given that Q can precede or follow an IP, much as do other adjuncts (but unlike other complementizers), I assume an IP adjunction analysis for Q, as shown in (6).

- (6) [IP Naa [IP (Thabo_i) o-pheh_j-ile [VP t_i t_j dijo]]]

Thus, children's use of Q might tell us about the existence of IP, but not CP.

2.3. Wh-Questions

What about *wh*-questions, or information questions? The basic strategy used in most Bantu languages, including Sesotho, is that question words are found *in situ*. This is the case for both objects (7a, b) and adjuncts (8a, b).

²Declarative sentences are characterized by penultimate lengthening at the end of a phonological phrase, and downdrift between successive High tones. Neither is present in yes-no questions (Doke and Mofokeng (1957)).

- (7) a. Thabo ó-pheh-ile éng?
IT 1Agr-cook-Perf 9what
'What did Thabo cook?'
b. Thabo ó-bón-é máng?
IT 1Agr-see-Perf 1who
'Who did Thabo see?'

- (8) a. Thabo ó-pheh-ile dijó káe?
IT 1Agr-cook-Perf 8food where
'Where did Thabo cook the food?'
b. Thabo ó-pheh-ile dijó néng?
IT 1Agr-cook-Perf 8food when
'When did Thabo cook the food?'

Interestingly, subjects cannot be questioned *in situ*, as shown by the ungrammaticality of (9). The only possible interpretation for (9) is as an echo question.³

- (9) *Mang o-pheh-ile dijó?
1who 1Agr-cook-Perf 8food
'Who cooked the food?' *Wh V O

"Logical" subjects can be questioned when they have not raised to Spec IP – that is, in expletive or locative inversion constructions where the subject remains in Spec VP (10), as the object of a *by*-phrase in passive constructions (11), or in a cleft construction (to be described in section 2.3.). (Machobane (1987), Demuth (1989, 1990)).

- (10) Ho-pheh-ile máng?
17Agr-cook-Perf 1who
'It was who that did the cooking?' Explt-V Wh

- (11) Dijó di-pheh-il-wé ké máng?
8-food 8Agr-cook-Perf-Pass by 1 who?
'Who cooked the food?' S V-Pass by-Wh

In short, question formation in Sesotho matrix clauses never involves syntactic movement of a question word to a CP projection. Given

³It is not entirely clear why Bantu languages (with the possible exception of Kiswahili) show this constraint. A possible explanation would be in terms of Bresnan and Mchombo's (1987) argument that subjects are grammatical Topics, and Topics are incompatible with the Focus function of question words.

Grimshaw's (1991; 1993) notions of extended projection and minimal projection, where only the structures needed for a given construction are projected, Demuth and Machobane (1994) argued that both Sesotho yes-no questions and *wh*-questions are only composed of an IP. Cleft questions, however, do involve a relative complementizer. I therefore turn to an examination of Sesotho relative clauses and clefts, both of which have CP structure.

2.3. Relative Clauses and Clefts

Relative clauses in Sesotho are restrictive relatives which modify the head noun in much the way that an adjective would. Given that Bantu languages have few adjectives, relative clauses play an important grammatical function. In Sesotho, relative clauses are formed with a relative complementizer (Rel) that agrees with the head noun of the matrix clause. They also exhibit the use of resumptive pronouns (PN), indicating that relatives in this language are formed through adjunction of a CP rather than by movement (cf. Sells (1984), Shlonsky (1992)). Demuth and Machobane (1994) showed that relative clauses do not differ from topicalization in terms of weak crossover effects and island constraints: Both apparently function as predicates rather than operator-variable constructions. Thus, although an examination of children's acquisition of Sesotho relative clauses will not provide evidence for the acquisition of movement, it will tell us about the type of clause adjoined, and whether that clause is a VP, IP, or CP.

Consider the relative clauses in (12): The word order is identical to that of a matrix clause, but is tonally in the participial mood rather than the indicative.

- (12) a. batho há-phehá-ng dijó.
 2person 2Rel + 2Agr-cook-RL 8food
 'People that cook food.'
 b. batho báo ké-ba-rátá-ng.
 2person 2Rel 1SgAgr-2PN-like-RL
 'People that I like.'
 c. batho báo ké-batlá-ng pere yá-bona.
 2person 2Rel 1SgAgr-want-RL 9horse 9Poss-2PN
 'People whose horse I like.'

All the relative clauses in (12) take a relative complementizer Rel, as well as a relative suffix *-ng* on the verb. The object and oblique relatives in (12b) and (12c) both take a resumptive pronoun (PN), as do topicalization structures (13).

- (13) Dijó, Thabo ó-á-*(di)-phéha.
 8-food 1T 1Agr-Pres-8PN-cook
 'Food, Thabo is cooking it.'

Rel markers are historically derived from demonstrative pronouns and object Rel markers are actually identical to Dems of the same noun class. However, the surface realization of the subject Rel (12a) differs slightly from that of the object/oblique Rel ((12b,c); see Appendix). In subject relatives Rel and Agr have coalesced to form a portmanteau morpheme; it is only when an adverbial is topicalized in the embedded clause (12a) that both Rel and Agr components of the portmanteau become visible.

- (12a) batho báo kajéno bá-i-phehá-ng dijó.
 2person 2Rel today 2Agr-cook-RL 8food
 'People that today cook food.'

Given that Rels in object relatives look like Dems, and Rels in subject relatives look like subject Agrs (in all but Classes 1, 8, and 10), we might expect problems of analysis for the language learner. In section 3, I show that this is the case.

Cleft constructions, including cleft questions, are formed in exactly the same way as relative clauses, except that the head noun is always the complement of the copula. Note that this means that question words are also always in object or oblique position in the matrix IP.

- (14) a. Ké máng yá-pheh-llé-ng dijó?
 Cop 1who 1Rel + 1Agr-cook-Perf-RL 8food
 'It's who that cooked the food?'
 b. Ké éng yéó Thabo á-e-pheh-llé-ng?
 Cop 9what 9Rel 1T 1Agr-9PN-cook-Perf-RL
 'It's what that Thabo cooked?'
 c. Ké káe móo Thabo á-pheh-llé-ng dijó téng?
 Cop where Rel 1T 1Agr-cook-Perf-RL 8food there
 'It's where that Thabo cooked the food?'

Though some have argued that the fronting of question words in languages like Japanese may actually be a case of *wh*-movement (e.g., Takahashi (1993)), Demuth and Machobane (1994) argued that this is not the case in Sesotho. Rather, the structure (for (14b)) is as in (15):

- (15) [_{IP} Ké éng] [_{CP} yéó [_{IP} Thabo á-e-pheh-llé-ng?]]]

In this section I have reviewed the structure of Sesotho yes-no questions, *wh*-questions, relative clauses, and clefts. I have shown that neither Sesotho yes-no questions nor *wh*-questions involve movement, but are simple IP structures. Furthermore, I have shown that, although Sesotho relative clauses and cleft constructions (henceforth, *relative constructions*) involve neither variable binding nor movement, both contain a relative complementizer which is structurally in the head of CP. In the next section, I examine the development of relative constructions (both relative clauses and clefts) in early Sesotho, focusing specifically on the realization of Rel as evidence for the presence of CP structure.

3. THE ACQUISITION OF RELATIVE CONSTRUCTIONS

The data examined for this study come from a longitudinal study of 3 Sesotho-speaking children's spontaneous interactions collected at monthly intervals over a 12-month period (Demuth (1984)). The children were audio recorded during conversations with family and peers in rural Lesotho, and included 1 boy—H (from ages 2;1 to 3;0), and 2 girls—L (2;1 to 3;2) and T (3;8 to 4;1). Both younger children used object and adjunction *wh*-questions by the age of 2;6. The most frequently used constructions are object-*eng* 'what', adjunct *kae* 'where', and *-ng* 'why' questions. Recall that Sesotho subjects cannot be questioned *in situ*. Yet the younger children did not use many of the alternatives: H used only 1 inverted subject (expletive) question, and L used 3 by-phrase questions (in conjunction with a passive verb) in the entire corpus. The most frequent mechanism for questioning subjects is the cleft construction, which constituted approximately one third of all the subject relative constructions used by each of the children, regardless of age.

3.1. Subject Relative Constructions

Data specifically addressing the acquisition of relative constructions was drawn from the sessions summarized in Table 1. Three observations can be made concerning the frequency of relative-construction used in early Sesotho. First, both younger children doubled their use of relative constructions between ages 2;6 and 3. Second, the younger children's use of subject relative constructions around age 3 approaches the frequency in use of subject relatives by the older child at 4. Third, the younger children use hardly any object relatives at 2;6 years, and this situation has not significantly changed by the age of 3. This contrasts with the older child, for whom object relative constructions constitute around 40% of all relatives used. It appears, therefore, that there are at least three identifiable stages of

TABLE 1
Relative Constructions and Total Number of Utterances

Child	Age	Subject	Object	Total Utterances
H	2;6	7	2	496
	3;0	15	2	582
L	2;6	5	2	504
	3;2	14	1	550
T	4;0-1	17	11	516

Note. Utterance = clause containing a verb.

development over time, from few relatives, to an increase in subject relatives, to an increase in object relatives.⁴

These factors are interesting in light of findings from the experimental literature, where *parallel functions* (SS and OO) were thought to be the easiest to process (Sheldon (1974)). The Sesotho data appear to be more consistent with proposals by de Villiers et al. (1979), wherein OS and SS constructions are the most frequently used by children under age 3. The following examples are typical of Sesotho relative constructions used at 2;6 years.⁵

- (16) *Pompom e sa bulang ke ela.*
(*pompom e-sa-bula-ng ke ela*)
9sweat 2Rel + 9Agr-Neg-open-RL Cop 9Dem
'The candy that won't open (unwrapp) is this one.'
(H, 2;6)
- (17) *Ma tatang tshepe ena yaka wena?*
(*ke mang ya-thetha-ng tshepe ena ya-ka wena*)
Cop 1who 1Rel + 1Agr-touch-RL 9iron 9Dem 9Poss-my 2SGPN
'Who's touching this piece of iron of mine, you?'
(H, 2;6)
- (18) . . . a bebutseng.
(*a-eho-tse-ng*)
6Rel + 6Agr-peeled-Perf-RL
' . . . the one/that is peeled.'
(L, 2;6)

⁴Even at age 4, few object clefts are used. The lack of object clefts may be due to discourse factors: Object position in declarative sentences is generally used for the introduction of new information, and objects can also be questioned in that position directly. In contrast, subject position cannot be used for either new information or questions; thus, a subject cleft must be used.

⁵The first line of each example is the child's utterance; the line below it (in parentheses) represents the grammatical equivalent.

- (19) . . . khomo e sule . . . entsileng.
 (khomo e-shw-ile-ng)
 9cow 9Rel + 9Agr-die-Perf-RL
 ' . . . the cow that died.'
 (L, 2:6)

Several observations can be made. First, the verbal relative suffix *-ng* is present in approximately 90% of all H's relative constructions at 2 indicating that he distinguished these constructions from both matrix clauses and other embedded clauses. This does not differ significantly from the presence of *-ng* in T's speech at age 4. The relatively consistent appearance of *-ng* in H's early relative constructions may be due in part to its invariant form, unlike Rel which must agree in class with the head noun. However, the full acquisition of *-ng* is nontrivial; it suffixes to the highest verbal element – either an auxiliary, if there is one, or to the main verb, except when the verb takes a tense marker of motion (e.g., *-tla* - 'come' [future marker]) or the potential marker *-ka* -. This may account for the less-than-perfect production of *-ng* even in 4-year-old T's speech.⁶ Child L showed use of *-ng* in 50% of her early relatives. Some of her "omissions" may have resulted from a lack of being able to produce word-final syllabic nasals at this point (18), or they may point to confusion in when and where to attach *-ng*, a possible factor involved in the recast in (19).

The second observation is that Rel, or a reduced (vowel) form of Rel, is present in 100% of L's subject relative constructions. Recall that subject Rel is a portmanteau morpheme, composed of Rel + Agr morphemes. Furthermore, this portmanteau morpheme is identical in form to subject Agr in all but Classes 1, 8, and 10. The Rels in both (18) and (19) are therefore ambiguous between Rel and Agr (see Appendix). Furthermore, many of the children's Class 1 Rel forms are reduced from *ya-* to *-a*, making them identical with the subordinate form of the third-person/Class 1 Agr. To complicate issues, many of the subject Agrs in children's speech before age 3 neutralize to an *a-* form, even in the case of 1Sg subject Agr *ke-* (Demuth (1992)). In short, at 2;6 none of L's Rel forms were unambiguously Rel; all can be interpreted as Agr. That is, none of L's early subject relative constructions are unambiguously CP structures.

H's Rel forms show a similar pattern. Again, none of H's subject Rel forms are unambiguously Rels at 2;6 years. Furthermore, in the cleft cases (e.g., (17)) Rel is missing altogether. It appears, therefore, that H has no Rel

⁶Correct placement of *-ng* may also be confounded by the fact that some auxiliaries (plus suffixed *-ng*) coalesce with the following subject clitic: . . . *o-ne-ng o-mo-bona* . . . > . . . *o-ni-o-mo-bona* . . . ' . . . you saw him/her . . .', rendering *-ng* opaque.

forms at this point, but like L, may be treating Rel as subject Agr. In sum, there is no overt evidence that either H or L are treating Rel as a CP complementizer at 2;6. Rather, I suggest that they have only an IP analysis of relative constructions at this point. Further support for this position comes from occasional examples after 2;6 years, where Rel takes the actual shape of the 2Sg indicative Agr (20). Such forms are considered a "grammatical" option, but are used infrequently (Doke and Mofokeng (1957)).

- (20) ko ona o tabwileng, q!
 (ke wena ya-e-tabo-tse-ng)
 Cop 2SgPN 1Rel + 1Agr-9PN-tear-Perf-RL
 'It's you that tore it!'
 (L, 2:8)

By 3 years both of the younger children use *-ng* appropriately in 90% of their forms, and subject Rels are consistently present (H had one omission). However, the forms that can be interpreted as being unambiguously Rels and not Agrs are still few: One third of both H's and L's Class 1 Rels take the full and unambiguous *ya-* form ((21) and (23)), and H has two unambiguous Rel forms of Class 10 (e.g., (22)).

- (21) Ya-thetsa-ng moo o-tla-cha.
 1Rel + 1Agr-touch-RL here 1Agr-Fut-burn
 'Whoever touches here will burn (herself/himself).'
 (H, 3:0)
- (22) Sheba dipere tse-tswana-ng.
 look at 10horses 10Rel + 10Agr-resemble-RL
 'Look at the horses that are alike.'
 (H, 3:0)
- (23) Ya kenang ka tung a mmate?
 (ya-kena-ng ka tu-ng ha o-mo-rate)
 'Rel + 1Agr-enter-RL Prep 9horse-Loc Neg 2SgAgr-1PN-like
 'The one that's entering the house, don't you like her?'
 (L, 3:2)

However, well over half of both children's forms still remain ambiguous between a Rel and Agr interpretation. Apparently, around the age of 3,

