Meisel, J.: 1990, 'INFL-ection: Subjects and subject-verb agreement in early child language. Evidence from simultaneous acquisition of two first languages: German and French', in J. Meisel (ed.), *Two First Languages. Early Grammatical Development in Bilingual Children*, Foris, Dordrecht.

Piaget, J.: 1971, *The Construction of Reality in the Child*, Ballentine Books, New York.

Platzack, C.: 1986, 'COMP, INFL, and Germanic word order', in L. Hellan and K.K. Christensen (eds.), *Topics in Scandinavian Syntax*, Reidel, Dordrecht.

Platzack, C.: 1990, 'A grammar without functional categories: A syntactic study of early Swedish child language', *Nordic Journal of Linguistics* 13, 107-126, also published in *Working Papers in Scandinavian Syntax* 45.

Platzack, C. and A. Holmberg: 1989, 'The role of AGR and finiteness in Germanic VO languages', *Working Papers in Scandinavian Syntax* 43, 51-76.

Plunkett, K. and S. Strömqvist: 1990, 'The acquisition of scandinavian languages', *Gothenburg Papers in Theoretical Linguistics* 59.

Pollock, J.-Y.: 1989, 'Verb movement, Universal Grammar, and the structure of IP', *Linguistic Inquiry* 20, 365-424.

Radford, A.: 1986, 'Small children's small clauses', *Bangor Research Papers in Linguistics* 1, 1-38.

Radford, A.: 1990, *Syntactic Theory and the Acquisition of English Syntax*, Basil Blackwell, Oxford.

Verrips, M. and J. Weissenborn: 1991, 'On the relation between the acquisition of verbal inflection and verb movement', ms., Max-Planck-Institut für Psycholinguistik, Nijmegen.

Weissenborn, J. and M. Verrips: 1989, 'Negation as a window to the structure of early child language', ms., Max-Planck-Institut für Psycholinguistik, Nijmegen.

KATHERINE DEMUTH

ACCESSING FUNCTIONAL CATEGORIES IN SESOTHO: INTERACTIONS AT THE MORPHO-SYNTAX INTERFACE

1. INTRODUCTION

Language acquisition studies have long noted that early acquisition patterns differ in important ways from those of adult speech. Specifically, early child language is full of what have generally been called 'open class items' (e.g. nouns, verbs), but relatively lacking in 'closed class items' (e.g. determiners, complementizers, etc.). Furthermore, early child language differs from adult language in that it seems to lack some types of movement (e.g. subject-aux inversion in English, verb movement in German). Drawing on recent developments in linguistic theory, where the organization of grammar is centered around Functional Categories such as DET, INFL, COMP and their projections (e.g. Abney, 1987; Fukui and Speas, 1985), it has been proposed that it is precisely these functional elements themselves that may be lacking from early child grammars (e.g. Radford, 1990; Guilfoyle and Noonan, 1988; see also Lebeaux, 1988). This would account for both the early lack of closed class items, and the early lack of movement to these functional, or head, positions.

The proposal that Functional Categories may be absent in early child grammars is intriguing in that it might finally explain many of the critical differences between early child and adult grammars. However, it also raises several questions concerning the status of Functional Categories within a theory of Universal Grammar (UG). If Functional Categories are not part of UG, then there must be some explanation for how they are eventually acquired. One proposal in the recent literature is the Maturational Hypothesis, i.e. that Functional Categories, or various other linguistic capabilities, 'mature' (e.g. Guilfoyle and Noonan, 1988; Radford, 1990), subsequently allowing for the building of functional projections. Others have suggested that functional heads must be lexically acquired in order to license the creation of maximal projections (e.g. Clahsen, 1990; Lebeaux, 1988). In this case the phonetic realization of heads would presumably serve

83

as the 'trigger' or as 'positive evidence' for the building of syntactic structure. Further evidence for this position would appear to come from some studies of German and French (e.g. Meisel and Müller, this volume; Deprez and Pierce, 1991). We will refer to this approach as the Lexical Projection Hypothesis, where the morpho-lexical realization of functional heads feeds the creation of functional projections. The final possibility, and the one ultimately argued for in this paper, we call the Functional Projection Hypothesis (cf. Whitman, Lee and Lust, to appear), where the building of syntactic structure may actually precede the phonetic (or morpho-lexical) realization of functional heads themselves (see also Weissenborn, 1990).

This paper evaluates both the Lexical Projection and Functional Projection Hypotheses by examining the morpho-lexical realization of functional heads and the control of syntactic structure in the acquisition of Bantu languages. It draws primarily on two studies of naturalistic speech from 6 Sesotho-speaking children below 3 years of age.[1] It shows that the acquisition of INFL types of structures in Sesotho is remarkably similar, in many respects, to that reported elsewhere in this volume for German and French. However, it also finds that access to DP structure appears earlier than that of IP and CP structures, and that the building of appropriate syntactic structure for DPs and CPs may precede the phonetic (or PF) realization of functional heads themselves. Finally, it concludes by suggesting that functional projections may play an important role in the formation of early grammars, even while functional heads themselves are phonetically null.

2. THE STRUCTURE OF SESOTHO INFL

The basic surface structure of Sesotho is SVO, though any of the six possible word order combinations is allowed when subject and object clitics (or 'markers') appear on the verb.[2] Subject markers (SMs) are obligatory, while lexical subjects can be optionally dropped (1a) or postposed (1b).[3]

(1) a. (S_i) SM_i-T/A-V-M O
     b. SM_i-T/A-V-M O (S_i)

As seen in (1a-b), the lexical subject and the SM are coindexed, showing subject-verb 'agreement'. In Bantu languages this 'agreement' is generally

realized by a set of different noun class (or gender/number) prefixes (14 in the case of Sesotho) and their corresponding subject and object clitic reflexes.[4] This is shown in (1c-d) below, where coindexation is represented by the gender/number feature involved, in this case #1.

(1) c.   (Thabo$_i$) ó$_i$-tla-rék-á   dijó.
          1T.   1SM-FUT-buy-M 8food
          'Thabo will buy some food.'
     d.   ó$_i$-tla-rék-á   dijó (Thabo$_i$).
          1SM-FUT-buy-M 8food 1T.
          'He will buy some food, Thabo.'

When the object marker (OBJ) cliticizes preverbally, it maintains the argument function, the lexical object becoming an optional, VP external adjunct. Compare (2a-b).

(2) a.   (S) SM-T/A-V-M O
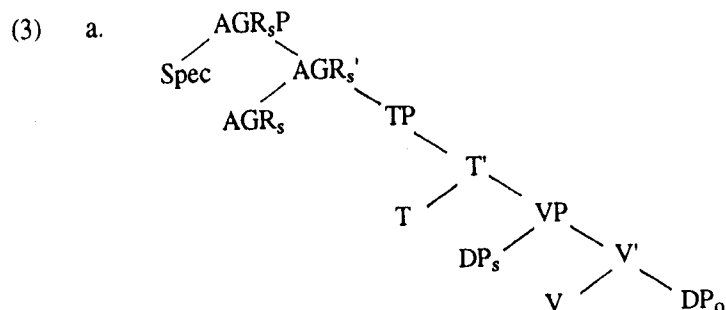   b.   (S) SM-T/A-OBJ$_i$-V-M (O_i)

That the lexical object in (2b) is external to the VP is shown in (2c-d).

(2) c.   (Thabo) ó-rek-á   di-jó.
          1T   1SM-buy-M 8-food
          'Thabo is buying the food.'
     d.   (Thabo) ó-á-di$_i$-rék-a+   (di-jó$_i$).
          1T   1SM-PRES-8OBJ-buy-M 8-food
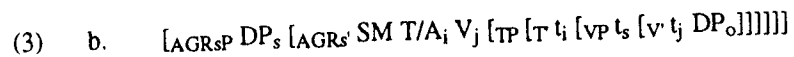   'Thabo is buying it, the food.'

Notice that there is a high tone (´) on the final vowel of the verb in (2c), while there is a mid (+) tone on the final vowel in (2d). Sesotho has a rule of tonal lowering (high tone > mid tone) which applies when the verb is final in the VP. This indicates that the lexical object is external to the VP when an object marker is present, as in (2d). Furthermore, the present tense marker -*a*- appears only when the verb is final in the VP (i.e. as an intransitive verb, or as a transitive verb with an OBJ). Thus, both tonal and morphological evidence show that the lexical object in (2d) is external to the VP (Demuth, 1990a, 1991). In other words, Sesotho does not show

object agreement, though this does occur in some Bantu languages (e.g. Swahili).

Following Pollock (1989) and Chomsky (1989), we assume that IP in Sesotho is composed of an AGR Phrase and a Tense Phrase, and that SM and T/A are the base generated terminal elements of each of those projections. The subject (DP_s) is base generated in SpecVP, as illustrated in (3a) below:

(3)   a.

$$[\text{AGR}_s\text{P} \quad \text{Spec} \quad \text{AGR}_s' \quad \text{AGR}_s \quad \text{TP} \quad \text{T}' \quad \text{T} \quad \text{VP} \quad \text{DP}_s \quad \text{V}' \quad \text{V} \quad \text{DP}_o]$$

We suggest that children's earliest grammars might consist only of VP. Once AGR_sP structure has been built and AGR_s is present, raising of the subject DP_s to SpecAGR_sP will be obligatory, where it then enters into Spec-head agreement with AGR_s. The verb must then raise to T and again to AGR_s via head-to-head movement to receive person and gender/number agreement.[5] The resulting S-structure is given in (3b).

(3)   b. $[_{\text{AGR}_s\text{P}} \text{DP}_s [_{\text{AGR}_s'} \text{SM T/A}_i \text{V}_j [_{\text{TP}} [_\text{T} t_i [_{\text{VP}} t_s [_{\text{V}'} t_j \text{DP}_o]]]]]]$

And what of OBJ? Following Chomsky (1989) we suggest that OBJ also heads a maximal projection AGR_oP, an Object Agreement Phrase, which dominates VP. Such a structure, before movement of V (and OBJ) to T, and subsequently to AGR_s, is illustrated in (3c).

(3)   c. $\ldots [_{\text{AGR}_o\text{P}} [_{\text{AGR}_o'} \text{OBJ} [_{\text{VP}} [_{\text{V}'} \text{V} t_o]]]]$
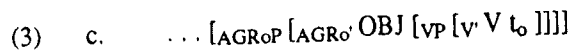
When the subject DP_s or object DP_o are extraposed, or 'scrambled', they adjoin off a higher XP projection.

We argue that the child's ability to 'scramble', or extrapose lexical subjects and objects, will only be achieved once both AGR_sP and AGR_oP structures have been built. Under the Lexical Projection Hypothesis this would mean that functional heads would need to be morpho-lexically filled and Spec-head agreement operative prior to the raising of DP_s or DP_o to higher XP structure (presumably to an A' position). Alternatively, the Functional Projection Hypothesis would predict that scrambling could take place prior to the phonetic realization of AGR_sP and AGR_oP. We turn now to an examination of the data.

2.1. The Acquisition of AGR_s, AGR_o, and 'Scrambling' Effects

Early stages of Sesotho acquisition (around 2 years) are generally characterized by a lack of SM, or by a 'shadow vowel' (Connelly, 1984) that lumps the SM along with the T/A and/or the OBJ marker into one underspecified morpheme (generally 'a' or 'e') (Demuth, 1988, 1991, forthcoming). A similar picture emerges from the early stages of acquisition in other Bantu languages (e.g. Siswati - Kunene, 1979: 85-91, 244). Examples such as those in (4) below are the norm (from Demuth, 1988: 312-313).[6]

(4)   a.   (2;1 yrs.)
             a lahlíle.
             (ke-di-láhl-íl-e+)
             1sSM-10OBJ-throw away-PERF-M
             'I threw them away.'

       b.   (2;1 yrs.)
             a e shápa.
             (ó-a-n-cháp-a+)
             1SM-PRES-1sOBJ-lash-M
             'S/he is lashing me.'

By around 2;4-2;5 years, in both Sesotho and Siswati, children begin to more consistently produce morphologically well-formed SMs and T/As, though there continue to be inconsistencies till around 3 years.

As is characteristic of many languages, early Sesotho (Demuth, forthcoming) and Zulu (Suzman, 1982) show an abundance of first person singular SMs, where lexical subjects are not required. Interestingly, an

increasing number of lexical subjects begin to be used about the time that SM and T/A begin to be more systematically differentiated (Demuth, 1987). One analysis would be that prior to this time DP_s is still lying in base generated SpecVP position, having no SpecAGR$_s$P to move to. Assuming the Lexical Projection Hypothesis, the increased use of lexical subjects around the time that SMs become morphologically more well defined would follow as a natural consequence of structure building.

We might then also predict that the first cases of DP_s postposing would occur after lexical subjects and SMs enter into Spec-head agreement, and this is in fact the case. A typical example is one like that in (5), where SM and T/A are morphologically distinct and well-formed, and DP_s has been postposed.

(5)   (2;6 yrs.)
         é-á-tsamay-a   koloi   yá-ka.
         (é-á-tsamay-a   kolóí   yá-ka)
         9SM-PRES-go-M   9car   9POSS-my
         'It's going, my car.'

It would therefore appear that TP and AGR$_s$P become independent projections about the time that their respective heads (SMs and T/A) become increasingly well-formed and differentiated as separate morphemes. This would appear to be a classic case of morphology feeding the creation of separate maximal projections. That a similar developmental scenario is found in languages as different as German, French and Sesotho would appear to lend credence to the position that the phonetic realization of heads triggers, or licenses, the building of maximal projections.

Given the Lexical Projection scenario outlined above, we might also expect the morpho-lexical realization of OBJ to be a prerequisite to lexical object postposing, and indeed this appears to be the case (Demuth, 1987, forthcoming). A typical example is given in (6), where SM, T/A and OBJ are all well-formed, and the lexical object has been extraposed.[7]

(6)   (3 yrs.) (from Demuth, 1987:101)
         n-ná   ke-a-e-batl-a   buka   yá:-ka.
         (n-ná   ke-a-e-bátl-a   búka   yá:-ka)
         1s-PN 1sSM-PRES-9OBJ-want-M   9book   9POSS-my
         'Me, I want it, my book.'

It would appear, then, that the morpho-lexical realization of Sesotho AGR$_s$ and AGR$_o$ is a prerequisite to the building of the maximal projections which they head. In other words, acquisition of the morphology would apparently serve to stimulate the development of separate syntactic projections. This appears to be in keeping with reports about the acquisition of INFL-AGR types of functional heads in German and French as well (cf. Clahsen, 1990; Meisel and Müller, this volume). Such findings, coming from very different languages, would appear to provide support for the Lexical Projection Hypothesis, suggesting that syntactic structure may only be built once the relevant functional heads have been phonetically realized. The Lexical Projection Hypothesis can be formulated as follows:

A.   *The Lexical Projection Hypothesis:*
      The building of a maximal projection will proceed only once an appropriate head has been phonetically realized.

There is one small problem with the Lexical Projection Hypothesis as it applies to Sesotho INFL (i.e. AGR$_s$ and T). Given the early reports of person and tense marking in German (Meisel and Müller, this volume), we might expect earlier projection of AGR$_s$P in Sesotho. In fact, there is tonal evidence that Sesotho-speaking children have awareness of the notion 'person' even before AGR$_s$ and T become morphologically distinguished. Demuth (1991) finds that first and second person SMs are correctly distinguished from third person SMs by low and high tone respectively as early as 2;1 years.[8] Thus, it might be that AGR$_s$P is present earlier than originally thought. But then why would scrambling effects begin only six months later? We keep both caveat and question in mind as we turn to a discussion of CPs and the acquisition of Sesotho COMP.

3.   THE STRUCTURE OF SESOTHO COMP

Relativization is a productive grammatical process in Sesotho; subjects, accusatives/datives, genitives and locatives can all be relativized (Doke and Mofokeng, 1957). Two sets of relative markers (both derived from demonstratives) are used, one when the head noun functions as the subject of the relative clause (Subject relatives), and another when it functions as an

Object or Oblique (Object relatives). These are marked as REL in (7a-c) respectively.

(7)   a.   ba-tho$_i$ [bá$_i$ pheh-á-*ng*   di-jó].
             2-person$_i$ [2REL$_i$/(1SM)$_i$ -cook-M-*RL*   8-food]
             'people [that cook food].'

       b.   ba-tho$_i$ [báo$_i$ ké-ba$_i$-rát-á-*ng*].
             2-person$_i$ [2REL$_i$ 1sSM-2OBJ$_i$-like-M-*RL*]
             'people [that I like].'

       c.   ba-tho$_i$ [báo$_i$ ké-batl-á-*ng*
                                   pere   yá-bo-na$_i$].
             2-person$_i$ [2REL$_i$ 1sSM-want-M-*RL*
                                   9horse   9POSS-2 PN$_i$]
             'people [whose horse I like].'
             Lit: 'people [that I like their horse].'

Both Subject and Object RELs agree in noun class with the head noun, i.e. both are noun class 2 in the above examples. An OBJ (e.g. *ba* in (7b)) or an independent pronoun (e.g. *bo-na* in (7c)) is required when the head noun functions as an object or oblique in the lower clause. Finally, a non-interrogative wh-operator -*ng* (RL) suffixes to the embedded verb.[9]

Sesotho REL behaves somewhat like relative *that* in English (e.g. the man *that* I saw), and like English, lies in COMP. Unlike English, however, there is no wh-equivalent used in relative clauses (e.g. the man *who* I saw). It is generally assumed that the structure of relative clauses is [CP*what*$_i$ [C'*that* [IP I saw e$_i$]]], where the wh-word generated in the embedded clause has been raised to SpecCP. This type of structure would account for southern dialects of German where both a wh-word and *that* are found in relative clauses. In Sesotho, however, there is no wh-movement at S-structure. We might therefore expect -*ng* to remain in the embedded clause, and this is precisely what happens, as shown in (7) above. It then raises along with the verb to AGR$_s$, raising again to SpecCP at LF.[10]

The S-structure of Sesotho relative clauses is shown in (8).

(8)
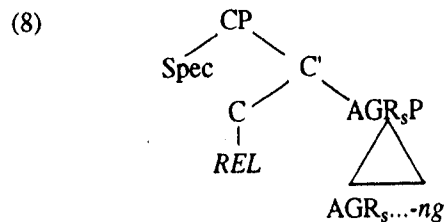
Relative clauses also appear as part of cleft constructions. Clefts are formed with the copula *ke* followed by the head noun, as shown in (9a) and (9b) respectively.

(9)   a.   ké   Thabo$_i$ [yá$_i$ pheh-íl-é-*ng*
                                      di-jó].
             COP   1T$_i$ [1REL$_i$/(1SM)$_i$ cook-PERF-M-*RL*
                                      8-food]
             'It's Thabo [that cooked the food].'

       b.   ké   di-jó$_i$ [tséo$_i$ Thabo   á-di$_i$
                                   pheh-íl-é-*ng*].
             COP   8-food$_i$ [8REL$_i$ 1Thabo 1SM-8OBJ$_i$
                                   cook-PERF-M-*RL*]
             'It's food [that Thabo cooked (it)].'

The clefted element can also be questioned, as in (9c) and (9d).

(9)   c.   ké   máng$_i$ [yá$_i$ pheh-íl-é-*ng*
                                     di-jó]?
             COP   1who$_i$ [1REL$_i$/(1SM)$_i$ cook-PERF-M-*RL*
                                      8-food]
             'It's who [that cooked the food]?'

       d.   ké   éng$_i$ [yéo$_i$ Thabo   á-e$_i$
                                   pheh-íl-é-*ng*]?
             COP   9what$_i$ [9REL$_i$ 1Thabo 1SM-9OBJ$_i$
                                   cook-PERF-M-*RL*]
             'It's what [that Thabo cooked]?'

Children's production of embedded constructions such as relative clauses and clefts should provide acquisition evidence of access to COMP. Evidence that they are treating these clauses as embedded, and not as conjoined main clauses, would come from the presence of *-ng*. In addition, specific evidence that COMP is filled would come from the PF realization of REL. According to the Lexical Projection Hypothesis, we would predict that RELs would be morpho-lexically well-formed once embedding and *-ng* appear. However, as shown in the next section, this is not the case.

3.1.Acquisition of CP and COMP

A few attempts at relative clauses are found in the spontaneous speech of Sesotho-speaking children between 2;1-2;4 years, becoming more frequent by 2;5 years. Typical examples are presented below, where REL may or may not take the appropriate phonetic shape, but where *-ng* generally surfaces, suffixed to the embedded verb.

(10)   a.   (2;2 yrs.)
ke tla ja [*e* thuwe*ng*].
(ke-tla-j-a [*e* thu-fl-w-é-*ng*])
1sSM-FUT-eat-M *9REL* mash-PERF-PASS-M-*RL*
'I will eat (the one) that has been mashed.'
[Referring to potatoes that are being peeled]

   b.   (2;5 yrs.)
bón-á tsenúku [*á* hl- *á* hlabá*ng*].
(bon-a tsunuku [*é* hlab-á-*ng*])
see-M 9needle *9REL* stab-M-*RL*
'Look at the needle that is stabbing.'

A few cleft constructions were found during the first recordings at 2;1 years (11), with a burst in the use of cleft constructions at 2;5 years (for at least one child), many of them as cleft questions (Demuth, 1984, forthcoming).

(11)   (2;1 yrs.)
e   má: [*e*   ketílé   póone]?
(ké   máng [*yá*   qet-íl-é-*ng*   póone]?)
COP   1who *1REL*   finish-PERF-M-*RL*   corn
'It's who that finished the corn?'

(12)   a.   (2;5 yrs.)
ké: nthéo   ka   moo [ké
fuwá*ng*]?
(ké éng   nthó   é   ká   móo [*yéo*
ké-e-fúdú-á-*ng*]?)
COP what 9thing 9DEM PREP here *9REL*
1sSM-*9OBJ*-stir-M-*RL*
'What is this thing in here that I'm stirring?'

   b.   (2;5 yrs.)
tsí   ntho   [*á*   rékílé*ng*].
(ké   nthó   [*yéo* á-e-rék-fl-é-*ng*])
COP   9thing *9REL* 1SM-*9OBJ*-buy-PERF-M-*RL*
'It's the thing that s/he bought.'

   c.   (2;5 yrs.)
é   nnâ   [lahléa].
(ké   nná   *yá* -lahl-ela-*ng*)]
COP   1sPN   *1REL* 9OBJ-throw out-APL-M-*RL*
'It's me that is throwing it away.'

The operator *-ng*, though occasionally missing (as in (11) and (12c)), is generally present, indicating that early Sesotho relative and cleft constructions are being treated as embedded clauses.[11] One might question whether these are not routine or lexicalized forms, however it appears that they are not; cleft constructions generally appear as a spontaneous clarification of some misunderstanding (Demuth, 1984, forthcoming). Furthermore, *-ng* is never overgeneralized to main clause verbs. The productive nature of Sesotho cleft constructions, plus the frequent appearance of *-ng*, argues strongly for the fact that these are neither routine constructions nor conjoined clauses, but rather productive, embedded structures. We therefore argue that CP structure and access to COMP must be available by at least 2;5 years, if not before. Under the Lexical Projection Hypothesis, we should therefore expect COMP to be lexically filled. However, as examples (12a-c) show, COMP is frequently left as null.

The possibility that access to the structural properties of COMP precedes the consistent realization of REL presents a challenge for the Lexical

Projection Hypothesis. We have seen above that the morphological well-formedness of RELs (either their actual presence, or their appropriate phonetic form) lags behind children's actual grammatical competence at producing relative and cleft constructions. Interestingly, even older children occasionally omit RELs or -ng. This is shown by the lack of -ng in (13d) and the absence of -ng in (13c) (where it has been elided along with part of the T/A marker (see fn. 10)).

(13) (4;1 yrs.)

   a.   Mmé   hakéré   o-ta-rek-él-á
                                 Nnéuoe   ma-sale   ála.
       (Mmé   hakéré   o-tla-rék-él-a
                                   Nnéuoe   ma-salé   ála)
       mother   not-so   2sSM-FUT-buy-APL-M
                             N.   6-earrings 6DEM
       'Mother, isn't it true you're going to buy
                          Nneuoe those earrings.'

   b.   á   tshwán-a-ng   lé   ále   á-ka.
       (á   tshwán-á-ng   le   ale   á-ka)
       6REL   like-M-RL   CONJ 6DEM 6POSS-my
       'that are like those of mine.'

   c.   áo   o-n'o-n-rek-éts-é oná.
       (áo   ó-né-ng   ó-n-ték-éts-é   oná)
       6REL 2sSM-PAST/CONT-RL
                         2sSM-1sOBJ-buy-APL:PERF 6IP
       'that you bought me.'

   d.   mohláng   re-il-é   ká nok-an-éng?
       (mo-hlá-ng   ré-il-é-ng   ká nok-an-eng)
       3-day-LOC   1pSM-go:PERF-M-RL to river-DIM-LOC
       'on the day when we went to the river?'

Such examples suggest that the lack of consistent REL marking in younger Sesotho-speaking children's relative clauses and clefts should not be taken as evidence for the non-existence of COMP. Rather, it suggests that the

structural properties of COMP are present even while the PF spellout of its form remains inconsistent.

The possibility of null Functional Categories raises problems for the Lexical Projection Hypothesis. First, it has been proposed that access to phrase structure is achieved by acquiring the governing lexical items - e.g. determiners, complementizers etc. (Clahsen, 1990; Lebeaux, 1988). When the lexical item is not present, the structure is presumed to be absent, even to the extent of 'falling back' to an earlier stage of the grammar. The picture that emerges here, however, is one where the structure is constant, while the PF realization of the functional head is variable.

Secondly, the Lexical Projection Hypothesis, as we have defined it in A., maintains that it is the phonetic instantiation of lexical heads that pushes the creation of syntactic projections. Here, however, we find that the creation of syntactic projections 'permits' or 'allows for' the (optional) phonetic realization of a functional head. In other words, functional heads cannot be phonetically realized unless there is a 'slot' for them to fill. We might then expect to find a certain amount of individual variation as to how and when functional head positions are morpho-lexically filled (i.e. some children might tend to be 'slot fillers', while others might tend to leave slots empty). Careful analysis of the early morphophonology of closed class items in the speech of two English-speaking children shows that this is probably true (Peters and Menn, 1990). We might also expect to find some cross-linguistic variation in this regard, and this also appears to be the case. Gawlitzek-Maiwald, Tracy and Fritzenschaft (this volume) report that one of the children in their study provides evidence of access to COMP, while the first complementizers appear shortly thereafter. They suggest that once the structural position is available, the child looks for something to fill it. Lee, Lust and Whitman (1990) and Whitman, Lee and Lust (to appear) also report that children show evidence of a COMP position in Korean by filling that head position with a complementizer, even though one never occurs in the equivalent adult constructions. In the Sesotho case it appears that even once COMP is structurally present it is only optionally filled, at least by the children examined to date. Taking this a bit further, we might predict that there would be cases where a COMP position could be structurally present, but never filled: This is precisely what is proposed for adult Korean (Lee, Lust and Whitman, 1990), and what is optionally found even in languages like English (e.g. ... the man [(who/that) I saw] ...). We therefore propose the following definition for the Functional Projection Hypothesis.

B.   *The Functional Projection Hypothesis:*
      The creation of a maximal projection allows for the (optional)
      phonetic realization of an appropriate head.

The possibility of building syntactic structure with early null, or
phonetically 'underspecified' functional heads, raises several questions:
Why should functional heads be morpho-lexically realized in the case of
Sesotho INFL, but not COMP? Is there some fundamental difference
between these two Functional Categories (i.e. verbs normally move to INFL
to pick up person/number, tense, or finiteness features, while this is
generally not the case for movement into COMP)? Or, is it possible that
INFL types of maximal projections are actually constructed earlier than
initially thought - i.e. prior to the phonetic realization of AGR$_s$ and T (see
Radford, this volume)? We keep these questions in mind as we consider
much earlier evidence of access to DET in the following section.

4. THE STRUCTURE OF SESOTHO DPs

We have already noted that Sesotho is characterized by a noun class (or
gender/number) agreement system. Agreement relations (of a slightly
different nature) also hold within DP. The surface structure of DPs is given
in (14).

(14) Table I:

	N	*DEM*	*POSS*	
Sg.	se-fate	se-na	sa-ka	'this tree of mine'
	7-tree	7DEM-this	7POSS-my	
Pl.	di-fate	tse-na	tsa-ka	'these trees of
	8-tree	8DEM-this	8POSS-my	mine'

Coindexation holds between the noun and its complements, as indicated by
noun class markers 7 (singular) and 8 (plural). Following Carstens (in
preparation) we suggest that the noun class prefix carries number features
(gender features being carried by the noun), and that it is a Functional
Category heading the maximal projection DP.[12] The noun would then need
to raise via head-to-head movement to receive number features. We assume

that once N has raised, both number and gender features can be passed onto
the demonstrative and possessive, each of which may be considered a
maximal projection in its own right, (the DEM and POSS prefixes
functioning as their respective heads). The D-structure for DPs is presented
in (15).

(15)
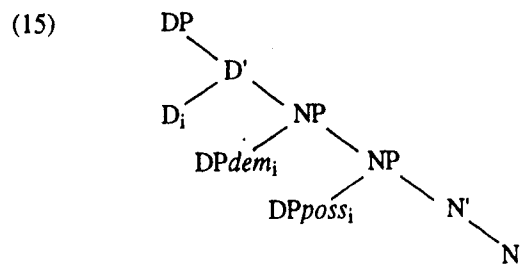
Regarding the acquisition process, appropriate word order and the
realization of D features on the noun (i.e. the noun class prefix) might
indicate that access to D has been acquired. However, nouns and their
prefixes might be initially produced as amalgams, or 'frozen forms' with no
awareness of D features *per se*. We would therefore take the appropriate
phonetic shape of noun class prefixes alone as being inconclusive regarding
the presence of a DP projection. Much more interesting, on the other hand,
would be the presence of D features (i.e. functional heads) on
demonstratives and possessives, providing evidence that coindexing, and
therefore access to D, has taken place. We turn now to a consideration of
the acquisition facts.

4.1. The Acquisition of D features, Demonstratives and Possessives

The early 'underspecification' of nominal prefixes has been widely attested
in acquisition studies of nominal morphology in several southern Bantu
languages (Siswati: Kunene, 1979; Sesotho: Connelly, 1984; Demuth, 1988;
Setswana: Tsonope, 1987; Zulu: Suzman, 1980, 1982, forthcoming).
Examples such as (16), with a null prefix or only a 'shadow vowel', are the
norm. Well-formed prefixes are extremely rare, though one did occur in this
particular sample.

(16)   (2;1 yrs.) (from Demuth, 1988: 309)
            Ø-phoko   (ma-phóqo)
            a-poko   6-green corn stalks
            ma-penke

Given the general lack of (well-formed) nominal prefixes at this point, we might assume that access to D has not yet been acquired, i.e. that it is lexical and not functional. However, further investigation of nominal use with demonstratives and possessives shows that this assumption is false: First, word order (i.e. N-DEM or N-POSS) is always correct - i.e. there is no ungrammatical scrambling. And second, the prefixes, or D features, on both demonstratives and possessives are generally of the appropriate phonological form, even when the noun class prefix itself (i.e. D features on the noun) is absent or phonetically underspecified. This is shown in (17a-b). below.

(17)   a.   (from Connelly, 1984: 102)[13]

            (1;9 yrs.)
            kwena   a-ka.
            (ma-kwenya a-ka)
            6-fat-cakes   6POSS-my
            'my fat-cakes.'
            (2 yrs.)
            asale   a-hae.
            (ma-sale   a-hae)
            6-earrings   6POSS-her/his
            'her earrings.'
            (2;3 yrs.)
            ekausi   tsa-ka.
            (di-kausi   tsa-ka)
            10-socks   10POSS-my
            'my socks.'

b.   (from Demuth, 1988: 313)

       (2;1 yrs.)
       kolo   sá-ne.
       (se-kólo   sá-ne)
       7-school   7DEM-that
       'that school.'
       (2;1 yrs.)
       ponko   lá-ne.
       (le-phoqo   lá-ne)
       5-green corn stalk   5DEM-that
       'that green corn stalk.'

Not only do these early examples show that access to the appropriate D features is present, but the range of noun classes (i.e. 5, 6, 7, 10 - both singular and plural) points strongly to the fact that these are productive rather than routine forms, and that there is not simply one general 'filler syllable' being used. Rather it shows that the child has access to the features of D, even though the functional head on the noun itself may surface as phonetically null. Thus, it appears that very young Sesotho-speaking children have access to the structural properties of DP, even though D itself may not be phonetically realized.

The Sesotho DP findings are noteworthy from at least two perspectives. First, access to DP structure would appear to be earlier than that reported here for either INFL or COMP. And second, the early evidence of access to D in Sesotho would appear to correlate with early evidence of possessive 's in English (e.g. Radford, 1990). Could it be that D is 'universally' acquired earlier than other Functional Categories? And if so, what theoretical explanation could underlie this possibility?

A couple of possibilities come to mind. First, given that early language is full of nouns, and that early DPs can be used in isolation, independent of Case marking or theta role assignment, we might predict that at least some children would master DP structure long before that of IPs or CPs. But such a piece-meal approach to a developing grammar is not very intellectually appealing. Alternatively, given that DPs are frequent in the input, one might argue for the early emergence of DP structure on 'phonological priming' or 'phonological bootstrapping' grounds. In this case evidence for the creation of DP structure might come from an abundance of phonetic input, even

though the child might not fully realize that evidence in his or her own phonetic output. We might call this the Phonological Priming Hypothesis, where phonological input may 'trigger', or provide evidence for the building of syntactic structure, even though the phonetic realization of functional heads themselves may lag behind. The Phonological Priming Hypothesis can be defined as in C. below:

C.   *The Phonological Priming Hypothesis:*
      The creation of a maximal projection is permitted once an appropriate head has been 'identified', subsequently allowing for that head to be (optionally) phonetically realized.

The Phonological Priming Hypothesis captures the fact that, while structure may be built prior to the consistent PF realization of heads, at least the 'identification' of appropriate heads must have taken place prior to the building of syntactic structure.[14] The modification made in C. now provides room for the 'phonological licensing' of functional heads in the creation of syntactic projections, even though the PF realization of functional heads themselves may lag behind the building of that syntactic structure. In other words, we have separated the Lexical Acquisition problem into an 'identification' and a 'realization' problem, where the creation of syntactic structure may depend on the first of these, but not on the second.

While the Phonological Priming Hypothesis might pacify both proponents of the Lexical Projection Hypothesis *and* the Functional Projection Hypothesis (or perhaps *neither*), it remains heavily 'input' driven. How are we to conclude, for instance, that there is more DP input than, say, CP or IP input? Furthermore, how are we to determine what the 'sufficient' amount of 'input' might be to motivate the creation of a maximal projection? Finally, and most importantly for the present discussion of DPs, are we to conclude that there are more demonstratives and possessives in the input than nominals themselves? Given the Phonological Priming Hypothesis, 'input' would have to be the explanation for the early absence of nominal (or even INFL and COMP) heads. Such a position is theoretically unsatisfactory, to say the least.

A third possible explanation for the early acquisition of functional heads on Sesotho demonstratives and possessives (and not on nouns, nor on INFL and COMP) assumes the Functional Projection Hypothesis, along with a production constraint, or 'PF Filter'. If we look more closely at early

Sesotho DPs we find that nominal prefixes, which are CV in Sesotho, are generally missing or surface in reduced vowel form when they precede a disyllabic stem. The reason for this becomes clearer once we mention that Sesotho has a rule of penultimate lengthening (i.e. 'stress') in phrase or utterance-final position. It is well known that children generally omit word-initial pre-stressed syllables at a certain stage of development (e.g. Echols and Newport, 1990; Stemberger, 1989). Thus, it is not surprising that most Sesotho nominal prefixes, or unstressed pre-nominal determiners in many other languages (e.g. English, German, Spanish), would be omitted in early speech. It is also not surprising that most functional heads on Sesotho demonstratives and possessives *would* surface (providing that access to their phonological spell-out is available), as they are the 'stressed' syllable in such disyllabic constructions. Thus, the particular morphophonological shape of Sesotho lexical items provides evidence of access to D, while at the same time explaining why D itself surfaces as phonetically null or reduced this point.[15]

The general lack of closed class items in early child language is not surprising given that they are generally stressless, phonetically reduced items. Even once they are correctly identified, they remain difficult to produce (see Gerken, Landau and Remez, 1990). This accounts for their variable surface realization as reduced 'filler syllables' or 'shadow vowels' across languages. If the functional head on Sesotho nominals is omitted for production reasons, then we suggest that the variable PF realization of functional elements (null, shadow vowel, and full form) across languages (e.g. Bloom, 1970; Brown, 1973; Peters and Menn, 1990; Stemberger, 1989; Connelly, 1984) may in many cases represent not a falling back to an earlier stage of grammar, as Lebeaux (1988) suggests, but only the variable late PF realization of functional elements. We therefore introduce the notion of 'null' Functional Categories (or lack of PF realization) as an early and expected stage in the acquisition process. We call this lack of early Phonetic Form the PF Filter, and suggest that it is this aspect of the acquisition process that is subject to maturational constraints. We define the PF Filter in D. below:

D.   *The PF Filter:*
      Phonetic form (e.g. the surface realization of lexical items and morphosyntactic strings) will develop gradually over time, subject to maturational constraints on production.

In most languages functional heads will eventually be filled with the appropriate Phonetic Form, while in others, such as Korean COMP (Lee, Lust and Whitman, 1990), they will be left as 'null'.

We can now modify the Functional Projection Hypothesis to include the PF Filter:

B'.   *The Functional Projection Hypothesis:*
       The creation of a maximal projection allows for the (optional)
       phonetic realization of an appropriate head, subject to PF Filter
       constraints.

In this section we have introduced the Phonological Priming Hypothesis, but have shown that it can not, by itself, fully account for the early presence of DPs. While phonological priming may indeed play an important role in facilitating the actual filling and positioning of functional heads (i.e. in terms of branching direction), we argue that it is not a 'sufficient' condition. Rather, we suggest that the Functional Projection Hypothesis, in conjunction with the PF Filter, helps to explain why Functional Categories are generally missing in child grammars, yet why early evidence of their presence is available in the particular case of Sesotho demonstratives and possessives.

5. DISCUSSION

We have argued above for the Functional Projection Hypothesis, and for the view that functional heads may surface as 'null' or be phonetically 'underspecified' for some period of time, even though functional projections are present. The proposal that there is a stage at which Functional Categories may be realized as 'null' has several implications. In particular, it raises the possibility that (at least some, and potentially all) maximal projections may be present very early in the acquisition process, perhaps 'from the beginning', i.e. as part of Universal Grammar. This we will call the strong version of the Functional Projection Hypothesis.

If Functional Categories are present early on, then what do early grammars look like? Do they, for instance, have some 'default' phrase structure already built into the system from day one? We suggest not. Rather we suggest that the notion of maximal projections, and the notion

that they have heads, is indeed present from the beginning, and that one of the child's first tasks, in addition to learning form-meaning correspondences, etc., is to determine what the head direction of those maximal projections is, and what kinds of elements can fill their heads. This, we argue, takes place relatively early and painlessly, being completed perhaps by the time first words are produced. Phonological Priming may facilitate the process, but should not be considered a prerequisite (i.e. as in the case of constructing Korean COMP). The early tonal evidence of person marking in Sesotho, despite the long and inconsistent production of subject markers that follows, points to the fact that structural aspects of functional projections may be in place well before functional heads take on consistent phonetic shape.

Does this mean that the acquisition process is finished before it has begun? Not by any means. Though very young children may have many of the necessary pieces of grammar at their disposal, they still have to put them together and make them work - all of them, not just some of them. For instance, part of the task of grammar building is presumably to determine what possible items might correctly fill a particular head, and the child may not fully exploit the potential of maximal projections from the beginning. For example, we know that in German more than just complementizers can fill COMP, and indeed Weissenborn (1990) shows that, although COMP position is present (as evidence by the presence of wh-questions and certain other grammatical factors), it is not fully utilized (e.g. in the case of declarative structures) at the early stages of grammar. Thus, while certain core components of children's developing grammars are present at the beginning of the acquisition process, others take longer to be fully realized.

Further evidence that the building of some types of syntactic structure is still taking place around 2;6 years comes from the findings on Sesotho scrambling effects. Here we saw that postposing of lexical subjects and objects started to occur only once AGR_s and AGR_o began to be morpho-lexically more well defined. Why should this be the case? The Lexical Projection Hypothesis would predict that scrambling could not take place until AGR_sP and AGR_oP were present. The Functional Projection Hypothesis, however, would say that those projections are present from the onset, but that non-local scrambling requires PF realization of functional heads for coindexing reasons, i.e. to keep referent relations transparent. In other words, children's grammar-building capabilities may operate under certain locality constraints: When locality relations hold (as within a DP),

PF realization of functional elements may not be necessary. On the other hand, when locality is not available (as in the postposing of lexical subjects and objects), PF realization of functional elements is required. If this is true, then children exhibit linguistic patterns found in natural languages themselves (though see Roeper, 1991): Those languages (like English) that have little 'agreement' morphology have relatively fixed word order, while those with a richer case/gender system (like German or Sesotho) exhibit various word order possibilities.

But there is an alternative explanation for these findings, and this has to do with what is at the core of early grammatical structure, and what might be considered to be part of the periphery. We have proposed that the initial task of the language learner is to construct a minimal set of necessary projections. We suggest that this may include DP, IP and CP. This minimal set of projections would handle most canonical cases of argument structure (e.g. subjects and objects and wh-phenomena). What it might not handle would be the periphery - i.e. adjuncts. Here we return to the case of Sesotho scrambling. Recall (from section 2.1) that postposed Sesotho subjects and objects are adjuncts, not arguments. As such, they are optional. Furthermore, they must be raised to a higher SpecXP, requiring further structure building. We might predict that such adjuncts would universally appear later than core arguments, only once appropriate structure for them had been built.

In conclusion, we find early evidence for the projection of DP, IP and CP despite the null (or variable) phonetic realization of functional heads. Yet we also find that the full exploitation of this early structure develops over time, as does the building of additional structure to handle non-core properties of the language (i.e. adjuncts). Finally, we argue that the development of syntax is largely independent of parallel developments in phonology, suggesting a modular, syntactic bootstrapping approach to the building of syntactic structure.

ACKNOWLEDGEMENTS

NOTES

[1]   Sesotho is a southern Bantu language spoken by approximately 4 million people, half of whom reside in the country of Lesotho, the other half residents of South Africa. Demuth (forthcoming) presents a brief grammatical sketch of Sesotho, along with an extensive review of the literature on the acquisition of Sesotho and other Bantu languages. The INFL and COMP data discussed here come from two children aged 2;1-3 yrs. (Demuth, forthcoming), while the DET data also include data from the four children in the Connelly (1984) study.

[2]   See Doke and Mofokeng (1957) for a comprehensive grammatical sketch of the language. Demuth (1990b) provides a more detailed account of Sesotho grammatical structure in keeping with current theoretical assumptions.

[3]   Glosses are as follows: APL = applicative, BEN = benefactive, CONJ = conjunction, COP = copula, DEM = demonstrative, DIM = diminutive, FUT = future tense, LOC = locative, M = mood, O = lexical object, OBJ = object clitic, PASS = passive, PAST/CONT = past continuous, PERF = perfective aspect, PN = independent pronoun, POSS = possessive marker, PREP = preposition, PRES = present tense, REL = relative marker, RL = verbal relative suffix, S = lexical subject, SM = subject marker, T/A = tense/aspect, V = verb, 8 = gender/number class #8, 1s = 1st person singular, ´ = high tone, + = mid tone, low tone = unmarked. A modified version of Lesotho orthography has been used.

[4]   Noun classes #1-14 are all 3rd person.

[5]   See Carstens and Kinyalolo (1989) for a somewhat different structure proposed for Swahili and Kilega.

[6]   The adult equivalent, as determined by the context of the utterance, is provided in parentheses.

[7]   The present tense marker in (6), which is found only when the verb is final in the verb phrase, indicates that the lexical object in this example has been postposed.

[8]   I thank Luigi Rizzi (p.c.) for drawing the potential grammatical significance of this factor to my attention.

[9]   That -ng is a wh-item can be seen from the fact that most wh-words end in -ng: eng 'what', mang 'who', neng 'when', hobaneng 'why', efeng 'which'.

[10]   More precisely, -ng raises to the highest AGR_s. In the case of compound tense forms (where another $AgrP_s$ and TP are projected above those given in (3)), -ng suffixes to the higher AGR_s (e.g. pere [tseo ke-ne-ng ke-e-bona] = horse [that I-past-ng I-it-see] 'the horse that I saw').

[11]   Examples (10a), (10b), (12b), and (12c) all come from the same child. Thus, even for a given child there is some inconsistency in the morpho-lexical realization of both REL and -ng.

[12]   We differ somewhat from Carstens in the labeling of this Functional Category as an abstract DP, rather than as a Plural or Number Phrase.

[13]   Tone was not marked in these examples.

[14]   We leave the notion 'identification' purposely vague to include both 'perception' and 'comprehension'.

[15] This would lead to the prediction that if either the stress system or the realization of the nominal gender/number prefix itself were different than that of Sesotho, we might expect to find different acquisition patterns, and this is in fact the case: Suzman (forthcoming) reports that noun class/gender prefixes in Zulu, which are VCV- in form, begin to consistently appear somewhat earlier than that reported for Sesotho (CV), Setswana (CV) or Siswati (both CV and VCV). Furthermore, Stemberger (1989:7) finds a few cases of early determiners (word-initial unstressed 'clitics') in English (1;11 years), predictably with monosyllabic nominal stems.

REFERENCES

Abney, S.: 1987, 'The English noun phrase in its sentential aspect', Ph.D. dissertation, MIT.

Bloom, L.: 1970, *Language Development: Form and Function in Emerging Grammars*, MIT Press, Cambridge.

Brown, R.: 1973, *A First Language: The Early Stages*, Harvard University Press, Cambridge.

Cardinaletti, A. and I. Roberts: 1991, 'Clause structure and X-second', ms., University of Venice and Geneva.

Carstens, V.: (in preparation),'The structure of Swahili', Ph.D. dissertation, UCLA.

Carstens, V. and K. Kinyalolo: 1989, 'On IP structure: tense, aspect and agreement', ms., UCLA.

Chomsky, N.: 1989, 'Some notes on economy of derivation and representation', *MIT Working Papers in Linguistics* 10, 43-74.

Clahsen, H.: 1990, 'Constraints on parameter setting. A grammatical analysis of some acquisition stages in German child language', *Language Acquisition* 1, 361-391.

Connelly, M.: 1984, 'Basotho children's acquisition of noun morphology', Ph.D. dissertation, University of Essex.

Demuth, K.: 1984, *Aspects of Sesotho Language Acquisition*, Indiana University Linguistics Club, Bloomington.

Demuth, K.: 1987, 'Discourse functions of word order in Sesotho acquisition', in R. Tomlin (ed.), *Coherence and Grounding in Discourse*, Benjamins, Amsterdam.

Demuth, K.: 1988, 'Noun classes and agreement in Sesotho acquisition', in M. Barlow and C. Ferguson (eds.), *Agreement in Natural Languages: Approaches, Theories and Descriptions*, University of Chicago Press, CSLI.

Demuth, K.: 1990a, 'Locatives, impersonals and expletives in Sesotho', *The Linguistic Review* 7, 233-249.

Demuth, K.: 1990b, 'Relative clauses, cleft constructions and functional categories in Sesotho acquisition', paper presented at the 5th Child Language Congress, Budapest.

Demuth, K.: 1991, 'Acquisition of the Sesotho tonal system', *Afrikanistische Arbeitspapiere* 26, University of Cologne.

Demuth, K.: (forthcoming), 'Acquisition of Sesotho', in D. Slobin (ed.), *The Cross-Linguistic Study of Language Acquisition, vol 3*, Erlbaum, Hillsdale.

Deprez, V. and A. Pierce: 1991, 'Negation and functional projections in early grammar', ms., University of Pennsylvania.

Doke, C. M. and S.M. Mofokeng: 1957, *Textbook of Southern Sotho Grammar*, Longman, Cape Town.

Echols, C. and E. Newport: 1990, 'The role of stress and position in determining first words', ms., Stanford University.

Fukui, N. and M. Speas: 1985, 'Specifier and projection', *MIT Working Papers in Linguistics* 8, 128-172.

Gerken, L. A., B. Landau and R.E. Remez: 1990, 'Function morphemes in young children's speech perception and production', *Developmental Psychology* 27, 204-216.

Guilfoyle, E. and M. Noonan: 1988, 'Functional categories and language acquisition', paper presented at the 13th Boston University Conference on Language Development.

Kunene, E.: 1979, 'The acquisition of Siswati as a first language: A morphological study with special reference to noun prefixes, noun classes and some agreement markers, Ph.D. dissertation, UCLA.

Lebeaux, D.: 1988, 'Language acquisition and the form of grammar', Ph.D. dissertation, University of Massachusetts at Amherst.

Lee, K.-O., B. Lust, B. and J. Whitman: 1990, 'On the acquisition of functional categories in Korean: A study of the first language acquisition of Korean relative clauses', paper submitted to the International Conference on Korean Linguistics.

Peters, A. and L. Menn: 1990, 'The microstructure of morphological development: Variation across children and across languages', ms., University of Hawaii.

Pollock, J.-Y.: 1989, 'Verb movement, Universal Grammar, and the structure of IP', *Linguistic Inquiry* 20, 365-424.

Radford, A.: 1990, *Syntactic Theory and the Acquisition of English Syntax. The Nature of Early Child Grammars of English*, Blackwell, Oxford.

Roeper, T.: 1991, 'Acquisition architecture: From triggers to trees in the realization of IP and CP', ms., University of Massachusetts at Amherst.

Stemberger, J.: 1989, 'Morphological aspects of child phonological processing', ms., University of Minnesota, Minneapolis.

Suzman, S.: 1980, 'Acquisition of the noun class system in Zulu', *Papers and Reports on Child Language Development* 19, 45-52.

Suzman, S.: 1982, 'Strategies for acquiring Zulu concord', *South African Journal of African Languages* 2, 53-67.

Suzman, S.: (forthcoming), 'Language acquisition in Zulu', Ph.D. dissertation, Witwatersrand University.

Tavakolian, S.: 1981, 'The conjoined-clause analysis of relative clauses', in S. Tavakolian (ed.), *Language Acquisition and Linguistic Theory*, MIT Press, Cambridge.

Tsonope, J.: 1987, 'The acquisition of Setswana noun class and agreement morphology, with special reference to demonstratives and possessives', Ph.D. dissertation, SUNY Buffalo.

Weissenborn, J.: 1990, 'Functional categories and verb movement: The acquisition of German syntax reconsidered', in M. Rothweiler (ed.) *Spracherwerb und Grammatik. Linguististische Untersuchungen zum Erwerb von Syntax und Morphologie*, Linguistische Berichte, Sonderheft 3, Westdeutscher Verlag, Göttingen.

Whitman, J., K.-O. Lee, and B. Lust: (to appear), 'Continuity of Universal Grammar in first language acquisition: The issue of functional categories', *Proceedings from NELS 1990*.