

# Revisiting the acquisition of Sesotho noun class prefixes<sup>1</sup>

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Early research on the acquisition of Bantu noun class prefixes indicated that these grammatical morphemes are produced early (2;6 years) and error-free, challenging notions of unique form-function mapping (Slobin, 1973, 1985). However, recent corpus research on the input learners hear shows that the Sesotho noun class system is more complex than originally thought, with noun class prefixes that begin with an unmarked (coronal) consonant being optionally realized as null when followed by some form of agreement. This paper investigates how two 2-3-year-olds learn the phonological and syntactic constraints governing the use of null noun class prefixes in Sesotho. It finds early evidence of both phonological and syntactic generalization, with both aspects of the system learned by the age of 3, but no lexical effects. Sesotho-speaking children therefore pay attention to both the beginnings and ends of words, and construct their grammar accordingly, even in the presence of noise.

*Operating Principle A: Pay attention to the ends of words. Slobin 1973:191*

## PREFACE

The issue of how and when Sesotho noun class prefixes are acquired was the topic of a seminar Dan and I taught while I was a postdoctoral fellow at UC Berkely from 1983-85. Since Bantu languages have multiple singular and plural noun class prefixes, this was a topic of particular theoretical interest for Dan given his Operating Principles of paying attention to the beginnings and ends of words, and unique form-function mapping (Slobin 1973, 1985). The preliminary investigation of how Sesotho noun class prefixes are learned did not support these Operating Principles, with multiple singular and plural prefixes appearing gradually between the ages of 2 and 3 (Demuth, 1988). This paper reports on recent research examining the noun class input Sesotho-speaking children actually hear. In so doing, it also provides insight into the grammatical structure of Sesotho, how it differs from other Bantu languages, and the learnability issues that arise. Equipped with this background it is now possible to better understand the apparent ‘gradual’ nature of the acquisition process, and to develop a more fine-grained model of how language learning takes place.

## INTRODUCTION

The acquisition of the Bantu noun class prefix system has long been a topic of theoretical interest. Most of Africa’s approximately 500 Bantu languages have between 13-18 noun class prefixes, though some have been lost, especially in languages serving as lingua francas. Compare, for example, the noun class system reconstructed for Proto-Bantu (Welmers, 1973) with those systems found today in

closely related Setswana and Sesotho, and the more distant Cameroonian language Western Eɟagam (Watters, 1980) (see also Guthrie, 1948; Meeussen, 1967). This is shown in Table 1.

[insert Table 1 about here]

Many of these noun classes show singular-plural pairings, as shown (orthographically) in the Sesotho examples in (1).

(1) Sesotho singular/plural nouns and prefixes

	<i>Singular</i>		<i>Plural</i>	
1	mo-tho	2	ba-tho	‘person’
1a	ø-mme	2a	bo-mme	‘mother’
3	mo-se	4	me-se	‘dress’
5	le-tsatsi	6	ma-tsatsi	‘day’
7	se-tulo	8	di-tulo	‘chair’
9	ø-tapole	10	di-tapole	‘potato’
14	bo-hobe			‘bread’

The complexity of this noun class system, and the fact that there are multiple morphological markers for the notion ‘plural’, led Slobin (1973, 1985) to propose that there might be the tendency for children to use one plural noun class prefix, and

overextend this to use with other plural nouns, showing unique form-function mapping. However, a review of the literature on the acquisition of Bantu noun class prefixes in Siswati, Sesotho, Setswana, and Zulu found little evidence for this position (cf. Demuth, 1988, 1992, 2003). Rather, children seem to acquire the Bantu noun class system with relative ease by the age of 3, typically showing errors of omission, but not errors of commission.

Demuth (1988) proposed that the lack of morphological overgeneralization was due in part to the agglutinative nature of most noun class prefixes, and to the phonologically transparent agreement system in which they participate. This is illustrated in the Sesotho examples in (2) below, where the numbers indicate the class to which the prefix belongs. (A more phonetically transparent version of Lesotho orthography has been used (cf. Doke & Mofokeng, 1985). Numbers indicate noun class. Glosses are as follows: AGR = subject-verb agreement, COP = copula, FOC = focus, PRF = perfect.)

- (2) a. Mo-sadi o-ngotse le-ngolo le-le-tle  
 1-woman AGR1-wrote/PRF 5-letter 5-5-nice  
 ‘The woman wrote a nice letter’
- b. Ba-sadi ba-ngotse ma-ngolo a-ma-tle  
 2-women AGR2-wrote/PRF 6-letter 6-6-nice  
 ‘The women wrote some nice letters’

Thus, although learning the gender and case marking system in German is difficult and protracted (Mills, 1986; Clahsen, Eisenbeiss, & Vainikka, 1994), learning the Bantu noun class and agreement system is comparably easy and error-free. The fact that Bantu noun class prefixes are morphologically easy to segment from the nominal stem and the fact that they participate in a relatively phonologically transparent agreement system provide mechanisms for early and error-free learning. At least this is the picture that has generally been offered to date.

Much of the original research on the acquisition of Bantu noun class prefixes was carried out in the 1970's and 1980's (Kunene, 1979, Suzman, 1980, 1991, 1996, Connelly, 1984, Tsonope, 1987, Demuth, 1988, Idiata, 1998). Most of this research examined data from longitudinal case studies of a few children for each language. The research by Kunene (1979) also included wug-tasks to nonce forms (Berko, 1958) for children learning Siswati, where occasional lack of segmentation and overgeneralization took place. Research on Sesotho, Setswana and Sangu also suggested that 2-year-olds were more likely to show earlier use of noun class prefixes with monosyllabic noun stems (Tsonope, 1987, Demuth, 1992, 1994, Idiata, 1998). Demuth (1992, 1994) suggested that this was due to the fact that a second syllable was required to meet disyllabic (binary foot) word-minimality requirements (e.g., *mo-tho* > *motho* 'person', but *le-phoqo* > *phoko* 'green corn stalk'). These studies also noted that between 2 and 2;6 there was a certain amount of variability in Sesotho prefix production, with alternation between null, filler syllable, and full-prefix forms, even for the same lexical item. However, none of these studies provided a quantitative

perspective on the development of noun class prefixes (though see Ziesler & Demuth, 1995). Today, with computerized longitudinal developmental databases, such as the Demuth Sesotho Corpus, it is possible to examine more closely the course of noun class prefix development over time (see Demuth (1992) and <http://chilides.psy.cmu.edu/> for further discussion of the children, data collection methods, and the data).

The existence of larger acquisition corpora, and the tools needed to exploit them, has also made it possible to examine more closely the input that children hear. This has been a critical methodological aspect of some of my early work on the acquisition of Sesotho passives (Demuth, 1989; 1990), and has recently become the focus of work by Tomasello and colleagues (e.g., Theakston, Lieven & Tomasello, 2003). This process also often leads to a better understanding of the structure of the target language.

Although many of the best-studied Bantu languages have excellent grammars and dictionaries, as well as a good body of theoretically sophisticated syntactic research, much is still not known about the structure of these languages. Yet, knowledge about the structure of the target language is critical for understanding the nature of the learning problem young language learners face.

In a study of children's acquisition of Sesotho noun class prefixes, Ziesler & Demuth (1995) observed that adults sometimes drop noun class prefixes in child-directed speech. They raised the possibility that this might have an effect on children's acquisition of noun class prefixes as well. However, it is only more recently that we have discovered that Sesotho-speaking adults selectively drop only certain noun class

prefixes, and only under certain syntactic conditions (Machobane, 2003, Machobane, Moloji & Demuth, 2004). If adults are dropping noun class prefixes, this raises questions about the actual nature of the input children hear, and the possible effects this might have on the acquisition of noun class prefixes. In the following section we present an analysis of the contexts in which null noun class prefixes are found in Sesotho and other closely related (Sotho) languages. In particular, we show that noun class prefixes that begin with a coronal consonant can be optionally dropped (realized as null) in the context of agreement. We then present new findings on the analysis of two Sesotho-speaking children between the ages of 2 and 3, showing how they learn the phonological and syntactic conditions under which noun class prefixes can be realized as null.

#### THE DISTRIBUTION OF NULL NOUN CLASS PREFIXES IN SESOTHO

Sesotho has 13 noun class prefixes. These are shown in (3) below. (Classes 1a and 2a take the same agreement forms as 1 and 2. Since they are also also restricted to humans, these are typically classified as a special sub-class of classes 1 and 2. Note also that classes 11, 12, and 13 have disappeared through internal process of morpho-phonological change).

(3) Sesotho noun class prefixes

Singular	Plural
1 mo-	2 ba-
1a ø-	2a bo-
3 mo-	4 me-
5 <u>le</u> -	6 ma-
7 <u>se</u> -	8 <u>di</u> -
9 ø-	10 <u>di</u> -
14 bo-	

Those prefixes that contain a coronal consonant (underlined above) can be ‘optionally’ dropped, or realized as null, but only when followed by some form of agreement. Thus, the coronal classes 5, 7, 8 and 10 can be realized as null when the noun is followed by an agreeing morpheme (4a), but not when there is no agreeing morpheme (4b). In contrast, non-coronal noun class prefixes cannot be dropped, even when agreement is present (4c).

- (4) a. Ba-tho ba-rata (di)-tapole tsa-ka  
2-people 2AGR-like 10-potatoes 10-my  
‘The people like my potatoes’
- b. Ba-tho ba-rata \*(di)-tapole  
2-people 2AGR-like 10-potatoes  
‘The people like potatoes’

- c. Neo o-rata \*(ba)-na ba-ba-tle  
 Neo 1AGR-like 2-children 2-2-beautiful  
 ‘Neo likes beautiful children’

Any type of agreement appears to license null noun class prefixes. A sample of the types of agreement contexts is provided in (5).

- (5) a. (Di)poleiti di-fihl-ile Subject  
 10-plate 10AGR-arrive-PRF  
 ‘The plates arrived’
- b. Bea (se)eta se-na Object  
 put\_down 7-shoe 7-this  
 ‘Put this shoe down’
- c. (Le)sela le metsi Copula  
 5-cloth 5COP 6water  
 ‘The cloth is wet’
- d. Ke (se)kolo sa-ng? Wh-word  
 FOC 7-school 7-what  
 ‘What kind of school is it?’

We suggest that the ability for the phonologically ‘unmarked’ noun class prefixes in Sesotho to optionally drop when the noun class prefix features are represented elsewhere in the phrase may be due to the different syntactic analyses of the noun class prefix across Bantu languages. If noun class prefixes actually mark number, as Carstens (1991, 1993) proposes, Sesotho appears to permit unmarked (coronal) prefix deletion if number (agreement) is marked elsewhere in the noun phrase (or determiner phrase). This suggests that noun class prefixes in Sesotho may be grammatical function items, whereas in other Bantu languages they may be bound morphemes that are listed in the lexicon. This contrast raises questions about the semantic content of noun class prefixes, the implications for syntactic structure, and the effects on how these morphemes are acquired. A fuller treatment of the syntax of these constructions goes beyond the scope of the present paper (see Bresnan & Mchombo (1995), Myres (1987), Visser (2001), and Machobane (1993) for further discussion).

One of the questions that arises in any study of grammatical alternations is how frequently different forms of a construction actually appear. We therefore examined a sample of the adult input to two of the children in the Demuth Sesotho Corpus. This included an analysis of child-directed speech productions in the first and last sessions for Hlobohang (at 2;1 and 3 years) and Litlhare (at 2;1 and 3;2 years). In the first case we found that adults consistently dropped 20% of coronal noun class prefixes that contained agreement. No other noun class prefixes were dropped, except for a few cases of ‘baby-talk’ in the earlier session, where the adult imitated the child’s attempt

to produce *mo-roho* ‘greens’ as *ayo*, or *royo*. In the second case we found that adults consistently dropped 35% of coronal nouns with agreement in both sessions. Noun class prefixes were also dropped on a few locative nouns, which is also grammatical (e.g., *le-ifo* > *ifo* ‘in the fire-place’, *le-saka* > *sak-eng* ‘at the corral’). Under no other conditions did adults drop noun class prefixes in their speech to children. Thus, adults appear to drop 20-35% of coronal noun class prefixes that are followed by some sort of agreement, at least in their conversations with 2 to 3-year-olds. The extent of this dropping across discourse genres is not known, but it is grammatical, and is heard in adult-directed speech as well.

This distribution of null noun class prefixes should be clear to the Sesotho learner. That is, noun class prefixes are only dropped with those noun class prefixes that contain a coronal consonant, but then only when it occurs with agreement. However, given that the majority of the time (65-80%) these prefixes do not drop, this distribution presents a potential problem for the learner. Even when both phonological and syntactic licensing conditions are met, the realization of noun class prefixes as null is variable. This may make it more difficult for the learner to extract the phonological and syntactic generalizations under which this process is permitted. We might then expect learners to show a protracted course of acquisition, where the learning path is characterized by either phonological or syntactic overgeneralizations, or both. Alternatively, children might take a lexical approach, only dropping prefixes on those items they typically hear with a null prefix. In the following section we present results from these 2 children’s acquisition of noun class prefixes over time, showing that

overgeneralization does take place, but that there may be some lexical effects as well, at least for very high frequency lexical items.

#### THE ACQUISITION OF SESOTHO NOUN CLASS PREFIXES

For this part of the study we examine all nouns produced by Hlobohang (boy, 2;1-3;0) and Litlhare (girl, 2;1-3;2). Prefixless nouns such as those in class 9, which accounted for much of the data, were excluded from the analysis. The total number of noun productions analyzed was therefore 1293 word tokens for Hlobohang and 1685 word tokens for Litlhare. All nouns containing a possible target prefix were then coded for the number of syllables in the noun stem (1, 2, 3 or more), the noun class (either coronal or non-coronal), the realization of the noun class prefix (null, filler (V or syllabic nasal), full), and the presence of any agreement. Subsequent analysis showed that fillers occurred in some of the children's prefix attempts, especially up the age of 2;6 (17% for Hlobohang, 25% for Litlhare). From 2;7 onwards, fillers dropped below 10% for both coronal and non-coronal target prefixes, indicating better overall mastery of CV prefix production.

Since previous reports had suggested that monosyllabic stems might be more likely to preserve noun class prefixes, we first examined prefix production as a function of the number of syllables per word. Hlobohang was significantly more likely to use noun class prefixes with monosyllabic nouns until 2;3 years. Litlhare also showed significantly more use of noun class prefixes with monosyllables until 2;4. Conversely, there was a greater likelihood of prefixes being truncated with words that were already

a disyllabic foot. These findings confirm the proposals of Demuth (1992, 1994), showing that Sesotho-speaking children may be aware of the language's word-minimality effects, and that grammatical morphemes such as noun class prefixes are more likely to be produced in these prosodically licensed contexts. This contributes to a growing body of literature showing that prosodic factors may account for some of the reported early variable production of grammatical morphemes in many languages (cf. Gerken, 1996, Lleó & Demuth, 1999). However, this effect tends to disappear around 2;3, at least in the case of Sesotho noun class prefixes.

Thus, some of the early variability in the use of noun class prefixes in Sesotho may be due to the more consistent use of prefixes with monosyllabic noun stems, forming a disyllabic foot. Surprisingly, however, Litlhare occasionally dropped noun class prefixes on monosyllabic stems (e.g., *(le)jwe lena* 'this stone', *(di)jo tsaka* 'my food'), and adults did the same! We suspect that the resulting monosyllabic noun prosodically cliticizes to the following modifier, resulting in a well-formed prosodic word. The prosodic structure of these forms, and the frequency with which they occur, is obviously an area for further research.

We then conducted three different analyses of the data to investigate the children's knowledge of the contexts in which Sesotho noun class prefixes can be optionally dropped. First, we examined the children's awareness that null prefixes are phonologically licensed by coronal consonants. Second, we explored their awareness

of the syntactic agreement constraints. Finally, we investigated the possibility that the children's use of null prefixes was lexically determined.

#### PHONOLOGICAL LICENSING OF NULL NOUN CLASS PREFIXES

We now address the issue of how and when children learn that only coronal prefixes can be realized as null. To do this we compared the production of coronal and non-coronal prefixes (including fillers), independent of agreement. As indicated in Figures 1 and 2, coronal prefixes were significantly less likely to be produced across all points in development for both children at  $p < 0.05$ . Overall patterns of development for both children show that coronal prefixes are significantly less likely to be produced than non-coronal prefixes (Hlobohang:  $\chi^2 = 67.93$ ,  $p < 0.001$ ; Litlhare:  $\chi^2 = 214.82$ ,  $p < 0.001$ ).

[insert Figure 1 about here]

[insert Figure 2 about here]

Further analysis examined the children's production of coronal and non-coronal prefixes at each point in time. A significant difference in the production of the two phonologically distinct prefixes ( $p < 0.05$ ) held for Hlobohang at all points except 2;7,

and then again from 2;9-3 when he produced all prefixes at near or above 90%. The difference for Lithlare was also significant at all points ( $p < 0.05$ ) except at 2;5.

Thus, both children produced coronal prefixes less often than non-coronal prefixes.

This indicates some awareness of the phonological licensing of null noun class prefixes from early in acquisition. In the following section we examine their understanding that agreement is also required for licensing null prefixes.

#### SYNTACTIC LICENSING OF NULL NOUN CLASS PREFIXES

Given both children's tendency to drop noun class prefixes more often when these contained coronal consonants, we then examined the data to determine if null prefixes were more likely to occur in the presence of agreement. In particular, we suspected that Lithlare's lowered prefix production with non-coronal prefixes at 2;4, 2;5, and 2;6 might have been due to the overgeneralization of agreement, thereby licensing the dropping of all prefixes that were coronal or had agreement. To investigate these possible overgeneralization effects, we combined the data for both children into two time periods: Time 1 (2;1-2;6) and Time 2 (2;7 – 3;0-3:2). The results are shown in (6).

(6) Percent production of noun class prefixes under different phonological and syntactic conditions

		Coronal		Non-coronal	
		AGR	No AGR	AGR	No AGR
Hlobohang	Time 1	56%	62%	90%	80%
	Time 2	71%	90%	91%	96%
Litlhare	Time 1	37%	62%	69%	82%
	Time 2	59%	82%	99%	98%

At Time 1, Hlobohang showed evidence of phonological overgeneralization, dropping coronal prefixes regardless of the presence of agreement. By Time 2, however, he correctly used null coronal prefixes only when agreement was present, showing that he had learned the syntactic licensing conditions for null prefixes by this time. At both times, Hlobohang was extremely accurate at producing non-coronal prefixes. His poorer performance in the non-coronal no agreement cases was due to his unsuccessful attempts to produce the lexical item *moroho* ‘greens’ as *aya* or *royo*. Recall that this is the lexical item that adults also produced in baby-talk form.

In contrast, Litlhare exhibited syntactic overgeneralization at Time 1, dropping prefixes on both coronals and non-coronals that contained agreement. That is, she seemed to be aware of both the phonological and syntactic licensing conditions, but permitted null

prefixes if either condition was met. Thus, Litlhare's initial analysis was that null prefixes were permitted at the union, rather than at the intersection, of the licensing conditions. By Time 2, however, she realized that null noun class prefixes were permitted only when both conditions were met. Thus, although she still dropped prefixes more often on coronals with no agreement than with non-coronals, she was much more likely to drop prefixes on coronals when agreement was present. Further examination of Litlhare's coronal nouns showed that prefixes were grammatically dropped on locative nouns (e.g., *(se)dibeng* 'at the well', *(le)lwaleng* 'at the mill'), but also on nouns with 3 or 4 syllables not followed by agreement (e.g., *(le)sheleshele* 'porridge', *(le)kotikoti* 'tin can', *(di)namune* 'orange'), suggesting a prosodic complexity or word-length explanation for some of her coronal prefix deletions.

In sum, both children showed overgeneralization of null noun class prefixes, indicating that they are not simply matching the input they hear. Hlobohang overgeneralized to all coronals at Time 1, suggesting that he was aware of the phonological constraints on licensing null prefixes. Litlhare overgeneralized to both coronals and to all nouns with agreement at Time 1, showing that she was aware of both the phonological and syntactic licensing conditions. She continued to phonologically overgeneralize at Time 2. Further analysis would be needed to determine if this interacts with prosodic constraints on word-size.

These findings suggest that Sesotho-speaking 2-year-olds are making both phonological and syntactic generalizations about the conditions which license null

prefixes. However, recall that adults employ null noun class prefixes on only 20-35% of those nouns that are licensed for null prefixes. We also noticed that some nouns are much more likely to be produced with null prefixes by adults when licensing conditions are met. In the next section we explored the possibility that children's use of null prefixes may also show evidence of lexical effects.

## LEXICAL EFFECTS

Recent research by Tomasello and colleagues (e.g., Tomasello, 1992; Pine, Lieven & Rowland, 1998) has suggested that children's early grammars initially show evidence of lexical learning, and only later begin to exhibit evidence of syntactic generalization. This raises the possibility that the apparent grammatical licensing children exhibit with respect to null noun class prefixes may actually be reduced to lexical effects. That is, perhaps some lexical items are more likely to be produced with null prefixes in the input children hear such that the children themselves use null prefixes with only some lexical items.

One way to test for possible lexical effects is to measure the frequency with which certain items are used in the input children hear. We therefore calculated the frequency of coronal lexical items in the input children heard, and compared this with their prefix truncation rates. The analysis suggests there was no correlation between lexical frequency in the input and children's truncation rates on different lexical items. This is probably due to the fact that we have only coded a small proportion of the adult data (about 8 hours for each child). However, the lexical item most likely to exhibit a null

prefix for both children and adults was the high-frequency lexical item *di-ntho* ‘things’. Thus, children may have a tendency to produce null noun class prefixes on at least some high-frequency lexical items that have a relatively high instance of null prefixes in the input they hear. However, in the small sample of input we examined there was no overall evidence of lexical effects. It therefore appears that children are making early grammatical generalizations regarding the conditions under which null prefixes are licensed. That is, they are paying close attention to both the beginnings and ends of words very early in the acquisition process.

## DISCUSSION

This study has shown that, despite some noise in the input, Sesotho-speaking 2-year-olds appear to have extracted both the phonological and syntactic generalizations which license null noun class prefixes. This is evidenced by their systematic forms of overgeneralization from 2;1 to 2;6. By 3, both children have begun to approach an adult-like grammar, dropping prefixes only in fully licensed contexts, and at about the same rate as that evidenced in the input they hear. This rapid learning is quite remarkable given the probabilistic nature of the input, where adults only variably produce null noun class prefixes, even when the phonological and syntactic context is met. Further research is needed to determine the possibility that discourse or other factors may also influence where and when adults produce null prefixes.

The findings presented here argue strongly against proposals that young language learners initially show only lexical learning, taking until the age of 3 or 4 to make grammatical generalizations (e.g. Tomasello, 1992). Rather, the present study shows that Sesotho-speaking children make both phonological and syntactic generalizations by the age of 2;6 – overgeneralizing the use of null prefixes to words they have never heard produced in this way. This is consistent with recent findings on the acquisition of word order (e.g., Abbot-Smith, Lieven & Tomasello, 2001; Narasimhan, Budwig, & Murty, 2005; Budwig, Narasimhan & Srivastava, 2006), suggesting that, at least in some domains, 2-year-olds can make robust grammatical generalizations.

The Sesotho findings raise many questions regarding the acquisition of noun class prefixes in other Bantu languages. To date we have found that null noun class prefixes are only permitted in the closely related Sotho group of languages (Sesotho, Setswana, Sepedi). For other Bantu languages, then, the use of noun class prefixes is obligatory. We would predict that, modulo prosodic constraints, the learning of noun class prefixes in other Bantu languages should be earlier, at least for those languages with CV (consonant + vowel) noun class prefixes like Sesotho. On the other hand, Nguni languages like isiZulu, isiXhosa and isiSwati have not only prefixes, but also pre-prefixes (note the initial copy vowel in isiZulu). These pre-prefixes are elided in the negative, and coalesce with conjunctions and other formatives (e.g., Xhosa: *na + isikolo* > *nesikolo*). Suzman (1991) reports that noun class prefixes in Zulu are only learned around 3;6, and Gxilishe (2005) reports the same for Xhosa. Kunene (1979)

further shows some overgeneralization of singular/plural forms in wug overgeneralization tasks, suggesting that morphological segmentation of the noun class prefix may be more difficult in Nguni languages, with the more variable form of (pre)prefixes contributing to their later acquisition.

The availability of larger on-line child language corpora, from a number of different Bantu languages, now makes it possible to explore the acquisition of Bantu noun class prefixes in a more systematic, quantifiable manner. The flurry of activity on these issues in the 1970's and early 1980's, fueled in part by Slobin's (1973) proposals for unique form-function mapping, left the impression that Bantu noun class prefixes were acquired early and easily, with little morphological overgeneralization. Children learning a variety of Bantu languages were shown to make very few errors of commission, permitting multiple morphological forms for marking the concept of plural. However, the acquisition of Bantu noun class prefixes may be more complex than originally thought. In particular, the syntactic and semantic status of the noun class prefix is now open to question. It is not clear how this difference in syntactic structure or semantic interpretation might affect the language learning process. This is obviously an area for further research.

## CONCLUSION

This study examined the phonological and syntactic licensing of null noun class prefixes by two Sesotho-speaking children between the ages of 2 and 3. First, it found

that adults used null prefixes in up to 35% of licensed contexts. It then demonstrated that both children showed phonological overgeneralization at 2;6, and one showed syntactic overgeneralization at 2;6. Both had limited their overgeneralization by 3, closely approximating the adult system, with no apparent lexical effects. These findings indicate not only that the learning of Bantu noun class prefixes is more complex than originally thought, but also that 2-year-olds are making phonological and syntactic generalizations, even in the context of variable input. Thus, it appears that these children are paying attention to both the beginnings and ends of words, since information from the prefix and the presence of agreement following the noun are both critical for determining the context for null prefix use. This suggests that young language learners are capable of making sophisticated phonological and syntactic generalizations by the age of 2;6, simultaneously paying attention to multiple levels of linguistic structure. Given the availability of large longitudinal corpora today, it is now possible to consider Slobin's Operating Principles anew, providing a more quantitative context in which to evaluate the mechanisms underlying the learning of language. We offer this study as a step in that direction.

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Figure 1. Hlobohang's production of coronal and non-coronal noun class prefixes.

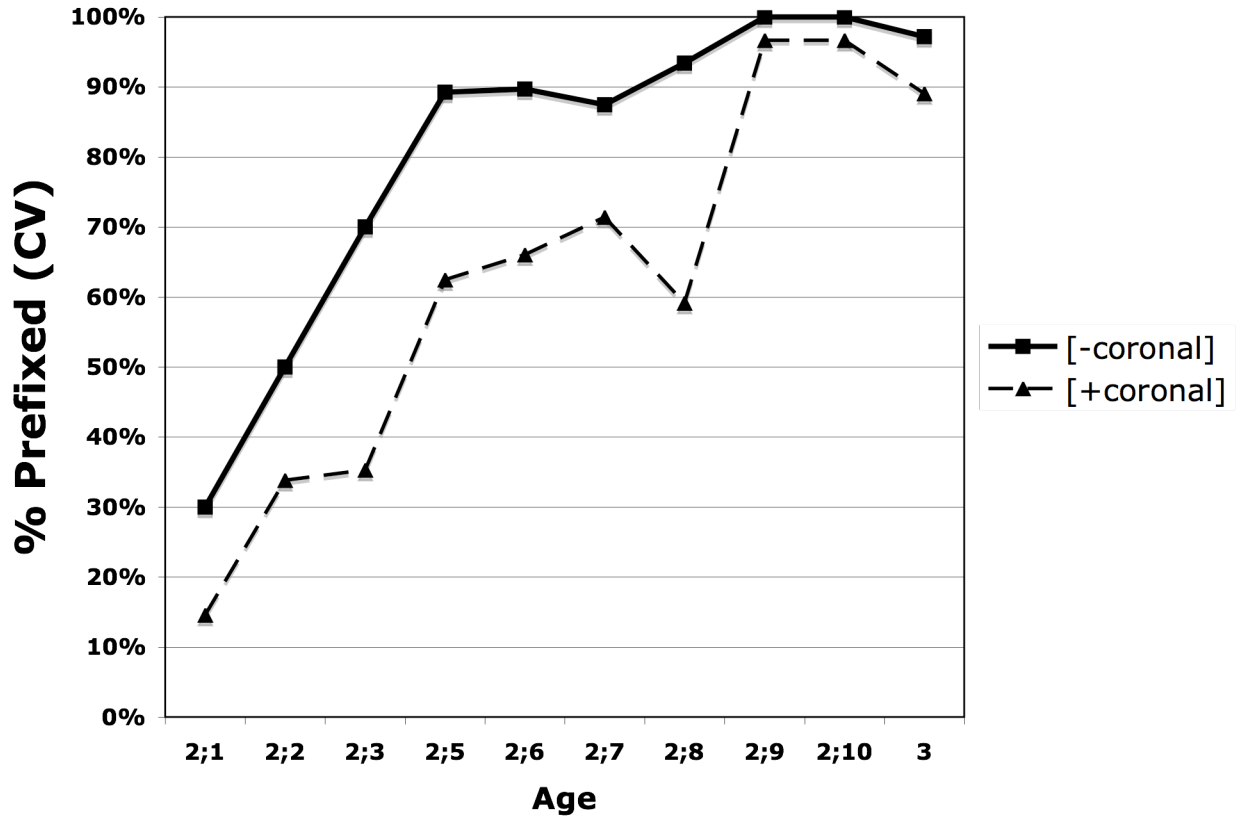


Figure 2. Litlhare's production of coronal and non-coronal noun class prefixes.

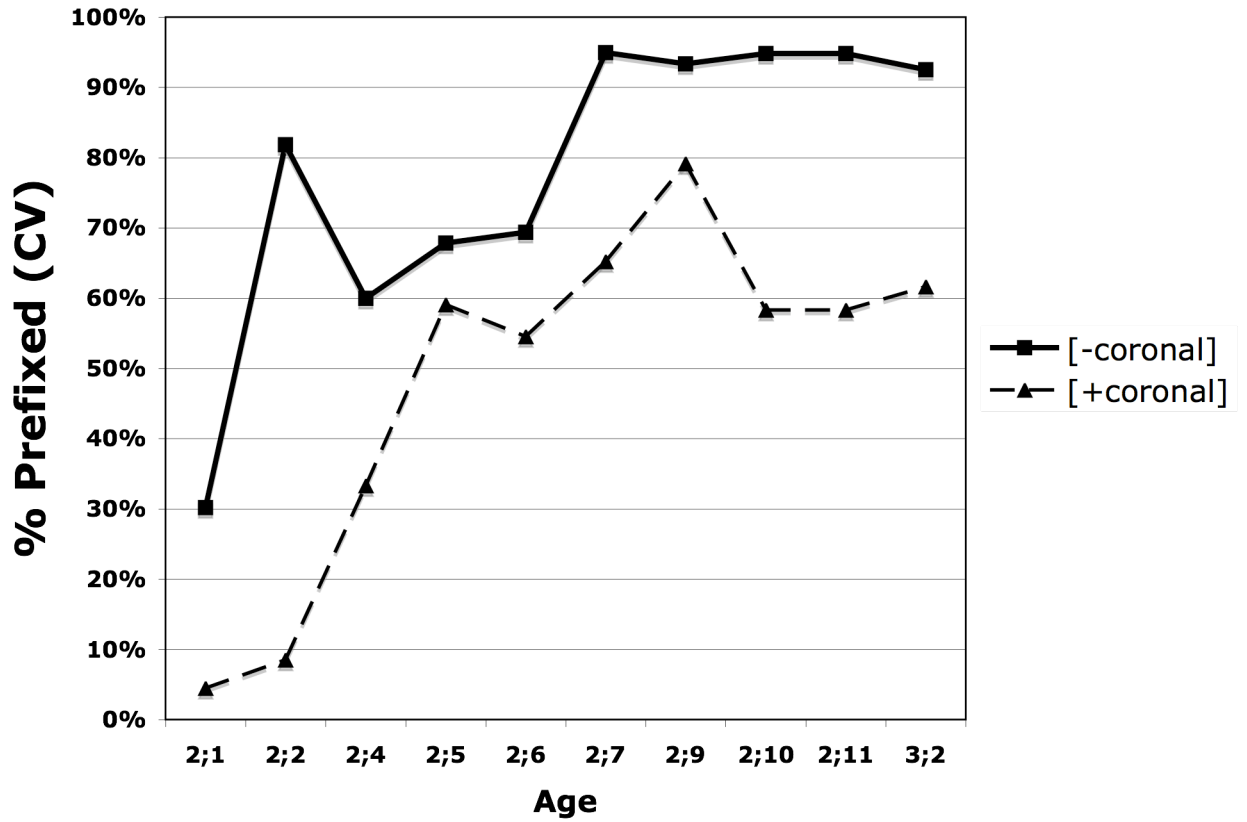


Table 1. Sample of Bantu Noun Class Systems

	<i>*Proto-Bantu</i>	<i>Setswana</i>	<i>Sesotho</i>	<i>W. Ejagam</i>
1	mo-	mo-	mo-	N-
1a	∅	∅	∅	
2	va-	ba-	ba-	a-
2a	βo-	bo-	bo-	
3	mo-	mo-	mo-	N-
4	me-	me-	me-	
5	le-	le-	le-	e-
6	ma-	ma-	ma-	a-
7	ke-	se-	se-	
8	βi-	di-	di-	bi-
9	ne-	N-	(N)-	N-
10	li-ne	diN-	di(N)-	
11	lo-	lo-		
12	ka-			
13	to-			
14	βo-	bo-	bo-	o-
15	ko-	ɣo-	ho-	
16	pa-	fa-		
17	ko-	ɣo-	ho-	
18	mo-	mo-		
19	pi-			i-

20 γο

21 γι

22 γα

23 γε

## Footnotes

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