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Argument structure and the acquisition of Sesotho applicatives

KATHERINE DEMUTH

Abstract

One of the long-standing issues in the study of language acquisition has concerned what is "innate" and what must be "learned." Much of this debate has focused on structures at the syntax/semantics interface, dealing specifically with how children acquire the argument structure of verbs. Bantu applicative constructions present an interesting arena for exploring these issues, where different verb classes take applicative objects with different thematic properties, only some of these patterning as true syntactic objects. Sesotho has an especially interesting system, where the syntax of applicative objects is further complicated by issues of animacy, raising questions regarding how this system is learned. This paper outlines the syntactic and semantic structure of Sesotho applicatives and then examines the spontaneous use of applicative constructions in the speech of two Sesotho-speaking children between the ages of two and three. It finds that these children use the applicative with a full range of verb classes, demonstrating appropriate semantic knowledge of the construction. However, the applicative structures they use exploit only a small portion of the available syntactic space. The paper concludes with a discussion of the implications of this study for learnability issues and outlines areas for further research.

1. Introduction

The acquisition of argument structure has long been a topic of interest in the language-acquisition literature and continues to be one hotly debated today. Some of the early research looked at the types of verbs children used with passive constructions, noting that these tended to be action verbs such as *hit* and *kick* rather than state verbs like *know* and *believe* (Maratsos et al. 1985; Pinker et al. 1987). That this appeared to be true not only for the acquisition of English, but also cross-linguistically

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(e.g. in languages like Sesotho; Demuth 1989, 1990a), provided additional support for the Chomskian position that certain aspects of language, such as basic semantic categories, might be "innate," and that this might facilitate the acquisition of syntactic structure (e.g. Pinker 1984, 1989). This "semantic bootstrapping hypothesis" has recently been challenged by Gleitman and colleagues, who maintain that it is actually SYNTAX (rather than SEMANTICS) that emerges first, where syntactic frames facilitate the acquisition of verb meaning. This has come to be known as the "syntactic bootstrapping hypothesis" (Gleitman 1990).

The purpose of this paper is not to provide definitive support for either of these positions, but rather to report on some empirical data that might shed some light on these issues. This study examines the early acquisition of applicative constructions (also known as "benefactive" constructions) in the southern Bantu language Sesotho. As the name suggests, these are constructions where an additional (often benefactive) NP is added to the argument structure of the verb. This is illustrated in the examples in (1).[1]

(1) a. Thabo o-tla-pheh-a dijo
Thabo AGR-FUT-cook-FV food
'Thabo will cook some food'

b. Thabo o-tla-pheh-el-a bana dijo
Thabo AGR-FUT-cook-APL-FV children food
'Thabo will cook the children some food/some food for the children'

Note that there is no preposition used in forming the applicative, though the English translation is often rendered with the preposition "for" or "to," constructions like those in (1b) being akin to English dative-shift constructions. Rather, grammatical-function-changing operations in Sesotho are morphologically marked on the verb in the form of morphemes called "verbal extensions." These include passive, reciprocal, causative, reversive, and applicative morphemes, all of which function to alter the argument structure of the verb (see Demuth 1992 for a fuller description of Sesotho morphosyntax).[2]

The syntax and semantics of Sesotho applicative constructions have been well studied, from both a descriptive and a theoretical perspective, and it is this work that provides the background for the current study (Doke and Mofokeng 1957; Machobane 1989; Morolong and Hyman 1977). Although the additional applicative argument is generally a benefactive, it can also have the thematic role of either a locative or a goal with certain classes of verbs. Thus, children must have some knowledge of both semantic verb classes and thematic roles if they are to employ applicative constructions correctly. Given that the thematic hierarchy differs somewhat from language to language (Machobane 1989), and that specific verbs may belong to different verb classes in different languages, much of what must be learned would appear to be language-specific. In addition, Bantu languages differ to the degree to which both objects of a ditransitive applicative construction are treated as full-fledged syntactic objects (i.e. being able to occur adjacent to the verb, triggering object agreement, and becoming the subject of a passive). Children learning Bantu languages must therefore determine not only the thematic hierarchy and classification of verbs in the specific language they are learning, but also whether that language is a SYMMETRICAL language, which treats both objects the same, or an ASYMMETRICAL language, where only one object has true "object" properties. Sesotho is particularly interesting in that it has a "mixed" system, showing symmetrical properties with respect to postverbal word order when the animacy of both objects is constant, and asymmetrical properties when animacy differs (Morolong and Hyman 1977). In all other respects, however, it behaves symmetrically. Sesotho applicative constructions therefore present both semantic and syntactic challenges for the language learner.

In this study we examine the spontaneous use of applicative constructions by two two- to three-year-old Sesotho-speaking children, noting the verb types with which the applicative is used and the syntactic constructions in which it appears. First, however, we turn to a syntactic and semantic description of applicative constructions, and the phenomena that make Sesotho especially interesting for acquisition.

2. The syntax and semantics of Sesotho applicative constructions

The syntax and semantics of Sesotho applicative constructions have been extensively studied by 'Malillo (Morolong) Machobane, and much of the following description of these constructions is based on her work (Morolong and Hyman 1977; Machobane 1989). In the following discussion we first present the use of the applicative with different semantic verb classes, noting the different types of applicative objects each takes and the resultant semantic interpretation of these constructions.[3] We then examine the syntax of these constructions, focusing on the object properties shown by different applicative arguments.

2.1. *Verb classes and applicative arguments*

Machobane (1989: 5–25) observes that both intransitive and transitive verbs can cooccur with the applicative. She also notes that intransitive

verbs split with respect to the type of applicative argument they take and uses this as a diagnostic for distinguishing unaccusative/ergative from unergative verbs: verbs such as *holela* 'grow up in/at Loc', *kulela* 'be ill in/at Loc', *belela* 'boil at/by Loc', *fihlela* 'arrive at Loc' take a locative argument and are considered unaccusatives, whereas verbs such as *lwanela* 'fight for', *ela* 'go to', *emela* 'wait for' (<*ema-* 'stand'), *hobella* 'dance for' take a benefactive argument and are considered unergative.[4] This is illustrated in (2) and (3) respectively.

(2) Unaccusative verbs
  a. Dintja di-hol-a kapele
  dogs AGR-grow-FV fast
  'Dogs grow fast'
  b. Dintja di-hol-el-a serob-eng
  dogs AGR-grow-APV-FV barn-LOC
  'Dogs grow up in the barn'

(3) Unergative verbs
  a. Banna ba-lwan-a ka-matla
  men AGR-fight-FV with-strength
  'The men are fighting fiercely'
  b. Banna ba-lwan-el-a bashangana
  men AGR-fight-APL-FV boys
  'The men are fighting for the boys'

Weather verbs such as *nela* 'fall onto/rain + NP/LOC' show "mixed" properties, taking either a locative or goal NP, as shown in (4).

(4) a. Pula e-n-el-a ditulo-ng (locative)
  rain AGR-fall-APV-FV chairs-LOC
  'Rain is falling on the chairs'
  b. Pula e-n-el-a ditulo (goal)
  rain AGR-fall-APL-FV chairs
  'Rain is falling on the chairs'

Machobane (1989: 73) reports that goal arguments can control object agreement, whereas locative arguments cannot, and uses this as a justification for regarding the two as different syntactic structures. This is a distinction that children must also learn.

Transitive verbs, on the other hand, tend to encode agent–patient relations, where an agent subject volitionally affects the object of the action verb. With an applicative these transitive verbs take an additional benefactive NP — those in (5) corresponding to English dative-shift constructions. However, when one object is animate and the other not, the animate object (in this case the benefactive) must occur adjacent to the verb, (5b): the alternative word order in (5c) is unacceptable.

(5) Transitive verbs
  a. Bana ba-pheh-a nama
  children AGR-cook-FV meat
  'The children are cooking meat'
  b. Bana ba-pheh-el-a 'me nama
  children AGR-cook-APL-FV mother meat
  'The children are cooking my mother meat'
  c. *Bana ba-pheh-el-a nama 'me
  children AGR-cook-APL-FV meat mother
  'The children are cooking meat for my mother'

Other verbs of this type include *balla* 'read X for Y', *ngolla* 'write X for Y', *bopela* 'mold X for Y', *binela* 'sing X for Y', *rekela* 'buy X for Y', *betlela* 'shape X for Y', *hlabela* 'slaughter X for Y'.

Other transitive verbs that cooccur with the applicative include verbs such as *utswetsa* 'steal X for/from Y', *batela* 'hit X for Y', *otlela* 'beat X for Y', where the additional NP may be either a benefactive or malefactive — that is, suffering the consequences of the action, as in (6) (cf. Machobane 1989: 18).

(6) a. Barutuwa ba-utsw-a diperekisi
  students AGR-steal-FV peaches
  'The students are stealing peaches'
  b. Barutuwa ba-utsw-el-a ntate diperekisi
  students AGR-steal-APL-FV father peaches
  'The students are stealing peaches from my father'

Although certain verb classes can only take certain applicative arguments, there is some flexibility in the nature of these restrictions. For example, although transitive verbs such as *pheha* 'cook' can take a benefactive argument (as in [5] above), they can also occur with a locative argument, (7). In this case the theme (rather than the applicative locative argument) is ordered immediately after the verb because it is higher on the thematic hierarchy (Machobane 1989: 18).

(7) Bana ba-pheh-el-a nama khotla
  children AGR-cook-APL-FV meat courtyard
  'The children are cooking meat in the courtyard'

With intransitive verbs of motion, the semantics is often one of "motion toward" or "in" a location (8b). With the addition of a benefactive NP,

the semantic interpretation becomes one of "on behalf of" or "toward," (8c) (Machobane 1989: 20).

(8) a. Banana ba-math-a lebal-eng
girls AGR-run-FV playground-LOC
'The girls are running in the playground'
b. Banana ba-math-el-a lebal-eng
girls AGR-run-APL-FV playground-LOC
'The girls are running to/in the playground'
c. Banana ba-math-el-a ntate lebal-eng
girls AGR-run-APL-FV father playground-LOC
'The girls are running for/to my father in the playground'

The above examples demonstrate that the applicative in Sesotho can be derived from most intransitive and transitive verbs. With intransitive verbs, the applicative object may be a benefactive, locative, or goal, depending on the class of verb. With transitive verbs the applicative object may be either a benefactive or a locative. The applicative can also be used in the formation of oblique questions (*Ba-math-el-a-ng*? 'Why are they running?'). Machobane (1989) reports that only psychological verbs (psych verbs) such as *tshosa* 'frighten', which have experiencer subjects, exhibit syntactic restrictions on the use of the applicative, using the applicative with predicational arguments.

Machobane (1989) shows that the restrictions on the type of applicative arguments that can cooccur with different verb classes are highly dependent on interactions with the thematic hierarchy. In particular, she demonstrates that the thematic role of the applicative argument cannot be higher than the thematic role of the external argument (subject) of the verb. Following Jackendoff (1972) and others, she proposes the following thematic hierarchy for Sesotho.

(9) Thematic hierarchy for Sesotho:
causer > agent > benefactive > experiencer > goal (animate) > theme > goal (inanimate) > locative > instrument

The thematic hierarchy in Sesotho differs slightly from the hierarchy proposed for other languages in that experiencer is ranked after benefactive, and animate and inanimate goals are ranked separately. Psych verbs in Sesotho therefore cannot allow benefactive objects because their experiencer subjects are lower on the thematic hierarchy than the benefactive. Likewise, unaccusative verbs, which have theme subjects, can take a locative but not a benefactive applicative argument. In acquiring the appropriate use of applicative constructions children must therefore learn

not only the thematic roles of different verb classes, but also the restrictions on the thematic roles that applicative arguments can take.

In the next section we show that an understanding of thematic roles is needed not only for selecting appropriate applicative arguments, but also for determining the syntax of Sesotho applicatives. We turn now to a discussion of the syntactic properties of applicative arguments, focusing specifically on their object properties.

2.2. *Object properties of applicative arguments*

Researchers have long noted the regular occurrence of object properties in Bantu languages (cf. Duranti and Byarushengo 1977; Gary and Keenan 1977; Hyman and Duranti 1982; Dryer 1983; Bresnan and Moshi 1990; Alsina and Mchombo 1990, 1993; Harford 1993). These include (1) the appearance of the applicative object immediately after the verb, (2) its ability to undergo object pronominalization (as an incorporated pronominal), and (3) its ability to become the subject of a passive.

Machobane (1989) and Morolong and Hyman (1977) show that in Sesotho, the animate object must appear in the position immediately following the verbs: the reverse order is unacceptable, as illustrated in (10).

(10) a. Banana ba-pheh-el-a 'me nama
girls AGR-cook-APL-FV mother meat
'The girls are cooking my mother meat'
b. *Banana ba-pheh-el-a nama 'me
girls AGR-cook-APL-FV meat mother
'The girls are cooking meat for my mother'

However, when the animacy of both objects is equal, the reverse order CAN be acceptable if the benefactive argument is focused, as, for example, if (11b) were the answer to the question "What did she buy the polish for?" (cf. Morolong and Hyman 1977).

(11) a. Rakhali o-rek-ets-e dieta tsa-hae pholeshe
aunt AGR-buy-APL-FV shoes of-her polish
'My aunt has bought her shoes polish'
b. Rakhali o-rek-ets-e pholeshe dieta tsa-hae
aunt AGR-buy-APL-FV polish shoes of-her
'My aunt has bought polish for *her shoes*'

When both objects are animate, the order of the objects can also be reversed under appropriate discourse conditions, with the resulting inter-

pretation being potentially ambiguous (Machobane 1989; Morolong and Hyman 1977):

(12) a. Sello o-shap-el-a Dineo bashanyana
Sello AGR-beat-APL-FV Dineo boys
i. 'Sello beats the boys for Dineo'
ii. 'Sello beats Dineo for the boys'
b. Sello o-shap-el-a bashanyana Dineo
Sello AGR-beat-APL-FV boys Dineo
i. 'Sello beats the boys for Dineo'
ii. 'Sello beats Dineo for the boys'

Interestingly, however, both the benefactive and the basic object show the same object properties with respect to triggering object pronominalization (OBJ), (14), and becoming the subject of a passive, (15).[5]

(13) Banana ba-pheh-el-a 'me nama
girls AGR-cook-APL-FV mother meat
'The girls are cooking meat for my mother'

(14) a. Banana ba-mo-pheh-el-a nama
girls AGR-OBJ-cook-APL-FV meat
'The girls are cooking meat for her'
b. Banana ba-e-pheh-el-a 'me
girls AGR-OBJ-cook-APL-FV mother
'The girls are cooking it for my mother'

(15) a. 'Me o-pheh-ets-w-e nama
mother AGR-cook-APL/PERF-PASS-FV meat
'My mother has been cooked meat'
b. Nama e-pheh-ets-w-e 'me
meat AGR-cook-APL/PERF-PASS-FV mother
'The meat has been cooked for my mother'

That is, except for surface word order, Sesotho treats both arguments of a transitive applicative as having full "object" properties, though other Bantu languages treat only the applicative object as a true object (Machobane 1989). Bresnan and Moshi (1990) refer to this difference in Bantu languages as one of parametric variation, with languages like Kinyarwanda and some dialects of Chichewa showing SYMMETRIC object properties, and languages like Kiswahili and other dialects of Chichewa showing ASYMMETRIC object properties. The chart below shows where various Bantu languages fall along this line, with Sesotho and Chishona showing "mixed" properties.

(16) Symmetrical vs. asymmetrical object "parameter":

Symmetrical	*Asymmetrical*	*"Mixed"*
Kinyarwanda	Kiswahili	Sesotho
Kihaya	Chimwini	Chishona
Kimeru	Hibena	
Mashi	Chickewa-A	
Luya		
Chichewa-B		

Machobane (1989) proposes that these differences can be captured by appealing to thematic relations, where languages differ slightly in the relative ranking of experiencer and benefactive, and where languages like Sesotho distinguish animate from inanimate goals.[6]

Thus, even if general properties of the thematic hierarchy are given as part of a general language capacity, language-particular instantiations of the thematic hierarchy must be learned, and this has implications for both the syntax and the semantics of applicative constructions. Although the applicative can be used with most verb types, the arguments they introduce (benefactive, locative, goal) differ with the class of verb. Furthermore, the symmetric versus asymmetric properties of Bantu languages must be learned, and in the case of Sesotho this is particularly complex: surface word order differs depending on the animacy of the object NPs — if animacy is equal, word order is flexible, either NP acceptable immediately adjacent to the verb under appropriate discourse (focus) conditions. However, if one argument is animate and the other inanimate, the benefactive argument must immediately follow the verb. In all other respects, however, Sesotho shows symmetric object relations: regardless of animacy, either object can pronominalize or become the subject of a passive. Thus, learners of Sesotho cannot use only word order or only the ability of the object to pronominalize as a diagnostic for determining the syntax of Sesotho applicative constructions. Rather, they must also learn that animacy and discourse constraints interact with the syntax and semantics of these constructions.

Children learning Sesotho must therefore determine, at some point in the course of acquisition, if the language they are learning has symmetrical or asymmetrical object properties, and/or if they are learning a "mixed" system like that of Sesotho. We might then predict that children learning Sesotho would make syntactic overgeneralization errors when animacy is not equal, treating both NPs as full-fledged objects and ordering them freely after the verb. Alternatively, we might expect children to be conservative, only allowing the benefactive argument of transitive applicatives to show full object properties, regardless of animacy conditions. This

more conservative approach would entail something like the *subset principle* (Berwick and Weinberg 1984), where children would start out with a "smaller" grammar, gradually expanding it once more language-specific positive evidence becomes available. On the other hand, if the semantics of the applicative is robust we might expect children to make overgeneralization errors, using the applicative with other verb classes, as was found in the acquisition of English causatives (Bowerman 1974, 1982, 1990) and Sesotho passives (Demuth 1989, 1990a). What follows is therefore an exploratory study — the first of its kind to examine the acquisition of applicative constructions in a Bantu language. We hope that it will address not only the specific issues regarding Bantu applicatives discussed above but will also shed some light on children's more general acquisition strategies at the syntax/semantics interface.

3. The acquisition of Sesotho applicative constructions

The data examined in this paper are drawn from the Sesotho Acquisition Corpus — a set of 98 hours of children's spontaneous speech productions during interactions with parents, siblings, and other family members in a rural village in Lesotho (Demuth 1984). Audio recordings were transcribed in broad phonemic transcription by the author in conjunction with the mother and/or grandmother of the child and independently checked by a trained Sesotho speaker at the National University of Lesotho. The data examined here include three three- to four-hour speech samples from two children (H is a boy, L is a girl) at 2;1, 2;6, and 3/3;2 years.

Applicatives in this study were identified by considering both morphological and discourse/pragmatic evidence. Thus, although the applicative morpheme (or a morphophonological variant thereof) was present in all cases, one of the arguments of the applicative verb (the locative, the theme, or occasionally the benefactive) may have been missing. Any verbs that were questionable as to their status as productive applicative forms have been omitted from the present analysis. Interestingly, the most frequently omitted argument is the theme, or "unspecified object," of transitive applicatives, a phenomenon found in adult speech as well.

In the following sections we first examine the children's problems with the morphophonology of the applicative. We then investigate the syntax and semantics of the applicative constructions they use.

3.1. *The morphophonology of the applicative*

Although it might be thought that the applicative morpheme would be easy for a child to recognize, and therefore easy to acquire and use, this may not be the case. The basic form of the applicative is *-el-*, but it also surfaces with the morphological variants *-l-*, and *-ets-* (e.g. *pheha* > *phehela* 'cook > cook for', *rwala* > *rwalla* 'carry > carry for', *rekisa* > *rekisetsa* 'sell > sell for'). Thus, children must first learn to identify the morphophonological variants of the applicative as encoding the same grammatical function and then learn to produce the appropriate morphophonological form with the appropriate verb stem. This may be further complicated when the base form of the verb already looks like a possible applicative, as in the case of *kwalla* 'to shut in' or *hobela* 'to dance'. However, some children appear to have learned this distinction with at least some verbs by three years of age, alternating between applicative and nonapplicative forms of the verb with appropriate arguments, even if their morphophonological realization of the verb stem and/or applicative morpheme is not perfect. This is illustrated in following examples from child L (recorded on the same day), where she first uses the applicative of the verb *kwalla* 'to shut in' (or rather a phonological variant thereof) with a benefactive object (and null theme), (17a), and then uses the verb in the nonapplicative form with only a theme object in (17b).[7]

(17) L 3 yrs.
  a. ko-kwalela
  (ke-o-kwall-el-a)
  AGR-OBJ-shut in-APL-FV
  'I'm closing [it] in for you'
  b. ke-ka-e-kwalla
  (n-ka-e-kwall-a)
  AGR-POT-OBJ-shut in-FV
  'I can close it'

Here we see that L makes both a semantic and a morphophonological distinction between these two utterances despite the fact that the uninflected form of the verb looks like an applicative itself.

Learning the morphophonemics of the applicative is made even more challenging by the fact that most of the other grammatical-function-changing morphemes (such as the passive, causative, reciprocal, reversive, stative) as well as *-il-* (the morpheme for perfect aspect) also occur infixed before the stem-final vowel of the verb. Previous findings indicate that Sesotho-speaking two-year-olds occasionally omit an affix when two or

more are required (Demuth 1984, 1990a). Nonetheless, the pragmatic intent of the utterance in most cases clearly involves the grammatical presence of both affixes. This is illustrated in (18), where child H was eyeing the author's tape recorder, asking her who bought it for her. Note that the applicative (*-el-*) is preserved, whereas the passive (*-w-*) and perfect (*-il-*) morphemes are missing, even though the word order indicates a passive construction, and the context implies a completed/past event (Note: *el* + *il* = *ets*). This is a frequently used construction in adult speech — one that children often hear. H has apparently deconstructed the verbal morphology into its component parts, producing only the applicative morpheme. That is, he seems to have carried out some morphological analysis, not producing the verb as an unanalyzed whole (cf. MacWhinney 1978). Interestingly, in this case it is the applicative morpheme that survives.

(18) H 2;4 yrs.
a rekela e mang?
(u-e-rek-ets-w-e ke mang)
AGR-OBJ-buy-APL/PERF-PASS-FV by whom
'You were bought it by who?'

Another factor that may make learning the applicative morpheme and its grammatical function somewhat challenging is that many verbs in their base form look like surface applicatives, even though they have no applicative meaning or concomitant argument structure. This includes common verbs such as *lela/lla* 'cry', *tsela* 'pour', and others. Thus, children learning Sesotho cannot simply rely on surface phonological similarity to learn about the syntactic and semantic function of the applicative: a deeper awareness of morphological alternations and how the applicative is variably encoded on the surface is necessary for the applicative to be fully acquired. We might therefore predict (along with Slobin 1985) that the semantic and syntactic nature of the applicative would be difficult to learn, its mastery being prolonged and subject to errors of both commission and omission. It is therefore interesting to find that the two children in this study seem to be using the applicative productively by 2;6 years, with few errors of either commission or omission (though the latter will need to be investigated more thoroughly). Table 1 shows the type, token, and percent of applicative verbs used out of the total number of verbs for each child between two and three years. Note that applicative verbs constitute between 3 and 4% of the total number of verbs used by these children. Further study of both older children and adults will be needed to determine if this accords with percentages found in the speech of older speakers.

Table 1. *Types, tokens, and percentage of applicative verbs used in spontaneous speech of two Sesotho-speaking two- to three-year-olds*

Child	Type	Tokens	Type/token ratio	Percentage of applicatives	Total *N* of verbs
H	27	42	0.64	0.03	1321
L	25	63	0.4	0.04	1464

Consecutive repetitions of a given applicative verb that are phonologically or syntactically identical are counted only once. Interestingly, however, many applicative verbs that occur in consecutive utterances often differed in form, with the unspecified object (theme) being omitted initially, then being included in the following utterance (as shown in [19]), or the benefactive argument being a reflexive in one case and full postverbal NP in the next, (20). That is, the children tended to recast their utterances rather than repeating exactly the same utterance twice, with variable appearance of arguments.

(19) H 2;1 yrs.
a. mmatele
(n-ngwath-el-e)
OBJ-feed-APL-FV
'Feed me [something]'
b. mmatele ijo
(n-ngwath-el-e dijo)
OBJ-feed-APL-FV food
'Feed me some food'

(20) L 2;6 yrs.
a. e patel[8]
(ke-i-pat-el-a)
AGR-RF-hide-APL-FV
'I'm hiding from myself'
b. a patela koko
(o-pat-el-a koko)
AGR-hide-APL-FV imaginary creature
'She's hiding from the imaginary creature'

Thus, from a young age both children seem to be aware of at least some of the thematic and syntactic properties of applicative constructions. We turn now to a closer examination of the semantic classes to which their applicative verbs belong, and the applicative arguments with which these occur.

3.2. *The semantics of Sesotho-speaking children's applicative constructions*

As noted above, the applicative can be used in all semantic verb classes (though restrictions apply with psych verbs). Both of the children in this study exhibit the use of applicatives with intransitive verbs (both unaccusatives and unergatives) as well as with transitives. Transitive applicatives made up the majority (70%) of both children's applicative verbs, with the remainder split relatively evenly between unaccusative and unergative verbs. We examine the children's use of the applicative with different verb classes below.

3.2.1. *Unaccusatives.* Recall that unaccusative applicatives add a locative argument, and that mixed verbs like *mathela* 'run to/toward' can add either a locative or a benefactive argument. Child H tends to use a locative NP or a locative adverb with his unaccusatives, (21a), though in (21b) he appears to use *mathela* with both a goal (*Chabadimaketse*) and a locative adverb (*kwana*). Since the semantic distinction between goal and locative is subtle, it is not clear if H is making a semantic "error" in this case, or simply treating both adverbs and the name of the town as locatives.

(21) H 3 yrs.
a. ha ke-w-el-e mona
NEG AGR-fall-APL-FV ADV
'I'm not falling down here'
H 2;6 yrs.
b. wena a mathela ma::::ne Chabadimachetse kwana
(wena o-math-el-a mane Chabadimaketse kwana)
you AGR-run-APL-FV ADV Chabadimaketse ADV
'You running over there to Chabadimaketse yonder'

In contrast, child L tends to omit the locative argument of unaccusatives altogether.

(22) L 3 yrs.
ya masenke ke aolelang
(ya masenke ke e-w-el-a-ng)
of tin roof is REL/AGR-fall-FV-RL
'The tin-roofed one is that which is falling down [there]'

It would appear, then, that these children use the applicative morpheme when required for adding a locative argument, even though L tended to omit the locative itself. This implies that they understand that the applicative can have the function of adding a locative argument, and that they have identified the class of verbs for which this is appropriate.

Interestingly, however, all but one of L's unaccusative applicatives involved the verb *wela* 'fall down'. Previous studies have indicated that L is less grammatically advanced than H at the same age (e.g. Demuth 1989, 1990a, 1995). It is possible that this is also reflected in a more restricted verbal lexicon. Alternately, it is possible that L is a more conservative learner, using productive morphology on a finite set of verbs before she generalizes to a larger class. Further investigation of L's and H's total verb inventory will be needed to evaluate this possibility.

3.2.2. *Unergatives.* Unergative applicatives generally add a benefactive argument. For both children, the large majority of benefactive arguments used with both unergatives and transitive verbs are animate. Most of H's unergative benefactives appear as pronominal objects. In contrast, many of L's tend to be reflexives, giving a "by myself" reading when the subject and benefactive are animate, generally 1st person singular.

(23) H 2;6 yrs.
ntachele
(n-chak-el-e)
OBJ-visit-APL-FV
'Pay me a visit'

(24) L 2;6 yrs.
a. kee thoballa
(ke-a-i-thobal-l-a)
AGR-PRES-RF-sleep-APL-FV
'I'm going to sleep by myself'
b. ke (i)tholel
(ke-a-i-thol-el-a)
AGR-PRES-RF-quiet-APL-FV
'I'm keeping myself quiet'

Once again, both children seem to recognize that unergative applicatives require a benefactive argument and to use one as required.

3.2.3. *Transitives.* Transitive verbs become ditransitive with the addition of an applicative suffix, adding a benefactive or locative argument to the theme that is already present. As noted with the children's unergative applicatives, the benefactive argument tends to be encoded as a pronominal or reflexive object, and this is especially true for child L. In addition, the theme is frequently dropped as part of the phenomenon of

"unspecified object deletion." Again, this is especially the case for L. This is shown in the following examples.

(25) L 2;6 yrs.
a. ke o kokel?
(ke-o-qoq-el-e)
AGR-OBJ-discuss-APL-FV
'Shall I discuss [something] with you?'
b. nka engolla mo
(n-ka-i-ngol-l-a moo)
AGR-POT-RF-write-APL-FV ADV
'I can write [something] by myself here'

Child L does seem to realize, however, that the applicative argument can be realized as a full NP, as shown in the consecutive utterances in (26).

(26) L 2;6 yrs.
a. amorekela
(a-mo-rek-el-a)
AGR-OBJ-buy-APL-FV
'She should buy [them] for him'
b. arekela Namane
(a-rek-el-e Namane)
AGR-buy-APL-FV Namane
'She should buy [them] for Namane'

It is occasionally the case that the theme is present and the benefactive missing. This is illustrated in (27), where there seem to be morphophonological problems as well.

(27) L 2;6 yrs.
a e tabolelele
(ke-tla-e-tabol-el-a)
AGR-FUT-OBJ-tear-APL-FV
'I'll tear it up [for him]'

Child H also shows one case of the benefactive missing but the theme being present along with applicative morphology, (28a).

(28) H 3 yrs.
a. o ngolla lengol?
(o-ngol-l-a lengolo)
AGR-write-APL-FV letter
'Are you writing a letter [for someone]?'

It is possible that the children meant to use the nonapplicative verb forms *tabola* 'tear' and *ngola* 'write' in these examples, which would not require a benefactive. However, the pragmatics of the discourse in both cases indicates that this is not the case. Furthermore, H goes on to use the same verb (albeit in a slightly different morphophonological form) with a locative argument, indicating that he knows it is an applicative, (28b).[9]

(28) b. Ntselleng ha re tlo ngolela ka mona
(Ntselleng ha-re-tlo-ngol-l-a ka mona)
Ntselleng let-AGR-FUR-write-APL-FV in here
'Ntselleng, let's write [a letter] in here'

This would seem to indicate that H has quite a sophisticated repertoire of arguments that he can use with transitive applicatives, but that discourse considerations may render some of these "optional."

In addition to benefactive and locative arguments, the applicative can also be used with oblique (why) questions. Both H (and occasionally L) use the transitive applicative in this form.

(29) H 3 yrs.
otlisetsang pere mo?
(o-tlis-ets-a-ng pere mo)
AGR-bring-APL-FV-WH horse here
'Why are you bring the horse here?'

In sum, both children use transitive applicatives with a variety of arguments and a variety of verbs. The benefactive is frequently encoded as an object pronominal or reflexive, and the theme is frequently omitted when it is an unspecified object. Table 2 provides a breakdown of which verb types the children used, and the surface syntactic realization of the arguments used with each verb class. Note the variety of constructions used (verbs from different classes) and the variety of surface-argument

Table 2. *Applicative verb types and surface realization of arguments used in spontaneous speech of two Sesotho-speaking two- to three-year-olds*

Verb type	Tokens	BEN-V TH	BEN-V	V BEN	TH-V	V TH	VLOC	V
Unaccusative (+Loc)	17						3	14
Unergative (+Ben)	14		12				1	1
Transitive (+Ben)	63	8	36	3	5	4		7
Transitive (+Loc)	11				3		8	
Total	105	8	48	3	8	4	12	22

realizations used (BEN-V TH represents a preverbal pronominalized benefactive OBJ[ect] and a lexical theme).

The children's use of applicative constructions appears to be productive, with the same verb frequently being used in different grammatical constructions. Further evidence of morphological productivity comes from the fact that the children's morphophonological realization of the applicative is often somewhat ill-formed, indicating that these constructions are being produced on-line and not accessed from the lexicon as an "amalgam" or lexicalized whole. We turn now to a discussion of the syntax of these constructions.

3.3. *Syntax*

As discussed in section 2, the benefactive NP of a transitive applicative in Sesotho must appear in the position immediately following the verb if it is the only animate argument, and it generally occurs here when animacy of both objects is equal unless the benefactive is focused. Interestingly, however, even though the benefactive functions as the "primary" object with respect to word order, both the benefactive and theme show the same object properties with respect to triggering object pronominalization and becoming the subject of a passive. We examine children's use of each of these constructions below.

3.3.1. *Thematic structure, animacy, and word order.* As mentioned in section 3.2, both of the children in this study tend to drop unspecified objects from transitive applicatives. Furthermore, they both tend to encode the benefactive argument as a pronominal (or reflexive) object. This means that the so-called "double-object" constructions that would provide evidence of children's knowledge of word-order restrictions simply do not exist (see Table 2). This was unexpected but in retrospect may not be so surprising: the data examined here are spontaneous speech productions where children's use of the applicative is highly affected by the discourse situations at hand. Under such situations unspecified object drop is likely to occur and does. It may be that the children are aware of the thematic and animacy restrictions on Sesotho word order but that the context for using both benefactive and theme as full NPs rarely occurs in everyday speech. If these constructions are extremely rare in the input children are exposed to, however, we might also expect their acquisition to be difficult and subject to error.

Recall, however, that postverbal word order is not the only test for determining if the language being learned has symmetric or asymmetric

object properties. Both pronominalization and passivization patterns in Sesotho indicate that it is basically a symmetrical language — that is, either object can passivize or become a pronominal object. We examine children's use of these constructions below.

3.3.2. *Pronominal objects.* As shown in Table 2, the majority of children's benefactive arguments are encoded as pronominal objects, and this is true with both intransitive and transitive applicatives. Almost all of these benefactives are animate (often first person). Perhaps more importantly, both children have a few cases where the THEME of a transitive applicative is encoded as a pronominal object, indicating that it is not just benefactives that can assume this syntactic position. Note that in all these cases the benefactive has been dropped, making these appear to be simple transitive verbs but for the applicative morphology and the pragmatics.

(30) L 2;6 yrs.
a ye thibele?
(o-le-thib-el-e)
AGR-OBJ-prevent-APL-FV
'Might you prevent it (from rolling) [for me]?'

(31) =(27) L 2;6 yrs.
a e tabolelele
(ke-tla-e-tabol-el-a)
AGR-FUT-OBJ-tear-APL-FV
'I'll tear it up [for him]'

(32) H 3 yrs.
a e patele Ntselleng?
(o-e-pat-el-a Ntselleng)
AGR-OBJ-hide-APL-FV Ntselleng
'Are you hiding it [for someone], Ntselleng?'

Recall also (from section 2.1) that one of the distinctions between locative and goal arguments is that only the goal can be a true object in being able to control object pronominalization. With the possible exception of example (21a) seen above (repeated here in [33]), the children in this corpus did not use any goal objects. It may therefore be that the thematic argument here is a locative rather than a goal, thereby not subject to undergoing pronominalization.

(33) =(21a) H 2;6 yrs.
wena a mathela ma::::ne Chabadimachetse kwana
(wena o-math-el-a mane Chabadimaketse kwana)
you AGR-run-APL-FV ADV Chabadimaketse ADV
'You running over there to Chadabimaketse yonder'

In sum, it would appear that these Sesotho-speaking children permit both benefactive and theme arguments of applicative constructions to undergo pronominalization. They may therefore have already determined that Sesotho is a symmetric language, where both objects can control object properties. If this is true, then we would also expect them to allow both benefactives and themes to surface as the subject of a passive transitive applicative.

3.3.3. *Passive subjects.* As it turns out, there are only a few cases of passivized transitive applications in the corpus examined here. A possible early example exists, but it is so morphologically impoverished that it is difficult to determine if it is an applicative, though the word order is clearly passive. Furthermore, it is an answer to a question where the passive applicative has been modeled in the previous utterance and therefore is likely not to be a productive construction at this early stage.

(34) L 2;1 yrs.
e phe a mame
(e-pheh-ets-w-e ke Mami)
AGR-cook-APL/PERF-PASS-FV by Mami
'It was cooked [for someone] by Mami'

If this were a productive construction, it would be a case where the theme has been promoted to subject and the applicative argument dropped. Note that the target verb in (34) includes not only the applicative and passive, but also perfect aspect, making it extremely morphologically complex to be used at this young an age. We have seen above, however, that H makes an attempt with a similar construction a few months later, (35) = (18), where the benefactive has been promoted to subject and the theme is realized as a pronominal object (though again the child's morphology is underdetermined).

(35) =(18) H 2;4 yrs.
a rekela e mang?
(u-e-rek-ets-w-e ke mang)
AGR-OBJ-buy-APL/PERF-PASS-FV by who
'You were bought it by who?'

The only other case of an applicative passive found in this corpus is with the following intransitive verb, where the benefactive *koloi* 'car' has been promoted to subject position (where it undergoes null-subject drop), the nonpassivized sentence reading something like 'petrol is finished on behalf of the car'.

(36) H 3 yrs.
e feletswe ke peterone
(e-fel-ets-w-e ke peterole)
AGR-finish-APL/PERF-PASS-FV by petrol
'It (the car) is finished by petrol'

Future research will be needed to determine when Sesotho-speaking children learn that both benefactive and theme arguments of a transitive applicative verb can function as full-fledged objects, surfacing as either pronominal objects or subjects of a passive.

In sum, the syntactic evidence presented here indicates that, by the age of three, the children in this study may be aware that Sesotho is basically a symmetrical language. There is no evidence, however, that they are aware of its "mixed" properties with respect to word order. Future research will be needed to determine if children are actively avoiding these constructions because they are difficult to learn, and/or if the discourse contexts for using these constructions are rarely present in everyday discourse.

4. Discussion

This paper has provided a preliminary examination of two two- to three-year-olds' spontaneous use of applicative constructions in the southern Bantu language Sesotho. The findings indicate that both children are using the applicative productively by the age of 2;6. Evidence of productivity comes from the discourse-appropriate use of the applicative morpheme with a range of unaccusative, unergative, and transitive verbs found in a variety of grammatical constructions, plus the frequent occurrence of morphophonological problems. Together these findings indicate that these children are using the applicative morpheme as a productive morphological element rather than as an unanalyzed, frozen form. The fact that these children also use a given verb in several different syntactic frames (i.e. with the lexical, pronominal, and/or null realization of arguments) further indicates that their use of the applicative with a given verb is not that of a frozen "construction."

The picture regarding children's knowledge of the syntactic restrictions on Sesotho applicatives, and specifically the language's "mixed" properties with respect to animacy and word order in "double-object" constructions, is far from clear. This is in part due to the fact that the benefactive is generally encoded as a pronominal object, and the theme frequently undergoes "unspecified object drop." There is some evidence that children

permit both theme and benefactive arguments to trigger object agreement and function as the subject of a passive, though the examples are few. Thus, it may be that the Sesotho-speaking three-year-olds in this study treat Sesotho as a symmetrical language, where both objects of a transitive applicative have full object properties. However, there are no examples in these corpora of transitive applicatives with two postverbal NPs. Thus, it is unclear when and how Sesotho-speaking children learn about the thematic, animacy, and discourse constraints on word order in transitive applicative constructions.

What are the implications of this study for issues of semantic vs. syntactic bootstrapping? It would appear that the children in this study have some understanding that the applicative morpheme adds another argument to the verb. In this sense they seem to understand the semantics of the construction. It also appears that they have some understanding of the semantics of different verb classes, adding a locative to unaccusative verbs and a benefactive to unergative verbs, and permitting either a locative or benefactive with transitive and mixed verbs. Further evidence of robust semantics might come from the overgeneralization of the applicative morpheme to psych verbs (e.g. *tshosa* 'frighten'), which generally take the applicative only with predicate complements, or from cases where "mixed" verbs were used with a goal rather than locative argument. Of particular interest would be those verbs, such as *mathela* 'run toward/for', that are classified differently across languages.

Alternatively, it could be that the syntax of applicative constructions, and specifically the thematic role of the additional argument, is instrumental in helping children determine the meaning (and class) of these verbs. The fact that the children in this study seem to use the applicative in appropriate pragmatic contexts, despite the fact that either the applicative argument or the theme is omitted, might indicate that the syntax of these constructions is robust. However, even if these children know that transitive applicatives take two objects, and know what the thematic restrictions on those arguments are, they may not yet have figured out how animacy, thematic role, and pragmatic focus interact to determine the ordering restrictions on postverbal NPs. If this is the case, then the notion of "syntactic frame" and its usefulness in inferring the semantics of verbs must be much more flexible than that conceived of in languages like English, where surface word order is much more restricted.

Ultimately, an examination of the input will be needed to determine if the "errors" the children in this study make are actually syntactic errors or are merely typical of argument drop found in daily discourse. If the forms used by the children in this study are a direct reflection of the patterns observed in adult speech, then the syntax of applicative constructions would appear to be underdetermined in the input. This raises the classic issue of the projection problem (Baker 1979) and the possibility that something along the lines of the subset principle must be the starting point for the conservative learner (e.g. Berwick and Weinberg 1984). We might then expect children to await sufficient positive evidence (which might take a long time to materialize) before making assumptions about the symmetric/nonsymmetric properties of the Sesotho applicatives. Alternatively, there might also be sufficient implicit negative evidence along the lines of that found in English dative-shift constructions for Sesotho-speaking children to construct the appropriate grammar (cf. Mazurkewich and White 1984; Randall 1987). In such a case the acquisition of the semantics of Sesotho applicative constructions might proceed with minimal assistance from the syntax. That is, the double object "frame" for determining the semantics of applicative verbs would be missing and might lead the learner to expect thematic argument structures of the form *agent V benefactive*, rather than *agent V benefactive theme* for transitive applicatives, treating them as transitive rather than ditransitive verbs. Again, further research concerning the nature of unspecified object deletion, and the discourse contexts under which it is used, will be needed to shed further light on these issues.

In conclusion, it appears that the Sesotho-speaking two- to three-year-olds in this study are using the applicative in appropriate, if not exhaustive, syntactic and semantic contexts. This is consistent with the picture of a conservative learner, where errors of omission (avoidance), but not commission, are found. Further study will be needed to determine the full extent of children's knowledge of these constructions and how it develops over time. We predict that these younger children may be using only a subset of permitted syntactic and semantic constructions, and that older children may exhibit both syntactic and semantic errors such as those found with English-speaking four- to five-year-olds with the causative (Bowerman 1990). Future study will therefore need to focus on older children, as well as the nature of the input.

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Notes

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ing this research. Correspondence address: Department of Cognitive and Linguistic Sciences, Brown University, Box 1978, Providence, RI 02912, USA. Telephone +1 401 863 1053. E-mail: Katherine_Demuth@brown.edu.

1. Glosses are as follows: ADV = adverb, AGR = subject marker, APL = applicative, FUT = future, FV = final vowel (mood), LOC = locative, NEG = negation, OBJ = object marker, PASS = passive, PERF = perfect, POT = potential, PRES = present, RF = reflexive, REL = relative complementizer, RL = relative suffix, WH = information question word. Mood, noun class prefixes, agreement, and tone have not been marked in this paper. Lesotho orthography is used throughout, with the exception that glides and [d] are rendered as such, and the voiceless aspirated coronal affricate is realized as *tsh*.
2. See Baker (1988a, 1988b) and Marantz (1984) for morphosyntactic analyses of Bantu applicatives that entail the notion of nominal "incorporation" into the verb.
3. For the purposes of this paper we leave aside discussion of verbs of perception such as *bona* 'see' and psych verbs such as *tshosa* 'frighten', verb classes that in the applicative take clausal predicates (cf. Machobane 1989).
4. Machobane (1989: 9–10) notes that standard diagnostics for distinguishing unaccusative from ergative verbs in other languages, such as the ability to undergo impersonal passivization in English (Perlmutter 1978), the possibility of occurring with *ne* cliticization, inherent reflexive *si*, and restrictions on auxiliary selection (*essere* 'be' vs. *avere* 'have') in Italian (Belletti and Rizzi 1981; Burzio 1986), particle–adjective conversion in English (Rappaport and Levin 1988), morphological case marking or agreement in Lakhota (Williamson 1979), and so on, lack counterparts in Sesotho. She notes that only the impersonal passive might be relevant but reports that restrictions here are not consistent with the locative/benefactive applicative argument distinction. For instance, some verbs that take a locative complement can occur with impersonal passives (e.g. *hola* 'grow', *fihla* 'arrive'), whereas others cannot (e.g. *bela* 'boil' and *kula* 'be ill'). For the purposes of this paper we follow Machobane (1989) in identifying unaccusative verbs as those that take locative arguments with the applicative, and unergative verbs as being those that take benefactive arguments. The reader may therefore find that the "classes" of verbs discussed here differ somewhat from languages with which they are more familiar.
5. In Sesotho (though not in all Bantu languages) the OBJ is an incorporated pronominal found in complementary distribution with the lexical object.
6. Cross-linguistic findings from the syntax of "locative-inversion" constructions provides further support for the view that Bantu languages vary slightly in the relative ranking of thematic roles (cf. Bresnan and Kanerva 1989; Harford 1990, 1993; Demuth 1990b; Machobane 1995; and Demuth and Mmusi 1997).
7. The first line encodes the child's utterance, and the second line (in parentheses) is the grammatical adult equivalent. The square brackets [ ] include material such as unspecified objects that have been omitted from the child's utterance.
8. The children's utterances sometimes seem to be missing an utterance-final vowel, especially after /l/. Sesotho has a tendency to devoice final vowels: acoustic analysis will be required to determine if the vowel has been simply devoiced or actually deleted.
9. The children in this study seem to prefer realizing *-ll-* sequences as *-lel-*. It is possible that this is evidence of morphophonological overgeneralization, where there is a tendency to realize the applicative as *-el-*. Alternatively, it may be that children of this age tend to avoid syllabic liquids, tending to syllabify them as the onset to a syllable rather than the nucleus. Further research will be needed to examine possible morphological vs. phonological accounts of this phenomenon.

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