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Production of infinitives by 5-year-old children with language-impairment on an elicitation task

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ABSTRACT

The infinitive productions of eight 5-year-old children with specific language impairment (SLI) on an elicited production task were compared with the infinitive productions of 25 3- to 5-year-old children with normally-developing language (NL). The basic infinitive structure itself did not seem to be a problem for these children since all eight of the children with SLI produced infinitival complements with at least five different main verbs. However, other aspects of infinitive sentences which must be learned as a lexical property of specific verbs appeared to present more difficulty for some of the children with SLI. Individual children with SLI showed limited or no subcategorization for ditransitivity (production of both an NP and an infinitival complement) or for infinitives with a lexical complement subject. In contrast to previous reports, only one of the children with SLI omitted the infinitive marker *to* more than once. Reference errors were consistent with what has previously been reported for NL children.

KEYWORDS

Complex sentences; infinitives; language development; specific language impairment; verb complements

INTRODUCTION

Children with specific language impairment (SLI) have been shown to have particular difficulty with learning and using verbs. These children require more exposures to learn new verbs (Oetting, Rice & Swank, 1995), they use new verbs less frequently than do language-matched controls (Skipp, 2000), and they produce fewer different verb types than do typically-developing children (Conti-Ramsden & Jones, 1997; Leonard, Miller & Gerber, 1999; Rice & Bode, 1993; Watkins, Rice & Moltz, 1993). Children with SLI may rely more on high frequency general verbs, such as *make* and *do*, than on more descriptive verbs (Fletcher, Ingham, Schletter & Sinka, 1997; Rice & Bode, 1993). They also show reduced usage of verb tense morphology (Rice & Wexler, 1996).

Learning a verb involves more than just determining the meaning of the word. It also involves learning which arguments can and must occur with that verb. Since argument structure is linked to the verb, difficulty with verb learning could thus lead to serious consequences for syntactic development. Thordardottir & Ellis Weismer (2001) reported a lower density of verb use per utterance by children with SLI, due both to their producing a larger number of utterances without any verb and to their producing fewer complex sentences that would include more than one verb. King (2000) reported that older children with SLI, aged 7–10 years, produced more verbs with zero complementation and produced fewer verbs with either a direct object noun phrase (NP) or prepositional phrase (PP) or with both an NP and PP complement.

Given these difficulties with verb-related aspects of language, children with language impairment might be expected to have difficulty with clausal complements embedded within the verb phrase, such as those in Example 1. One such type of complement is the infinitival object complement (1c). Infinitives cannot be produced with all verbs. Rather, main verbs must be subcategorized for infinitival complements, and this lexically specific information must be learned verb-by-verb. In evaluating a child's production of infinitives, we must, therefore, look not only at the number of infinitives produced by the child but at the number of different verbs with which infinitives are produced. The current investigation looked at infinitive production on an elicited production task in which children were provided with specific opportunities to produce infinitives with a variety of different verbs.

1. a. I knew *where it went*.
   b. I thought *he had left*.
   c. I tried *to find it*.

Acquisition of infinitives by children with typical development

Children with typical development first produce infinitives at around 2 years of age along with other object complements (Bowerman, 1979; Limber, 1973), embedded sentences functioning as direct objects of the verb in the main clause. The earliest infinitives involve a small set of main verbs which appear to function like modal verbs, primarily *want* and *go* and less often *got* and *have* (Bloom, Tackeff & Lahey, 1984). These are either unmarked as in Example 2 or in catenative form as in Example 3.

Bloom *et al*. (1984) reported production of the *to* infinitive marker as first appearing between 2;0 and 2;3 for the four children in their study. The earliest marked infinitives, as in Example 4, involve an unstated complement subject that is coreferential with the subject of the main verb (Bloom *et al*., 1984; Limber, 1973).

2. She going eat it over there.
3. I wanna read book.
4. I got to move him up.

Children become productive with infinitives – that is, they produce infinitives with several main verbs – and consistently include the infinitive marker *to* by the time that their mean length of utterance is 3.5 (Bloom *et al*., 1984). Infinitives with an intervening noun phrase between the main and complement verb, such as those in Example 5, are a later development. Limber (1973) reported their appearance at around 2;5 years. Bloom *et al*. (1984) reported that these forms were not produced until MLU was 3.5, which may be at a later age for some children (at about 3;3 years based on the age-MLU relationship reported in Miller & Chapman, 1981). Eisenberg (1997) found that these later developing infinitive forms continue to be produced infrequently in conversation even by 5-year-old children.

5. a. I want Daddy to do it.
   b. I'll help you to find the buttons.

Chomsky (1969) was the first to report that children up to 10 years of age misinterpret infinitives with *promise* by making the second noun act out the complement verb. Eisenberg (1989) and Eisenberg & Cairns (1994) found this same form-meaning mapping pattern in the productions of 5-year-old children for infinitives with both *promise* and *threaten*, such as those in Example 6.[1] The children also produced [Verb-to-Verb] infinitives, such as those in Example 7, with a non-mentioned referent acting out the complement verb. The children thus produced infinitives for meanings that would not be allowed in adult grammar. In assessing children's knowledge of infinitives, therefore, we must look at the meanings of their infinitive sentences as well as at the forms that they produce.

6. a. #Ernie promised Mickey to hug Bert. [enactment: Mickey hugs Bert]
   b. #Mickey threatens Ernie to fall. [enactment: Ernie falls]

7. a. #Bert wants to find Mickey. [enactment: Ernie finds Mickey]
   b. #Ernie begs to carry Bert. [enactment: Mickey carries Bert]

Production of infinitives by children with SLI

Jones & Conti-Ramsden (1997) compared three children with SLI – ages 3;9; 5;3 and 5;8 – with their 2-year-old MLU-matched siblings. They identified six verbs that were used by all six of the children. Three of these verbs – *get*, *go*, *want* – are among the earliest infinitive-taking verbs reported by Bloom *et al*. (1984). All three of the 2-year-old younger siblings produced infinitives with at least two of these verbs. However, only one of the children with SLI produced any infinitives, and this was with only one

verb, *want*. This result suggests that infinitives may be later emerging and also less productive – that is, produced with fewer different verbs – for children with SLI than for typically-developing children. Eisenberg (2003) looked at the production of infinitives in the conversational speech of 5-year-old children with SLI. She found that some of these children produced infinitival object complements with fewer verbs than did NL children of the same age or even younger.

Johnston & Kamhi (1984) reported that children with SLI produced fewer tokens and made more errors than their MLU-matched controls in the secondary verb category of Developmental Sentence Scoring, the category in which infinitive sentences are scored (Lee, 1974). These authors concluded that the *to* infinitive marker seemed particularly vulnerable to error by children with SLI. In a study by Leonard, Eyer, Bedore & Grela (1997) which looked at a number of different morphemes, the SLI group demonstrated a lower percentage of use for the *to* infinitive marker on a sentence completion probe than did age-matched and MLU-matched groups.

The present study investigated the infinitives produced by 5-year-old children with SLI on an elicited production task. Several potential difficulties that these children might have with infinitives were identified. These included limited productivity with infinitival complements across a range of verbs, non-emergence of later developing infinitival complements with an intervening NP between the main and complement verb, persistence of non-adult form-meaning mappings, as well as omission of the *to* infinitive marker.

The following questions were asked: (1) Do 5-year-old children with SLI produce infinitival complements with a range of different verbs? (2) Do these children with SLI produce infinitival complements with an intervening NP between the main and complement verbs and, if not, do they produce them with a range of main verbs? (3) To what extent do these children with SLI produce infinitival complements with adult meanings? (4) Do these children with SLI consistently produce the *to* infinitive marker? It was predicted that the children with SLI would produce infinitives with fewer main verbs, would produce no or few infinitives with an intervening NP, would allow external reference on their infinitives, and would show inconsistent usage of the *to* infinitive marker.

METHOD

Participants

Participants included eight children between the ages of 5;1 and 5;11 (mean 5;7) who had previously been identified as language-impaired by a speech-language pathologist based on parental report, performance on a standardized test of language at least 1.5 standard deviations below the mean, and language sample analysis. Mean length of utterance in morphemes (MLU) at the time of the study for all participants was at least 1.25 standard deviations below the mean for their age (see Table 1). All participants were receiving therapy for simple syntax and/or morphology, but none of the children had worked on infinitive sentences in therapy. Based on parent and teacher report, there were no concerns about intellectual or psychological functioning.

Table 1 Utterance length data for the children with SLI

Participant	*Age*	*MLU*	*No. standard deviations*	*Utterances ≥ 4 words*
S1	5;7	4.25	–1.25	59%
S2	5;8	4.45	–1.33	67%
S3	5;9	4.01	–1.73	51%
S4	5;2	3.10	–2.74	38%
S5	5;11	3.45	–2.11	50%
S6	5;3	3.61	–2.10	42%
S7	5;5	3.23	–2.50	52%
S8	5;1	4.27	–1.39	56%

The infinitive productions of the children with SLI were compared with data from a group of 25 children with normal language (NL) aged 3;7–5;4 (mean 4;3) whose infinitive productions had been previously reported in Eisenberg & Cairns (1994) and Eisenberg (1997). All the children with SLI in the current study as well as the NL children used for comparison were monolingual English-speaking and had passed a hearing screening administered at 25dB for the frequencies 1000, 2000 and 4000 Hz. At least one-third of each child's utterances were four words or longer so that they would be expected to be producing object complements (Bowerman, 1979; Limber, 1973).

Procedure

A structured procedure involving a story completion task was used to provide opportunities for production of infinitive sentences with a variety of main verbs. In this procedure, the examiner started a story and simultaneously acted out the story by manipulating toy figures. Each story consisted of several simple sentences so that the infinitive form was not modelled by the examiner. At the end of each story, the examiner started the target sentence by stating the sentence subject and the main verb. The examiner then asked the child to complete the story and restarted the target sentence, producing just the sentence subject with rising intonation. As an example for the target sentence 'Mickey wants to swim', the examiner said 'Mickey wants …You finish the story. Mickey …?' Following the child's production, the examiner directed the child to act out the utterance. Having the children act out their utterances provided information about the meanings encoded by their infinitive sentences. Prior to administration of the experimental items, the children were trained to do the story completion and act out responses first with stories requiring simple sentences and then for stories requiring small clause complements with the verbs *watch* and *see*.

Each child was seen for three sessions. During the first session, a hearing screening was administered and a language sample was obtained. During the second and third sessions, the experimental items were administered.

Stimuli

Target sentences on the elicited production procedure included 12 infinitive-taking verbs, some that were early appearing – *want*, *like*, *remember*, *say, tell*, *try*, *ask* – and some that were not – *force*, *beg*, *promise*, *shout, threaten*. A verb was considered to be early appearing if it had been reported as being produced in the spontaneous speech of 2- to 3-year-old children (Bloom *et al*., 1984; Bowerman, 1973; Limber, 1973). All the complement verbs (the verbs targeted to appear in the infinitival clause) were selected from lists of verbs produced by 1- and 2-year-old children in single clause utterances (Bloom, 1970; Bowerman, 1973; Tomasello, 1992). These included intransitive verbs – *climb*, *jump in*, *sleep*, *stand up*, *swim, swing* – and transitive verbs – *clean up*, *eat*, *find*, *hug*, *pick up*, *throw*.[2]

The main verbs that can take infinitival complements differ from each other in some important ways. These lexically-specific properties are listed and illustrated in Table 2. One difference has to do with subcategorization for object noun phrases in addition to the infinitival complement. Infinitive-taking verbs that are monotransitive can appear in sentences with just the infinitival object complement. Infinitive-taking verbs that are ditransitive can (and, for some verbs, must) take an object noun phrase as well. A second difference relates to the nature and interpretation of the infinitival subject. Most infinitival complements have a phonetically null subject, called PRO, but infinitives with some verbs have lexically specified subjects. Where there is a PRO subject, that subject must get its reference from somewhere. For most Verb-Noun-to-Verb (VNtoV) infinitives, the PRO infinitival subject co-refers with the object NP. This is referred to as object control. For most Verb-to-Verb (VtoV) infinitives and some exceptional VNtoV infinitives, the PRO infinitival subject is coreferential with the main clause subject. These infinitives are, therefore, referred to as subject controlled. There are also some VtoV infinitives that do not co-refer with the main clause subject but, instead, are assigned a referent based on the discourse context. These infinitives are termed uncontrolled. Based on these properties, Eisenberg (1989) suggested five sentence frames (listed in Table 3) that infinitive-taking verbs could enter into. The main verbs included in the current study were classified into six different types according to which sentence frames they allow (see Table 4).

The stories involved two context conditions. In the coreferential condition, the subject of the main verb was intended to be the same person who would act out the infinitive verb action. In the non-coreferential condition, someone other than the subject of the main verb was intended to act out the infinitive verb action. Each verb was included in a coreferential and a non-coreferential story, for a total number of 24 items, two with each verb. One story with each verb was presented in each of the experimental sessions. Each session included half of the items for each of the two story contexts conditions. Order of item presentation was randomized within each session.

Table 2 Lexically-specific properties of infinitive-taking verbs

Properties	*Categories*	*Examples*
Transitivity	transitive	Mickey tried to swim.
	ditransitive	Mickey told Ernie to swim.
Infinitival subject	PRO	Mickey told Minnie. [PRO to swim]
	lexical	Mickey wanted. [Minnie to swim]
Control of PRO	subject-controlled	Mickey^{i} promised (Minnie^{k}). [PRO^{i} to swim]
	object controlled	Mickey^{i} told Minnie^{k}. [PRO^{k} to swim]
	uncontrolled	Mickey^{i} said. [PRO^{k} to swim]

Note. The same superscript means that they refer to the same person; different superscripts mean that they do not refer to the same person.

Table 3 Sentence frames for infinitive-taking verbs

Single-noun sentences		
(a) transitive subject-controlled	N^{i}-V-[PRO^{i}-to-V]	Mickey wants to swim
(b) uncontrolled transitive	N^{i}-V-[PRO^{k}-to-V]	Mickey says to swim
Two-noun forms		
(c) transitive with lexical subject	N^{i}-V-[N^{k}-to-V]	Mickey wants Ernie to swim
(d) ditransitive object controlled	N^{i}-V- N^{k}-[PRO^{k}-to-V]	Mickey tells Ernie to swim
(e) ditransitive subject controlled	N^{i}-V-N^{k}-[PRO^{i}-to-V]	Mickey promises Ernie to swim

Table 4 Verb type according to subcategorization for direct object and control properties

	1 want, like	*2 tell. force*	*3 try, remember*	*4 ask, beg*	*5*[a] *promise, threaten*	*6*[b] *say, shout*
N^{i}-V-[N^{k}-to-V]	+	–	–	–	–	–
N^{i}-V-[PRO^{i}-to-V]	+	–	+	+	+	–
N^{i}-V- N^{k}-[PRO^{k}-to-V]	–	+	–	+	–	+[b]
N^{i}-V-N^{k}-[PRO^{i}-to-V]	–	–	–	+	+[a]	–
N^{i}-V-[PRO^{k}-to-V]	–	–	–	–	–	+

[a] The object NP with type 5 verbs is optional

[b] Type 6 verbs allow ditransitive forms with an explicitly marked and optional object NP (e.g., 'Mickey says to Bugs to swim.')

Table 5 Coding of infinitive forms and enactments

Infinitive forms	*Examples*
VtoV	Mickey likes to swing real high
VNtoV	Donald tells Bugs to find his toy
VtoVNV	Donald tries to make him go to sleep
Enactments[a]	
Ns (sentence subject)	*Mickey* likes to swing real high
	Bugs threatens Mickey to throw the ball
N2 (second noun)	Donald tells *Bugs* to find his toy
Ne (external referent)	Bugs shouts to clean up the toys (*Donald*)

[a] The complement verb actor is italicized and/or in parenthesis after the utterance

RESULTS

Only infinitives that had both a main verb and a complement verb were included in the analysis. Utterances such as 'Bugs wants to' or 'to throw the ball' were, therefore, excluded from the analysis. Response coding is illustrated in Table 5. Infinitive sentences were coded according to their surface form as VtoV, VNtoV, or VtoVNV. The children's enactments of their utterances were coded to indicate the actor selected by the child to perform the complement verb action as the sentence subject (Ns), the second noun (N2), or an external referent not mentioned in the utterance (Ne).

Number and form of infinitive sentences

There were 100 infinitives produced out of the 192 opportunities. Of these, 60 were VtoV forms, 32 were VNtoV forms and 8 were VtoVNV forms. Overall, the children with SLI produced more VtoV than VNtoV sentences and showed the same relative proportions of these infinitive sentences as has been shown by NL children (Eisenberg & Cairns, 1994). The relative proportion of VtoV and VNtoV sentences (shown in Table 6) was, however, different depending on verb type.

Of particular interest are verb types 2 and 3, which allow only one of these sentence forms. There were seven VtoV sentences with type 2 verbs (*tell, force*), although the VtoV form is not grammatical with this verb type since these verbs require an object NP in adult grammar. In contrast, there were no ungrammatical VNtoV infinitives with type 3 verbs (*try, remember*), with which this infinitive form is not grammatical. The children with SLI produced only VtoV infinitives with type 3 verbs and did not produce sentences such as '*Mickey tries Bugs to swim.' This pattern of allowing VtoV infinitives with type 2 verbs but not allowing VNtoV infinitives with type 3 verbs is consistent with the productions reported for NL children (Eisenberg & Cairns, 1994).

Table 6 Number and proportion of VtoV and VNtoV forms produced with each verb

Main verbs	*VtoV*	*VNtoV*
Type 1		
want	9	7
like	12	1
Total	21 (72%)	8 (28%)
Type 2		
tell	3	4
force	4	5
Total	7 (44%)	9 (56%)
Type 3		
try	10	0
remember	8	0
Total	18 (100%)	0 (0%)
Type 4		
ask	3	2
beg	5	5
Total	8 (53%)	7 (47%)
Type 5		
promise	4	2
threaten	2	4
Total	6 (50%)	6 (50%)
Type 6		
say	1	2
shout	5	1
Total	6 (67%)	3 (33%)
Total for all verbs	66 (67%)	33 (33%)
Total for NL	297 (64%)	170 (36%)

As shown in Table 7, all eight children produced infinitives with at least five main verbs and produced VtoV forms with at least three main verbs, consistent with the performance reported for NL children (Eisenberg, 1997). Three of the SLI participants produced VNtoV infinitives with only one main verb, as did three of the 3-year-old NL children. All the 4- and 5-year-old NL children produced VNtoV infinitives with at least three different verbs (Eisenberg, 1997).

Table 7 Number of main verbs (out of 12) with which each participant produced infinitives

Group	*Participants*	*VtoV*	*VNtoV*	*In all infinitives*
SLI	S1	4	7	10
	S2	9	1	10
	S3	5	8	12
	S4	4	6	9
	S5	6	1	6
	S6	4	3	5
	S7	5	1	6
	S8	12	2	12
	Mean	6.1	3.6	8.8
	Range	4–12	1–8	5–12
NL	Mean	7.04	4.68	8.8
	Range	2–11	1–9	5–11

Table 8 Number of children producing VtoV and VNtoV infinitives with each verb type

	VtoV only	*VNtoV only*	*Both forms*	*Total*
1 want, like	1	0	7	8
2 tell, force	3	5	0	8
3 try, remember	8	0	0	8
4 ask, beg	4	3	1	8
5 promise, threaten	3	3	0	6
6 say, shout	3	1	1	5
1,4,5,6 combined[a]	1	0	7	8
All verbs	0	0	8	8

[a] These verb types allow both VtoV and VNtoV forms

The number of children producing VtoV and VNtoV sentences (shown in Table 8) varied among the verb types. All eight children produced VtoV sentences with type 3 verbs (*try, remember*) and, as indicated above, produced no ungrammatical VNtoV infinitives with both an object NP and infinitival complement. Verb type 1 (*want, like*) was the only verb type for which the majority of the children produced both infinitive sentence forms. For all the other verb types, the children produced either the VtoV

Table 9 Number of children producing sentences with 1 or 2 complements with each verb type

	Produce only sentences with 1 complement[a]	*Produce only sentences with 2 complements*[b]	*Produce sentences with 1 or 2 complements*
1 want, like	8	n/a	n/a
2 tell, force	3	5	0
3 try, remember	8	0	0
4 ask, beg	4	3	1
5 promise, threaten	3	3	0
6 say, shout	3	1	1
4,5,6 combined[c]	4	1	3
All verb types	2	0	6

[a] Sentences produced with just an infinitival complement
[b] Sentences produced with both an NP and infinitival complement
[c] These verb types allow infinitive sentences with both one and two complements

form or the VNtoV form and did not produce both forms, even though all these verbs allow both forms.

This is an interesting finding because of the differing underlying structure of the VNtoV infinitive for type 1 verbs, as was shown above in Table 4. The VNtoV infinitive form with *want* and *like* is mono-transitive, involving a single complement, whereas for verb types, 2, 4, 5 and 6 the VNtoV form is ditransitive, as was shown above in Table 3. Thus, the underlying structure of VNtoV forms will differ in the number of complements as a function of verb type. Table 9 shows the number of children who produced infinitives with either one or two complements. All eight children produced infinitives with a single complement, but two children did not produce infinitives with both an infinitival and an NP complement . For verb types 4, 5 and 6 – the verb types that allow infinitives with and without an NP complement – there were children who produced only single-complement infinitives, children who produced only infinitives with both complements, and children who produced both forms. For verb type 2 – for which infinitives without an object NP are ungrammatical – there were children who produced either single-complement infinitives or infinitives with both complements, but no children who produced both forms. Comparing this performance to that of NL children, only two 3-year-old NL children produced only monotransitive infinitives. All the 4- and 5-year-old NL children produced ditransitive infinitives (Eisenberg, 1997).

Of the three children with SLI who produced ungrammatical VtoV sentences with type 2 verbs, two produced VtoV sentences such as those in Example 8 with both *force* and *tell*. However, although many of the NL children produced ungrammatical VtoV infinitives with the later-appearing verb *force*, only six NL children produced such

Table 10 Number of participants (out of 8) producing each infinitive form with each verb type and referent choice

Sentence form and referent choice	*Type 1 want, like*	*Type 2 tell, force*	*Type 3 try, pretend*	*Type 4 ask, beg*	*Type 5 promise, threaten*	*Type 6 say, shout*	*All verbs*
NVtoV							
only Ns	4	1	5	2	2	0	0
only Ne	0	0	1	1	0	3	0
Ns + Ne	4	2	2	2	1	1	8
Total	8	3	8	5	3	4	8
NVNtoV							
only Ns	0	0	0	0	0	0	0
only N2	7	5	0	3	2	2	7
Ns + N2	0	0	0	1	1	0	1
Total	7	5	0	4	3	2	8
All infinitives	8	8	8	8	6	5	8

Ns: sentence subject selected to act out the complement verb
Ne: external (non-mentioned) referent selected to act out the complement verb
N2: second noun selected to act out the complement verb

sentences with the early-appearing verb *tell* and these children were aged 4;6 or younger (Eisenberg & Cairns, 1994).

8. a. *Bugs forces to jump.
   b. *Donald tells to find his toy.

Omission of the *to* infinitive marker was infrequent and occurred only on sentences in which there was no noun between the infinitive marker and complement verb. Three of the SLI participants omitted *to* only once in an infinitive with *beg*. One other participant omitted *to* three times with three different verbs. In contrast, there was only one NL child aged 4;2 who had omitted *to*, and this occurred in only one infinitive sentence (Eisenberg, 1989).

Meanings expressed by the infinitival sentences

In adult grammar, the only allowable referent for VtoV infinitives is the subject NP (Ns), except for verb type 6 (*say, shout*), which requires an external referent (Ne). Table 10 shows the number of children allowing each interpretation for their VtoV sentences. Only one of the children with SLI produced no reference errors on VtoV infinitives. All

the other children made at least one error of allowing an Ne meaning with verb types 1–5, as shown in Example 9, and one child also made the error of allowing an Ns meaning with a type 6 verb, as shown in Example 10.

9. a. #Mickey likes to throw the ball in the net. [enactment: Bert throws the ball]
   b. #Donald tries to go to sleep. [enactment: Mickey sleeps]
   c. #Donald begs to pick up Mickey. [enactment: Bert picks up Mickey]
   d. #Bugs promises to go on the swing without you. [enactment: Donald swings]

10. #Donald shouts to hug and then XXX. [enactment: Donald hugs Mickey]

For VNtoV infinitives, the only allowable referent for the complement subject in adult grammar is the second noun (N2) for verb type 1 (*want, like*), type 2 (*tell, force*) and type 6 (*say, shout*). All the participants who produced VNtoV sentences with these verb types allowed only the correct N2 interpretation. For verb type 5 (*promise, threaten*), the allowable referent in adult grammar is Ns but an N2 interpretation has been frequently attested to in child grammars (cf. Chomsky, 1969). Of the three children producing VNtoV forms with this verb type, two allowed only N2, as shown in Example 11, and the other allowed both interpretations. Verb type 4 (*ask, beg*) does allow both NI and N2 interpretations in adult grammar, but only one of the children who produced VNtoV forms with these verbs allowed both interpretations. All these non-adult interpretation patterns for mapping infinitive form to complement subject referent have been observed by some 5-year-old NL children (Eisenberg & Cairns, 1994).

11. * Bugs promises Donald to go. [enactment: Donald swings]

DISCUSSION

All eight of the 5-year-old children with SLI in the current study were productive for infinitives with a variety of main verbs, including four children who had produced no true infinitives or produced infinitives with only one or two main verbs in conversation (Eisenberg, 2003). All the children produced at least one infinitive sentence with an intervening NP between the main and complement verbs. However, three children were not productive for these later-developing infinitives but produced them with only one verb. Based on previous reports (Johnston & Kamhi, 1984; Leonard *et al*., 1997), it had been expected that the children with SLI would demonstrate frequent omissions of the *to* infinitive marker. However, only one of the children with SLI omitted *to* more than once, showing a 27% omission rate (on 3 out of 11 VtoV infinitive sentences).

There were eight verbs on the elicited production task that require an Ns interpretation on VtoV infinitives in adult grammar.[3] The children, however, did not demonstrate this reference constraint for all verbs but, instead, allowed external reference for VoV infinitives with some verbs. There was one SLI child who made this reference error with five different verbs and on 36% (5 out of 14) of the VtoV infinitives produced with these verbs. The other children with SLI showed this reference error with only one or two verbs, consistent with the pattern shown by all the NL children except for one of the younger ones. This child, aged 3;10, made this

Table 11 Patterns of delay in the infinitive productions by children with SLI

Production of VNtoV infinitives with too few main verbs ($N = 3$)
Production of only monotransitive infinitives with no production of ditransitive infinitives ($N = 2$)
Production of ungrammatical VtoV infinitives with both *force* and *tell* ($N = 2$)
Omission of the *to* infinitive marker more than once ($N = 1$)
Allowing external reference on VtoV infinitives with verbs other than *say* and *shout* ($N = 8$)
Allowing object reference on VNtoV infinitives with *promise* and *threaten* ($N = 3$)

reference error on four different verbs and on 20% (4 out of 20) of the VtoV infinitives produced with these verbs (Eisenberg, 1989). Thus, even the high frequency of this error for the one SLI child may not reflect an abnormal error frequency (as per Leonard, 1998) but may be a pattern that is shown by some 3-year-old children.

There has been considerable discussion in the literature about whether the pattern of language development by children with SLI is delayed or deviant (see, for instance, Leonard, 1972; Menyuk, 1964). Individually, each of the patterns shown by these children with SLI (see Table 11) seems to reflect a delay in the development of infinitives relative to what has been shown by NL children. That is, there was nothing in the infinitive productions of these children with SLI that has not previously been demonstrated by younger NL children.

Of particular note were errors that were not made by the children with SLI. None of the children with SLI produced VNtoV infinitives with the verbs *try* and *remember*, although they did produce VtoV sentences with *tell* and *force*. This suggests that, like NL children, the children with SLI were conservative in allowing sentences with both an infinitival and a noun phrase complement (Eisenberg & Cairns, 1984). None of the children allowed external reference on VNtoV sentences, although they did allow this meaning for VtoV infinitives. This suggests that, like NL children, the children with SLI followed the reference constraints of the adult grammar. Omissions of the *to* infinitive marker occurred only on VtoV infinitives and not with an intervening NP between the main and complement verbs, consistent with the developmental pattern reported by Bloom *et al*. (1984) for 2-year-old NL children. It does not seem to be the case, therefore, that these 5-year-old children with SLI showed any deviant patterns in their infinitive production. Rather, these children with SLI demonstrated patterns that have been shown by younger NL children.

Eisenberg & Cairns (1994) identified several aspects of infinitive acquisition that appear to be learned separately. The children with SLI in the current study appeared to have difficulty with some, but not all, these aspects. The basic infinitive structure itself did not seem to be a problem for these particular children since all eight of them produced infinitival complements with at least five different main verbs. However, other aspects which must be learned as a lexical property of specific verbs appeared

Table 12 Utterances produced by S6 (age 5;3)

Utterances with infinitival complements	*Utterances without an embedded clause*
Donald wants to stand up.	Bugs forces and Donald thinks it's the deep end.
Mickey wants Bugs to come in with him.	Mickey forces then he pushes him.
Mickey likes to swing real high.	Bugs tries and he got on top.
Mickey likes Bugs to throw the ball.	Bugs remembers and Mickey forgets.
Donald tells Bugs to find his toy.	Donald asks and Mickey says yes.
Donald tries to push him.	Mickey asks and he doesn't want Bugs to do it.
Donald begs help him carry the box.	Mickey promises and he doesn't do it.
	Bugs promises and he broke the promise.
	Bugs threatens and he gonna throw it on his head.
	Donald threaten and Mickey is scared.
	Bugs say 'maybe he gonna look under the blanket'.
	Mickey says and he doesn't want it.
	Donald shouts then Bugs is happy.

to present more difficulty for some of the children with SLI. Two of the children with SLI did not produce any infinitives with ditransitive verbs that take both a clausal and a phrasal complement. Three other children showed limited subcategorization for ditransitivity, producing VNtoV infinitives with only one ditransitive verb and otherwise using these verbs in simple or coordinated sentences without an embedded complement as shown for one child in Table 12. Another child did not produce VNtoV infinitives with verbs that take a lexical complement subject in adult grammar.

Since the current study looked only at 5-year-old children with SLI at a single point in time, it may be the case that more or even all of the children with SLI had had an earlier history of delay with the infinitive form that has resolved for some of these children. In addition, the current study involved a limited number of children with SLI. Further study involving a larger number of children and including longitudinal data might reveal difficulties with the infinitive form that were not demonstrated in the current study. In addition, it is intriguing that even the four children with SLI who had produced no true infinitives or shown limited productivity for infinitives with different verbs in conversation (Eisenberg, 2003) did produce the basic infinitive structure with different verbs on an elicited production probe. This suggests that the limited production of infinitives in conversation may in part reflect a problem with mobilizing syntactic knowledge (a performance issue) rather than a lack of knowledge per se (a competence issue).

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NOTES

1. I have used the convention of marking ungrammatical utterances with * and marking reference errors with #.
2. These are the verbs that were modelled by the examiner while telling the story. Some of these verbs were modelled with prepositions and these have been listed accordingly.
3. Since there were only two verbs that require external reference on VtoV infinitives and only two verbs that require an Ns meaning on VNtoV infinitives, the frequency of those types of reference error could not be compared between the SLI and NL children.

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