

Production of infinitival object complements in the conversational speech of 5-year-old children with language-impairment*

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ABSTRACT

The infinitive productions of eight 5-year-old children with Specific Language Impairment (SLI) were compared with the infinitive productions of 25 3- to 5-year-old children with normally-developing language (NL). The mean number of infinitives was the same for the SLI group as for the NL group. However, individual children with SLI produced no or few infinitives or showed limited productivity for this sentence form with different main verbs. It was not possible to conclude that infinitives are problematic for all children with SLI, as has been reported for verb inflections. Rather, difficulty with this sentence form seems to be an individual difference among children with SLI.

KEYWORDS

Acquisition of syntax; conversational development; MLU; morphological development; verbal complements

INTRODUCTION

Recent studies have shown that children with Specific Language Impairment (SLI) have particular difficulty with aspects of language that involve the use of verbs (Fletcher & Peters 1984, Gavin, Klee & Membrino 1993, Hadley 1998, Rescorla, Roberts & Dahlsgaard 1997). Children with SLI produce fewer different verb types than do typically-developing children (Conti-Ramsden & Jones 1997, Leonard, Miller &

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Gerber 1999, Rice & Bode 1993, Watkins, Rice & Moltz 1993), they require more exposures to learn new verbs (Oetting, Rice & Swank 1995), and they use new verbs less frequently than language-matched controls (Skipp 2001). 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. Other studies (Fletcher, Ingham, Schletter & Sinka 1997, Rice & Bode 1993) have suggested that children with SLI may rely more on high frequency general verbs, such as *make* and *do*, than on more descriptive verbs.

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 – *do*, *get*, *go*, *look*, *put*, *want* – that were used by all six children. The SLI children produced fewer different morpho-syntactic forms with these verbs and produced each morpho-syntactic form with fewer different verbs than did their younger siblings. The authors suggested that children with SLI may have difficulty generalizing morpho-syntactic forms to a variety of verbs. Of particular interest for the current project were the infinitive-taking verbs, *get*, *go* and *want*. All three of the younger siblings and two of the SLI children produced marked infinitives with *want* such as the utterance in (1). None of the SLI children produced a verbal complement with *got* but all three of the younger siblings produced either an unmarked infinitive such as (2a) without the *to* infinitive marker or a marked infinitive such as (3a). None of the SLI children produced a verbal complement with the verb *go* but two of the younger siblings produced either an unmarked infinitive such as (2b) or a marked infinitive such as (3b). The children with SLI in the study by Jones & Conti-Ramsden (1997) were, therefore, less productive with verbal complements – that is, they produced complements with fewer verbs – than their younger siblings, although matched for utterance length.

- (1) I want to build a big bridge.
- (2) a. Got mend that car.
b. She going eat it over there.
- (3) a. Got to move him up.
b. But that one going to be yours.

Acquisition of infinitives

Children 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 (2) above or in catenative form as in (4) below. 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 (1) and (3) above, are of the form [Noun-Verb-to-Verb] and involve an unstated complement subject that is coreferential with the subject of the main verb (Bloom *et al.* 1984, Limber 1973).

- (4) a. I wanna read book.
b. I gonna get it.

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 of the form [Noun-Verb-Noun-to-Verb] with an intervening noun phrase between the main and complement verb, such as those in (5) below, are a later development. Limber (1973) reported their appearance at around 2;5, but Bloom *et al.* (1984) reported that these forms were not produced until MLU was 3.5, which corresponds to about 3;3 (using the reference data of Miller & Chapman 1981). Eisenberg (1997) reported that these later-developing infinitive forms continue to be produced infrequently even by 5-year-old children.

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

Production of infinitives by children with SLI

The verbs that were looked at in the Jones & Conti-Ramsden (1997) study included *want*, *go* and *get*, three of 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 SLI children in that study 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. In a study of 14 older children with SLI, aged 7–10 years, King (2000) reported that the SLI children produced as many verbs with object complements as typically developing children. However, the SLI children produced more verbs with zero

complementation and they produced fewer verbs with either a direct object noun phrase (NP) or prepositional phrase (PP) or with both an NP and PP complement. This limited production of verbs with two phrasal complements is particularly interesting since this suggests that children with SLI might show more limited production than their typically-developing peers of ditransitive infinitives. These are infinitives with two complements, such as the sentence in (6), that have both an NP object (*me*) and an infinitival object (*to clean my room*).

(6) Mommy told me to clean my room.

No study has focused on the infinitive sentences produced by children with SLI. However, 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 of the *to* infinitive marker on a sentence completion probe than did the age-matched and MLU-matched groups. Leonard *et al.* (1997) did not report usage of the *to* infinitive marker in conversational speech because this morpheme did not meet their criterion of 10 obligatory contexts by more than half of each subject group. 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* (Lee 1974), the category in which infinitive sentences are scored. Johnston & Kamhi (1984) concluded that the *to* infinitive marker seemed particularly vulnerable to error by children with SLI.

The present study investigated the infinitives produced by 5-year-old children with SLI in their conversational speech to determine the extent to which this might be an area of difficulty. 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, as well as omission of the *to* infinitive marker. In addition, it was also possible that the children with SLI might not produce infinitival complements at all. The following questions were asked: (a) Do 5-year-old children with SLI produce infinitival complements? (b) If infinitival complements are used, are they produced with a range of different verbs? (c) Are the infinitival complement sentences of these children with SLI limited to a few high frequency verbs? (d) Are infinitival complements with an intervening NP between the main and complement verbs emerging for these children with SLI? (e) Do these children with SLI omit the *to* infinitive marker?

TABLE 1. *Utterance length data for the children with SLI*

Participant	Age	MLU	SD from mean	% utterances \geq 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%

METHOD

Participants

Participants included eight children between the ages of 5;1 and 5;11 (mean age 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 parental and teacher report, there were no concerns about intellectual or psychological functioning.

The infinitive productions of the SLI children were compared with data from a group of 25 children with normal language (NL) between the ages of 3;7 and 5;4 (mean 4;3) whose infinitive productions had been previously reported in Eisenberg & Cairns (1994) and Eisenberg (1997). All the SLI children 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 they would be expected to be producing object complements (Bowerman 1979, Limber 1973). The performance of each of the SLI children was compared with the performance ranges for the entire NL group and, where different from

the entire NL group, for the seven oldest NL children (age range 4;8–5;4, mean 5;1), hereafter referred to as the 5N group.

Procedure

A language sample of at least 100 utterances was elicited from each child during play in a clinic room with a graduate student assistant (GA). There were four sets of toys used during the sampling session. One set was introduced at the start of the session and then an additional set of toys was brought out every 7–8 minutes, approximately. The children were free, however, to use either the new toys or any of the toys presented earlier.

The language samples for the NL children had been obtained during mother-child interactions. We chose not to use mother-child interactions for the SLI children because of the large number of questions asked by the mothers. Since language-impaired children tend to be less talkative and more difficult to understand, there may be a tendency to ask them more questions to elicit more utterances and check understanding (Yoder, Davies & Bishop 1992). However, children with SLI have been reported to produce more elliptical responses to questions than do NL children (Johnston, Miller, Curtiss & Tallal 1993) and this might have reduced the opportunities for producing complete utterances with complements. The interactant was, therefore, a GA trained to follow the child's lead and make comments rather than ask questions.

The sample was transcribed by the GA who had elicited the sample. A second GA independently transcribed approximately 25% of each sample. Point-by-point reliability for word transcription was at least 94% for each of the samples. Another GA reviewed all of the transcripts and manually marked all the utterances that either contained two or more lexical verbs or that involved an omitted main verb *be* and a second lexical verb. This was reviewed by the author for two of the samples. Errors in marking utterances involved over-inclusion of sentences with an auxiliary verb and only one lexical verb, but there were no errors of omitting qualifying sentences. The author then further narrowed the utterance set to include only infinitive sentences.

Infinitive sentences were separated into object complements and non-complementing infinitives. Infinitival object complements were defined as infinitival clauses that functioned as the direct object of the verb in the main clause, as in (7). Non-complementing infinitives, such as the sentence in (8), functioned in a grammatical role other than the direct object of the main verb. Only the object complements were included in the current analysis. Only infinitives that included both a main verb and a complement verb were included in the analysis. Utterances

without a complement verb such as 'I don't want to' were, therefore, excluded. Since catenative forms might function as modals rather than as main verbs with an embedded complement, the infinitive sentences were further separated into catenative forms and true infinitives. Catenative forms were defined as those productions in which [ə] was attached to the main verb and which, therefore, did not provide a context for the *to* infinitive marker, as in (4) above. The term true infinitive was used for productions that provided a context for the *to* infinitive marker, whether or not it was actually produced, as in (2) and (3) above. True infinitives were divided into [Noun-Verb-*to*-Verb] sentences such as the sentence in (7), hereafter referred to as single-noun infinitives, and [Noun-Verb-Noun-*to*-Verb] sentences such as (9), hereafter referred to as two-noun infinitives.

(7) We need to have dinner.

(8) It's not for it to cook.

(9) How you get this to work?

RESULTS

Number and type of infinitive sentences

Table 2 shows the number of infinitive sentences produced by the SLI and NL children. Data have been separately reported for catenative forms and true infinitives as well as for the total of both forms combined (referred to as 'all infinitival complements'). As can be seen in this table, the mean number of infinitives produced was about the same for both groups. The proportions of true infinitives and catenative forms was also the same for both the NL and SLI groups, with 56% of the infinitive sentences being true infinitives and 44% being catenatives. The older NL children in the 5N group, however, actually produced a lower proportion of true infinitives, with 55% of their infinitives being catenatives and only 45% being true infinitives.

The majority of the true infinitives were single-noun forms with few two-noun infinitives being produced by either group. Each child in the 5N group produced at least four single-noun infinitives, although there were NL children aged 4;6 and younger who produced only two or three. In contrast, the youngest of the SLI children (S8) produced no true infinitives at all, and two of the other SLI children (S3 and S6) produced only one or two single-noun infinitives. Only 10 of the NL children and three of the SLI children produced any two-noun infinitives, and only one NL child produced more than two of these infinitive forms.

TABLE 2. *Number of infinitives produced*

Participants	Age	All infinitival complements	Catenatives	True infinitives	Single-noun infinitives	Two-noun infinitives
S1	5;7	17	5	12	12	0
S2	5;8	34	13	21	20	1
S3	5;10	3	2	1	1	0
S4	5;2	11	3	8	7	1
S5	5;11	12	2	10	10	0
S6	5;3	5	3	2	2	0
S7	5;5	15	6	9	7	2
S8	5;1	15	15	0	0	0
SLI group:	total	112	49 (44%)	63 (56%)	59	4
	mean	14.0	6.1	7.9	7.4	0.5
	range	3–34	2–15	0–21	0–20	0–2
NL group:	total	324	142 (44%)	182 (56%)	164	18
	mean	13.0	5.7	7.3	6.6	0.72
	range	6–37	0–20	2–17	2–15	0–3
5N group:*	total	107	59 (55%)	48 (45%)	48	0
	mean	15.3	8.4	6.9	6.9	0
	range	8–24	2–19	4–12	4–12	0

* includes only the seven oldest NL children (age range 4;8–5;4, mean 5;1)

Verb use in infinitive sentences

The verbs *go*, *want* and *have* were the most frequent infinitive-taking verbs for both SLI and NL groups, both in terms of the number of children who used each verb and the number of infinitives produced with each verb (see Table 3). The NL children produced all three of these main verbs, as well as the verb *get*, both as catenatives and in true infinitives. Like the NL children, the SLI children used *want* in both catenatives and in true infinitives. However, *go* was used only in catenative form and *have*, with one exception, was produced only in true infinitives. All the less frequent verbs (listed as ‘other verbs’ in Table 3) that were used by the SLI group were also used by children in the NL group. All these less frequent main verbs were produced only in true infinitives. However, it should be noted that most of these verbs cannot be produced in catenative form in adult English.

The three high frequency verbs combined accounted for the majority of infinitives produced by the children in both groups. Over 85% of the

TABLE 3. *Usage of the most frequent infinitive-taking verbs*

Verb	SLI			NL		
	No. children (n = 8)	All infinitival complements	Catenatives	No. children (n = 25)	All infinitival complements	Catenatives
<i>go</i>	8	30	0	23	94	60
<i>want</i>	7	22	10	20	62	17
<i>have</i>	4	24	23	21	96	44
Proportion of total productions		68%	52%		78%	85%
Other verbs used with infinitives						
Other verbs used with infinitives			Other verbs used with infinitives			
<i>forget</i>		<i>suppose</i>	<i>allow</i>	<i>learn</i>	<i>show</i>	
<i>get</i>		<i>use</i>	<i>forget</i>	<i>like</i>	<i>suppose</i>	
<i>know</i>			<i>get</i>	<i>love</i>	<i>tell</i>	
<i>like</i>			<i>help</i>	<i>mean</i>	<i>try</i>	
<i>need</i>			<i>know</i>	<i>need</i>	<i>use</i>	

TABLE 4. *Number of different verbs used by SLI and NL children in true infinitives (I) and catenative forms (C)*

Subject	Total*	T	C
S1	3	2	2
S2	7	5	3
S3	2	1	1
S4	9	7	2
S5	5	4	2
S6	2	1	1
S7	4	3	2
S8	3	0	3
SLI group: mean	4.4	2.9	2.0
range	2-9	0-7	1-3
NL group: mean	4.5	3.7	1.8
range	2-9	1-9	0-4

* Some verbs were used in both catenative form and as true infinitives, so the sum of the T and C columns may be more than the total number of verbs

catenative forms produced by each group involved these three verbs. For production of true infinitives, however, these high frequency verbs accounted for 72% of the utterances produced by the NL group but accounted for only 54% of the true infinitives produced by the SLI group.

Table 4 shows the number of verbs used by the SLI and NL children. With one exception, the NL children produced infinitives with at least three different verbs and produced true infinitives with at least two different verbs. Each child in the 5N group produced infinitives with at least four different verbs and produced true infinitives with at least three verbs. In contrast, two of the SLI children (S3 and S6) produced infinitives with only two different verbs and only one of these verbs was produced in a true infinitive. Another SLI child (S1) used three different verbs but produced true infinitives with only two of these verbs. These SLI children were comparable to some of the younger NL children, aged 4;0 or less, who produced true infinitives with only one or two verbs. One other SLI child (S8) also used three different verbs

but produced only catenative forms, not producing true infinitives with any verb.

Production of the 'to' infinitive marker

Eight of the NL children omitted the *to* infinitive marker in up to three sentences each for a total of 15 instances. Omissions of *to* by NL children occurred with the verbs *want*, *have*, *go*, *get* and *tell*. With the exception of *tell*, these were all higher frequency verbs that were produced by the children in both catenative and true infinitive sentences. With the exception of one child aged 4;6, these omission errors were only produced by children aged 4;0 and younger. None of the children in the 5N group produced any omissions of *to*. Only one of the SLI children (S7) showed any instances of *to* omission, and these were in two sentences with the verb *want*. Similarly to the NL group, this was the only high frequency verb produced by the SLI children in both catenative and true infinitive forms. Over half the *to* omissions produced by the NL group were with the verb *go*. This verb was, however, only produced in catenative form by the SLI group so that there would not have been any opportunities for either producing or omitting the infinitive marker with this verb.

DISCUSSION

The SLI group showed the same frequency of usage as the NL group in the number of infinitival sentences produced. There were no SLI children who did not produce any infinitival complements. Several of the SLI children, however, produced no or few true infinitives. These children were limited to producing mostly or only catenative forms.

There were two SLI children who produced true infinitives with only one verb and one other SLI child who produced no true infinitives. This is in contrast with the 5N children, all of whom produced true infinitives with at least three different verbs, although there were some NL children aged 4;0 and younger who produced true infinitives with only one or two verbs. The infinitive productions of these SLI participants was, thus, more like younger NL children than like their age peers. It was not possible to determine any differences between the NL and SLI children in their usage of two-noun infinitives because of the low usage of these forms by either group. This is consistent with the findings previously reported by Eisenberg (1997) that usage of this later-developing infinitive form is infrequent in conversation and is not related to age and language level.

The SLI and NL groups showed the same set of high frequency

verbs: *go*, *want* and *have*. These were the same verbs identified by Bloom *et al.* (1984) as the earliest infinitive-taking verbs produced. These three verbs accounted for the majority of infinitives produced by both SLI and NL children. This is consistent with the findings of Rice & Bode (1993) which show that children rely heavily on a small set of high frequency verbs. However, whereas Watkins *et al.* (1993) found that high frequency verbs accounted for the same percentage of verb types and verb tokens for their SLI and NL children, in the current study the proportion of true infinitives produced with the high frequency verbs was higher for the NL children than for the SLI children. What this suggests is that the SLI children were already producing catenative forms with their earlier infinitive-taking verbs and did not as readily produce these same verbs with the *to* infinitive marker.

Omissions of the *to* infinitive marker were infrequent. These errors were only produced by NL children aged 4;6 and younger, and only one of the SLI children produced this error. Most of these omissions were with the high frequency verbs that occurred in both catenative and true infinitive forms. Interestingly, the one SLI child (S7) who produced omissions of the *to* infinitive marker was one of the more productive with the infinitive form. S7 produced more infinitives than most of the 5N children. His productivity in terms of number of main verbs used in true infinitives was also comparable to the 5N children. S7 produced the main verb *want* either in catenative form or with an omitted *to*. Thus, he did not produce this verb with the infinitive marker. This finding, as well as the lower proportion of true infinitives with the high frequency early verbs, is consistent with the developmental course described by Bloom *et al.* (1984) for younger NL children that true infinitives with the *to* infinitive marker first emerge in later-acquired verbs rather than with earlier-learned complement verbs that had been previously produced in catenative form.

Looking at the performance of individual children, three of the SLI children showed limited usage of the infinitive form relative to even the 3-year-old NL children. Although producing a large number of infinitive sentences, S8 produced only catenative forms and did not produce any true infinitives. Two other children, S3 and S6, produced fewer infinitives overall than even the 3-year-old NL children and produced true infinitives with only one verb each. A fourth child, S1, although producing a large number of true infinitives, produced these infinitives with only two main verbs. Although comparable to the verb usage of some of the 3- and 4-year-old NL children, this is less productive than the performance of the 5-year-old NL children. The

remaining four SLI children demonstrated production of infinitive sentences that was comparable to their age peers.

The limited performance of the four children cannot be attributed to their age. Although two of the children, S6 and S8, were among the youngest of the SLI children, another one of the younger participants, S4, was highly productive with infinitives, producing these complements with nine different main verbs. The limited performance with infinitives was also not related to grammatical development as measured by MLU, since two of these children showed a higher MLU, and S4, the most productive of the SLI children for infinitives, had the lowest MLU of the SLI group.

The individual performances of the SLI children thus showed these children to be heterogeneous with respect to their production of infinitives. It is, therefore, not possible to conclude that problems with infinitival complements are a necessary feature of language impairment, as has been suggested for deficits with verb morphology (Bedore & Leonard 1998, Rice & Wexler 1996). Rather, the infinitive form seems to be problematic for only some children with SLI.

Several caveats are, however, in order. 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 had an earlier history of difficulty with the infinitive form that has resolved for some of these SLI children. In addition, the current study involved a limited number of children with SLI and looked only at conversational speech. Further study involving a larger number of children, involving larger samples or even alternative data such as elicited production responses, and including longitudinal data might reveal difficulties with the infinitive form that were not demonstrated in the current study. In addition, it would be worthwhile to look at other forms of complementation to determine if children with SLI have a unique problem with infinitives or whether this is part of a larger deficit.

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