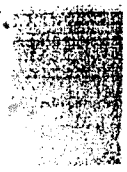

Clinical Focus

Eliciting Verbs From Children With Specific Language Impairment

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The focus of assessment and intervention is often aimed at increasing the lexical skills of young children with language impairment. Frequently, the use of nouns is the center of the lexical assessment. As a result, the production of verbs is not fully evaluated or integrated into treatment in a way that accounts for their semantic and syntactic complexity. This paper presents a probe for eliciting verbs from children, describes its effectiveness, and discusses the utility of and problems associated with developing such a probe.

Assessment and intervention efforts for young children with language impairments often focus on the lexicon. Early lexicons consist of a variety of word types, notably nouns and verbs. Recently, studies suggest that verbs may be a problematic area for children with specific language impairments (SLI). During preschool and early elementary age, these children possess less diverse verb repertoires (Watkins, Rice, & Moltz, 1993) and rely on general all-purpose (GAP) verbs such as *get*, *make*, and *go* (Rice & Bode, 1993). Furthermore, children with SLI also have been found to produce semantic verb errors (Kelly & Rice, 1992; Rice & Bode, 1993). In comprehension probes, these children do not interpret change-of-state verbs in the same manner as age-comparison peers (Kelly & Rice, 1994). Their identification of verbs in quick incidental learning contexts is not maintained when compared to nouns and to the verbs of their age-comparison peers (Rice, Oetting, Marquis, Bode, & Pae, 1994). In order to assess and, if appropriate, select verb choices for lexical intervention, the speech-language pathologist needs a systematic way of evaluating the child's current system of verb use.

Several options are available for evaluating a child's lexicon. Standardized word checklists or vocabulary tests that require picture labeling are typically chosen. Unfortunately, these tools are either heavily noun biased and/or limited to the single word level. As such, verbs are either not evaluated or are evaluated in a static context at the one-word level. A further limitation of standardized testing is that the semantic and syntactic context of verbs is not considered in the selection of verb stimuli. Verbs can occur in a range of transitivity contexts and belong to a large number of semantic classes. Unfortunately, standardized tests do not identify or capture this range of possibilities.

Another assessment technique for evaluating word use available to the speech-language pathologist is determining type-token ratios from language samples. In particular, computing verb type-token ratios from language samples has been shown to be an important indicator of lexical diversity (Watkins et al., 1993). However, the use of verb type-token ratios, although informative about the diversity of verb use, lacks the systematic control of all the variables that contribute to a verb's complexity (i.e., syntactic and semantic complexity) and tells us little about the meaning the child has ascribed to a particular verb.

A final way of assessing word production is through informal probes. The benefit of devising an informal probe for assessing verbs is that the probe can be designed to capture the dynamic contexts of verbs, which takes into consideration the semantics of the verb as well as its syntactic type. In this paper, we report on an informal probe developed for eliciting verbs from a variety of semantic categories and diverse sentence contexts. Such a probe could be easily used or adapted by clinicians interested in their client's ability to produce verbs.

The Verb Elicitation Probe

We developed an informal probe to assess verb production as part of a larger study of verb alternation. Of primary interest was a child's ability to label an action event. In developing the probe, several factors were considered.

These included a verb's semantic characteristics, the syntactic contexts in which the verb could occur, and its frequency of use by children. The extent to which a verb could be depicted or demonstrated was also an important consideration throughout the discussion of a particular verb. Finally, because the probe was designed for research purposes to be used with young children who spoke English as well as group of children who spoke K'iche', a language spoken in Guatemala, we needed to consider cultural factors in how we represented actions and manipulables.

Semantic category was determined based on the work of Pinker (1989) and Levin (1993). These investigators suggest that verbs may be learned and organized in the lexicon according to their semantic category. Although there are many semantic categories from which to choose (see Levin, 1993), we selected five because of other variables (e.g., depiction and syntactic type). We selected these five semantic categories: change of state (e.g., cut, fold), contained motion (e.g., stay, bounce), volitional action (e.g., throw, dance), expression (e.g., cry, sing), and directed motion (e.g., go, leave). Change of state verbs are those that undergo a physical change as a result of the action. Contained motion verbs keep the object that is moving in a small, confined area. Volitional action verbs are those that are internally initiated and motivated. Expression verbs are those that result in a vocalization and/or reveal the emotion of the participant. Lastly, directed motion verbs are those verbs of motion that have a specific path and/or endpoint.

Verbs rarely occur in isolation; rather, sentences are built around verbs. Thus, the argument structure of a verb, or its syntactic type, should be considered when assessing verb production. Not all verbs can occur in the same syntactic contexts. We examined four syntactic verb classes: fixed transitive, fixed intransitive, causative, and antipassive.

Verbs that are fixed transitives can only occur in transitive and passive contexts. For example, *cut* can be produced in sentences with a direct object: "Charlie *cut* the paper," or with the passive form: "The paper *was cut*." The direct object context indicates a cause agent; in the example it is *Charlie*. The passive form is used to achieve an intransitive context ("The paper was cut"), indicating the result of the action.

In contrast, a fixed intransitive verb, such as *laugh*, can only be produced in intransitive sentence contexts and sentences with periphrastic clauses, such as "Natelise *laughed*" or "Stan *made her laugh*." Intransitive contexts are those without a direct object that indicate the result state of some action. The periphrastic clause (i.e., *made* + clause) is a way of achieving a transitive context indicating a cause agent.

Other verbs, known as causative alternates, can vary freely between intransitive and transitive contexts using a lexical alternation, such as "Debbi *stopped* the car" and "The car *stopped*." Finally, antipassive verbs can occur in transitive and intransitive contexts, yet they do not lexically alternate similarly to the causative alternate verbs. That is, they cannot alternate by having the direct object serve as the subject. A causal relationship can only be established by using a passive construction. For instance, the verb *climb* can be produced in both transitive and intransitive contexts ("Ian *climbed*" and "Ian *climbed* the fence"). However, *climb* cannot lexically alternate to result in *"The fence *climbed*." Instead, the passive must be used ("The fence *was climbed*").

An easy way to determine a verb's syntactic type is to try to alternate the verb from a transitive context (with a direct object) to an intransitive context (without a direct object). For example, the verbs *drop* and *fall* seem very similar with respect to semantic properties. Both involve downward motion. However, these verbs do not share the same syntactic type. You can say "I *dropped* the pen" and "The pen *dropped*" by moving the direct object to the subject position. In contrast, although the intransitive form of *fell* is acceptable, "The pen *fell*"; the transitive form, "I *fell* the pen," is not. Thus, *drop* is a causative alternate verb, whereas *fall* is a fixed intransitive verb. Interestingly, many children as they are acquiring their verb system will make errors such as "I *felled* it." These errors are thought to be reflections of the child not yet understanding the syntactic privileges of the verb or its range of semantic distinctions (Bowerman, 1974; Lord, 1979; Pinker, 1989).

The frequency of use of each verb was determined using the oral spoken word norms of Hall, Nagy, and Linn (1984). Hall et al. provide frequency for the production of 400,000 words. The data were derived from Caucasian and African-American preschoolers from working class and middle class families between 4;6 and 5;0 (years;months). In their study, each child was recorded for 5 hours over a 2-day period at both home and school with a variety of interactants. The frequency of each verb was derived from the data of Hall et al. and our verb list was divided into low- and high-frequency verbs. We divided the verbs into two groups based on the median frequency. The following are the proportions of high-frequency verbs in each syntactic type and semantic category: Fixed transitives [1.0 (3/3)]; fixed intransitives [.77 (10/13)]; causatives [.50 (9/18)]; antipassives [.55 (5/9)]; change of state [.5 (6/12)]; contained motion [.62 (5/8)]; volitional action [.77 (10/13)]; expressive [.80 (4/5)]; and directed motion [.40 (2/5)].

In our larger research program, we administered the verb probe to children who spoke K'iche' as well as children who spoke English as their native language. Because the same verb probe was to be used with both groups of children, cultural factors were considered in the process of verb selection. For example, we used Native American toy figures for some of our items to be consistent with the Indian culture in Guatemala. We also opted not to use a Sesame Street figure dressed as a police officer because of the potential negative response to uniformed individuals in the villages of Guatemala. Field testing in Guatemala revealed several differences in the way English and K'iche' lexicalize motion events. For example, K'iche' uses three distinct verbs to describe the action of breaking a stick by hand, breaking a stick across one's knee, and breaking a stick by hitting it against the ground.

Because we wanted the elicitation probe to capture the

dynamic qualities of verbs, small manipulable figures and toys were chosen rather than pictures. We experimented with which verbs we could depict. Depictability involves how well the verb could be represented with an overt action. Mostly, we sought the action and prop that would highlight the action itself. This resulted in the exclusion of some verbs, such as statives (*want*, *know*, *like*). These verbs were deemed much harder to portray or act out than action verbs such as *throw* or *walk*.

In an effort to sample a large range of verbs in a short period of time, we strove to maximize the child's attention to probes by minimizing the amount of time it took to administer the probe and by making the probe as interesting as possible. We saved time by having short elicitation questions and action scenarios. With one set of verbs, primarily the directed motion verbs, we opted for a narrative about three pigs coming and going, entering and leaving houses, in an effort to maintain the child's interest. Occasionally, after the presentation of a probe item, we allowed the children to do the action on their own (i.e., blow bubbles and pop them or make their own creation with Play-Doh) to maintain their interest in the probe.

In all, a total of 43 verbs were selected for semantic category, syntactic type, frequency of use, cultural considerations, and depictability (see Table 1). For each verb, we had a script that set up the action scene and asked a set question to elicit the verb. The script, props, and actions for the probe are provided in Appendix A.

The resulting verb elicitation probe was piloted with both children and adults. Because previous studies have shown that verbs may be a vulnerable area for children with specific language impairment (SLI), we predicted that these children would perform similarly to their language-comparison group, yet poorer than their age-comparison group. We expected the adults to perform the probe at high levels of proficiency.

Preliminary Study of the Verb Elicitation Probe

Participants

Seven children with SLI and two comparison groups [7 children developing typically with similar ages (AC) and 7 children with comparable language skills (LC)] participated in this preliminary study. The children with SLI and the children in the age-comparison group ranged in age from 5;1 to 6;7 years. The children in the language-comparison group ranged from 2;6 to 4 years of age. Table 2 displays the characteristics of the children.

The children with typical development were required to pass the Fluharty Language Screening Test (Fluharty, 1978) and a hearing screening. A language sample was collected and the Expressive One-Word Picture Vocabulary Test (EOWPVT) (Gardner, 1990) was administered. Language samples were collected during a 45-minute play session using the same toys across all children. The SLI and language-comparison group were within .3 on their Developmental Sentence Scores (Lee, 1974). DSS was used rather than Mean Length of Utterance as a matching index because the children with SLI produced MLUs (e.g., >3.5) or were at ages (e.g., >5 years) at which reliability of MLU for matching has been questioned (Klee, Schaffer, May, Membrino, & Mougey, 1989; Scarborough, Wyckoff, & Davidson, 1986). Following Lee's procedures (1974), Developmental Sentence Scores were based on the child's first 50 unique utterances that contained both a subject and a predicate.

Questionnaires concerning the children's developmental milestones and medical history were obtained from the parents. None of the typically developing children or the children with SLI demonstrated neurological, hearing, motor, cognitive, or emotional/behavioral disorders.

The children identified as SLI were enrolled in Language Preschool or Language Kindergarten in the public schools. These children received a comprehensive assessment of their language abilities before participating in the study. Six of the seven children with SLI were male and had significant impairment of syntactic and morphological abilities as measured by the Structured Photographic Elicited Language Test–II (Werner & Kresheck, 1983) and Developmental Sentence Scoring analysis (Lee, 1974). Developmental Sentence Scores were all below the 10th percentile based on the children's ages. The same procedures were used for eliciting language samples and computing DSS as were used for the language-comparison group. All of the children except for Child 4 with SLI

TABLE 1. Verb stimuli.

Syntactic Type	Semantic Category				
	Change of State	Contained Motion	Volitional Action	Express	Directed Motion
Fixed Transitive	**cut**		**put, throw**		
Fixed Intransitive		**stay**	**look, walk, sleep, dance**, swim	**talk, cry, laugh,** roar	**go, come,** enter
Causative	**break, open, pop, stop,** close, tear, smash, boil, loosen, fold	**turn, drop, move, roll,** float, bounce, wind	**fly**		
Antipassive	**wash**		**eat, drink, climb,** sweep, follow	**sing**	leave, return

Note. High-frequency verbs are boldfaced.

TABLE 2. Participant characteristics of children with SLI.

Subject	Gender	Age	Nonverbal Score	SPELT-II	VTTR	DSS	EOWPVT	TACL
1	M	6;7	98	-2.33	.44	6.08	108	WNL
2	F	6;2	101	-1.00	.49	8.24	95	WNL
3	M	5;7	104	-2.33	.52	5.27	102	-1.00
4	M	5;2	90	-2.33	.42	3.10	78	-1.64
5	M	5;3	87	-2.33	.56	4.44	91	-1.88
6	M	5;7	99	-2.33	.30	4.24	95	-1.04
7	M	5;2	107	-2.33	.46	6.26	87	WNL

Age Comparison
Children With Typical Language Development

Subject	Gender	Age	EOWPVT
1	M	6;6	121
2	F	6;2	117
3	M	5;9	115
4	M	5;1	115
5	F	5;3	129
6	F	5;8	128
7	M	5;1	81

Language Comparison
Children With Typical Language Development

Subject	Gender	Age	DSS	EOWPVT
1	F	3;5	6.16	110
2	M	4;0	7.92	139
3	M	3;6	5.6	117
4	M	2;6	3.4	102
5	M	2;10	4.24	114
6	F	2;6	4.28	107
7	M	3;7	6.12	121

Key:

Gender = *M*ale or *F*emale.

Nonverbal = (Columbia Mental Maturity Scales) Mean is 100, standard deviation is 16.

SPELT-II (Structured Photographic Expressive Language Test) = ± standard deviation.

DSS (Developmental Sentence Score) = All scores reported are clinically significant (i.e., below the 10th percentile).

TACL (Test of Auditory Comprehension of Language) = WNL is within normal limits; others are - standard deviation.

EOWPVT (Expressive One Word Picture Vocabulary Test) = Mean is 100, standard deviation is 15.

VTTR (Verb Type-Token Ratio) = Data from Watkins et al. (1994) provide a Mean for Children With SLI at .42, Mean for Age Comparisons at .48, and Mean for Language Comparisons at .50).

displayed age-appropriate expressive vocabulary skills as measured by the EOWPVT. However, when the raw scores from the EOWPVT were compared across groups, significant differences were evident. The age-comparison group scored higher than both the language-comparison group and the children with SLI on the EOWPVT: $T = 2$, $p < .025$ one-tailed; $T = 1$, $p < .025$ one-tailed. There was no difference between the language-comparison group scores and the scores of the children with SLI ($T = 3$, $p > .05$ two-tailed).

Four of the children with SLI (3, 4, 5, and 6) had a receptive component to their language problem as determined by the Test of Auditory Comprehension of Language–Revised (Carrow-Woolfork, 1985). All of the children with SLI displayed nonverbal abilities within normal limits as measured by the Columbia Mental Maturity Scale (Burgemeister, Hollander Blum, & Lorge, 1972).

A group of ten adults with typical language also were administered the verb elicitation probe to provide an upper developmental index. The adults ranged in age from 19 to 30 years of age, with half of the group consisting of males and half consisting of females. These adults reported no history of language impairment and no current language impairment.

Procedure

The 43 verbs described earlier in this paper were elicited by having the examiner act out an action with manipulable objects. Scripted dialogue was used to elicit each verb in a consistent manner. The probe administration time ranged from 15 minutes for some of the older children and adults to 45 minutes for the youngest children. Responses were audio-recorded, and a second examiner made online transcriptions of responses. The responses were scored as correct or incorrect. In order for a response to be correct, the child had to produce the target verb. The use of morphology marking tense was not counted against the child. For example, regardless of whether the response was *walk*, *walks*, *walked*, or *walking*, for the verb *walk*, a correct response was tallied. An incorrect response was: (a) a synonymous verb or an onomatopoeic response, (b) a semantically similar verb, (c) an adjective describing the result of the action, (d) a probe-related response, (e) an off-target response, or (f) no response. A trial was

readministered in situations where it appeared that the child was labeling some other action associated with the probe that occurred as the result of examiner error. For example, if a pig figure fell over while entering the house, and the child responded with *fell over* versus *enter*, we readministered that verb item. Other items, such as *sing*, sometimes needed to be readministered because the song the pig sang sounded like a nursery rhyme to some children, rather than a song. Thus, if a child's incorrect response was suspected to be due to some other aspect of the probe manipulation, the item was readministered.

Reliability

Initial transcription of the language samples for all children was completed by the third and fourth authors with the aid of online transcriptions. The first author reviewed each tape for accuracy, and the transcription was corrected. Next, an independent transcriber blind to the details of the study listened to each of the children's samples and noted disagreements with the first transcription. Disagreements were then reviewed by the first author and the independent transcriber. Those instances where agreement could not be achieved were counted as disagreements. A transcription reliability of 98% was computed for the children with SLI, the language-comparison group, and the age-comparison group. This high percentage is most likely a reflection of the multiple passes made on the initial transcription, as well as the relative intelligibility of the children in the study.

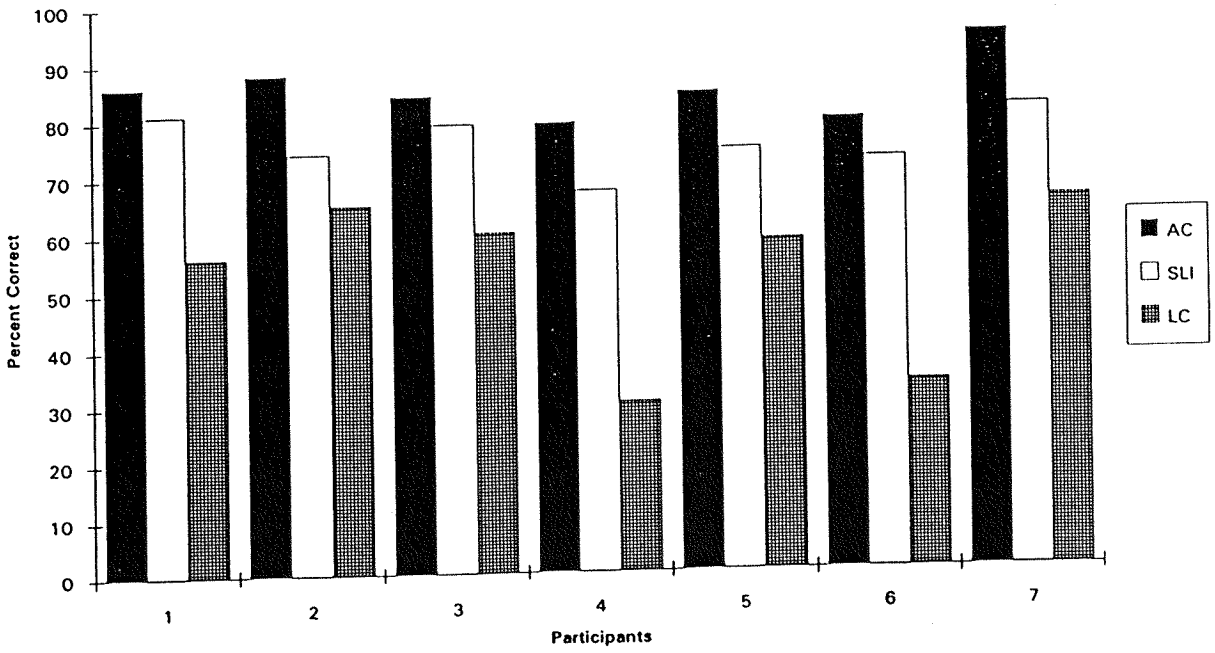
Twenty percent of each child's verb elicitation probe audio-recording was randomly selected to determine the scoring reliability. An independent judge listened to 9 items administered per child, or 63 items per group and 189 items overall. Reliability was 98.4% for each of the three groups of children.

Results

We found that the probe elicited verbs differently from each of the three groups of children (Cochran $Q = 25.57$, $p < .001$). Figure 1 shows that the age-comparison peers consistently performed more accurately than the children with SLI or the language-comparison group (Wilcoxon Matched-Pairs Signed-Ranks Tests, $T = 0$, $p < .01$, one-tailed; $T = 0$, $p < .01$, one-tailed). The children with SLI outperformed their language-comparison group ($T = 0$, $p < .02$, two-tailed). As a group, the age comparisons succeeded in labeling the verb event correctly 84% of the time compared to 76% for children with SLI, and 52% for the language-comparison group. The adults performed at a high level of proficiency with a 92% correct labeling of verbs.

Incorrect responses took a variety of forms that included: synonymous verbs, verbs related to the general scenario presented, resultive states of the verb's action, off-topic responses, and no responses. Synonymous verbs were defined as those that could be substituted for the target verb given the scenario presented in the probe. This required the synonymous verb to also be consistent with the target verb's transitivity. For example, *rip* was determined to be synonymous with *tear*. Both *rip* and *tear* are causative alternative verbs. A list of synonyms that were elicited in this study are provided in Appendix B. Interestingly, both typically developing groups of children used noun-for-verb substitutions that served as verb synonyms.

FIGURE 1. Correct verb productions.



For example, *brooming* and *brushing* were produced for *sweeping*, and *scissoring* was used for *cutting*. Similar novel errors were not observed in our small sample of children with SLI.

It is possible that if we had included synonyms as correct responses, it may have led to a ceiling effect in the probe. This was true only for the older age-comparison group and the adult group. The language-comparison children and the children with SLI produced the fewest synonym errors, accounting for 30% and 36% of their errors, respectively. In contrast, synonyms accounted for 81% of the errors for the older age-comparison children, and 55% of the adult's errors. When the synonyms were counted as correct, the percentage correct for the entire verb elicitation probe changed to 67% for the language-comparison group, 84% for the children with SLI, 97% for the age-comparison group, and 96% for the adult group. Even with these increases in percentage correct, the analyses of group differences remained the same as before the inclusion of synonyms as errors. That is, the children in the age-comparison group continued to do better than the children with SLI and the language-comparison group: $T = 0$, $p < .01$, one-tailed; $T = 0$, $p < .01$, one-tailed. The children with SLI also continued to fare better than the language-comparison children ($T = 0$, $p < .02$, two-tailed).

Informal analysis of each group's responses indicated that the most problematic verbs for all groups (i.e., those verbs produced by two or fewer children per group) were *come*, *enter*, *leave*, and *return*. Most children substituted *walk*, *go in*, *go out*, and *go back* for these verbs. Three of these verbs are low frequency, all are directed motion verbs, half are fixed intransitives (*come* and *enter*), and half are antipassives (*leave* and *return*).

Those verbs that were not problematic for all three groups of children (i.e., five or more children in each group labeled the verb) included: *cut*, *put*, *throw*, *walk*, *swim*, *cry*, *break*, *open*, *roll*, *bounce*, *eat*, *drink*, and *climb*. Of these 13 nonproblematic verbs, 11, or 85%, were high-frequency verbs. Nonproblematic verb elicitations were extended across most semantic categories and all syntactic types. For instance, three verbs are change of state, two are contained motion, seven are volitional action, and one is an expressive verb. The volitional action category had the highest percentage of verbs classified as nonproblematic compared to the other semantic categories (54% of the volitional action verbs were nonproblematic). With respect to syntactic type, all four syntactic types contained nonproblematic verbs. The fixed transitive verbs contained the greatest percentage of nonproblematic verbs (100%) compared to the other syntactic types.

Semantic and Syntactic Type Effects

The semantic category of the verb appeared to have an effect on the labeling of verbs in some instances. Developmental differences were seen between the age-comparison group and the language-comparison group in the semantic categories of volitional action, contained motion, and change of state: $T = 0$, $p < .01$, one-tailed; $T = 0$, $p < .01$, one-tailed; $T = 0$, $p < .01$, one-tailed. In all of these latter categories, the older children labeled more verbs correctly than the younger children. The children with SLI performed better than the language-comparison group in the categories of contained motion and change of state: $T = 0$, $p < .05$, two-tailed; $T = 0$, $p < .05$, two-tailed. No differences were observed between the children with SLI and the

FIGURE 2. Proportion correct of verbs according to semantic category.

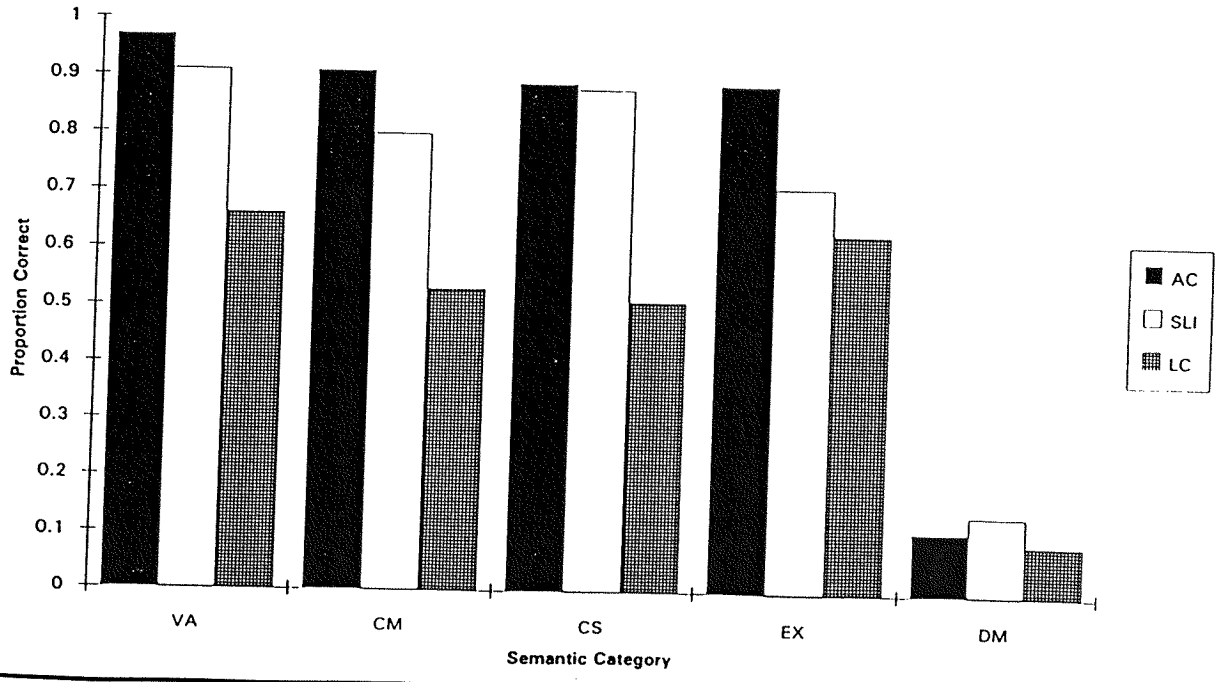
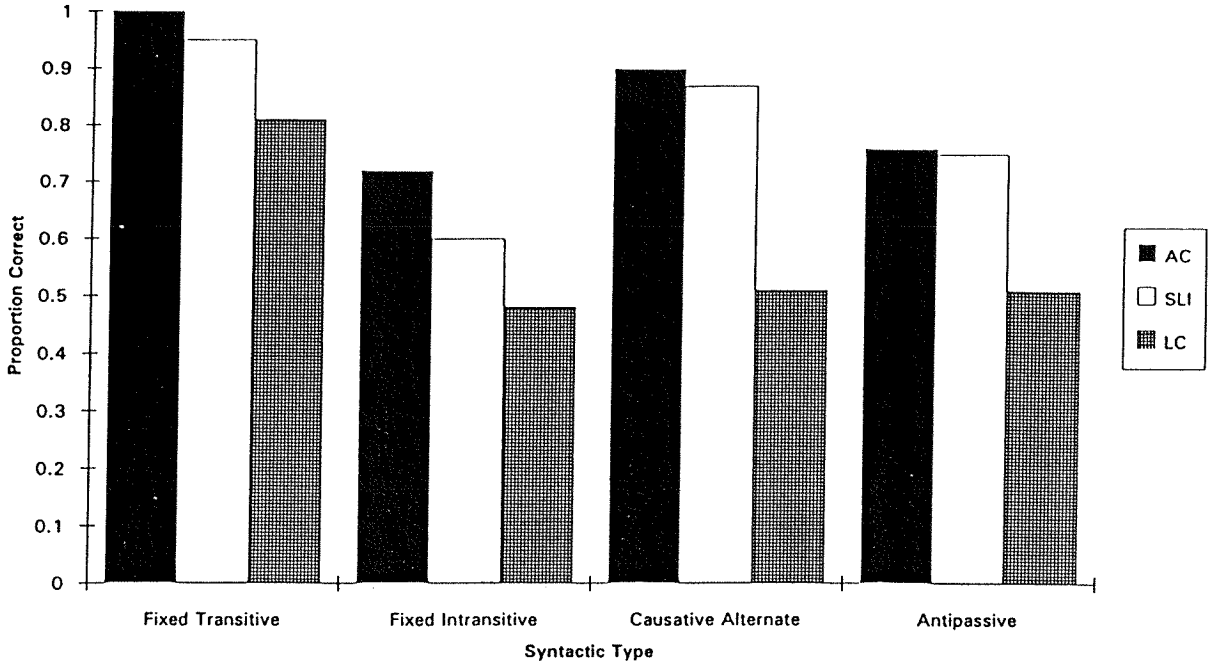


FIGURE 3. Proportion correct of verbs according to syntactic type.



age-comparison group. Figure 2 shows the proportion correct for each group of children.

A verb's syntactic type also appeared to have some influence on a child's labeling of verbs. Each group was similar in the order of proficiency in that fixed transitives were labeled correctly more often than causative alternates. Causative alternates were labeled correctly more often than antipassives and fixed intransitives. Finally, antipassives were labeled correctly more often than fixed intransitives (Figure 3).

Developmental differences were observed between the age-comparison children and the language-comparison children with the fixed transitive ($T = 0$, $p < .025$, one-tailed), causative alternate ($T = 0$, $p < .01$, one-tailed), and antipassive verbs ($T = 0$, $p < .01$, one-tailed). Children with SLI performed better than the language-comparison group on the causative alternate verbs ($T = 0$, $p <. 02$, two-tailed). No differences were observed between the children with SLI and the age-comparison group; however, a trend was evident in fewer productions of fixed intransitive verbs by the children with SLI.

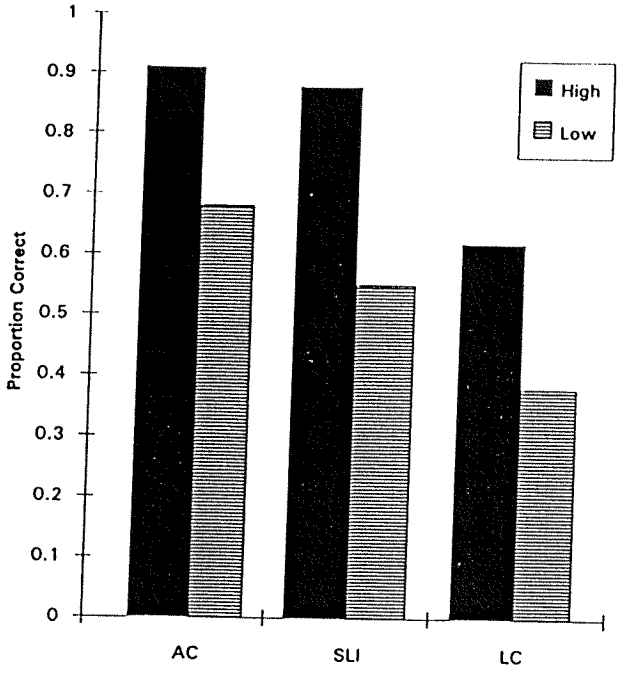
Frequency Effects

Frequency effects were observed in the elicitation probe. The high-frequency verbs were elicited more often than the low-frequency verbs for all groups (Figure 4). For both the high- and low-frequency verbs, the age-comparison group performed better than the younger language-comparison group: $T = 0$, $p < .01$, one-tailed; $T = 0$, $p < .01$, one-tailed. In addition, the children with SLI outperformed the younger language-comparison children: $T = 0$, $p < .02$, two-tailed; $T = 0$, $p < .02$, two-tailed. The age-comparison group labeled more low-frequency verbs correctly than the children with SLI ($T = 0$, $p < .025$, one-tailed).

Summary

The results suggest that verb frequency, semantic category, and transitivity all in some way contribute to a child's labeling of verb events. The verbs that were labeled 80% of the time by children with typical development aged 5 to 7 years were high-frequency verbs, verbs that describe volitional action, change of state, contained motion and expression, and verbs that were syntactically classed as fixed transitive and causative alternate verbs. The younger children with normal language development showed a slightly different profile of results with accuracy between 50 and 70% for many categories. The verbs most frequently elicited from these children were high-frequency verbs, volitional action and expressive verbs, and fixed transitive verbs. The children with SLI tended to label fewer verbs than the age-comparison group, particularly those of low frequency. A trend was evident for these children to label fewer fixed intransitive verbs compared to same-age peers. In contrast, the children with SLI performed similarly or outperformed their language-comparison peers. These results are consistent with a delay in verb development, yet some strengths relative to the language-comparison group were evident in the areas of contained motion and change of state verbs, and causative alternate verbs. The children with SLI labeled the high-frequency verbs, volitional action, change of state, and contained-motion verbs, and fixed transitive and causative alternate verbs at an 80% level or above.

FIGURE 4. Proportion correct of verbs according to frequency.



Application of the Verb Elicitation Probe to Clinical Interests

The utility of the verb elicitation probe is twofold: (a) for identification of a problematic area and (b) for intervention planning. The verb elicitation probe was successful in eliciting a range of verbs from children 2-1/2 years old to 7 years old with substantially more success as the children increased in age, showing developmental changes over time. In our preliminary study, SLI children did not label as many verbs as their age-comparison peers, suggesting an area of weakness. Although these data require confirmation from larger samples of children, our findings illustrate the usefulness of a verb elicitation probe to evaluate a child's labeling of verbs.

The verb elicitation probe offered a more sensitive verb index compared to the standardized test results. All but one of the children with SLI scored within normal limits on the EOWPVT; however, these children did not label verbs with the same proficiency as their same-age peers. Such a finding would have been missed if the clinician had relied on standardized assessment alone. It is possible that these children's verb problems may have been detected using verb type-token ratio (VTTR) data from language samples. However, some of the children with SLI in the current study had verb type-token ratios within normal limits, and others did not (refer back to Table 1). Following the data from Watkins et al. (1994), if we consider a VTTR of .42 as within the impaired range, then only two subjects in the current study would have been identified as having verb labeling problems. These same two subjects, SLI 4 and SLI 6, also performed the poorest on the verb elicitation probe. Thus, the verb elicitation probe supplemented the language sample data by providing a systematic way of evaluating the factors that verbs are made of; namely, semantic and syntactic components, depictability, and frequency. Even language sampling in its richness did not elicit a large number of the verbs assessed on the probe. For the children with SLI in this study, only 7 to 16% of those verbs in the elicitation probe were also found in their language samples.

The second purpose for the verb elicitation probe is to assist intervention planning. If the child's verb system appears to be weak, then this probe will provide information regarding the semantic, syntactic, and frequency elements of the child's verbs in a systematic manner. Our preliminary study suggests that children with SLI may find low-frequency verbs and fixed intransitive verbs to be challenging. However, given the small number of subjects used and the heterogeneity of children with SLI, it is likely that a number of profiles are possible and that the use of an informal probe like the verb elicitation probe could yield valuable information for determining which verb subclasses might be in need of remediation. With the exception of a few longitudinal studies (Bowerman, 1974; Tomasello, 1992) we lack extensive developmental data on verb acquisition to guide us with more specific guidelines for verb selection for intervention. Most lexical targets are selected on the basis of their functionality; however, the three areas that may influence verb acquisition studied in this research (frequency, semantic category, and syntactic type) may be considered when constructing potential verb targets for intervention. Not surprisingly, all of the children tended to label high-frequency verbs more often than low-frequency verbs. It should be noted that frequency was not determined by how often the children heard the word from adults (i.e., input frequency), but the frequency with which preschoolers produced a given verb. Thus, this result speaks to the functionality of the verb (i.e., how often children tend to use these verbs) and gives some credence to the use of child spoken-frequency norms when devising elicitation probes and treatment targets.

Both semantic category and syntactic type appeared to influence the elicitation of verbs. All of the children had difficulty labeling directed motion verbs and the least difficulty labeling volitional action verbs. According to Smiley and Huttenlocher (1995), directed motion, change of state, and self-action verbs are primitive conceptual elements that appear to be early-developing. Why, then, did the children in this study display difficulty with the directed motion verbs? Two reasons seem plausible: the low frequency with which these verbs occurred or the elicitation techniques for these verbs. Three of the four verbs that were not elicited were low-frequency verbs. In addition, all of the verbs were part of a group of verbs enacted with pig figurines coming and going to each other's houses. However, other verbs elicited with the pigs, such as the directed motion verb *go* and verbs *stay* and *follow* were elicited from children. The fact that *go* is a high-frequency verb elicited within the pig scenarios helps rule out the possibility of probe factors as the cause for not eliciting these verbs. The children most often labeled the actions for directed motion verbs *come*, *enter*, *leave*, and *return* by responding with *walking* or *going into*, which are

accurate conceptualizations of the event depicted. These alternatives are not incorrect, rather, another way to express movement. The *going into* response uses a GAP verb, *go*. GAP verbs have been reported to be relied on when specific verbs are not retrieved (Rice & Bode, 1993). The *walking* response indicates that the children responded more to the motion depicted rather than the directional action associated with the movement. The latter response reflects an observation by Talmy (1985) that English tends to separate motion and direction in its verb lexicon, whereas other languages (e.g., Spanish) combine such concepts.

The ease with which children labeled volitional action verbs may be related to internally motivated action, frequency, or the syntactic type of the verb. Frequency seems unlikely because both volitional action verbs and expressive verbs contained the same proportion of high-frequency items. Further, expressive verbs were elicited less than change of state and contained motion verbs, the latter two having low proportions of high-frequency verbs. Similarly, influence of syntactic type seems unlikely given that the volitional action verbs were distributed across a number of categories, with most volitional action verbs in the least successfully elicited context, fixed intransitives. The remaining explanation is that children more readily label those motions that are internally driven and therefore more salient to them.

Regarding syntactic type, verbs that were fixed transitives were the most often elicited, followed by causative alternates, antipassives, and finally fixed intransitives. However, the causative alternates and the antipassives were more likely to be labeled by the children with SLI and their age-comparison peers when compared to the language-comparison group. Whereas the elicitation of the fixed transitives could be explained by frequency effects (i.e., each of these verbs is a high-frequency verb), neither verb frequency alone nor semantic composition can explain the increased elicitation of causative alternate and antipassive verbs compared to the fixed intransitive verbs. It may be that the causative alternate verbs allow more syntactic flexibility and appear more frequently in a wider range of contexts. This diversity may have made the verbs more salient to the children. Antipassive verbs also share the latter qualities in that they can occur in both intransitive and transitive contexts (e.g., *"I'm singing"*; *"I sang a song"*). This diversity of contexts may have led to the developmental differences seen between the older and younger children.

Smiley and Huttenlocher (1995) hypothesize that the salience of words in input sentences as well as the number of contexts in which words are used by parents may affect the order of words learned and the meaning children attach to words. The reduced number of elicitations with the fixed intransitive verbs may have been due to the reduced number of contexts that these verbs will be heard from the input or because this category included many expressive and directed motion verbs. Despite our inability to factor out the influence of frequency with semantic and syntactic composition, two results appear not to be influenced by this shortcoming of our study. Those are the high elicitation of volitional action verbs and the high elicitation of causative and antipassive verbs.

Ultimately, the verbs to target will be determined based on the probe results. High-frequency verbs may outnumber low-frequency verbs in selecting which verbs to target. For older children with SLI, semantic categories such as change of state, contained motion, and volitional action verbs may be more readily labeled. Verbs that are causative alternates or antipassives may also be good selections. Also, it may be useful to select some areas of strength (i.e., contained motion and high-frequency verbs) to facilitate the learning of more difficult syntactic type verbs (i.e., fixed intransitives).

Shortcomings of the Probe and Modifications for Clinical Use

Assessment of and intervention for children with language impairment need to move beyond the focus on nouns. The linguistic complexity associated with verbs calls for more sophisticated elicitation techniques. Eliciting verbs in both familiar and unfamiliar syntactic types and in a number of semantic categories requires knowledge of the underlying features associated with each verb. With this knowledge in hand, informal probes using manipulables can be devised and individualized per child.

Clinicians may choose to use the verb elicitation probe in its current state (Appendix A) as a criterion-referenced tool. However, despite the care given to developing the probe, we encountered unanticipated problems and recognize its limitations. First, it may be necessary to add or delete verbs from some syntactic, semantic, and frequency categories to achieve a more equal balance across items. The finding that some of our preliminary results may be due to high or low number of items in certain areas such as high-frequency or various semantic categories makes it difficult to fully determine the differential effects of frequency, semantic category, and syntactic type. One way to improve the probe would be to have equal numbers of high- and low-frequency verbs in each semantic category and each syntactic type. For example, we suggest adding some low-frequency fixed intransitive verbs to the probe because all of the fixed transitive verbs in our list are high-frequency verbs.

Another limitation of the probe is that it captures only action verbs that are easily depicted. It is still unclear to what extent children with SLI produce state verbs such as *need*, *want*, *think*, and so on. These verbs express some very basic concepts and are most useful to young children. Therefore, the clinician will need to search the language sample for occurrences of such verbs.

A limitation that is perceived by the authors as advantageous is the need to evaluate the cultural appropriateness of each stimulus item. This can be accomplished by determining the best ways and the best props to use for a given cultural population. In its current state, our verb elicitation probe has been administered to children who are monolingual English speakers as well as children from a native Indian village of Guatemala. A good way to determine the appropriateness of the verb elicitation

techniques is to ask adults of a given culture to participate in the probe and give feedback on its accuracy.

The probe provided here is limited to use with children under 7 years of age given the ceiling effect observed for the age-comparison group and the adults. It should be noted that the ceiling effect occurred when synonym errors are included as correct. This finding should alert the clinician that verb elicitation probe responses will be variable and include other acceptable, though nontarget, responses.

As an alternative to being used in its current form, the verb elicitation probe could be modified as needed by including verbs of the clinician's choice. Importantly, each verb's semantic and syntactic type, its depictability, any cultural differentiations, and its frequency of use need to be considered on selection. Depending on the child's verb results, the clinician may choose to target one type of verb (i.e., fixed intransitive) or a range of verbs that cut across a number of semantic, syntactic, and frequency dimensions. Even if a specific type such as fixed intransitive verbs is selected for intervention, the clinician will need to think carefully about which semantic class and frequency to use with these types of verbs.

Another way to use the results of the probe would be to conduct an error analysis to better understand the meaning associated with the child's use of verbs. Some children with semantic deficits in particular tend to use their words imprecisely or with unclear meaning. Children who provide incorrect responses that are synonymous with or related to the probe may benefit from a revised probe that includes a closer evaluation of verb meaning versus verb labeling. The verb elicitation probe can be modified to obtain the child's interpretation of the verb's action (Pye, Loeb, & Pao, in press). For instance, some children might have broadly defined semantic space, where *break* can be used to describe a number of cutting, tearing, and ripping actions. In contrast, other children may possess more narrow semantic space, where little overlap in action meaning is observed. One way to determine this would be to elicit many semantically similar verbs. Although the current probe only allows this type of comparison among three verbs (break, cut, and tear), the clinician could develop his/her own probe to include more semantically similar verbs.

Finally, it should be cautioned that there may be some children with SLI who perform well on the verb elicitation probe who still require intervention that includes verbs. Previous researchers have studied language sample data where children are required to use verbs in a variety of situations and sentence types under the pressure of discourse (cf. Rice & Bode, 1993; Watkins et al., 1993). In these contexts, it has been determined that children with SLI tend to rely on a small set of verbs or GAP verbs for 40 to 50% of the verb productions. However, as Rice and Bode (1993) point out, it is not the case that these children lack other more specific verbs in their repertoire. Rather, children with SLI substitute the GAP verbs for verbs that appear elsewhere in their language sample. They suggest that these children may have problems with semantic mapping that in turn make retrieval of a particular verb vulnerable under the pressures of discourse.

It is possible that labeling the verb event in familiar contexts, such as in our verb elicitation probe, is less demanding for children with SLI compared to retrieving and selecting verbs in a variety of sentential and textual contexts. Thus, children with SLI may also exhibit difficulty mapping verbs in certain linguistic contexts. These children will require a more extensive evaluation of the ways in which they alternate verbs in different transitivity contexts with different syntactic constructions. Our recent study of the ability of children with SLI to alternate verbs in a number of syntactic contexts suggests that some syntactic types may be especially difficult for these children (Loeb, Pye, Redmond, & Richardson, 1994). The clinician can modify the current verb elicitation probe by asking both agent (i.e., "What am I doing?") and patient questions (i.e., "What happened to the _____?") when eliciting verbs to determine if a child can alternate a verb between a transitive and intransitive context and what type of syntactic constructions they use to do so. For instance, the first pass through the verb elicitation probe might focus on a particular verb's use in transitive contexts. The clinician would ask the agent question: "What did I do to the rock?" (You *moved* it). The next pass through the probe, the clinician would ask for the intransitive context using a patient question "What did the rock do?" (It *moved*).

This study provides an introduction for the clinician to the complexities of verbs that need to be considered for evaluation and intervention planning purposes. As we increase our understanding through research about the developmental progression of verbs, taking into consideration their semantic characteristics as well as their use in a variety of contexts, we will be able to clarify the course of children's verb acquisition and further inform our assessment and intervention efforts.

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Appendix A

Verb Elicitation Probe

Target Verb	Objects	Dialogue
Boil	Pot with water on stove	Prompt: "This pan has water in it. We turn on the stove and now the water's getting really hot. There are bubbles in it. What's the water doing?"
Bounce	Rubber ball	[E bounces on table]. Prompt: "What's the ball doing?"
Break	Toothpick	[E breaks toothpick] Prompt: "What did the toothpick do?"
Climb	Firetruck, person	[person goes up the extended ladder in a slow, continuous motion. Give prompt before the person reaches the top] Prompt: "See the boy on the ladder? What's he doing?"
Close	Stove/oven door	[E closes oven door] Prompt: "What did I do?"
Cry	Mother, child	[E puts the baby in mother's arms and says, "Here's the mommy with her baby." The mother makes a 1/4 turn and the baby cries] Prompt: "What is the baby doing?"
Cut	Scissors, paper	E folds, cuts paper and asks: Prompt: "What am I doing?"

Target Verb	Objects	Dialogue
Drink	Bottle, man	[E moves figure with bottle in drinking motion, while gulping] Prompt: "What is he doing?"
Drop	Pen	[E drops pen] Prompt: "What did the pen do?"
Eat	Food, man	[E moves figure] "See, he has his food. He goes like this [E makes eating noises]." Prompt: "What's he doing?"
Fold	Paper	E folds paper and asks: Prompt: "What am I doing?"
Float	Small boat, blue pool, ping pong ball, toothpick	[E puts object in pool. Try boat first] Prompt: "What is the _____doing?"
Fly	Kite, man	[E puts kite in man's hand, holds kite up in the air and says, "Look, he has a kite. It's in the air now." Prompt: "What's the kite doing?"
Follow	A large & small pig	[E has small pig follow after the large pig in a curved path and says, "See the pigs." [E picks up little pig and prompts: "What's this pig doing?"
Laugh	Mother & baby	[E holds figures upright and says, "Here's the mother and baby. All of a sudden the baby says hahahahaha." What did the baby do?
Loosen	String around dog, rope	John ties dog to the fence and says, "Oh, this is too tight." John loosens the rope around dog's neck. Prompt: "What did John do to the rope?"
Move	Pen, rock	[E moves rock along a flat surface with a pen] Prompt: "What did the rock do?"
Open	Stove with oven door closed	[E opens oven door] Prompt: "What did the door do?"
Pop	Bubbles	[E blows bubbles and captures one and pops it] Prompt: "What did the bubble do?"
Put	Car, Mother/child	[E takes mom and child, and has mom take child out of baby carrier and puts in back seat.] Prompt: "What did the mom do?"
Roar	Tiger	[E manipulates tiger so it is up on its hind legs and says "Rahr." Prompt: "What did the tiger do?"
Roll	Red Ball	[E rolls ball sideways (away from the child, and not hitting an object] Prompt: "What did the ball do?"
Sing	Girl	[E holds Mary] "Lalalalalalala" Prompt: "What is Mary doing?"
Sleep	Mother, baby	The mommy holds the baby in her arms and makes small rocking motions. E says, "It's been a long day, the baby is tired." E makes snoring noises. Prompt: What is the baby doing?"
Smash	Play-Doh	E makes a small bowl with Play-Doh and smashes it using the side of fist in a slow-moving rolling motion. Prompt: "What did I do?" OR
	Dixie cup	[E smashes cup with fist] Prompt: "What did I do?"
Stop	Person, stop sign	[E moves Charlie in the car toward the stop sign and says "Look what's there" [E stops the car] Prompt: "What did the car do?"
Sweep	Mother, child, broom	[E puts broom in mom's hand and has her sweep and says "Here's the mom." Prompt: "What is she doing?"
Swim	Pool with water, girl, jar of water	[E moves Mary close to the pool and says "Oh there's water in the pool. I think I'll get in." E moves Mary across the pool in a swimming manner.] Prompt: "What is Mary doing?"
Talk	Man, girl	[E moves John and Mary towards one another and says,"John and Mary just met in the street." E pretends to talk back and forth with the figures by saying blah, blah, blah.....] Prompt: "What are they doing?"
Tear	Post-it	[E slowly tears a post-it in two pieces]. Prompt: "What am I doing?"
Throw	Red ball	[E throws the ball into a corner] Prompt: "What did I do?"
Turn	Red ball	[E turns ball 180 degrees with thumb and index finger] Prompt: "What am I doing?"
Walk	Man	[E moves the man's legs forward for a short distance] Prompt: "What is he doing?"

Target Verb	Objects	Dialogue
Wash	Mom/child, swimming pool	[E has mom holding baby out over the pool and says, "This baby is really dirty." E has mom take a washcloth and wash the baby.] Prompt: "What is the mommy doing?"
Wind	Yoyo	[E winds string around yoyo] Prompt: "What am I doing?"

The above verbs are listed in alphabetical order. However, in the probe they were presented in random order with the exception of the narrative about pigs given below. The figures for *eat*, *walk*, and *drink* had movable legs and mouths that opened and closed.

Leave	Three pigs and two cardboard houses (one big, two small pigs)	[E sets the large and small pig (the first pig) in one house and the other small pig (the second pig) in the other house so they are sideways to the subject. E says, "Here are two little pigs doing something in their houses. Now this pig is done." E moves the first pig out of the house. Prompt: "What is he doing?"
Stay		E moves the first pig back towards his house and says "Now the first little pig is leaving, but look at the big pig (points to it). Prompt: "What is this pig doing (pointing to the big pig)?
Go		E moves the pig towards the other pig's house and says, "Now the first little pig sees the other house." Prompt: "Now what is the pig doing?"
Come		E switches to the other pig while the first pig is still moving towards its house and says "Here's the other little pig in its house. It looks out the window and sees the first little pig." Prompt: "What does it see the first pig doing?"
Enter		E moves the first pig to the door of the second pig's house, and then moves it into the house. While the first pig is still moving into the house, E says, Prompt: "What is the first pig doing now?"
Talk		E moves the pigs towards one another and pretends the first pig does the talking by saying "How are you? What are you up to?...." Prompt: "What is he doing?"
Sing		E holds the second pig and says "The second little pig decides to do something else. She goes "Mary had a little lamb...." Prompt: "What is the second pig doing?"
Dance		E moves the pigs together as though dancing, while humming. Prompt: "What are they doing?"
Look		E has the first pig wave good-bye to the second pig and moves him back to his own house. After the first pig moves a little way back the second pig says, "I have something to show you." E turns the first pig briefly once towards the second pig (half turn and back). Prompt: "What is he doing?"
Return		E moves the first pig back towards the second pig. Prompt: "Now what is the first little pig doing?"
Follow		E has small pig follow after the large pig in a curved path and says, "See the pigs." E picks up the little pig and says: Prompt: "What's this pig doing?"

Appendix B

Synonymous Verb Errors

Target Verb	Age Comparison Group	Language Comparison Group	Group with SLI
Fold	bend	bend	
Close		shut	
Cut		scissoring	
Follow		not leading	
Laugh		hee hee hee	
Loosen	taking it off, untighten it		trying to get it loose, untying it
Pop		splat, broke	
Sleep		take a nap	
Smash	squash it	squish, smush	punch it down
Tear	rip	rip	rip
Turn	spinning, twisting	spinning around	
Wash		clean, wipe	
Wind	roll	rolling, rolling up, stringing	rolling it around, rolling up, go round in a circle
Come	walking over, walking into his house, walking towards	go in	
Enter	going in, going into, walking in	come in, walk in, getting in his house, go in, getting into	walking in, go in, trying to get in
Go	walking over to, walking up to the other	walking to	
Leave	going out, walking out (of the house)	walk out, going outside, going out	going, going out, going outside, went outside
Return	going back, walking back		walking back, going back
Talk			saying hello