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A Method for Assessing the Use of First Person Verb Forms by Preschool-Aged Children with SLI

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Abstract

Children with specific language impairment (SLI) often have extraordinary difficulty in the use of tense and agreement morphemes. Because spontaneous speech samples may not provide a sufficient number of obligatory contexts for these morphemes, structured probe items are often employed. However, these usually emphasize actions that can be readily illustrated through drawings, which tend to have third person subjects. In this paper we describe a method that has been successful in creating obligatory contexts for a first person morpheme – auxiliary *am* – that heretofore has been assessed exclusively through spontaneous speech samples. Participants were 32 mainstream American English-speaking children comprising three diagnostic subgroups: children with SLI, typically developing age-matched peers, and younger typically developing peers matched for mean length of utterance (MLU). The children participated in a task in which they described their actions for an audience; these descriptions required the use of auxiliary *am*. The results revealed that the children with SLI used auxiliary *am* with significantly smaller percentages than both groups of typically developing children, a finding that is consistent with findings that employ other tense and agreement morphemes. Clinical applications of this method are discussed.

Keywords

child language; language impairment; language disorders; assessment

Introduction

For English-speaking children with specific language impairment (SLI), one of the most widely documented problem areas is the use of grammatical morphemes that mark tense and agreement. These morphemes include past tense *-ed*, third person singular *-s*, copula and auxiliary forms of *be*, and the forms of auxiliary *do*. As a group, children with SLI make less use of such grammatical morphemes than do younger typically developing children with comparable mean lengths of utterance (MLU) (eg, Cleave and Rice, 1997; Johnston and

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Kamhi, 1984; Leonard *et al.*, 1997; Oetting and Horohov, 1997; Rice and Wexler, 1996). Many children with SLI continue to show limitations in the use of these morphemes into the early elementary school grades (Marchman *et al.*, 1999; Norbury *et al.*, 2001; Rice *et al.*, 1998). Composite measures of tense and agreement morphemes show good sensitivity and specificity in distinguishing children with SLI from their typically developing peers (Bedore and Leonard, 1998; Rice, 1998). Indeed, Rice and Wexler (2001) have released a clinical test focusing on tense and agreement verb morphology that emphasizes the instrument's sensitivity and specificity at each chronological age.

Although early studies of tense and agreement morpheme use by children with SLI involved spontaneous speech samples as the principal source of data (Ingram, 1972; Johnston and Schery, 1976; Leonard, 1972; Menyuk, 1964), recent investigations have employed more structured probe tasks (Leonard *et al.*, 1997; Oetting and Horohov, 1997; Rice and Wexler, 1996). The advantage of such tasks is that they yield a larger number of obligatory contexts for each morpheme, and hence provide researchers and clinicians with a more representative picture of the child's ability. Typically, probes also assess the child's use of the morpheme with a wider range of verbs than might occur in spontaneous speech samples. In spontaneous speech, for example, a child might make frequent use of auxiliary *is* in utterances such as *What's she doing? Where's he going?* and *He's gonna ____* but produce relatively few utterances involving this morpheme in other sentences. By employing probe items that require the child to use auxiliary *is* with, say, 10 to 20 different lexical verbs (eg, *is running, is jumping, is eating, is dancing*), the clinician should be able to ascertain whether the child's ability with this morpheme extends beyond a few, limited contexts.

The probe tasks reported in the literature have focused principally on tense and agreement morphemes with third person subjects, as contexts requiring such morphemes can be readily elicited through drawings or enactments. To our knowledge, tasks of this sort have not yet been employed to elicit utterances requiring the use of first person verb forms such as auxiliary *am*. Indeed, studies that have examined auxiliary *be* forms in probes have focused instead on the morphemes *is, are, was, and were* (eg, Leonard *et al.*, 2003).

There are important reasons for examining children's use of first person verb forms such as auxiliary *am*. First, this morpheme has not received much attention even in studies of children with SLI that employ spontaneous speech samples as the source of data. When this morpheme has been included, it has been grouped with other auxiliary and/or copula forms and not reported separately in the results of these studies (eg, Cleave and Rice, 1997; Leonard *et al.*, 1999). A finding that auxiliary and/or copula *be* is more problematic for children with SLI than for their typically developing peers is important information. However, *be* forms include *is, are, was, and were* as well as *am*. Therefore, low percentages on a composite measure of *be*-form use in spontaneous speech by children with SLI are no assurance that *am* is similarly difficult for these children. In fact, data from young typically developing children suggest that auxiliary *am* might lag behind other auxiliary *be* forms. For example, in a study of typically developing two- to three-year-olds, Theakston *et al.* (2005) reported percentages of use of auxiliary *am* in obligatory contexts that were significantly lower than percentages for auxiliary *is*.

Second, Tomasello (2003) has provided a great deal of evidence that young children's early use of morphemes is heavily influenced by the contexts in which they appear with great frequency. High frequencies of co-occurrence tend to 'unitize' the expression in terms of the lexical items and morphemes involved (Tomasello, 2003, p. 106). The consistency with which *am* appears in the context *I'm* could well render it more accessible and learnable by children with SLI than the other finite verb morphemes.

Finally, there is evidence that children with SLI are less likely to interact in conversational settings with multiple participants (Craig, 1993; Craig and Washington, 1993; Fey and Leonard, 1984; Rice, Sell, and Hadley, 1991). In addition, studies have indicated that these children are more likely to show higher levels of withdrawn behavior as reported by teachers (Fujiki, Brinton, Morgan, and Hart, 1999; Redmond and Rice, 1998) and observed during free play settings (Fujiki, Brinton, Isaacson, and Summers, 2001). The factors responsible for children's reluctance to participate are both social and grammatical. That is, on the one hand an increase in children's tendency to talk about their own experiences may provide them with greater conversational success. Yet, it is possible that the children's perceived difficulty with the grammatical requirements involved in first person descriptions (eg, difficulty with first person verbs such as auxiliary *am*) may temper their willingness to participate in conversation with others.

Given the importance of determining whether the use of *am* constitutes a problem area for children with SLI, it is important to devise a probe task that is capable of eliciting utterances that require the use of this morpheme. In this paper, we describe a method that appears to be successful toward that end. We test the suitability of the method not only in terms of its ability to generate obligatory contexts for auxiliary *am* but also by determining whether it yields differences between children with SLI and typically developing children. Following the presentation of the results, we discuss the advantages and possible clinical applications of the method, along with several caveats.

Method

Participants

Thirty-two children from a mainstream American English-speaking community served as the participants. Twelve of the children, nine boys and three girls, had been diagnosed as exhibiting a language disorder and met the criteria for SLI. These children ranged in age from 4;6 to 6;6 ($M = 5;3$, $SD = 0;7$). All of these children scored below the 10th percentile on the Structured Photographic Expressive Language Test – II (SPELT-II) (Werner and Kresheck, 1983a). Each child passed a hearing screening, a screening for oral-motor ability, and showed evidence of using word-final /m/ without error. The latter criterion was appropriate given that the most frequent context for *am* places this morpheme in a contractible position (*I'm*) and hence word-final /m/ served as a useful index of the children's ability to meet the phonological requirements of this context. Finally, all children in the SLI group scored above 85 on the Columbia Mental Maturity Scale (CMMS) (Burgemeister *et al.*, 1972). The children's MLUs based on a 100-utterance spontaneous speech sample showed a range of 3.43 to 4.91 ($M = 4.21$, $SD = 0.41$). Although MLU did not serve as a

selection criterion, this measure was used as a basis for matching with the younger typically developing children serving as one of the comparison groups, as seen below.

Ten typically developing children with no history of language or learning problems served as age controls (hereafter, the TD-A children). Six of the children were boys, four were girls. The age range (4;8 to 6;4), mean age (5;4) and standard deviation (0;7) for this group were highly similar to those of the SLI group. All children scored within the average range on the SPELT-II, the CMMS, and passed all of the screening measures described above. These children's MLUs ranged from 4.35 to 6.37 ($M = 5.39$, $SD = 0.74$).

The remaining 10 children, five boys and five girls, were younger, ranging in age from 2;11 to 4;5 ($M = 3;7$, $SD = 0;6$). The children's MLUs resembled those of the SLI group in range (3.82 to 4.70), mean (4.23) and standard deviation (0.35). Given the younger age of these children, the SPELT-P (Werner and Kresheck, 1983b) was administered rather than the SPELT-II. All children scored within the average range on this test. In addition, all children passed a hearing screening, an oral-motor screening, and showed evidence of producing word-final /m/ with accuracy. For the children age 3;0 and older, the CMMS was administered; for those under age 3;0, we administered the Leiter International Performance Scale – Revised (Roid and Miller, 1997). In each case, the children scored within the average range for their age. Hereafter, these children are referred to as the TD-MLU group. A summary of the scores for the three groups of children on the language and nonverbal intelligence tests appears in the Appendix.

Materials and Procedure

Children's use of auxiliary *am* was explored by adapting a probe task used by Leonard *et al.* (2003) to elicit auxiliary *is*, *are*, and *was*. The general task makes use of a puppet theatre and 'shows' performed by characters. The child is asked to describe the shows during or after (depending on the target morpheme) the characters perform the actions.

In the adaptation for auxiliary *am*, the child served as the 'star' of the show, performing the actions that corresponded to the probe items. The child was introduced to a turtle puppet named 'Shy Turtle' and was told that often Shy Turtle was too timid to watch the shows, often keeping his head inside his shell. Therefore, the child had to describe what he or she was doing during the action so that Shy Turtle could enjoy the show despite not being able to see it.

Two examiners participated. The first sat next to the child. This examiner set up the props for each item and then whispered the name of the action in the child's ear (eg, *draw*). The verb was produced by the experimenter in the bare stem form, with no accompanying auxiliaries or inflections. When the theatre curtain opened, the child then performed the action. The actions that were selected were those that could be maintained by the child (eg, drawing, waving, dancing). Once the curtain opened and the child began to perform the action, the first examiner said 'What do you think, Shy Turtle?' The second examiner, controlling the turtle puppet, served as the voice of Shy Turtle, and responded with 'Oh, I don't know. I'm too shy to watch. Tell me about the show'. The child, still performing the action then provided a description (eg, *I'm waving*).

Eighteen probe items were employed, each designed to elicit a different verb that could be described in the present progressive. The verbs/actions used for the 18 items were: *cutting*, *waving*, *digging*, *cooking*, *eating*, *washing*, *standing*, *holding*, *combing*, *pushing*, *watching*, *reading*, *drawing*, *sweeping*, *walking*, *dancing*, *hiding*, and *spinning*. These 18 items were preceded by two practice items (employing the verbs/actions *writing* and *cleaning*). Verbs with word-initial /m/ were avoided, as the child's inclusion or omission of the contraction 'm might be difficult to determine if immediately followed by this phoneme. All children performed an appropriate action for each item, though, as will be noted below, in some instances they produced an alternate verb (eg, *colouring* rather than *drawing*).

Scoring and Reliability

All responses were examined to ensure that they constituted appropriate contexts for auxiliary *am*. These were defined as productions of the first person singular pronoun *I* and the lexical verb inflected with *-ing*. (It should be noted that we found no instances of *me* used in place of *I*.) For each group of children, over 95% of the responses met the criteria for assuming an appropriate context for *am*. However, in a small number of instances, the child produced the verb without a subject (eg, *waving* instead of *I waving* or *I'm waving*). These were treated as unscorable because the children might have been attempting to express a gerund (as in 'This [new action] is waving') or some other response that did not require *am*. Because these occasional unscorable items reduced the total number of items from 18 to 17 for a few children, percentage of use (eg, $11/17 = 65\%$) rather than raw frequency of use was used as the dependent measure.

The probe responses of seven children were scored by an independent judge to assess interjudge reliability. Three of the probes were randomly selected from children in the SLI group, and two each were selected at random from the two TD groups. The independent judge scored the probe responses without knowing the children's group membership. Item-by-item agreement between the independent judge and the original scorer was 98%. The percentages of agreement for the SLI, TD-MLU, and TD-A groups were 96%, 100%, and 100%, respectively.

Results

The children's use of auxiliary *am* on the probe task was examined by means of an analysis of variance (ANOVA) with participant group (SLI, TD-MLU, TD-A) serving as a between-subjects variable. Arc-sine transformations were performed on the percentage data to meet assumptions of homogeneity of variance. Post-hoc testing at the .05 level was then performed through least-significant-difference (LSD) testing to determine precise group differences. These were also assessed by calculation of the effect size *d*. Following Cohen (1988), effect sizes greater than 0.80 were regarded as large.

The ANOVA revealed a significant difference, $F(2, 29) = 9.18, p < .001$. LSD testing at the .05 level indicated that the children with SLI ($M = 53.08, SD = 43.27$) showed significantly less use of auxiliary *am* than both the TD-MLU children ($M = 94.40, SD = 13.72, d = 1.45$) and the TD-A children ($M = 99.40, SD = 1.90, d = 2.05$). The latter two groups did not differ. A summary of the results appears in Figure 1. All instances in which

the children failed to produce *am* were cases of omission; there were no substitutions of *am* by another auxiliary form.

The group data for the children with SLI is masking one important finding. Four of the 12 children with SLI produced *am* on 100% of the items. Thus, the very clear differences (and large effect sizes) shown between the SLI group and each TD group was driven by the limited use of *am* by eight of the children.

Although this study focused on one particular morpheme, *am*, it was also possible to gain an impression of the children's use of other finite verb morphemes. This analysis was limited to the data for the children with SLI, given that the TD groups showed high percentages of use and very little variability. We examined the spontaneous speech samples of the children with SLI and calculated a finite verb morphology composite for each child (after Leonard *et al.*, 1999), after removing all contexts for *am*. The resulting composite made use of past *-ed*, third person singular *-s*, and both the copula and auxiliary forms *is*, *are*, *was*, and *were*. The composite was calculated for each child by adding all of the obligatory contexts for the above morphemes and dividing this total into the total number of actual productions of these morphemes. This figure was then multiplied by 100. The finite verb morpheme composites for the children with SLI ranged from 20% to 89% with a mean of 63.50% ($SD = 24.37$). These values are somewhat higher than the finite verb morpheme composites of the children with SLI seen in previous studies (eg, Leonard *et al.*, 1997), and suggest that, as a group, the particular children with SLI in the present study were not as severely affected as those participating in early investigations. This fact may explain in part why four of the 12 children with SLI in the present study performed at ceiling levels on auxiliary *am*.

To determine whether the SLI group's use of auxiliary *am* on the probe task was related to these children's overall use of finite verb morphology in spontaneous speech, we performed a Pearson product-moment correlation between these scores. A relationship was not found, $r = .086$, $p = .791$. Although the four children with SLI who performed at ceiling levels on auxiliary *am* showed finite verb morphology composites that were among the highest in the group, several other children with relatively limited use of auxiliary *am* showed relatively high degrees of finite verb morphology use. The four children with 100% use of auxiliary *am* did not appear to differ from other children in the SLI group in terms of age, SPELT-II scores, or CMMS scores.

Discussion

Before discussing the findings and their potential clinical value, we should offer some qualifications. A review of our elicitation procedure reveals that the second examiner, acting as Shy Turtle, produced *I'm* in 'Oh, I don't know. I'm too shy to watch. Tell me about the show'. It is plausible that the appearance of *I'm* in the examiner's speech facilitated the children's use of *I'm* when formulating the description of their actions. This does not seem likely given how engaged the children appeared to be in performing the action at the time the examiner produced this utterance. It can also be noted that *I'm* was flanked on either side by utterances that did not contain this form. Furthermore, *'m* in the examiner's utterance was a copula form, not an auxiliary form as required in the child's response, and the word *I* was

also used by the experimenter without *'m* in the preceding sentence ('Oh, I don't know'). However, the most important observation is that, if children were relying on the examiner's use of *I'm* to assist them in formulating their response, one would have to conclude that the typically developing children, not the children with SLI were the chief beneficiaries of this information. Judging from their relatively poor performance, the children with SLI were apparently not making use of this information to the same degree as the typically developing children. We think that a more plausible interpretation is that the examiner's use of *I'm* was simply not the focus of attention on the part of any of the children, and that it played only a minor role at best.

Advantages of the Method

Approximately 95% of the children's utterances during this task contained an obligatory context for *am*. Furthermore, the focus on the children's own actions – with the children being the 'stars' of the show – resulted in enthusiastic participation on the children's part. These findings suggest that the method might have considerable clinical value.

Of course, the value of this method is also influenced by whether assessment of auxiliary *am* use is likely to yield clinically valuable information. In fact, we found that the children with SLI used this morpheme with significantly smaller percentages than did younger typically developing children matched according to MLU as well as typically developing children of the same age. This finding mirrors the often reported finding of relatively low degrees of use of tense and agreement morphemes by children with SLI.

On the other hand, given that a minority of the children with SLI showed high degrees of use of auxiliary *am*, we cannot assume that this morpheme will always present the same level of difficulty for all children with SLI. For the children with SLI who showed high degrees of use of auxiliary *am*, we could not identify any specific factor that might have facilitated their use of this morpheme. It is possible that these particular children benefited from the frequent co-occurrence of *am* with *I* (in *I'm*) to a greater extent than other children in the group. Further study of this issue seems warranted.

Implications for Language Assessment and Treatment

Because several children with SLI produced auxiliary *am* with consistency, it is clear that assessment of children's use of this morpheme should not stand alone; other details of language must also be examined. However, because this morpheme was indeed problematic for the majority of the children with SLI, clinicians should consider the possibility that it could constitute a part of a child's grammatical difficulty. In fact, given that *am* is part of the tense and agreement constellation that is a core deficit in SLI, this is a detail that probably should not be ignored. Fortunately, the method employed here seems rather successful as a means of evaluating a child's use of this morpheme.

Given the ease with which obligatory contexts could be obtained and our impression of children's engagement in the task employed, we believe this type of task also has potential for application in language treatment sessions. For example, in a group therapy format, children could take turns being the 'star' of the show, and therefore have an opportunity to

describe their own actions in contexts that promote use of *am*. Such activities could eventually be combined with variations where children also describe for the character what another child is doing (e.g., *She's drawing*). In this way, the children can gain valuable experience not only using each auxiliary form but also changing from one auxiliary form to another depending on the demands of the speaking situation.

Although the clinical implications of this work are considerable, future research is needed. Additional investigations are necessary to determine the precise proportion of English speaking children with SLI who have difficulties with *am*. It is clear from our study that this morpheme is problematic for most children with SLI, but we do not yet know how pervasive this difficulty is in the SLI population. Research directed at children who speak non-mainstream variants of English might also be useful. For example, in African American English, auxiliary *is* and *are* are variable in typically developing children and adults. However, there are several suggestions in the literature that *am* is obligatory in this variant of English (Burns *et al.*, 2000; Green, 2002; Oetting and McDonald, 2001). If future studies confirm this impression, the morpheme *am* might prove helpful in the identification of SLI among African American English-speaking children, and therefore a method of the type described here would seem to be especially important.

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Appendix

Expressive language percentile scores and nonverbal standard scores for the three groups of participants (SLI, TD-MLU, TD-A)

Group	Subject ID	Expressive Language Percentile Score	Nonverbal Standard Score
SLI	2175	1 st *	115 ^a
SLI	2146	1 st *	108 ^a
SLI	2152	1 st *	112 ^a
SLI	2171	3 rd *	110 ^a
SLI	2042	1 st *	90 ^a
SLI	2044	7 th *	107 ^a
SLI	2140	1 st *	102 ^a
SLI	2134	6 th *	105 ^a
SLI	2170	4 th *	89 ^a
SLI	2234	1 st *	107 ^a
SLI	2184	1 st *	101 ^a
SLI	2233	1 st *	108 ^a

Group	Subject ID	Expressive Language Percentile Score	Nonverbal Standard Score
TD-MLU	2161	82 nd *	106 ^a
TD-MLU	2203	17 th **	110 ^b
TD-MLU	2208	36 th *	125 ^a
TD-MLU	2200	18 th **	111 ^b
TD-MLU	2201	60 th *	121 ^b
TD-MLU	2210	42 nd *	143 ^a
TD-MLU	2209	53 rd **	124 ^b
TD-MLU	2214	17 th **	137 ^b
TD-MLU	2229	42 nd **	145 ^b
TD-MLU	2223	43 rd **	119 ^b
TD-A	2122	62 nd *	121 ^a
TD-A	2212	82 nd *	113 ^a
TD-A	2182	40 th *	111 ^a
TD-A	2169	98 th *	150 ^a
TD-A	2213	75 th *	141 ^a
TD-A	2187	62 nd *	111 ^a
TD-A	2197	32 nd *	122 ^a
TD-A	2215	38 th *	120 ^a
TD-A	2172	84 th *	109 ^a
TD-A	2231	9 th *	109 ^a

* Structured Photographic Expressive Language Test – Second Edition (SPELT-II)

** Structured Photographic Expressive Language Test – Preschool (SPELT-P)

^a Columbia Mental Maturity Scale (CMMS)

^b Leiter International Performance Scale (Leiter)

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Figure 1.

Mean percentages of use of auxiliary *am* (and standard errors) by the children with specific language impairment (SLI), the younger typically developing children matched for mean length of utterance (TD-MLU), and the typically developing children matched for age (TD-A).