

## The use of definite and indefinite articles by children with specific language impairment

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Among the grammatical limitations seen in English-speaking children with specific language impairment (SLI) is a prolonged period of using articles (e.g., *a*, *the*) inconsistently. Most studies documenting this difficulty have focused on article omission and have not made the distinction between definite and indefinite article contexts. In this study, there were 36 participants: 12 5-year-olds with SLI, 12 typically-developing children matched for age, and 12 younger, typically-developing children matched with participants in the SLI group according to mean length of utterance. All 36 children participated in a task requiring indefinite article use, and a task requiring use of the definite article, in which the referent of the noun had already been established in the discourse. The children with SLI showed less use of definite articles in particular, relative to both groups of typically-developing children. Substitutions as well as omissions were seen. The findings suggest that the article limitations of the children with SLI were attributable in part to an incomplete understanding of how definite articles are to be used.

**Keywords:** *Specific language impairment (SLI), children, expressive language, definite article, indefinite article.*

### Introduction

An especially well documented problem seen in children with specific language impairment (SLI) is a protracted period of inconsistency in the use of grammatical morphology. This problem is often striking in English-speaking children with SLI. These children show an extended period of inconsistency with such grammatical morphemes as past tense *-ed*, third person singular *-s*, auxiliary *is* and *are*, and the articles *a* and *the*, among others.

Problems with those grammatical morphemes pertaining to tense have been studied in greatest detail in children with SLI. The degree to which these particular morphemes are used in obligatory contexts represents an especially accurate means of identifying children with language impairment, showing very good levels of sensitivity and specificity in distinguishing children with SLI from their typically-developing peers (Bedore & Leonard, 1998; Rice, 2003). However, the articles *a* and *the*, although less intensively studied, also seem to constitute a problem area for children with SLI.

The strongest evidence that article use is a weakness in children with SLI comes from studies that compare these children with a younger typically-developing group as well as a group of typically-

developing children matched for chronological age. The younger children in these studies were matched with the children with SLI according to mean length of utterance (MLU). Studies showing greater use of articles in obligatory contexts by younger MLU-matched children than by children with SLI have been reported by Rice and Wexler (1996), Leonard, Eyer, Bedore, and Grela (1997), and McGregor and Leonard (1994). Such findings are not limited to English; they have been reported as well for Italian (e.g., Bortolini, Caselli, & Leonard, 1997) and Swedish (Hansson, Nettelbladt, & Leonard, 2003). The purpose of the present study is to examine the use of articles by English-speaking children with SLI, with the goal of determining whether the type of article—definite or indefinite—is an important factor in understanding these children's difficulty in this area of grammar.

### Articles in English

In English, articles make a distinction between definite and indefinite (Ionin, 2006). The choice of a definite or indefinite article depends not only on the speaker's intent but also on what the speaker assumes on the part of the listener (Givón, 1993). If the speaker assumes that the referent is accessible to

the listener, the referent is expressed in the definite. If it is not assumed to be accessible to the listener, it is expressed in the indefinite.

According to Givón (1993), there are three conditions under which a speaker might assume that a referent is accessible to the listener. First, the speaker and listener might be able to focus on the same referent during the act of speaking (e.g., *Do you see the dog over there?*). Second, a speaker might use the definite under the assumption that the referent is known and accessible to all members of the speech community (e.g., *The moon will be full tonight*). Finally, the definite might be used when the referent appeared in the preceding discourse and is thus still mentally accessible to the listener (e.g., *My mother bought me a tie and a blazer. Unfortunately, the tie is hideous*). It is this third condition that is of primary interest in the present study.

#### *Article use by typically-developing children*

Early studies of young typically-developing children's use of articles relied on samples of the children's spontaneous speech (Brown, 1973; de Villiers & de Villiers, 1973). These studies showed that, on average, consistent use of articles in obligatory contexts occurs shortly after the children's third birthday. As children approach this age, omissions of articles gradually decrease in proportion. However, given the difficulties that spontaneous speech can present in determining with confidence whether the context obligates definite *the* or indefinite *a*, investigators have combined the two article types in calculating percentage of use. The potential difficulty in determining which article is obligated in a particular context can be seen in the following example. Assume a child is at home and approaches a box of toys. After rummaging through the box, the child holds up a toy truck. An utterance such as *Here's a truck!* might be expected if the child had forgotten the contents of the toy box or had not seen the toy truck before. On the other hand, the utterance *Here's the truck!* might be expected if the child had been looking for that particular toy truck. Unfortunately, the context does not permit a judgement as to which of these interpretations is the correct one. Therefore, there is no way of knowing with confidence if the child's choice of article was appropriate; only the fact that an article was required can be determined with confidence. Of course, on occasion, it is possible to determine from the context whether the definite or indefinite article is obligated. Brown (1973) noted that when the context permitted such a determination, the children in his study were quite accurate, although some substitution errors occurred in each direction (*the* for *a* as well as *a* for *the*).

Subsequent studies employed experimental tasks specifically designed to obligate either definite or indefinite article use (Emslie & Stevenson, 1981; Maratsos, 1974, 1976). The results of these investi-

gations suggest that by 4 years of age, children make a clear distinction between definite and indefinite reference. However, use of *the* and *a* do not follow the same developmental trajectory. Initially, children produce the article *a* primarily in naming contexts (e.g., *That's a truck*). By age 3 years, use of indefinite *a* occurs in a wider variety of contexts, though the definite form *the* is occasionally used as a substitute. This substitution might be "egocentric" in nature, reflecting the child's failure to take into account the listener's perspective (Maratsos, 1976, p. 91).

Appropriate use of the definite article *the* appears adult-like by 4 years of age. However, there appears to be a rather abrupt increase in appropriate use which occurs either between 2–3 years of age (Emslie & Stevenson, 1981) or between 3–4 years of age (Maratsos, 1974), depending on the details of the experimental task. In each of these studies, use of *the* was assessed in a context in which the referent had already been introduced in the discourse. As various authors have noted (e.g., Brown, 1973; Emslie & Stevenson, 1981; Maratsos, 1974), this type of context for definite article use requires the speaker to retain information about the referents already made known to the listener. Such memory demands may be taxing for young children. For this reason, it is difficult to distinguish a child's inability to take the listener's knowledge into account due to memory factors from an absence of intent to take this knowledge into account because the child does not understand the discourse requirements of definite article use.

Some investigators have attempted to characterize the status of articles in young children's grammars. Hyams (1996) proposed that, early in development, articles, like morphemes pertaining to tense, are optional in children's sentence use, alternating from omission to correct use. Specifically, it is assumed that in the children's grammars, like the grammars of adults, articles reflect the grammatical category of Determiner housed within a Determiner Phrase. However, unlike in the adult grammar, it is assumed that, early in grammatical development, children can optionally generate utterances that lack the Determiner Phrase. In such cases, no article appears in the child's utterance.

Schafer and de Villiers (2000) take a different approach in describing the early period of article use by children. According to their framework, indefinite articles do not function as true determiners and do not require a Determiner Phrase. Instead, indefinite articles appear within a Number Phrase, much as is seen in phrases such as *one car*. In contrast, definite articles do require a Determiner Phrase in the adult grammar. However, to function as determiners, definite articles must contain a "point of view" feature that marks nouns whose referents are identifiable by the listener. Schafer and de Villiers (2000) propose that young children's use of definite articles do not contain a point of view feature, as

indicated by their difficulty in using definite articles when the referent had already been established in the discourse. They propose that in the early period of definite article use, these articles do not reflect a Determiner Phrase but instead are simply merged with a Noun Phrase. According to Schafer and de Villiers, the different status of indefinite and definite articles in the grammars of young children should lead to different levels of accuracy. Indefinite articles should be used more accurately than definite articles. It is not clear that this framework provides a clear basis for predicting the type of error that should occur in definite contexts. Upon examining their own data, Schafer and de Villiers found that young children's errors included both omissions and inappropriate productions of the indefinite article in contexts requiring definite articles.

Finally, the prosodic requirements of article use have also been suspected to play a role in young children's inconsistent use of articles. Gerken (1991, 1994) tested the notion that an article's position in a phonological phrase would affect its likelihood of being produced or omitted. Gerken reasoned that articles—which are monosyllabic weak syllables—would be more likely to be omitted if they appeared in sentence-initial position, as in *The bear kissed him*, given the relative difficulty of producing weak syllable–strong syllable sequences (as in *the bear*). Inclusion of the article was expected to be higher when the article was preceded by a strong syllable in the sentence, thus allowing the article to be produced in a strong syllable–weak syllable sequence. An example of the latter is seen in *Pete kissed the bear*. Using a sentence repetition task, Gerken's predictions were borne out in the data.

#### *Article use by children with SLI*

Like the early studies of article use by typically-developing children, the early studies of children with SLI made use of spontaneous speech samples and combined all instances of *the* and *a* to form a single category (Leonard, 1995; Leonard et al., 1997; Rice & Wexler, 1996). Therefore, only the omission or inclusion of an article was considered in obligatory contexts; it was not possible to determine whether an article was produced but used inappropriately. As noted previously, these studies have shown that children with SLI are less likely to use articles in obligatory contexts than are younger typically-developing children matched for MLU. These same studies have also revealed relatively limited use of tense-related morphemes by the children with SLI, prompting Rice and Wexler (1996) to suggest that inconsistent use of articles and tense-related morphology may each constitute a clinical marker of SLI.

The prosodic context appears to be an important factor in the use of articles by children with SLI. McGregor and Leonard (1994) adapted the procedure of Gerken (1991, 1994) by asking children with

SLI to repeat short sentences that contained an article in a prosodic position in which it either could or could not align with a preceding strong syllable. The children were more likely to omit the article when it could not align with a preceding strong syllable, and hence formed a weak syllable–strong syllable sequence with the following noun (e.g., *the car*).

Studies of children with SLI acquiring other languages that employ monosyllabic weak syllable articles have yielded similar findings. Leonard and Bortolini (1998) traced the frequent omissions of articles by Italian-speaking children with SLI to the fact that articles can only rarely align with a preceding strong syllable in Italian. Hansson et al. (2003) found that Swedish-speaking children with SLI were more likely to omit indefinite articles than definite suffixes. The former are monosyllabic syllables that precede the noun (e.g., *ett tåg* ‘a train’); the latter are monosyllabic syllables attached to the end of nouns (e.g., *tåget* ‘the train’). To determine whether the difference in omission rate was related to the prosodic distinction or to the difference in definiteness, these investigators examined the children's ability to use article + adjective + noun sequences. In such sequences, articles are used to mark definite as well as indefinite noun phrases. In these contexts, definite articles were omitted as frequently as indefinite articles.

The goal of the present study was to determine whether the difficulty with article use experienced by English-speaking children with SLI is uniform across definite and indefinite contexts, or whether definite articles, in particular, are problematic for these children. There are two reasons for suspecting greater difficulty with definite articles, both relating to the use of *the* when the referent has already been established in the discourse. First, based on proposals by Schafer and de Villiers (2000), adult-like use of definite articles requires a point of view feature that is not acquired by children until well after indefinite articles (whose acquisition requires no such feature). According to Schafer and de Villiers, errors will be more frequent in definite contexts than in indefinite contexts and could involve either omissions or inappropriate productions of *a*. A second reason to suspect greater difficulty with definite articles in these contexts is that even if children with SLI can adopt the listener's perspective, they must hold in memory which referents had been introduced in the preceding discourse. If retention is the primary problem, errors in definite contexts should consist principally of inappropriate productions of the indefinite form.

Because previous research suggests that prosodic factors can influence article use, we control such factors in the present study by requiring the children to produce both definite and indefinite forms in isolated article + noun contexts (e.g., *the dog*; *a car*). This prosodic context can lead to omissions, but these should be comparable across definite and indefinite contexts. There would be no reason to

expect, based on prosodic factors alone, any differences between definite and indefinite articles in omission frequency. To determine whether the observed pattern of use reflects the pattern seen in typical development, we recruited two groups of children to serve as comparison groups, one matched with the children with SLI according to age, the other—a younger group—matched with the children with SLI according to MLU.

## Method

### Participants

Thirty-six monolingual mainstream American English-speaking children ranging in age from 2;10 (years;months) to 7;0 served as the participants. Twelve of the children, six boys and six girls, had been diagnosed as exhibiting a language disorder and met the criteria for SLI (hereafter, referred to as the SLI group). The children in this group ranged in age from 4;5–7;0 ( $M = 5;1$ ,  $SD = 8.04$  months), the approximate age range for which inconsistent article use can be expected in children with SLI based on previous studies. Each of the children with SLI was receiving language intervention at the time of the study. All of the children with SLI scored below the 10<sup>th</sup> percentile on the *Structured Photographic Expressive Language Test-II* (SPELT-II; Werner & Kresheck, 1983), a norm-referenced test of morphosyntactic use. The children were selected for this study on the basis of these scores. Standard scores on the SPELT-II ranged from 67–78 ( $M = 68.75$ ,  $SD = 3.52$ ). These children also scored at least 1.5 SD below the mean for their age on a composite measure of the children's use of finite verb morphology (Leonard, Miller, & Gerber, 1999). This measure combines the children's use of the tense-related morphemes past tense *-ed*, third person singular *-s*, and the copula and auxiliary forms *is*, *are*, *am*, *was*, and *were* to form a composite percentage of correct. The children's mean score was 59.08 ( $SD = 21.07$ ). Additionally, all of these children passed a hearing screening, an examination of oral-motor function, and showed no evidence of frank neurological dysfunction such as seizure disorders or cerebral palsy, and none were under medication for the prevention of seizures, according to parent report. Each child also scored at least 85 on the *Columbia Mental Maturity Scale* (CMMS; Burgemeister, Blum, & Lorge, 1972), a test of non-verbal intelligence. Scores on this test ranged from 85–132 ( $M = 106.5$ ,  $SD = 12.28$ ). Their MLUs, based on a 100-utterance spontaneous speech sample, ranged from 3.45–4.67 morphemes ( $M = 4.10$ ,  $SD = .45$ ). These samples occurred during free play with the examiner. MLU did not serve as a selection criterion for the children in this group; however, 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.

Twelve children with no history of language or learning problems were matched to the children in the SLI group according to age (hereafter, referred to as the TD-A group). Six of the children were boys and six were girls. These children ranged in age from 4;6–6;10 ( $M = 5;1$ ,  $SD = 7.65$  months). Each of the children in the TD-A group was within 2 months of age of a child in the SLI group. All of the children in this group scored within the average or above average range on the SPELT-II. Their standard scores on the SPELT-II ranged from 88–134 ( $M = 106.75$ ,  $SD = 13.36$ ). The children also scored within 1 SD of the mean for their age on the finite verb morphology composite ( $M = 98.33$ ,  $SD = 1.97$ ). Each of the children in this group had scores above 85 on the CMMS; standard scores ranged from 106–134 ( $M = 118.33$ ,  $SD = 9.2$ ). Additionally, all of the children passed hearing and oral motor screenings and showed no evidence of neurological impairment by parent report. These children's MLUs ranged from 4.07–7.06 ( $M = 5.05$ ,  $SD = .72$ ).

The remaining 12 children were matched to the children in the SLI group according to MLU in morphemes (hereafter referred to as the TD-MLU group). MLU matching was performed to ensure that the younger typically-developing comparison group was comparable to the younger groups used in previous comparative studies. In those previous studies, MLU matching was also employed. The TD-MLU group consisted of four boys and eight girls ranging in age from 2;10–3;9 ( $M = 3;3$ ,  $SD = 3.65$  months). The MLU of each of the children in this group was within .3 morphemes of the MLU of a child in the SLI group (range = 3.34–4.78;  $M = 4.19$ ,  $SD = .52$ ). Although some studies have used .2 rather than .3 morphemes as the criterion for matching (see Leonard & Finneran, 2003), it can be seen from a comparison of the MLU ranges for the SLI and TD-MLU groups (3.45–4.67 vs 3.34–4.78), their mean MLUs (4.10 vs 4.19), and the SDs of their MLUs (0.45 vs 0.52), that the MLUs of these two groups were indistinguishable. Because some of the participants in this group were too young to be administered the SPELT-II, all of the children in this group were administered the US standardization of the *Reynell Developmental Language Scales* (Reynell & Gruber, 1990). Standard scores on the Reynell Expressive Language scale ranged from 96–126 ( $M = 114.17$ ,  $SD = 9.66$ ), and standard scores on the Reynell Verbal Comprehension scale ranged from 98–125 ( $M = 108.00$ ,  $SD = 8.93$ ). All children scored within 1 SD of the mean for their age on the finite verb morphology composite ( $M = 86.33$ ,  $SD = 17.37$ ). For the children in this group aged 3;6 and above, standard scores on the CMMS ranged from 108–138 ( $M = 122.25$ ,  $SD = 12.82$ ). Children in this group under age 3;6 were too young to be given the CMMS

and were instead administered the *Leiter International Performance Scale-Revised* (Roid & Miller, 1997). All of the children scored within the normal range on this test; standard scores ranged from 95–129 ( $M = 113.63$ ,  $SD = 14.70$ ). Finally, all of the children passed hearing and oral motor screenings, and their neurological histories were unremarkable.

The number of children recruited for each group (12) was based on prior work comparing similar groups' use of grammatical morphemes (e.g., Leonard, 1995; Leonard et al., 1997). In those studies, large effect sizes were seen with Ns as low as 10 per group.

Given previous suggestions that optional article use might accompany the optional use of tense-related morphemes (Hyams, 1996), we compared the three groups' finite verb morphology composite scores, which are composed entirely of morphemes involving tense. A significant difference was seen among the three groups,  $F(2, 33) = 19.23$ ,  $p < .001$ , partial  $\eta^2 = .54$ . The children with SLI used these morphemes significantly less in obligatory contexts than both the TD-MLU group ( $d = 1.42$ ) and the TD-A group ( $d = 3.91$ ).

#### Materials and procedure

The children's ability to make the definite-indefinite distinction was explored by adapting an elicitation task used by deVilliers, Schafer, Pearson, and Seymour (2000). The task did not make use of any objects or pictures. In the task, the children were read short "stories", one-to-three sentences in length, and asked questions by the examiner. All of the stories were imagined and the questions that followed each story were designed to elicit noun phrases containing the articles *a* or *the* (e.g., *A cat and a dog were playing in the backyard. One of them barked. Guess which*). In the adaptation used in the present study, additional, original short stories were created that followed the format used by deVilliers et al. (see Appendix for a complete list of items).

A single examiner interacted with the child. The examiner sat directly across from the child and began by explaining the task directions. Prior to administering the test items, a practice item was given to the child, with feedback provided. All children passed the practice item. For each test item, the examiner read aloud to the child a story one-to-three sentences in length. After each short story, the examiner asked the child a question that was designed to elicit the target response of a singular count noun with the appropriate preceding article. If the child's answer was one that did not require an article (e.g., the child used a mass noun like *sand*, a plural noun like *shoes*, or a possessive adjective like *my*) the child was prompted by the examiner asking, *What else?* or *Anything else?* If the child's second response was still one that did not require the use of a singular definite or indefinite article, then the response was noted and

the next item was administered. If the child made no attempt to respond, the item was re-presented one time only.

Two lists of questions were employed, one that obligated the use of the definite article *the* in a discourse-related context, and one that obligated use of the indefinite article *a*, yielding two conditions. In the definite article condition, the target response involved a referent already mentioned in the story (e.g., Examiner: *A cat and a dog were playing in the backyard. One of them barked. Guess which*. Child: *The dog*). In the indefinite article condition, the target response involved a referent that had not been mentioned or referred to in the story, but one that could be assumed in the situation (e.g., Examiner: *Stephen wants to call home. What can he use to call home with?* Child: *A telephone, A phone, A cell phone*). In their study using similar items, deVilliers et al. (2000) found that items requiring the use of *the* were relatively difficult for young children across American English dialect groups.

Each of the conditions was administered during separate sessions on separate days. The order of administration of conditions was counterbalanced across the children in each group. Each condition consisted of eight test items, as shown in the Appendix.

#### Scoring and reliability

All responses were examined to ensure that they constituted appropriate contexts for the definite or indefinite article. Scorable items were those in which an appropriate noun was produced even if there was substitution or omission of the target article. Items were considered unscorable if an inappropriate noun was produced. One type of unscorable response was the use of a mass noun such as *sand*, a plural noun such as *shoes*, or a possessive adjective such as *my*. Another type of unscorable response was the production of a wholly inappropriate noun, even if an article accompanied it. For example, for an indefinite article item, if the examiner said, *Stephen wants to call home. What can he use to call home with?* and the child's response was *a letter*, then an appropriate noun was not produced and the item was labelled unscorable. If, on the other hand, the child's response was *phone*, then the item was considered scorable and counted as an omission of the indefinite article *a*. Unintelligible responses were also labelled unscorable and were not counted in the scoring.

Across all three groups of children, 83% of the responses were scorable. All children provided scorable responses for more than half of the items in each condition, and no child's data were excluded from data analysis. For the children with SLI, an average of 7.67 ( $SD = .77$ ) of the eight definite article items were scorable, as were 6.92 ( $SD = .90$ ) of the eight indefinite article items. For the TD-MLU

children, a mean of 7.33 (SD = .88) of the definite article items and 5.92 (SD = 1.37) of the indefinite article items were scorable. For the TD-A children, scorable responses averaged 7.83 (SD = .38) for definite article items and 7.17 (SD = .93) for indefinite article items. Because these occasional unscorable items reduced the total number of items for some of the children, the percentage of scorable items that were correct was the basis of comparison rather than the number of correct items for each condition. That is, for each child, in each condition, the number of correct articles was counted and divided by the total number of scorable items in that condition for that child. This number was then multiplied by 100, yielding a percentage score for each child in each condition.

The responses of seven children (three children randomly selected from the SLI group, and two children randomly selected from each of the two TD groups) were scored by an independent judge to assess inter-judge reliability. The independent judge scored the responses without knowing the children's group membership. Agreement between the independent judge and the original scorer meant that both judges had to agree that the child's response was scorable or unscorable, that the response was correct or incorrect, and, in the case of incorrect responses, whether the response was an error of substitution or omission. A discrepancy between the two judges on any of these decisions constituted a disagreement for that item. Item-by-item agreement between the independent judge and the original scorer was 94%. The percentages of agreement for the SLI, TD-MLU, and TD-A groups were 95%, 94%, and 91%, respectively.

## Results

The children's ability to make the definite-indefinite distinction on the elicitation task was examined by means of a mixed-model analysis of variance (ANOVA) with participant group (SLI, TD-MLU, TD-A) serving as a between-subjects variable and article type (definite, indefinite) serving as a within-subjects variable. Effect sizes for the ANOVA were computed using partial  $\eta^2$ , defined as the proportion of the main or interaction effect's variance plus associated variance that is explained. Least significant difference tests at the .05 level were applied to all significant ANOVA differences, with effect sizes calculated using  $d$ , which reflects the size of the effect for the difference between two means. Following Cohen (1988),  $d$  effect sizes of  $\sim .50$  were considered to be medium effect sizes, and effect sizes greater than .80 were regarded as large. The corresponding means and standard deviations for the three participant groups for each condition appear in Table I.

A significant main effect was seen for participant group,  $F(2, 33) = 7.87$ ,  $p = .002$ , partial  $\eta^2 = .32$ , and

article type,  $F(1, 33) = 36.54$ ,  $p < .001$ , partial  $\eta^2 = .53$ . However, interpretation of these main effects is modulated by a significant participant group by article type interaction,  $F(2, 33) = 5.64$ ,  $p = .007$ , partial  $\eta^2 = .26$ . Post-hoc testing at the .05 level indicated that the children with SLI ( $M = 19.79$ ,  $SD = 30.37$ ) showed significantly less use of the definite article *the* than children in the TD-MLU group ( $M = 44.44$ ,  $SD = 39.26$ ,  $d = .70$ ), who, in turn, showed significantly less use of the definite article than the children in the TD-A group ( $M = 76.34$ ,  $SD = 26.29$ ,  $d = 1.99$ ). However, as can be seen from Table I, the three groups did not differ in their indefinite article use. To illustrate how similarly these two groups performed on the indefinite article items, we computed the percentage of overlap in the two groups' distributions. As described by Cohen (1988), a  $d$ -value of 0 means that 100% of the combined area is shared by the two distributions—there is 100% overlap. When such calculations were applied to the indefinite article items, both the overlap between the scores of the SLI and TD-MLU groups and the overlap between the scores of the SLI and TD-A groups was 90%. Eleven of the 12 children in the SLI group were less accurate on definite article items than on indefinite article items. The same was true for eight of the 12 TD-MLU children and six of the 12 children in the TD-A group.

For both types of items, the majority of errors produced by the children with SLI were errors of substitution. This was especially salient for definite article items, as the children very frequently produced the indefinite article *a* in place of the appropriate definite article *the*. Substitution errors also outnumbered omission errors for indefinite article items, although the number of errors on indefinite article items was quite low. Importantly, even the omission errors on definite article items by the children with SLI were more frequent than their substitution errors on indefinite article items. For the TD-MLU children, substitution errors were more frequent than omission errors on definite article items. However, for these children, omissions on indefinite article items were slightly higher in frequency than substitutions. The TD-A children showed a similar number of substitution and omis-

Table I. Mean percentages correct (and standard deviations) by condition for the three participant groups.

Condition	Participant group		
	SLI	TD-MLU	TD-A
Definite <i>the</i>	19.79 (30.37)	44.44 (39.26)	76.34 (26.29)
Indefinite <i>a</i>	86.97 (13.13)	84.32 (27.00)	89.14 (17.62)

SLI = children with specific language impairment; TD-MLU = typically-developing children matched for mean length of utterance; TD-A = typically-developing children matched for age.

Table II. The total number of substitution and omission errors on definite and indefinite article items for the three participant groups (SLI, TD-MLU, TD-A).

Condition	Participant group		
	SLI	TD-MLU	TD-A
Substitutions—Definite <i>the</i> items	50	36	12
Omissions—Definite <i>the</i> items	25	12	10
Substitutions—Indefinite <i>a</i> items	8	4	2
Omissions—Indefinite <i>a</i> items	3	8	8

SLI=children with specific language impairment; TD-MLU=typically-developing children matched for mean length of utterance; TD-A=typically-developing children matched for age.

sion errors on definite article items, and slightly more omission errors than substitution errors on indefinite article items. The number of substitution and omission errors by each of the three participant groups on each type of article item can be seen in Table II.

In a final analysis, we attempted to determine whether poor performance on the definite article items used in this study might have the potential to serve as a clinical marker of language impairment. That is, we asked whether these items would be successful not just in showing group differences, but in sorting children into separate groups (SLI, TD) according to their performance on these items. Because diagnostic classification always takes into account a child's age, our analysis focused on the definite article performance of the SLI and TD-A groups. A logistic regression analysis revealed 83% sensitivity and 83% specificity. That is, 83% of the children in the SLI group were correctly classified as falling in the impaired group (sensitivity) and 83% of the children in the TD group were correctly classified as typically-developing (specificity). Two children in each group were misclassified.

## Discussion

The purpose of the present study was to examine the ability of English-speaking children with SLI to make the definite-indefinite (*the*, *a*) distinction using an experimental task that has proven successful in eliciting these forms from TD children. As a group, these children clearly used the definite article (*the*) with lower percentages than TD age-matched peers and younger TD children matched for MLU. Their performance in contexts obligating the use of the indefinite article (*a*), however, was comparable to both groups of TD children. Before discussing the interpretation and implications of these findings, we make explicit some of the limitations of the study.

### Limitations of the study

One caution that is warranted is that the present study examined only one type of definite article use

and one type of indefinite article use. These types of use are highly relevant, as the choice of *the* vs *a* in these items hinges on whether the referent has already been introduced in the discourse, and such contexts are very common in everyday language use. Nevertheless, we cannot conclude from our findings that children with SLI are similarly weak in using definite articles in other types of contexts. For example, as noted earlier, in a sentence such as *The moon will be full tonight*, the assumption that the speaker is referring to a particular moon is based on shared knowledge of the larger speech community, not on prior mention in the discourse. Future research will be needed to determine whether the pattern of results observed in this study holds true for definite and indefinite articles tested in other contexts, or whether children with SLI differ in their success with a particular article depending on the type of context in which it must be used.

Another factor that must be taken into consideration is the fact that the prosodic context was controlled by employing a task that required article+noun, that is weak syllable-strong syllable sequences in isolation. This decision permitted a clearer picture of the role of the definite-indefinite distinction in the children's speech, as the two types of contexts did not differ in their prosodic demands. However, it is plausible that the differences we observed between the children's definite and indefinite article use may differ somewhat when greater prosodic variation is allowed.

Another potential limitation is that we cannot exclude the possibility that some of the article omissions by the children were cases in which an elliptical response was intended. The investigators first making use of this task, deVilliers et al. (2000), raised this possibility when they found lower than expected scores for definite articles. They suggested that the children might have treated the task as a guessing game, one that permitted elliptical answers that lacked an article. To an extent, this may have been true as well for the children in the present study. However, two important observations suggest that this factor can account for only a portion of the findings. First, the children with SLI were much less accurate in their use of definite articles than both younger TD children matched for MLU and same-age TD peers. Thus, it would have to be assumed that the children with SLI were more likely than the other children to treat the task as a guessing game. Second, the children with SLI were much more likely to produce the indefinite article in place of the definite article than to omit the definite article. Such errors cannot be viewed as elliptical responses. It would seem, then, that other factors were also involved in leading to the children's limited use of definite articles.

Finally, it is possible that differences favouring the TD-MLU group over the group of children with SLI were magnified because the TD-MLU group

had a larger percentage of females and language development is often more advanced in females than in males. However, recall that the SLI and TD-MLU groups did not differ in their use of the indefinite article *a*, even though neither group was at ceiling level. If the larger percentage of females in the TD-MLU group were the principal factor in explaining the group difference for definite articles, the SLI and TD-MLU groups would not be expected to perform in such a similar manner when using indefinite articles.

#### *The sources of difficulty for children with SLI*

As in previous studies (e.g., Leonard et al., 1997; Rice & Wexler, 1996), we found that the children with SLI were less proficient with article use than both MLU-matched and age-matched TD children. As reported in the Method, we also found that these same children with SLI showed lower degrees of use of tense-related morphemes than the TD-MLU and TD-A children. However, this apparent parallel between article use and tense-related morpheme use has limits. Although individual children may show somewhat greater use of one type of tense-related morpheme (e.g., copula *is*) than another (e.g., past tense *-ed*), one does not find reports of children performing at high levels of accuracy on certain tense-related morphemes while still showing rather low levels of accuracy on others. In the present study, such a discrepancy was found across the two types of articles; the children with SLI were much more accurate in their use of indefinite articles than in their use of definite articles. It was definite article use in particular that distinguished the children with SLI from their typically-developing peers. What was the basis of this difficulty?

In the case of our tasks, prosody does not seem to be a primary factor. If problems were attributable primarily to prosody, omissions would be very frequent and similar in degree for definite and indefinite contexts, given that both *the* and *a* are weak monosyllables and preceded either a stressed monosyllabic noun (e.g., *the dog, a car*) or a multisyllabic noun with a stressed initial syllable (e.g., *the pencil, a bottle*). However, for the children with SLI, omissions were five times more frequent in definite contexts than in indefinite contexts.

Such an asymmetry in omission frequency cannot be readily accommodated by an assumption of optional article use (Hyams, 1996), because this type of account assumes that both indefinite and definite articles reflect the category Determiner within a Determiner Phrase. Utterances that lack articles are presumably generated without a Determiner Phrase, but it is not clear how the type of article within the Determiner Phrase can affect this process.

The most plausible explanation for the lower accuracy levels in definite contexts than in indefinite

contexts is that appropriate use of the definite article placed demands on the children that were not required for appropriate indefinite article use. First, the children had to possess the knowledge that the definite article is used when the referent is already known to the listener. Second, the children had to keep track of the fact that the referent had already been made known to the listener as they formulated their response. Retention of this information constituted a demand on memory.

We suspect that both of these factors were in play. Given that verbal working memory limitations are closely related to language performance in children with SLI (see Leonard, Ellis Weismer, Miller, Francis, Tomblin, & Kail, 2007), failures in recall could easily have contributed to the children's lower accuracy with definite articles. However, it does not seem likely that memory failures can be the sole explanation for the findings. If the children fully grasped the rules of definite article use but often failed to keep track of whether the referent had already been mentioned, their errors should have been almost exclusively substitutions of the indefinite *a* in place of the definite *the*. Yet a significant minority of the children's errors in this context took the form of omission. Another reason why memory failures alone may not entirely explain the difficulty seen in definite article use by the children with SLI rests in the high number of scorable responses obtained. That is, in order for a response in the definite article condition to be considered scorable, the child had to use a pre-mentioned referent in their response, which required retention. Given that the number of scorable responses by the children with SLI was comparable for both article conditions, memory failures cannot reasonably be viewed as the sole explanation for our findings.

One way that future research might better isolate the role of this memory factor is by experimentally manipulating the distance and amount of material separating the first mention of the referent by the examiner from the subsequent mention of the referent by the child. Presumably, the likelihood of the child using an indefinite form in place of the definite form would increase as the distance and amount of intervening material increased. If, on the other hand, the child's difficulty were one of not knowing when a definite article should be used, the use of an indefinite article in a definite context would probably not be influenced by distance from first mention of the referent.

This direction of research seems preferable to attempts at reducing the memory demands as a "cleaner" test of the children's ability to use the definite article when the referent has already been established in the discourse. For example, assume that pictures of the referents are presented as the referents are mentioned and these remain visible as a memory aid to use as the children provide their response. The problem with such a task is that any



use of the definite article by the children could just as easily be based on the physical context (the presence of the picture of the referent) shared by speaker and listener—a context that also calls for the definite article (e.g., *Do you see the dog in this picture?*) (Givón, 1993).

In general, the findings seem consistent with the proposal put forth by Schafer and de Villiers (2000) that indefinite and definite articles reflect different grammatical categories, and that adult-like use of the latter requires a point of view feature. This feature is presumably lacking in the grammars of young children, and might be argued to be especially late to develop in the grammars of children with SLI.

On the surface, the fit between our findings and the Schafer and de Villiers (2000) proposal seems quite close. However, one detail requires further investigation. Schafer and de Villiers (2000) found that when young children had difficulty with definite articles, their errors consisted of both omissions and substitution errors, and, presumably, both types of errors were compatible with their “absent point of view feature” interpretation. However, it is not clear to us why in one instance an omission should occur and in another instance an indefinite article is used as a substitute. As noted earlier, because omissions of definite articles greatly outnumbered omissions of indefinite articles, prosodic factors do not seem responsible for many of the definite article omissions. Furthermore, use of indefinite articles as a substitute within the Schafer and de Villiers approach would suggest that children often had a tendency to employ a Number Phrase (e.g., *treating a car much like one car*) when the referent had already been mentioned.

Clearly, more research is needed to arrive at a complete understanding of the difficulties experienced by children with SLI in the use of definite articles. However, we believe that the present study has moved the field forward by showing that article use by children with SLI is not a unitary process. Instead, along with any factors attributable to prosody, it appears that the definite–indefinite distinction in the English article system plays an important role in influencing the degree to which the appropriate form will be used by these children.

#### *Clinical implications*

If the findings from the present study are replicated, they offer some possible suggestions for assessment and intervention. First, it would appear that clinicians will need to carefully assess children’s use of articles. It might appear from a spontaneous speech sample that a child uses articles in most obligatory contexts. However, on close inspection, these articles may not show the proper variety of definite and indefinite articles. Second, it might be the case that the use of definite articles with nouns that have already been introduced in the discourse will prove

especially difficult for children with SLI. It would seem important for clinicians to closely monitor children’s choice of articles in these contexts. If children continue to use indefinite articles in these contexts, therapy activities might be designed to assist the child in recognizing the contexts in which definite articles should be employed.

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#### Appendix: Experimental task items for definite and indefinite article conditions

##### Definite ‘the’ items

- 1) A cat and a dog were playing in the backyard. One of them barked. Guess which.
- 2) A mouse and a bird were sitting by the river. One of the animals flew away. Guess which.
- 3) Susie was hungry. She saw a pencil and a hamburger on the table. She ate one. Guess which.
- 4) John was happy. He had a ball and a cupcake in his hands. He bounced one. Guess which.
- 5) Christine wanted to write a letter to her friend. She found a necklace and a pencil in her bag. She used one to write with. Guess which.
- 6) It was time for Jake to sweep the floor. He had a sock and a broom. He used one to sweep the floor with. Guess which.
- 7) A little boy was playing with his toys. He had a car and an airplane. One of them had wings. Guess which.
- 8) A woman wanted to take a picture. She had a button and a camera. She used one of them to take a picture. Guess which.

##### Indefinite ‘a’ items

- 1) Mom wants to take Susie, Ryan, and the dog to the park. What can they all ride in?
- 2) Jeff wants to take his favourite game, his basketball, and his new shirt to his Grandma’s house when he goes to visit. What can he put them all in?
- 3) Mary has jello, soup, and cereal to eat. What can she use to eat it all with?
- 4) Jerry wants to give the baby some milk. What does he put the milk in?
- 5) Sue wants to write the letter. What can she write the letter with?
- 6) Stephen wants to call home. What can he use to call home with?
- 7) Johnny wants to go somewhere that has slides, monkey bars, and swings. Where can he find all of these things to play with?
- 8) Lynn wants to unlock the door to the house. What could she unlock it with?