
Children's Productions of the Affix *-ed* in Past Tense and Past Participle Contexts

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Children's productions of the affix *-ed* in past tense and past participle contexts (e.g., *the boy kicked the ball* vs. *the ball was kicked*) were examined in spontaneous conversations and elicited productions. The performances of 7 children with specific language impairment (SLI) were compared with those of 2 control groups of typically developing children (age matches, MLU matches). Children with SLI produced fewer obligatory contexts for both past tense and past participle forms than did the control children, and were more likely to omit past tense affixes. In contrast, few omissions of the past participle were observed across all 3 groups. Implications for theories regarding the morphological deficits associated with SLI are discussed.

KEY WORDS: specific language impairment, grammatical morphology, past tense, past participle, morphosyntax

Limitations in the development of the English past tense affix *-ed* have been well-documented in children with specific language impairment (SLI) and are regarded by some as a hallmark feature of the condition (e.g., Conti-Ramsden, Botting, & Faragher, 2001; Leonard, 1998; Leonard, Bartolini, Caseli, McGregor, & Sabadini, 1992; Marchman, Wulfeck, & Ellis Weismer, 1999; Oetting & Horohov, 1997; Rice, Wexler, & Cleave, 1995; Rice, Wexler, & Hershberger, 1998; Rice, Wexler, & Redmond, 1999; van der Lely & Ullman, 1996; Windsor, Scott, & Street, 2000). Well into the elementary grades, English-speaking children with SLI perform considerably worse than both typically developing children of similar ages and younger children with similar levels of mean length of utterance (MLU; cf. Conti-Ramsden et al., 2001; Rice et al., 1998; Windsor et al., 2000). Deficiencies have been documented across a variety of language tasks, including spontaneous conversations, elicited productions, sentence completion, sentence recall, production of nonsense forms, writing samples, and grammaticality judgments. The tendency of children with SLI to omit *-ed* affixes within obligatory past tense contexts accounts for most of their difficulties in this area.

Theoretical accounts of the source of these errors have been varied but can be divided into two general classes. Some proposals have focused on the morphophonological mechanisms associated with tense marking, whereas other proposals have focused on the maturation of morphosyntactic principles associated with tense. The morphophonological component of English tense marking represents the patterns children need to extract from the input in order to produce the various forms

associated with past tense. Specifically, children have to learn to “add *-ed*” to regular verb stems and recognize the various alternative phonological processes involved in indicating the past tense of irregular verbs.

Although morphophonological theories disagree on the specific nature of the proposed deficit, all posit that some aspect of learning “how to indicate tense” has been disrupted. For example, Leonard’s (1989, 1998; Leonard et al., 1992) low phonetic substance (LPS) account has focused on the potential interaction between phonological complexity and children’s efficacious extraction of the regular past tense paradigm. According to the LPS account, children with SLI have inadequate language processing resources; the presence of challenging forms at the phonological level creates a bottleneck that results in either the incomplete or incorrect analysis of grammatical morphemes at the morphological level. The challenging nature of regular past tense for children with SLI is accounted for by the LPS because the *-ed* affix is characterized by a brief burst and formant transition lasting a few tens of milliseconds and appears in unstressed sentence positions relative to surrounding elements in the verb phrase. The cumulative effect for children with SLI is that a greater number of exposures of the *-ed* affix are required before tense becomes incorporated into their grammatical systems.

Another morphophonological model of tense deficits in SLI was presented by Marchman, Wulfeck, and Ellis Weismer (1999). This model, based on Connectionist principles, implicates a different interaction between phonology and morphology than does the LPS account. According to Marchman et al., the problems children with SLI encounter with the acquisition of regular past tense are due to their heightened sensitivity to phonological information. Phonological similarities between verb stems for some regular verbs and high frequency irregular verbs that do not alternate across their present, past, or past participle forms (e.g. *hit, cut, put*) set up a competition between these two morphological classes. Typically developing children are able to accommodate the overlap and eventually distribute their verbs into the appropriate classes by incorporating other morphophonological cues. Children with SLI, however, struggle through the competition between these similar verb classes for an extended period of time. Thus, omissions of the *-ed* affix on regular verbs by children with SLI are considered the result of irregularization errors—errors of extending an alternation pattern of “no change” associated with high frequency irregular verbs to a class of regular verbs.

In contrast to the explanatory premium morphophonological theories have placed on the form of past tense verbs, other theories of the tense deficits associated with SLI have stressed the importance of morphosyntactic properties associated with tense. A prominent

morphosyntactic theory of SLI is Rice and Wexler’s (Rice, 2000; Rice et al., 1995) extended optional infinitive (EOI) account. According to the EOI account, children with SLI are delayed in their resolution of a stage observed in typically developing children when tense is not regarded as an obligatory syntactic feature. During this stage, children use both nonfinite and finite verbal forms in sentence positions requiring a finite verb. In contrast to the predictions of the morphophonological models, which are silent on issues outside of tense omissions, the EOI account predicts that other important aspects of the development of tense are intact in children with SLI. For example, under this account children with SLI should not be confused with making distinctions between present and past temporal reference nor would they allow past tense forms to appear in unlicensed sentence sites (e.g., **He wanted to kicked a ball*; see Rice, 2000). Rice and Wexler have provided further evidence that children with SLI are aware of important distributional and phonological differences between regular and irregular verbs, at least at a level that is commensurate with their general language skills (e.g., MLU or vocabulary level; cf. Rice, Wexler, Marquis, & Hershberger 2000; see also Oetting & Horohov, 1997). Thus, the deficiencies in tense marking associated with SLI are characterized quite differently under the EOI account. The EOI account describes the tendency of children with SLI to use non-tensed verbs as a limitation in knowing “whether to indicate tense” in every main clause.

Homophonous Morphological Forms as a Test of Competing Theories

Morphophonological and morphosyntactic accounts of SLI differ dramatically in the emphasis placed on the phonological characteristics of verbal inflections. Predictions based on these two perspectives have been evaluated through the examination of children’s productions of homophonous morphological forms. For example, Rice and Oetting (1993) examined children’s spontaneous language samples for productions of the English *-s* affix in obligatory contexts for the plural (e.g., *two clock-s*) and for the regular third person singular present tense (e.g., *he walk-s*). At the phonological level, each of these *-s* affixes are brief and unstressed. Only the verbal inflection, however, encodes or “checks off” tense information. Results indicated that for both plurals and present tense inflections, children in the SLI group performed significantly worse than their MLU matches, but, as Rice and Oetting noted, the children with SLI were quite comparable to the MLU controls in their use of plurals. Omissions were the most common error produced by both groups on both forms. Rice and Oetting concluded that their data provided little support for the LPS hypothesis because this theory failed

to account for the magnitude of differences across morphemes that have identical phonetic values.

This conclusion has not gone unchallenged, however. Leonard (1998) has pointed out that there might be additional confounds complicating a direct comparison between the English plural and present tense affixes. For example, the semantic and syntactic loads associated with children's processing of verbs are probably relatively higher than nouns; these differences could explain some of the observed discrepancies in children's productions of these homophonous grammatical affixes. In other words, morphophonological accounts may be able to accommodate differences between homophonous forms by suggesting that phonological complexity may be a necessary but insufficient condition to tax the limited processing capacities of children with SLI. Other variables, such as the frequency of children's input, output, semantic opacity, or grammatical complexity may contribute additional stresses to children's vulnerable morphological systems that, when combined with phonologically challenging forms, lead to the observed deficiencies in marking tense. A more direct test of the role of phonological form on children's development of tense marking would then be to compare tensed verbal forms to homophonous non-tensed verbal forms.

In English, the morphophonological alternation "verb stem+*-ed*" appears with regular verbs during the marking of past tense (e.g., *the boy kicked the ball*) and in the marking of perfect aspect on the past participle (e.g., *The ball was kicked by the boy*). More importantly, for testing the predictions of morphophonological models, past participles appear to be at least as complex phonologically, morphologically, semantically, grammatically, and distributionally as the past tense.

The morphological paradigms involved in the marking of past participles in English are complex, representing five major classes of alternations (see Quirk, Greenbaum, Leech, & Svartik, 1995). The first class includes all regular verbs (e.g., *cleaned, kicked, smashed*) and a large set of irregular verbs, and is composed of those verbs whose past tense and past participle forms are identical (e.g., *brought, built, caught, had, left, kept, said, taught, thought, told*). The second class contains high frequency irregular verbs such as *hit, cut, and put* that remain unchanged across their present, past, or past participle forms. For a third class of irregular verbs, the past participle is generated via the affixation of *-en* to their past tense form. This class includes verbs like *beaten, broken, spoken, stolen*. For the fourth class of irregular verbs, the *-en* morpheme is affixed to the present tense form (e.g., *blown, eaten, taken, thrown*). A final class of irregular verbs uses participle forms that are distinct from both their present and past tense forms (e.g., *been, drunk, gone, written, ridden*).

Production of the English past participle likewise requires command of four advanced grammatical contexts: the passive (*The window was smashed*), the present perfect (*He has smashed the window*), the past perfect (*He had smashed the window*), and the past modal (*He would have smashed the window*). From both syntactic and semantic perspectives, each of these sentences would be considered complex relative to simple active sentences because they require children to coordinate multiple relations between tense, voice, aspect, and mood within the verb phrase.

Investigations into naturally occurring language use suggest that the sentence frames in which the English participle appears occur infrequently in the speech directed toward children. For example, Brown (1973) reported that only 18 past participles occurred in his sample of 713 adult utterances. Gathercole (1986) found an average of one occurrence of the present perfect for every 6 hr of speech directed at children. Gordon and Chafetz (1990) estimated that Standard American English speaking children hear a passive sentence, one of the more common contexts in which past participles appear, in only 1 of every 1,000 utterances directed to them.

In sum, an assessment of the past participle as it typically occurs in Standard American English suggests that complexity (phonological, paradigm, semantic, and grammatical) and frequency should all conspire to make the development of this particular verbal form challenging.

The Acquisition of English Past Participles

Compared to what is available on the development of the English past tense, information regarding the acquisition of English past participle forms is considerably limited. Cromer (1974) noted that the sentence types associated with this verbal form appear relatively late and are probably rare in children's spontaneous speech samples. Subsequent investigations have supported this prediction. For example, Gathercole (1986) found a total of three occurrences of the present perfect in 12 hr of recorded speech, and Wells (1979) found only 19 passive sentences in 18,000 utterances produced by 60 children between the ages of 36 and 42 months. No child in the Wells (1979) data set produced more than three tokens. Fletcher (1981) analyzed language samples collected on 32 three-year-old children and compared their use of the regular past tense *-ed* and the past participle *-ed* across different contexts. Results indicated that the regular past tense *-ed* occurred almost four times more frequently than the participle *-ed*. Fletcher also noted that the past tense forms were distributed over a wider variety of lexical verbs.

In spite of its relatively low rate of occurrence in natural conversations, several investigators have reported that it is possible to elicit spontaneous productions of passive sentences in young children with modest modifications to the typical conversational exchange (Brooks & Tomasello, 1999; Marchman, Bates, Burkardt, & Good, 1991; Pinker, Lebeaux, & Frost, 1987). For example, Brooks and Tomasello (1999) have demonstrated that children as young as 3 years old can be taught quickly to produce passive sentences spontaneously and with nonsense words when an adult provides additional discourse supports (modeling, expansions, extensions, scaffolding, etc.).

Israel, Johnson, and Brooks (2000) examined the development of past participles in passive sentences in the spontaneous samples of 7 children from the CHILDES archive (MacWhinney, 1995). Ages across samples ranged from 15 to 65 months. The number of language sampling sessions varied across children from 20 (Peter and Eve) to 210 (Abe) and the total number of participles observed ranged from 41 (Eve) to 360 (Abe). Unfortunately for the present discussion, rates of participle omission were not tracked, but examples of this error appear in the report's appendix (*I have close the door; There I get it fix*).

In a cross-sectional sample of school age children, Moder (1989) examined the production of past participles in first, fourth, and sixth graders. Participles were elicited from 60 children using a sentence completion procedure with present perfect, passive, past modal, and past perfect sentence targets. Results indicated that all three groups experienced considerable difficulty producing correct participle forms in that all three age groups marked the past participle but frequently used the wrong form. Interestingly, the two older groups of children were more likely to overtly mark no-change verbs (e.g., *I would have cutted it*) than the younger group. Across all three groups of children, the passive sentence context was the most successful at eliciting correct participles.

Johnson (1985) used a sentence recall task to elicit *-en* participles in present perfect sentences from 22 typically developing 4- and 5-year-olds. On average, children used some form of the perfect 67% of the time and a non-target sentence frame (e.g., the active sentence) 33% of the time. Uninflected verb stems were an uncommon error and appeared in only 3.8% of children's responses.

In sum, based on a handful of investigations into the topic, the acquisition of English past participle forms by typically developing children appears to be a protracted process, with documented evidence suggesting that commission errors persist into early adolescence with some verbs in some contexts. Omissions of participle affixes in obligatory contexts by preschool children have also been noted, but may represent an uncommon

error. The results of one study suggest that using passive sentence targets during elicited production tasks may be more successful than using other sentence types.

Prediction of Morphophonological Accounts

There are several reasons to predict that *-ed* participles should be vulnerable to omission by English-speaking children with SLI. First, the *-ed* affix as it appears in both past tense and past participle contexts represents an unstressed, brief duration, low salience morpheme. Second, the morphological processes involved in the inflection of participles are complex, involving no less than five different types of alternation, and some of these incorporate regular and irregular past tense alternations. Third, participles appear in semantically and syntactically complex sentence frames that require children to coordinate multiple frames of temporal reference within the verb phrase. Fourth, participle sentence frames appear infrequently in the speech of Standard American English speaking children and in the speech that adults direct toward these children.

Each of these areas, phonological salience, semantic complexity, syntactic complexity, input frequency, and output frequency, has been implicated—to various extents—as responsible for the difficulties encountered by children with SLI. In each of these areas, the past participle *-ed* would be at least as challenging as the regular past tense *-ed*. Thus, morphophonological accounts of SLI, such as the LPS and alternative accounts motivated more directly by Connectionist principles, predict that children with SLI should produce more participle omissions within obligatory contexts than typically developing children of similar chronological ages and general language levels.

Predictions of the EOI Account

A morphosyntactic perspective predicts substantially different outcomes. Recall that the EOI account assumes that children with SLI understand the morphophonological mechanics involved in marking tense and other grammatical features, at a level that is commensurate with their general language level. Their deficit in tense marking resides in the appreciation that tense is obligatory. According to this framework, morphophonological knowledge should be sufficiently available for the inflection of past participles, and their performance with these nonfinite forms should be very similar to the performances of younger typically developing language matches. The EOI account also predicts that children with SLI should omit past tense *-ed* more often than they omit participle *-ed*.

Participle Marking by Children With Specific Language Impairment

Given the modest amount of information regarding the acquisition of the English past participle in general, it is not surprising that the production of past participles by English-speaking children with SLI has also received very little attention. Smith-Lock (1993) found very few differences between children with SLI and language-matched typically developing children in their productions of participles during an elicitation task. Seventeen children with SLI (age range = 64–87 months) were matched to a group of typically developing children on the basis of chronological age (age match [AM]) and to a group of younger typically developing children on the basis of their overregularization rates (language match [LM]). Although matching on the basis of overregularization rates is somewhat unconventional, children in the LM group turned out to be, on average, 2 years younger than those in the SLI group—an age difference that is consistent with more traditional matching indices, such as MLU or vocabulary test scores (cf. Leonard, 1998).

Results indicated that comparable levels of correct past participle use were observed across all three groups of children (SLI: 42%; LM: 39%; AM: 42%). Children from all three groups also produced highly similar error types. The most common error was the inappropriate extension of the *-ed* affix with irregular verbs (e.g., “he got bited”), accounting for 23%, 27%, and 16% of children’s responses from the SLI, LM, and AM groups, respectively. Another common error among the SLI and LM groups was the use of the active sentence version of the passive target. Children in the AM group produced considerably fewer omissions in contexts requiring a form marked with the participle than did either the SLI or LM groups. In contrast, the two language-matched groups were nearly identical in their omission rates (AM = 0.08%; SLI = 10%; LM = 9%). These results suggest that omissions or bare stems were not a prominent feature of affected or unaffected children’s production of participles during elicited productions. Most of the errors represented selection of the wrong participle form or the use of nontarget sentence frames. The chief limitation of these data is that they do not allow for direct comparisons between children’s use of the homophonous past tense and participle forms.

Leonard et al. (2003) recently examined children’s use of homophonous past tense and participle forms. Twelve children with SLI (age range = 4;5 [years;months] to 6;10) were matched to 12 typically developing children on the basis of chronological age and to 12 younger typically developing children on the basis of MLU. A cloze procedure was used to compare children’s productions of the past tense *-ed* to their productions of

the past participle *-ed* (e.g., *The spoon got washed by the bunny, and the fork...*). Results indicated that children with SLI were less accurate in their productions of both *-ed* affixes (past tense: SLI = 26.5%; LM = 77.83%; AM = 93.9%; past participle: SLI = 53.08%; LM = 81.83%; AM = 94.25%). A significant Group × Morpheme Type interaction was also identified, such that children with SLI were less accurate with the past tense *-ed* than with the past participle *-ed*, a difference that was not found within the performances of the control groups. The authors concluded that “the surface properties of *-ed* cannot adequately account for the past tense *-ed* difficulty shown by the children with SLI” (Leonard et al., 2003, p. 43), a finding that was recognized as problematic for the LPS account. However, children with SLI were also less accurate than the MLU matches in using passive participle *-ed*. This suggests, as the authors noted, “that either the surface properties of *-ed* are responsible for a portion of the difficulty, or these children have a separate, non-tense related deficit in the area of verb morphology” (Leonard et al., 2003, p. 43).

Questions Directing the Current Investigation

Information regarding the development of past participles by children with SLI is limited, although the status of participle forms is relevant to the evaluation of competing accounts. The results of one study suggested that past participles might represent an area of relative strength for children with SLI, whereas the results of another study have suggested that past participle omissions may indeed be part of the morphological symptoms associated with SLI. In this study, data from spontaneous conversations and elicited productions were used to examine further the following questions: (a) Do children with SLI differ from typically developing age matches and MLU matches in their productions of *-ed* participles? (b) Do children with SLI omit past participle *-ed* affixes more often than they omit regular past tense *-ed* affixes?

Method

Participants

Participant characteristics are summarized in Table 1. Three groups of children participated: a group of 7 children with SLI; a group of 7 typically developing children matched to the SLI group on the basis of chronological age (± 3 months), hereafter referred to as the age matched (AM) group; and 7 typically developing children matched to the SLI group on the basis of MLU in morphemes ($\pm .30$ morphemes), hereafter referred to as the language matched (LM) group. The

Table 1. Participant characteristics: group means, standard deviations, and ranges.

Group	Age ^a	Mother's education ^b	Nonverbal ^c	Language quotient ^d	MLU ^e
SLI					
M	73	3.14	102.57	73.57	4.03
SD	6.96	0.38	11.87	13.12	0.69
Range	64–82	3–4	93–123	62–95	3.29–5.39
LM					
M	43	3.7		111.71	4.13
SD	5.29	0.49		7.70	0.59
Range	37–53	3–4		105–124	3.49–5.30
AM					
M	72	3.0	108.42	111.57	4.63
SD	7.15	1.38	4.72	7.61	0.51
Range	64–81	2–5	103–116	102–121	4.13–5.62

Note. Groups: SLI = specific language impairment; LM = language matched MLU-equivalent; AM = age matched.

^aAge in months.

^bScale where 1 = *some high school* and 5 = *some graduate school*.

^cNonverbal: Columbia Mental Maturity Scale, age deviation scores—not collected on children younger than 64 months.

^dLanguage Quotient: Test of Language Development–Primary: Third Edition spoken language quotient for children 48 months and older; Preschool Language Scale, Third Edition total language standard score for children younger than 48 months.

^eMean length of utterance in morphemes based on complete and intelligible utterances.

matching criterion of .30 morphemes was based on the smallest standard error of measurement associated with MLU across the age span considered in this study (see Eisenberg, McGovern Fersko, & Lundgren, 2001; Leadholm & Miller, 1992). MLU values used to match participants were based on 30-min conversational interactions with an adult examiner (minimum of 120 complete and intelligible child utterances: $M = 268$, $SD = 112$). Nonsignificant group comparisons confirmed the equivalence of groups on the matching variables, age matches: $t(12) = 0.191$, $p = .851$; MLU matches: $t(12) = -0.309$, $p = .762$.

Children in the SLI group (4 boys, 3 girls; 7 Caucasian) were recruited from the caseloads of certified speech-language pathologists working in local schools, as well as from referrals through the University of Utah Speech-Language-and-Hearing Clinic. Children with reported diagnoses of autism, pervasive developmental disorder (PDD), attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD), or any other socioemotional/behavioral disorder were not included in the SLI group. To qualify, potential SLI participants had to meet the following criteria: (a) monolingual English status; (b) previously identified as having a language

impairment by a certified speech-language pathologist and receiving services at the time of the study; (c) nonverbal achievement within normal limits, operationalized as an age deviation score of 85 or higher on the Columbia Mental Maturity Scale (CMMS; Burgemeister, Blum, & Lorge, 1973); (d) a passing score (9 of 10 items correct) on a probe screening for consistent use of word final *-t* and *-d*; (e) normal hearing acuity as measured by a hearing screening at 25 dB at 1000, 2000, and 4000 Hz; and (f) performance below 1 *SD* on at least two subtests of the Test of Language Development–Primary: Third Edition (TOLD-P:3; Newcomer & Hammill, 1997). The inclusionary cut-off of 1 *SD* is at the high end of the range of cut-off values recommended in the literature (cf. Leonard, 1998); however, this value has been shown to be generally consistent with speech-language pathologist judgments and referrals (Aram, Morris, & Hall, 1993; Records & Tomblin, 1994). Language deficits of this magnitude have also been shown to be as persistent as language deficits identified using a more stringent criterion (Johnson et al., 1999). The overall TOLD-P:3 spoken language quotients for the individual children in the SLI group were 71, 64, 89, 62, 64, 95, and 70. Two children (SLI3, SLI6) in the SLI group had overall TOLD-P:3 spoken language quotients of 89 and 95 and were included in this study because they met all of the inclusionary criteria.¹

Children in the AM group (4 boys, 3 girls; 7 Caucasian) and LM group (3 boys, 4 girls; 6 Caucasian, 1 African American) were recruited through schools, preschools/daycares, and after-school programs within the same communities as the children with SLI. Based on earlier reports, MLU matches were sought from children 2 years younger than the SLI children (i.e., 3–4-year-olds). To be included in the control groups, participants needed to have (a) monolingual English status; (b) a score within normal limits (age deviation score of 85 or higher) on the CMMS (AM group only); (c) an unremarkable developmental and educational history,

¹In contrast to the other participants in the SLI group who demonstrated mixed receptive/expressive language impairments, the TOLD-P:3 profiles of these particular children indicated relative weaknesses on some of the expressive language subtests (e.g., SLI3's Organizing Quotient = 76; SLI6's Speaking Quotient = 85) that were compensated by average/above average performances on some of the receptive language subtests (e.g., Listening Quotients for SLI3 and SLI6 were 106 and 100, respectively). More notably, both participants performed 2.0 *SDs* below the mean on the TOLD-P:3 Sentence Imitation subtest, a task that has proven to be highly sensitive in detecting language impairments in school-age children (Conti-Ramsden et al., 2000). Evidence of the children's SLI status was also present within their conversational samples, including several instances of omissions of obligatory grammatical forms (SLI3: "And my guy get down," "That guy coming"; SLI6: "We going already," "You not going camping"), pronoun errors (SLI6: "Guys, you gonna share with you helmet and her little bike," "Do you mom say it was ok?" "Did you pack everything because him wants to go too?") and errors in producing complex sentences (SLI3: "Pretend that not happen"; SLI6: "You remember that thing what he hid," "I need to take out all the stuff what I packed").

including a negative history of speech/language delay, learning disability, autism or PDD, or ADD/ADHD as indicated by parental report; (d) normal hearing acuity as measured by a hearing screening at 1000, 2000, and 4000 Hz at 25 dB; and (e) scores within normal limits (above 1 *SD*) on all subtests of the TOLD-P:3 or both scales of the Preschool Language Scale, Third Edition (PLS-3; Zimmerman, Steiner, & Pond, 1992), depending on the age of the participant.

Conversational Sampling Procedures

A 30-min spontaneous conversational sample with an examiner was collected for each participant during free-play using a set of age-appropriate toys (taken from the Playmobil™ rescue helicopter, hospital, and camping sets). Sony TC-D5 PRO II tape recorders with tie-pin ECM-T140 external microphones were used. To encourage obligatory contexts for regular past tense and participle verbs, two elicitation strategies were implemented. First, examiners (the author and graduate student assistants in communication sciences and disorders) were trained to model a minimum of 5 tokens of each form in their conversational contributions. Second, following language sampling suggestions provided by Hadley (1998), examiners were also instructed to contribute personal anecdotes involving hospital/camping experiences during the sample. These personal narratives were followed up with requests for similar information from the children (e.g., “Tell me what happened when you went camping.”).

Within 2 weeks of collecting each sample, examiners transcribed and entered samples into Version 6.1 of the Systematic Analysis of Language Transcripts (SALT; Miller & Chapman, 2000) using the coding conventions established for the Kansas Language Transcript Database (Howe, 1996). A second examiner checked each transcript for spelling/typographical errors, as well as for transcription, segmentation, and coding errors. Disagreements between examiners were resolved through consensus whenever possible. If disagreements between examiners were not resolved after three passes, disputed portions were coded as unintelligible.

Elicitation Probes

The particular verbs used during the elicitation probes were *chopped*, *cleaned*, *colored*, *kicked*, *picked*, *planted*, *painted*, *smashed*, and *washed*. These verbs were selected because they represent common easily depicted events involving animate agents and inanimate recipients. In addition, all of these verbs alternate between active and passive forms that are likely to be accessible to young children.

Procedures for eliciting past tense verbs from young children, developed by Mabel L. Rice and her colleagues, were adapted for use in this study (cf. Rice et al., 1995). In this protocol, children are presented with two pictures in succession. First, a picture of an ongoing activity with a child as an agent acting upon inanimate objects was presented and labeled by the examiner (e.g., “Here the boy is kicking a football.”). This presentation was followed by a second picture, where the completed action is depicted and the inanimate object is shown as having undergone a change in state or location. This picture is labeled by the examiner and followed with a prompt to produce a past tense verb (e.g., “Now the boy is done kicking. Tell me what he did.”). If the child responded with a participle form (e.g., “He’s done” or “He’s finished”) or an incomplete response, a follow-up sentence completion prompt was used (e.g., “Tell me what he did to the football. Say it this way. He...”). In order to avoid frustration, only three re-administrations of a particular past tense item were allowed.

In order to make the task demands across the two elicitation probes as similar as possible, the pictures depicting completed actions (i.e., the second picture) were also used to elicit participle forms. This time, children’s attention was drawn to the specific inanimate recipient of each action (e.g., “Somebody has been kicking footballs. See this football? Tell me about this football.”). If children responded with an active sentence (e.g., “Somebody kicked the football”) or an incomplete response, a follow-up sentence completion prompt was used (e.g., “Say it this way. The football was...”). Only three re-administrations of a participle item were allowed.

During both probes, children were presented with practice items containing irregular verbs prior to the administration of the experimental items and encouraged to respond with complete sentences containing a subject and a verb. If multiple trials were required, only the response representing the closest match to the target was counted. Only those responses containing a subject and a predicate were counted as correct. For the participle targets, this also meant the inclusion of the auxiliary *have* or *got*, or some version of *BE* as a main verb (i.e., “The football kicked by the boy” would not be included as correct). To control for order effects on children’s performances, the administration sequence of the past tense and participle elicitation probes was counterbalanced across participants within each group. Children’s responses during the elicitation probes were recorded online and by audiotape.

Reliability

Six language samples (two selected randomly from each group) were used to measure interrater reliability on the conversational measures. The selected samples

were transcribed independently by another rater, and interrater agreement was calculated using the total number of agreements divided by the total number of agreements + disagreements. Interrater reliability was determined separately for the total number of morphemes in agreement and for the total number of utterance boundaries and segmentations in agreement, yielding overall levels of 98% and 97% agreement, respectively.

Responses from 6 children (2 selected randomly from each group) were used to measure interrater reliability on the experimental probes. An undergraduate student in the Department of Communication Sciences and Disorders served as an independent judge and compared her responses to those recorded online by the examiner. Interrater agreement was calculated for the elicitation probes using the total number of agreements divided by the total number of agreements + disagreements and yielded a value of 98% for the past tense elicitation probe and 93% for the past participle elicitation probe.

Results

Children in the SLI group were ranked by age from youngest to oldest, and this ranking served as the basis for the age and MLU matches. Results of the conversational sampling procedure and elicitation probes for past tense and past participle are displayed in Tables 2 and 3, respectively.

Conversational Samples: Past Tense

In Table 2, the number of child utterances, obligatory contexts, verb types and tokens, omission errors, commission errors, and the percentage correct use are displayed for each participant. Because of the small number of obligatory contexts for some of the participants, group differences are reported descriptively. Following the morpheme coding conventions for regular past tense *-ed* outlined in Howe (1996), the number of obligatory contexts for the regular past tense within each language sample, the number of correct productions, and error counts of omissions and commissions were tallied. Direct imitations of adult utterances were not included in the counts of obligatory contexts. The number of obligatory contexts for the regular past tense varied considerably within groups but also showed overlap across groups (SLI: 2–14; LM: 2–10; AM: 2–19). In general, children with SLI tended to produce fewer obligatory contexts than their LM and AM peers, with the notable exceptions of SLI1, SLI6, and SLI7. Although the obtained rates of obligatory contexts for the regular past tense appeared to be limited for some of the participants, the overall frequencies across groups compares favorably to

counts reported by other investigators (Balason & Dollaghan, 2002; Fletcher, 1981; Leadholm & Miller, 1992; Wells, 1979, 1985).

As displayed in Table 2, most of the children in the SLI group had difficulty providing the regular past tense affix within obligatory contexts relative to their age and language matches (percentage correct: SLI pooled mean = 55.5%; LM pooled mean = 90.63%; AM pooled mean = 98.1%). For affected children within this age range, this outcome was not surprising given previous investigations (cf. Leonard, 1998; Rice, 2000). Only 1 participant in the SLI group, SLI6, correctly inflected her verbs at a rate that was comparable to her age and language match. All tense-marking errors produced were due to omissions of the tense affix. No commission errors were observed.

Conversational Samples: Past Participle

A tally of obligatory past participle contexts within each language sample was based on several considerations. First, as with the regular past tense counts, direct imitations of adult utterances were not included. Second, only verbal forms encoding completive/perfect aspect were included in the counts. These included all instances of the passive, present perfect, past perfect, and past modal but excluded adjectival forms derived from participles (i.e., participials such as *the twisted ankle*). Third, sentences containing examples of *supposed to* and *used to* were also excluded from participle counts due to difficulties in reliably identifying the presence/absence of the *-ed* affix within this context.

Variation within groups in the number of obligatory contexts for the participle *-ed* was large and displayed considerable overlap across groups (SLI: 0–5; LM: 1–5; AM: 0–7). Across all three groups, obligatory contexts for participle forms appeared less frequently and with fewer lexical verbs than contexts for the past tense, a result that is consistent with Fletcher's (1981) observations. In the current study, however, the ratio of past tense *-ed* to past participle *-ed* forms produced was closer to 2:1 rather than 4:1.

Although obligatory contexts for the participle *-ed* appeared about half as frequently as the past tense *-ed* during conversational exchanges, children from all three groups correctly inflected these forms at high rates (SLI pooled mean = 87.50%; LM pooled mean = 94.45; AM pooled mean = 91.67%), and the rate of participle affixation by the SLI group was considerably higher than their rate of past tense affixation. Although participle errors were rare, both errors of omission and commission were observed (e.g., SLI2: "It calls a apple"; "It's calls (uh) a apple"; target sentence: "It's called an apple").

Table 2. Production of past tense *-ed* and participle *-ed* during spontaneous language samples.

Group	No. of child utterances	Past tense <i>-ed</i>				Participle <i>-ed</i> ^a			
		Obligatory contexts (Verb types/tokens)	Omission errors	Commission errors ^b	% correct use	Obligatory contexts (Verb types/tokens)	Omission errors	Commission errors ^c	% correct use
SLI									
SLI1	177	5/7	6	0	14.29	1/1	0	0	100.00
SLI2	167	2/2	1	0	50.00	1/2	0	2	0.00
SLI3	121	2/2	1	0	50.00	2/2	0	0	100.00
SLI4	218	2/2	2	0	0.00	0	—	—	—
SLI5	198	2/2	1	0	50.00	2/3	0	0	100.00
SLI6	484	10/14	0	0	100.00	3/3	0	0	100.00
SLI7	254	6/7	5	0	28.57	4/5	0	0	100.00
<i>Pooled total</i>	1619	36 tokens	16	0	55.55	16 tokens	0	2	87.50
LM									
LM1	435	2/3	1	0	66.67	3/3	0	0	100.00
LM2	226	1/3	0	0	100.00	2/2	0	0	100.00
LM3	283	3/4	0	0	100.00	2/2	0	0	100.00
LM4	400	4/4	0	0	100.00	1/1	0	0	100.00
LM5	361	4/4	1	0	75.00	3/4	1	0	75.00
LM6	150	8/10	1	0	90.91	3/5	0	0	100.00
LM7	278	4/4	0	0	100.00	1/1	0	0	100.00
<i>Pooled total</i>	2133	32 tokens	3	0	90.63	18 tokens	1	0	94.44
AM									
AM1	295	5/6	0	0	100.00	3/3	1	0	66.67
AM2	249	7/11	0	0	100.00	5/7	1	0	85.71
AM3	376	8/10	1	0	90.00	2/2	0	0	100.00
AM4	524	3/3	0	0	100.00	3/7	0	0	100.00
AM5	190	2/2	0	0	100.00	1/1	0	0	100.00
AM6	346	12/19	0	0	100.00	3/4	0	0	100.00
AM7	203	2/2	0	0	100.00	0	—	—	—
<i>Pooled total</i>	2183	53 tokens	1	0	98.11	24 tokens	2	0	91.67

Note. Groups: SLI = specific language impairment; LM = language matched MLU-equivalent; AM = age matched.

^aParticipial adjectives (e.g., *the twisted ankle*) and instances of *supposed to* and *used to* were excluded from participle counts.

^bCommission errors with past tense include overmarking, present tense, and irregularization (e.g., *he kickded the ball*; *he kicks the ball*; *he koke the ball*).

^cCommission errors with participles include overmarking, present tense, and irregularization (e.g., *the ball was kickded*; *the ball was kicks*; *the ball was kicken*).

In sum, the elicitation strategies used during the collection of conversational samples appeared to give children with SLI and children with typical language skills similar opportunities to produce obligatory contexts for the regular past *-ed* and participle *-ed* forms. Individual, rather than group, differences contributed most to the observed variation in obligatory contexts. Consistent with previous reports, children with SLI were more likely than typically developing controls to omit regular past tense affixes. This was not the case for past participle affixes, which were consistently marked by most of the children.

Elicitation Probe: Past Tense

Elicitation probe results are reported in Table 3. Here the responses representing correct, nontarget sentences, omissions, commissions, nontarget irregular verbs, and “no verb” responses are presented for each participant. Group differences were explored through parametric analyses. All proportional data were arcsine transformed prior to analyses (Winer, 1971). Where appropriate, omnibus one-way analyses of variance (ANOVAs) with Dunn–Sidak follow-up comparisons were used to verify the presence of significant main group effects and pairwise differences. In those instances where the AM

Table 3. Production of past tense *-ed* and participle *-ed* during probes.

Group	Past tense <i>-ed</i>						Participle <i>-ed</i>							
	Correct	Nontarget sentence ^a	Omission errors	Commission errors ^b	Irreg. verb ^c	No verb ^d	% correct use ^e	Correct	Nontarget sentence	Omission errors	Commission errors	Irreg. verb	No verb	% correct use
SLI														
SLI1	0	3	5	0	1	0	0.00	4	1	0	0	1	3	100.00
SLI2	0	0	5	0	4	0	0.00	3	2	0	0	2	2	100.00
SLI3	3	0	6	0	0	0	33.33	1	6	0	2	0	0	33.33
SLI4	0	4	5	0	0	0	0.00	1	6	1	0	1	0	50.00
SLI5	7	1	0	1	0	0	87.50	7	0	0	1	1	0	87.50
SLI6	7	1	1	0	0	0	87.50	9	0	0	0	0	0	100.00
SLI7	3	3	1	0	2	0	75.00	3	3	0	0	1	2	100.00
<i>Pooled total</i>	20	12	24	1	7	0	44.44	28	18	1	3	6	7	87.50
LM														
LM1	8	0	1	0	0	0	88.89	8	0	1	0	0	0	88.89
LM2	6	0	3	0	0	0	66.67	4	3	1	0	1	1	80.00
LM3	8	0	1	0	0	0	88.89	6	2	0	0	1	0	100.00
LM4	6	1	1	0	1	0	85.71	6	0	0	0	2	0	100.00
LM5	7	0	1	1	0	0	77.78	5	1	0	2	1	0	71.14
LM6	4	3	2	0	0	0	66.67	3	6	0	0	0	0	100.00
LM7	7	0	2	0	0	0	77.78	6	0	2	0	1	0	75.00
<i>Pooled total</i>	46	4	11	1	1	0	79.31	40	12	4	2	6	1	86.96
AM														
AM1	9	0	0	0	0	0	100.00	9	0	0	0	0	0	100.00
AM2	9	0	0	0	0	0	100.00	9	0	0	0	0	0	100.00
AM3	9	0	0	0	0	0	100.00	9	0	0	0	0	0	100.00
AM4	9	0	0	0	0	0	100.00	9	0	0	0	0	0	100.00
AM5	8	0	1	0	0	0	88.89	7	0	0	0	2	0	100.00
AM6	9	0	0	0	0	0	100.00	9	0	0	0	0	0	100.00
AM7	8	0	1	0	0	0	88.89	7	0	2	0	0	0	77.78
<i>Pooled total</i>	61	0	2	0	0	0	96.83	59	0	2	0	2	0	96.72

Note. Groups: SLI = specific language impairment; LM = language matched MLU-equivalent; AM = age matched.

^a Nontarget sentence = participle and progressive sentence frames for past tense targets, and past tense and progressive sentence frames for participle targets.

^b Commission errors include overmarking, present tense, and irregularization.

^c Irreg. verb = irregular past tense and past participle forms (whether or not correctly marked).

^d No verb = incomplete responses that did not contain both a subject and a predicate; also includes "I don't know" and "no responses."

^e Percentage correct use was calculated from total number correct/total number of obligatory contexts produced (correct + omission errors + commission errors).

group's performance was at ceiling or floor, two-tailed independent *t* tests were used to compare the SLI and LM group means.

Group means of the proportion of responses containing an obligatory context for the regular past tense, whether the verb was correctly inflected or not, were as follows: SLI, $M = 70\%$, $SD = 22$; LM, $M = 93\%$, $SD = 13$; AM, $M = 100\%$, $SD = 0$. Because the AM group's performance was at ceiling, an independent *t* test verified that the SLI group mean was significantly lower than the LM group mean, $t(12) = -2.60$, $p = .023$. These results suggest that although high levels of obligatory contexts were elicited from the control groups, children with SLI had more difficulty producing obligatory contexts for the regular past tense during the elicitation task.

Group means on the proportion of regular past tense responses representing the use of a nontarget sentence frame (e.g., the participle, "He's finished kicking," "He's done," or the progressive, "He was kicking the ball") were as follows: SLI, $M = 19\%$, $SD = 18$; LM, $M = 7\%$, $SD = 13$; AM, $M = 0$, $SD = 0$. Group differences between the SLI and LM groups were not significant, $t(12) = 1.51$, $p = .157$. These results suggest that children with SLI were similar to MLU matches in their use of nontarget sentence frames, an error that did not occur in the responses produced by their AM peers.

Group means on the proportion of regular past tense responses representing irregular verbs or incomplete responses with missing verbs were as follows: SLI, $M = 11\%$, $SD = 17$; LM, $M = 2\%$, $SD = 4$; AM, $M = 0$, $SD = 0$. Group differences between the SLI and LM groups were not significant, $t(12) = 1.44$, $p = .175$.

Children's correct use of the regular past tense was examined within the obligatory contexts they produced. Because all of the children produced at least four obligatory contexts, data from all participants were included in the analysis. Group means were as follows: SLI, $M = 40\%$, $SD = 41$; LM, $M = 79\%$, $SD = 10$; AM, $M = 97\%$, $SD = 5$. An omnibus ANOVA, with the proportion of correctly inflected regular verbs within obligatory contexts as the dependent variable and group as the between-subjects variable, verified the presence of significant group differences, $F(2, 18) = 14.541$, $p < .0001$, $\eta^2 = .618$. Follow-up Dunn-Sidak analysis indicated that the following pairwise comparisons reached the .05 level of significance: SLI < LM < AM. These results suggest that within the MLU and age levels examined in this study, children with SLI perform considerably worse than their typically developing peers, although variation within the SLI group was large. This finding is consistent with the extant literature.

Elicitation Probe: Past Participle

Group means on the proportion of responses containing an obligatory context for the participle, whether

the verb was correctly inflected or not, were as follows: SLI, $M = 51\%$, $SD = 31$; LM, $M = 74\%$, $SD = 23$; AM, $M = 97\%$, $SD = 8$. An omnibus one-way ANOVA, with proportion of responses containing an obligatory context as the dependent variable and group as the between-subjects variable, verified the presence of group differences, $F(2, 18) = 8.233$, $p = .003$, $\eta^2 = .478$. Follow-up Dunn-Sidak analysis indicated that the following pairwise comparisons reached the .05 level of significance: SLI = LM < AM. These results suggest that children in the AM and LM groups were producing obligatory contexts for the participle at high rates. By comparison, children in the SLI group experienced difficulty producing obligatory contexts. Although the SLI group mean was lower by comparison, there was enough overlap between the SLI and LM performances to render group differences nonsignificant.

Group means on the proportion of participle responses representing the use of a nontarget sentence frame (e.g., the regular past, "He kicked the ball," or the progressive, "He was kicking the ball") were as follows: SLI, $M = 29\%$, $SD = 29$; LM, $M = 13\%$, $SD = 26$; AM, $M = 0$, $SD = 0$. Children in the AM group did not produce this kind of error. Although children with SLI generally produced more nontarget sentences, group differences between the SLI and LM groups were not significant, $t(12) = 1.07$, $p = .306$.

Group means on the proportion of participle responses representing irregular verbs or incomplete responses with missing verbs were as follows: SLI, $M = 20\%$, $SD = 20$; LM, $M = 14\%$, $SD = 11$; AM, $M = 3\%$, $SD = 8$. Group differences were not significant, $F(2, 18) = 2.858$, $p = .084$.

Children's correct use of participles was examined within the obligatory contexts they produced (i.e., correct productions + commission errors + omission errors). Because participant SLI4 produced only two obligatory contexts, his data were not included in the analyses. All of the other children produced at least four obligatory contexts. Group means were as follows: SLI, $M = 82\%$, $SD = 28$; LM, $M = 88\%$, $SD = 13$; AM, $M = 97\%$, $SD = 8$. Group differences were not significant, $F(2, 17) = 0.973$, $p = .398$. These results suggest that high rates of correct use were observed across all three groups, for those children producing enough obligatory contexts.

Percentage Correct in Obligatory Contexts Collapsed Across Elicited and Spontaneous Samples

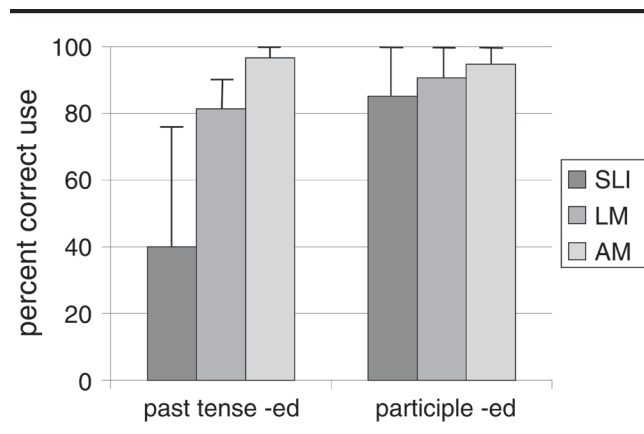
Because the number of obligatory contexts varied from child to child, children's correct usage of the *-ed* affixes was collapsed across elicited and spontaneous samples in order to increase the stability of group comparisons. This yielded a minimum of seven obligatory

past tense contexts for each participant. Participant SLI4 produced a total of two obligatory contexts for the participle across both the elicited and spontaneous samples, so his data were excluded from the participle analyses. All of the other participants produced a minimum of five obligatory past participle contexts. Group means associated with the pooled estimates of children's use are displayed in Figure 1, which shows a clear dissociation in children's command of the *-ed* affix across regular past tense and participle contexts. In particular, children with SLI presented with considerable limitations in their affixation of the regular past tense but were proficient in their affixation of the participle: past tense, $F(2, 18) = 15.654, p < .0001, \eta^2 = .635, SLI < LM < AM$; past participle, $F(2, 17) = .421, p = .663, SLI = LM = AM$. This dissociation occurred in spite of the fact that significantly fewer passive sentence targets than active sentence targets were elicited from children with SLI.

Discussion

The results of the current investigation were similar to those reported in Smith-Lock (1993). In both study samples, children with SLI did not demonstrate inordinate difficulty with the mechanics of marking participle forms within obligatory passive contexts and performed similarly to the typically developing LM controls. In contrast to the high omission rates of past tense *-ed* by most of the children with SLI, their command of the obligatory nature of participle *-ed* during the elicitation task was indicative of performance appropriate for their general language levels. This finding was consistent with predictions based on the EOI account and problematic for the LPS and Connectionist accounts. The language sample results confirmed the probe data profiles and were also consistent with findings on children with SLI

Figure 1. Correct production of regular past tense *-ed* and participle *-ed* in obligatory contexts, collapsed over probes and spontaneous samples.



acquiring languages other than English. For example, Rothweiler and Clahsen (1994) reported a similar dissociation between German participles and finite verbal forms in conversational samples collected on children with SLI and MLU matches.

There was some overlap between the probe findings of the current study and the results reported in Leonard et al. (2003). Both studies found that past tense targets were considerably more challenging to children with SLI than were past participles, suggesting that the surface properties of *-ed* cannot adequately account for the challenging nature of past tense marking. These findings were also consistent with predictions based on the EOI account and problematic for the LPS and Connectionist accounts. The main difference between the current study and that of Leonard and colleagues is that the latter found that children with SLI produced significantly fewer correct past participles than the MLU matches.

There are a number of methodological differences between Leonard et al. (2003), Smith-Lock (1993), and the current study that might have accounted for the observed differences in children's participle productions. For example, differences in group size between the current study and Leonard et al. (7 vs. 12, respectively) bring up the possibility that there may not have been sufficient power to detect group differences that reflected moderate effect sizes. This was not the case, however, for the design used by Smith-Lock, which included 17 children per group. Replication through additional studies is clearly warranted.

Both Smith-Lock (1993) and the current study included nonmorphological measures of language impairment in their eligibility criteria (e.g., standardized tests of vocabulary, grammatical comprehension, sentence imitation, and clinical judgment), whereas Leonard et al. (2003) selected participants exclusively on the basis of their deficits in grammatical morphology, as measured by a standardized test and a language sample measure. Differences between participants in the type or severity of language impairments may also have contributed to the different outcomes observed. Further investigations should more closely examine the potential influences that semantic and syntactic deficits have on children's participle productions.

Another methodological difference between the three studies was whether children were encouraged or required to produce "full passives" (i.e., passive sentences containing a *by* phrase: *the ball got kicked by the boy*) during the elicitation task. Leonard et al. (2003) excluded children's responses if they represented "truncated passives" (e.g., *the football got kicked*), whereas Smith-Lock (1993) and the current study included these sentences because they represented obligatory contexts for the past participle. There are two issues associated with

truncated passives that might have increased the likelihood that children with SLI would inflect the past participle in this context. First, as suggested by some authors, there might be a semantic difference between children's interpretations of full versus truncated passives, such that young children are more likely to extend an adjectival rather than a verbal interpretation to truncated passives (cf. Marchman et al., 1991; Pinker et al., 1987). Van der Lely (1996) provided some evidence that children with SLI may be particularly inclined to interpret passive sentences in this way (but see Rice & Francois, 2001). If this was the case, children in the present study may have found the production of participle affixes easier than past tense affixes because of semantic differences between adjectives and verbs. However, the most common error type produced by the children with SLI during the participle probe was the nontarget active sentence frame, in which children reversed the placement of the inanimate subject during the prompt into the object position of their responses (e.g., *The boy kicked the football*). In other words, children with SLI demonstrated their appreciation of the verbal characteristics of the participle by alternating into the active voice. If children were treating these forms as adjectives, there would be no motivation to switch into the active voice, and we might also expect occasional substitution errors involving nontarget adjectives (e.g., *The dishes were dirty*). No such errors were observed in any of the children's productions.

The second issue associated with truncated passives is the participle's default position at the end of the sentence, where it would likely receive relatively more stress than past tense verbs, which are often placed in sentence medial positions. Thus, observed differences between the past tense and past participle could have been due to suprasegmental differences between the kinds of sentence positions these affixes appeared in. In addition to other phonological variables, sentential stress has played an operative role within morphophonological accounts, particularly the LPS (Leonard, 1998). The elicitation probe data offered some support for this hypothesis. Specifically, all three groups of children were more likely to produce the participle in sentence final position (68%, 73%, and 67% of the time for the SLI, LM, and AM groups, respectively) than they were to produce the past tense in sentence final position (18%, 19%, and 14% of the time for the SLI, LM, and AM groups, respectively). An examination of the conversational sample data, however, revealed no differences between the occurrences of participles and past tense verbs. Across all three groups of children, both verbal forms occurred more frequently in sentence medial position (approximately 67% of the time). The role sentence position plays in the likelihood that children will produce obligatory participle or past tense affixes during different production tasks clearly warrants further investigation.

Until these empirical issues are resolved through additional investigations, the exact status of participles in the grammatical systems of children with SLI remains inconclusive. However, preliminary investigations into children's productions of homophonous participle forms have an important implication for our understanding of the tense marking difficulties associated with SLI: Therapeutic regimens that focus only on the processing of brief, unstressed, low salience affixes will inevitably be incomplete.

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