Auxiliary BE Production by African American English–Speaking Children With and Without Specific Language Impairment

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Purpose: To examine 3 forms (*am, is, are*) of auxiliary BE production by African American English (AAE)–speaking children with and without specific language impairment (SLI).
Method: Thirty AAE speakers participated: 10 six-year-olds with SLI, 10 age-matched controls, and 10 language-matched controls. BE production was examined through samples and a probe.
Results: Across tasks, visual inspection suggested that the children with SLI overtly marked BE at lower rates than the controls, and all groups marked *am* at higher rates than *is* and *are,* with few dialect-inappropriate errors. Within the samples, the children also overtly marked *is* at higher rates when preceded by *it/that/what* than when it was preceded by a personal pronoun. A subset of these results was confirmed statistically. The children's marking of BE also varied across tasks; for the age-matched controls, this variation was tied to their AAE dialect densities.
Conclusions: These findings show across-dialect similarities and differences between children's acquisition of AAE and mainstream American English. Similarities involve the rate of the children's BE marking as a function of their clinical status and the nature of their dialect-inappropriate errors. Differences involve the children's rates of BE marking as a function of the form, context, and task.

KEY WORDS: African American English (AAE), specific language impairment, grammatical morphology

Across studies of mainstream dialects of English, grammatical morphology surfaces as an area of particular difficulty for children with specific language impairment (SLI; Bishop, 1997; Leonard, 1998; Rice, 2003). Less is known about the grammatical profile of SLI in children who speak nonmainstream dialects of English despite the fact that studies of SLI have been extended to a wide range of languages, including Cantonese (Klee, Stokes, Wong, Fletcher, & Gavin, 2004); Dutch (de Jong, 2003), French (Paradis & Crago, 2000; Paradis, Rice, Crago, & Marquis, 2008), German (Rice, Noll, & Grimm, 1997), Hebrew (Ravid, Levie, & Ben-zvi, 2003), Hungarian (Lukács, Leonard, Kas, & Pléh, 2009), Inuktitut (Crago & Allen, 2001), Italian (Bortolini, Caselli, & Leonard, 1997), Japanese (Fukuda & Fukuda, 2001), Spanish (Bedore & Leonard, 2001), and Swedish (Hansson, Nettelbladt, & Leonard, 2000).

Fortunately, studies of the SLI profile within nonmainstream dialects of English are beginning to emerge in the literature (Oetting, Cantrell, & Horohov, 1999; Oetting & Garrity, 2006; Oetting & McDonald, 2001;

Oetting & Newkirk, 2008; Ross, Oetting, & Stapleton, 2004; Seymour, Bland-Stewart, & Green, 1998). These studies show grammatical morphology to be difficult for nonmainstream English–speaking children with SLI as well, but far more work is needed to explicate the nature of these difficulties. This study was designed to contribute to this literature by focusing on children's use of one nonmainstream dialect (African American English [AAE]) and one grammatical structure (auxiliary BE).

We selected AAE for study because of the high rates at which speakers of this dialect produce nonstandard grammatical structures relative to speakers of other nonmainstream varieties. This feature of AAE makes it a model system for studying the nature of SLI within the context of English dialect variation. Within AAE, we chose to study auxiliary BE for two reasons. First, auxiliary BE plays a central role in a number of models that explain the morphosyntactic tense and agreement deficits associated with the SLI grammar profile. For example, the extended optional infinitive (EOI) account, proposed by Rice and colleagues (Rice & Wexler, 1996; Rice, Wexler, & Hershberger, 1998; Rice, Wexler, Marquis, & Hershberger, 2000), explains these deficits as specific to a cluster of morphemes for which children with SLI remain in a protracted state of development relative to overt finiteness marking. This model also predicts that children with SLI, like their typically developing peers, will not make errors of commission with these structures at any point in development. Other theoretical models, such as the low phonetic substance account, the morphological richness account, and the surface account, have been proposed by Leonard and colleagues (Leonard, 1998; Leonard et al., 2003; Lukács et al., 2009; C. Miller, Kail, Leonard, & Tomblin, 2001; Montgomery & Leonard, 1998, 2006). Common to these models is a characterization of these same grammatical deficits of SLI as related to a limited capacity and/or slowed processing of linguistic material (see also Owen & Leonard, 2006, for a discussion of these models and others as general information-processing accounts). Although these models do not make specific predictions about the nature of children's errors, they can accommodate the low rates of errors that have been documented in the SLI literature.

Ideally, studies of AAE-speaking children with SLI should be conducted to test, tease apart, and ultimately refine these various competing theories, but unfortunately these types of studies cannot be conducted until more basic information is known about AAE. This basic information includes the frequency, nature, and function of auxiliary BE within adult AAE as well as the developmental trajectory of this structure for AAE-speaking children who are developing language typically. For EOI and other linguistic accounts of SLI, this information is needed to make predictions about the underlying representation and required checking constraints of tense and agreement within the AAE grammar. For processing-based accounts of SLI, this basic information is needed to identify appropriate processing variables that may or may not lead a child with SLI to have particular difficulties with this structure.

The second reason we selected BE for study is that this grammatical structure is considered by many to be "one of the oldest and most frequently examined variables in the paradigm of quantitative sociolinguistics" (Rickford, Ball, Blake, Jackson, & Martin, 1991, p. 103). Given this, there is an existing adult literature base that could be used to guide the study. This literature has repeatedly shown AAE speakers' overt marking of BE to be probabilistic in nature, rather than all or none, and tied to several linguistic contexts and/or constraints (Baugh, 1980; Green, 1993; Labov, 1969; Wolfram, 1974; Wyatt, 1991). These constraints, initially discussed by Labov (1969), are summarized in Table 1 and are described in terms of an AAE speaker's likelihood of producing an overtly marked BE form (e.g., "He is walking") rather than a zero-marked form (e.g., "He walking"). In addition to overtly marked and zero-marked forms of BE, speakers of AAE (and other nonmainstream English dialects) have been shown to produce some surface forms of BE in an extended range of contexts (e.g., *was* can be produced with second person subjects, as in "We *was* walking").

Although much of the AAE literature on constraints has been based on adults, three studies have been completed with young children, and results from these studies are consistent with those documented for older speakers. Wyatt (1991) studied 10 typically developing 3- to 5-year-olds' productions of copula *is* and *are* using spontaneous language samples and found that the children overtly marked second person *are* at rates that were lower than their rates of overtly marked third person *is* (55% vs. 81%). Also, the children overtly marked the copula forms with preceding contexts involving *it/that* at higher rates than those with preceding contexts involving noun phrases, and both of these contexts were marked at higher rates than those with preceding contexts involving personal pronouns (96% vs. 79% vs. 44%). These findings suggest that the grammars of AAE speakers as young as age 3 years are influenced by some of the same linguistic constraints that have been shown to operate in adult AAE.

Burns, Paulk, Seymour, and Pearson (2000) also used language samples to study 22 typically developing 5-year-olds' productions of *am, is, are, was,* and *were* in both copula and auxiliary contexts. Similar to Wyatt's (1991) findings, rates of overtly marked *are* were relatively low; rates of overtly marked *is* were just over 80%, and rates of overtly marked *am, was,* and *were* were above 90%. Although this study included both copulas and auxiliaries, these results again suggest that some of the constraints detailed in Table 1 (i.e., person/number, tense) are operative in child AAE speakers.

Table 1. Linguistic constraints in African American English.

Constraint	Description
Person/number	First person singular forms are more likely to be overtly marked than third person singular forms, and all first and third person forms are more likely to be overtly marked than all second person forms: "I am happy" (more likely) vs. "He is happy" (less likely) vs. "You are happy" and "We are happy" (least likely).
Tense	Forms with tense are more likely to be overtly marked than those without: "She was walking" (more likely) vs. "She is walking" (less likely).
Contractibility	Uncontractible forms are more likely to be overtly marked than contractible forms: "Is she happy?" (more likely) vs. "She is happy" (less likely).
Grammatical function	Copula forms are more likely to be overtly marked than auxiliary forms: "She is happy" (more likely) vs. "She is walking" (less likely).
Type of preceding context	Forms preceded by *it/that/what* are more likely to be overtly marked than forms preceded by a specific noun phrase, and these are more likely to be overtly marked than those preceded by a personal pronoun: "It is big" (more likely) vs. "John is happy" (more likely) vs. "She is happy" (less likely).

Finally, Wynn and Oetting (2000) studied 40 AAE-speaking children's productions of copula and auxiliary BE. Similar to the other two AAE child studies discussed here, the participants ranged from 4 to 6 years of age, and the data were collected from language samples. However, in this study one third of the children were classified as having SLI, and the others served as typically developing age controls or language controls. Some of the findings from this study are presented in Table 2. As can be seen, the results were consistent with those of Burns et al. (2000) and Wyatt (1991) because rates of overtly marked *are* were lower than rates of overtly marked *is,* and rates of overt marking for both of these structures were lower than those produced for *am, was,* and *were*. The AAE-speaking children with SLI also marked *am, is,* and *was/were* at lower rates than the control children, although only the SLI- and age-matched comparison of *is* was statistically reliable. Low and unequal numbers of BE contexts across forms and groups appeared to contribute to the null findings. Indeed, there were 1,112 tokens of *is,* but the number of tokens for the other forms of BE were lower (*am* = 112, *are* = 291, *was/were* = 468). Wynn and Oetting's results not only are consistent with the other studies of young typically developing AAE speakers but also suggest that young AAE speakers with SLI adhere to the linguistic constraints of their dialect. Given the preliminary nature of Wynn and Oetting's study and the focus of these three AAE child studies on the copula and/or the copula and auxiliary BE forms combined, there is a need to further explore these findings.

Table 2. Percentage overt marking from Wynn and Oetting (2000).

Variable	SLI *M (SD)*	Age-matched group *M (SD)*	Language-matched group *M (SD)*
First person *am*	75 (32)	86 (32)	100 (0)
Second person *are*	25 (35)	25 (28)	29 (25)
Third person *is*	43 (20)	63 (16)	49 (17)
Was/were	90 (14)	97 (4)	92 (16)

Note. SLI = specific language impairment.

As background for the present work, it is also important to review previous SLI studies of auxiliary BE that have been conducted with children who speak mainstream American English (MAE). As previously discussed, these children mark certain grammatical morphemes, including auxiliary BE, at lower rates than both age- and language-matched controls. For example, Cleave and Rice (1997) examined BE production in spontaneous language samples by 12 five-year-olds with SLI and 10 typically developing language control children. The results showed that rates of overt marking by the language control children were higher than those produced by the children with SLI (language matches = 81% vs. SLI = 50%). In another study, Leonard et al. (2003) examined auxiliary *is/are* and *was/were* production by 15 children with SLI, 15 age-matched control children, and 15 language-matched control children. Instead of language samples, a puppet show was used to elicit productions of present and past progressive constructions (i.e., auxiliary *is/are* or *was/were* + verb /*–ing*/). Again, rates of overt marking by both groups of control children were higher than those of the children with SLI (age matches > 89%, language matches = 79%, SLI = 50%). In a follow-up to this study, Polite, Leonard, and Deevy (2005) used the same elicitation task to examine children's productions of auxiliary *am*. The results paralleled their earlier findings in that rates of overt marking by the control children were again higher

than those of the children with SLI (age-matched: 95%; language-matched: 99%; SLI, 63%).

To summarize, the prominence of BE in theoretical explanations of language impairment, the extant literature of BE in adult (and some child) AAE speakers, and studies of BE with MAE-speaking children with SLI make this structure an excellent choice for extending the study of SLI to AAE. As mentioned earlier, although it is too early to use studies of BE in AAE to tease apart competing theoretical accounts of SLI, a study of BE by AAE-speaking children with and without SLI should provide important information as to the nature and function of BE in child AAE as well as determine whether AAE-speaking children with SLI show difficulties with this structure relative to AAE-speaking control children.

On the basis of the preceding literature review, we predicted both across-dialect similarities and differences in the children's overt marking of BE. For across-dialect similarities, we predicted group differences in the AAE-speaking children's rates of BE marking as a function of their clinical status (i.e., with or without SLI) and a lack of commission errors by both the children with and without SLI. For across-dialect differences, we predicted rates of BE marking that would vary as a function of the linguistic constraints of AAE.

To complete this work, we followed the methods of previous SLI studies and collected BE data from AAE-speaking children using language samples and an elicitation probe. The primary linguistic constraint we examined was type of BE form, and the forms included *am, is,* and *are*. Recall that these three forms of BE are overtly marked at different rates in the language samples of AAE speakers. Also, these three forms (unlike *was* and *were*) all express present tense, are contractible, and can be elicited using the same stimuli and prompts within an experiment.

The two primary questions guiding the study were (a) are there group differences between AAE-speaking children with and without SLI for production of auxiliary BE?, and (b) are AAE-speaking children's rates of BE marking influenced by the type of BE form (*am* vs. *is* vs. *are*)? When possible, we also examined whether the children's marking of these BE forms was influenced by the type of preceding context (*it/that/what* vs. noun phrase vs. personal pronoun). Although this study was not originally designed to examine the influence of this variable on the children's BE productions, the adult AAE literature and findings by Wyatt (1991) warranted this analysis.

Method

Participants

The participants, all African American and speakers of AAE, were recruited from three parishes (Ascension, East Baton Rouge, and St. Tammany) within southeastern Louisiana and as part of two dissertation studies at Louisiana State University. Race was confirmed through parental report, and dialect status was confirmed through blind listener judgment of the children's spontaneous language. Using a previous sample of 93 children, Oetting and McDonald (2002) showed listener judgment to be a valid measure of children's dialect type and rate (i.e., for dialect type, 97% of children previously studied were accurately classified; for dialect rate, correlations between listener judgment and more laborious methods of language sample analysis were ~.60–.70). Following the methods of Oetting and McDonald, three PhD students who were native AAE speakers with expertise in child language acquisition and impairment in the context of AAE judged, using a 7-point Likert scale, each child's dialect after listening to a 1-min spontaneous language sample, and then these scores were averaged. Ratings were holistic in nature and based on the listeners' perceptions of the children's vocabulary, morphosyntax, phonology, and paralinguistic behaviors. A score of 1 on the scale indicated that the listener perceived no usage of AAE, whereas a score of 2 indicated some use, and a 7 indicated heavy usage. The mean average rating across participants was 4.81 (SD = 0.97, range = 3.00–6.67).

Ten children (six girls, four boys) were selected for inclusion in the group with SLI on the basis of the following four criteria: (a) receiving services from a speech-language clinician, (b) performance within normal limits on the Figure Ground and Form Completion subtests of the Leiter International Performance Scale—Revised (Leiter–R; Roid & Miller, 1998), (c) greater than 90% accuracy on an articulation screener, and (d) performance greater than 1 SD below the mean on the Test of Language Development—Primary, Third Edition (TOLD–P:3; Newcomer & Hammill, 1997). Because all of the participants in this group were receiving speech-language services, testing with the TOLD–P:3 was considered confirmatory of SLI status rather than diagnostic. We chose a cutoff of –1 SD because Records and Tomblin (1994) found that speech-language pathologists consider a language test score of –1.0 SD indicative of clinical impairment. In addition, this score is consistent with many of the studies that have examined SLI within the context of various linguistic backgrounds (see Klee et al., 2004; Oetting & McDonald, 2001, 2002; Rice et al., 1998; Wynn & Oetting, 2000). For the children with SLI in this study, all scored 1.2 SDs below the mean, and nine of the 10 scored 1.5 SDs below the mean.

We selected a total of 20 typically developing children—10 age-matched control children (AM; six girls, four boys) and 10 language-matched control children (LM; six girls, four boys)—on the basis of the following four criteria: (a) not receiving services by a speech language clinician, (b) performance within normal limits on the

Leiter–R subtests, (c) greater than 90% accuracy on the articulation screener, and (d) performance within normal limits on the TOLD–P:3. AM control children were individually matched to the children with SLI using age in months; matched pairs were within 4 months of age of one another. LM control children were individually matched to the children with SLI using mean length of utterance in morphemes (MLU_m); matched pairs were within 0.66 morphemes of one another.

We administered two additional measures to collect descriptive information about the participants: (a) the Peabody Picture Vocabulary Test—III (PPVT–III; Dunn & Dunn, 1997) and (b) maternal education level. Group profiles for the eligibility and descriptive measures can be found in Table 3. To examine differences between the groups on these measures, we conducted one-way analyses of variance (ANOVAs) with Tukey follow-up testing. Differences between the SLI group and both control groups were found for the TOLD–P:3, $F(2, 29) = 63.64$, $p = .00$, partial $\eta^2 = .83$, and the PPVT–III, $F(2, 29) = 33.25$, $p = .00$, partial $\eta^2 = .71$. Group differences were also found for MLU_m, $F(2, 29) = 6.85$, $p = .00$, partial $\eta^2 = .34$, and maternal education, $F(2, 28) = 3.96$, $p = .03$, partial $\eta^2 = .23$. For MLU_m the difference was between the AM group and the other two groups (AM > SLI and LM), and for maternal education the difference was between the SLI group and the AM group. One-way ANOVAs for Leiter–R scores and listener judgment ratings did not reveal group differences: Leiter–R, $F(2, 29) = 0.77$, $p > .05$; listener judgment rating, $F(2, 29) = 1.40$, $p > .05$.

Language Samples

We used language samples to examine the children's spontaneous productions of auxiliary *am, is,* and *are*. These samples were elicited through a play session with the child and an examiner. Materials used to facilitate talking during the play sessions included toys (i.e., a gas station, cars, people, picnic/park set, Legos, baby doll and baby care items) and three Apricot pictures (Arwood, 1985). Although an attempt was made to make these samples longer than our previous AAE child samples (to increase the number of BE tokens available for the analysis), the focus was on conversational speech as we (and others who have collected data on AAE speakers) have done in previous studies. Given this, explicit prompts were not used to elicit the target BE forms from the children.

We transcribed, coded, and checked the children's utterances using Systematic Analysis of Language Transcripts (SALT) software guidelines (J. Miller & Iglesias, 2004). The samples averaged 174.37 ($SD = 50.13$) complete and intelligible utterances, with a range of 101 to 335 utterances. The total number of utterances across samples was 5,231 (SLI = 1,896, AM = 1,526, LM = 1,809). We used the SALT software to search and extract the children's spontaneous productions of *is, am,* and *are*. These forms were then coded as standard overtly marked (e.g., "He is walking"), nonstandard zero marked (e.g., "He walking"), nonstandard overtly marked (e.g., "They is walking"), and dialect-inappropriate marked (e.g., "He am walking"). In MAE, children's productions of marked forms that are not felicitous within their dialect (e.g., "He am …") are referred to as *errors of commission*.

Elicitation Probe

We also created a probe to elicit auxiliary *am, is,* and *are* productions from the children. This probe included six training items with the verbs *singing, pushing, waving, drinking, smiling,* and *listening,* and 30 experimental items with the verbs *cutting, digging, cooking, eating, washing, combing, reading, drawing, sleeping,* and *blowing*. Each of the experimental verbs was used three times within the probe, once with each of the three BE forms.

Table 3. Participant characteristics: Group means.

Group	Age (months)	AAE rating[a]	Leiter–R[b]	TOLD–P:3[c]	PPVT–III[d]	MLU_m	Maternal education[e]
SLI	77.50 (4.77)	5.20 (0.74)	20.60 (3.03)	66.10 (8.49)	78.00 (4.90)	5.09 (0.89)	12.22 (1.92)
AM	74.60 (3.13)	4.50 (1.00)	22.50 (3.89)	98.90 (7.59)	100.00 (7.82)	6.49 (0.90)	14.70 (1.57)
LM	55.80 (4.05)	4.73 (1.09)	22.90 (5.71)	99.10 (6.35)	100.40 (7.95)	5.13 (1.14)	14.10 (2.38)

Note. Numbers in parentheses are standard deviations. MLU_m = mean length of utterance in morphemes; AM = age-matched control group; LM = language-matched control group.

[a]African American English (AAE) rating: average ratings from three listeners (range: 1 = *no use of AAE,* 7 = *heavy use of AAE*). [b]Total scaled scores from the Figure Ground and Form Completion subtests of the Leiter International Performance Scale—Revised (normative $M = 20$, $SD = 6$). [c]Syntax quotient of the Test of Language Development—Primary, Third Edition (normative $M = 100$, $SD = 15$). [d]Standard score from the Peabody Picture Vocabulary Test—III (normative $M = 100$, $SD = 15$). [e]Maternal education level: highest grade completed (12 = high school graduate, 16 = college graduate).

We created two sets of picture cards to elicit the target forms from the participants. One set of picture cards depicted an adult African American woman performing each of the target actions, and the second set of cards showed one of three possible agents. A multicolored happy face icon was selected to represent the child in order to elicit the construction "I am X-ing," a picture of the Muppet character Gonzo was used to elicit the third person singular form "Gonzo is X-ing" or "He is X-ing," and a picture of the Muppet characters Kermit and Miss Piggy together were used to elicit "Kermit and Miss Piggy are X-ing" or "They are X-ing."

The task consisted of the examiner first introducing each item by showing the agent card and saying "This shows a picture of____" (e.g., Gonzo). Then the action card was shown, followed by the examiner's prompt "This shows someone ____ (e.g., cutting). Tell me how you would say that Gonzo does that—'cutting.'"

Participants were trained on the elicitation probe using the six training items before the experimental items were presented. The training items were introduced in the same manner as the experimental items in order to familiarize the participants with the task rather than provide models of standard or nonstandard BE forms. Given this, the participants received corrective feedback for using an inappropriate format (i.e., a verb form other than the targeted present progressive) but not for the nature of their BE productions. To proceed to the experimental phase, each participant was required to demonstrate the ability to produce the response format of appropriate noun or pronoun + standard or nonstandard auxiliary BE form + target present progressive form on 80% of the items. As it turned out, the preceding context of 90% of the children's BE productions on these training items included pronouns rather than noun phrases.

After training, participants were randomly assigned to one of two fixed orders of the 30 items. During administration of the 30 items, if the child did not respond or gave an inappropriate response format, the examiner repeated the prompt. If the child still gave no response or an inappropriate response, the examiner provided a verbal cue, such as "He …." If the third attempt resulted in no response or an inappropriate response, the examiner would prompt the child to "make a sentence using these words" and then supply the appropriate noun or pronoun and present progressive form for the experimental item. If the child still did not respond or responded inappropriately, the item was to be skipped; however, this situation did not arise.

Reliability

For the language sample transcripts, we randomly selected two samples from each of the three participant groups, and these were independently transcribed and coded by a second pair of examiners. Samples were examined for morpheme and utterance boundary decisions and identification of the auxiliary BE forms. The results of the reliability check indicated that interrater agreement was above 90% for both morphemes and BE forms (ranges: morphemes, 91%–96%; BE, 99%–100%). Interrater agreement was slightly lower for utterance boundaries, with a range of 87% to 93%. Nevertheless, the MLU_m values that were generated from the two sets of samples varied by no more than 0.22 morphemes (M = 0.10, range = 0–0.22).

For the elicited probes, a second judge randomly selected and independently scored at least 30% of the responses from each group. Reliability for the elicited probe collapsed across groups was 97%; interrater agreements for each of the groups were as follows: SLI, 93%; AM, 100%; LM, 99%.

Results

Spontaneous Language Samples

The frequencies of the participants' auxiliary *am, is,* and *are* productions within the language samples are presented in Table 4. The category of nonstandard marked responses accounts for instances of dialect-appropriate subject–verb disagreement with BE (e.g., "They is") as well as the use of the form *I'ma,* as in "I'ma walk to the store" (literally, "I'm going to walk to the store"). Although not part of MAE, both of these nonstandard marked forms of BE are felicitous in AAE (cf. Green, 2002; Rickford, 1999). Given that this study was framed as an investigation of BE in the context of AAE, we classified these types of nonstandard marked productions as the form type that matched the AAE production. Therefore, *I'ma* productions were included as *am* contexts, and *They is* productions were classified as contexts for *is,* not for *are*. As it turned out, very few of these dialect-appropriate, nonstandard marked productions were found in the samples (SLI, n = 3; AM, n = 3; LM, n = 14), and most involved the children's use of *I'ma* (SLI, n = 3; AM, n = 1; LM, n = 12). The remaining nonstandard marked tokens involved subject–verb agreement with *is* (AM, n = 2; LM, n = 2). All of the samples also were searched for dialect-inappropriate instances of subject–verb agreement (e.g., "You am …," "He are …," "They am"), but none was found.

As shown in Table 4, two participants produced no auxiliary BE contexts. Also, the frequencies at which the different BE contexts were produced varied considerably. Across groups, *is* contexts were the most frequently produced (n = 208), and *am* contexts were produced the least (n = 74). In addition, among the participants who produced one or more of the BE contexts, *am* contexts averaged fewer than three per sample, *are* contexts averaged

Table 4. Frequency counts of responses for participants with one or more BE contexts: Language samples.

Variable	SLI	AM	LM	Total
Am				
Number of participants	7	5	7	19
Standard marked	18	8	25	51
Nonstandard marked	3	1	12	16
Dialect appropriate	3	1	12	16
Dialect inappropriate	0	0	0	0
Nonstandard zero marked	4	0	3	7
Number of contexts	25	9	40	74
Number of contexts *M* (*SD*)	3.57 (2.23)	1.50 (1.22)	5.71 (5.96)	2.47 (3.71)
Is				
Number of participants	10	9	8	27
Standard marked	8	26	17	51
Nonstandard marked	0	2	2	4
Dialect appropriate	0	2	2	4
Dialect inappropriate	0	0	0	0
Nonstandard zero marked	58	31	64	153
Number of contexts	66	59	83	208
Number of contexts *M* (*SD*)	6.60 (5.19)	6.56 (5.73)	10.37 (3.38)	7.70 (5.06)
Are				
Number of participants	10	7	9	26
Standard marked	4	13	3	20
Nonstandard marked	0	0	0	0
Dialect appropriate	0	0	0	0
Dialect inappropriate	0	0	0	0
Nonstandard zero marked	36	19	41	97
Number of contexts	40	33	44	117
Number of contexts *M* (*SD*)	4.00 (2.91)	4.71 (2.50)	4.89 (4.04)	4.50 (3.14)

fewer than five, and *is* contexts averaged fewer than eight. These low numbers of BE productions occurred in spite of our attempt to elicit language samples that were close to 200 utterances.

Although these data are consistent with previous studies that have used language sample data, the production of too few BE tokens within a data set can contribute to misleading percentage data. For instance, a participant might overtly mark a particular form at 100%, but if this rate is based on only one or two BE tokens one must question the integrity of the calculation. For this reason, child language researchers often use a criterion of three or more contexts of a target structure for inclusion in the analysis (cf. Cleave & Rice, 1997; Hansson et al., 2000; Rice & Oetting, 1993). The data from the 27 children who produced at least three BE contexts are shown in Table 5. For these data, we calculated percentage of marking by summing the children's number of overtly marked (standard and dialect-appropriate nonstandard) forms and dividing this number by the sum of the children's overtly marked and zero-marked forms.

The nonnormally distributed data and unequal sample sizes across groups rendered parametric analyses inappropriate, so we used nonparametric tests to examine differences for the variables of interest. The first analysis examined group differences between the children's rate of marking for the three BE forms combined, for the 27 children who produced at least three BE contexts. The AM group produced the highest rate of overt marking ($M = 47\%$), followed by the LM group ($M = 38\%$) and the SLI group ($M = 24\%$). Although these percentages suggest that the groups differed in their marking of BE, the differences were not statistically significant when tested by a Kruskal–Wallis test; $\chi^2(2, N = 27) = 3.93$, $p = .14$.

Next, we conducted a Kruskal–Wallis test for each BE form. As before, only data from children who produced at least three tokens of the BE form being examined were included within the analysis. Application of this criterion led to *am* data from only eight (27%) participants, so this structure was not analyzed. For *is* and *are,* however, data were available from 21 and 17 participants, respectively. Analyses of these structures revealed group differences for both: *is,* $\chi^2(2, N = 21) = 5.85$, $p = .05$, and *are,* $\chi^2(2, N = 17) = 7.41$, $p < .05$. Mann–Whitney follow-up *t* tests of these group differences indicated that participants in the AM group produced *is* at significantly

Table 5. Participants with three or more BE contexts: Language samples.

Variable	SLI	AM	LM	Total
Am				
Number of participants	4	1	3	8
Number of contexts *M* (*SD*)	5.00 (1.83)	4.00 (0.00)	10.67 (6.51)	7.00 (4.78)
% marking *M* (*SD*)	96 (8)	100 (0)	96 (7)	96 (7)
Is				
Number of participants	7	6	8	21
Number of contexts *M* (*SD*)	8.71 (4.79)	9.33 (4.97)	10.38 (3.34)	9.52 (4.19)
% marking *M* (*SD*)	21 (21)	55 (29)	26 (24)	32 (28)
Are				
Number of participants	5	6	6	17
Number of contexts *M* (*SD*)	6.20 (2.59)	5.17 (2.40)	7.00 (3.80)	6.67 (3.78)
% marking *M* (*SD*)	7 (11)	39 (34)	1 (3)	16 (26)
Collapsed BE				
Number of participants	10	8	9	27
Number of contexts *M* (*SD*)	12.80 (8.48)	12.25 (8.50)	18.56 (8.85)	17.22 (7.93)
% marking *M* (*SD*)	24 (15)	47 (25)	38 (32)	35 (26)

higher rates than the SLI group (55% vs. 21%), $U = 5.00$, $p < .05$, and *are* at significantly higher rates than the LM group (39% vs. 1%), $U = 3.50$, $p < .05$. Differences between the AM and SLI groups and between the AM and LM groups also approached significance for *are* and *is,* respectively (*are*: AM = 39% vs. SLI = 7%, $U = 5.50$, $p = .08$; *is*: AM = 55% vs. LM = 26%, $U = 10.50$, $p = .08$).

The final analysis of these data examined whether the preceding context of the BE form affected the children's rates of overt marking. Recall from Table 1 that Labov's (1969) work demonstrated a linguistic constraint that favors overt marking of BE forms when the preceding context is *it/that/what* or a noun phrase as opposed to a personal pronoun. To test whether this constraint was operative, we examined the preceding contexts of all *is* and first and third person *are* contexts. We did not examine second person *are* contexts because the preceding context is invariantly a pronoun (i.e., "You are"). We also excluded questions that were not instances of *what* preceding contexts because the syntactic construction of questions can place the contexts of interest after the auxiliary rather than before (i.e., "They are walking" vs. "Are they walking?").

As shown in Table 6, again a limited number of tokens for the variables of interest limited the analysis. As a point of illustration, consider that the five children in

Table 6. Preceding contexts: Language samples.

	Is			*Are*		
Variable	Personal pronoun	*It/that/what*	Noun	Personal pronoun	*It/that/what*	Noun
SLI group						
Number of participants	8	5	6	9	1	2
Number of contexts	37	9	13	15	2	2
% marking *M* (*SD*)	6 (12)	25 (43)	4 (10)	39 (49)	0 (0)	0 (0)
AM group						
Number of participants	6	4	8	6	1	1
Number of contexts	25	7	25	13	1	1
% marking *M* (*SD*)	22 (29)	88 (25)	45 (50)	64 (50)	0 (0)	0 (0)
LM group						
Number of participants	8	4	8	5	5	1
Number of contexts	31	7	32	9	5	1
% marking *M* (*SD*)	23 (34)	63 (48)	22 (25)	0 (0)	40 (55)	0 (0)
Total % marking *M* (*SD*)	17 (26)	56 (46)	26 (37)	37 (47)	29 (48)	0 (0)

the LM group who produced *it/that/what* contexts for *are* marked these at a mean rate of 40%. However, three of the children marked *are* at a rate of 0%, whereas the other two marked it at 100%. Because of the insufficient number of tokens and ambiguous data for *are,* the analysis focused on *is*. When this was done, the results indicated that the children in the AM group adhered to the constraints, marking *is* in *it/that/what* and noun phrase contexts at higher rates than those preceded by personal pronouns. The same was partially true for the children in the SLI and LM groups, who showed higher rates of overt marking for *is* when the preceding context involved *it/that/what* than when it involved a personal pronoun. To test these trends statistically, we conducted paired Wilcoxon *t* tests for each of the three groups (SLI, AM, LM). These results showed that the AM group's rates of marking in *it/that/what* contexts differed from their rates of marking in personal pronoun contexts, $t(3) = 3.46$, $p < .05$ (*M*s = 88% vs. 22%). No other within-group difference was deemed statistically reliable.

Elicitation Probe

Data from the elicitation probe are listed in Table 7. Note that for the probe, the BE target was considered to be the context for each item. In other words, if the target for the item was "They *are* reading" and the child produced "They *is* reading," this production was counted as a nonstandard production of *are*. This coding procedure differed from what was used in the language samples, but it ensured an equal number of tokens for each BE form across the groups. Also, 87% of the children's responses on the probe included a personal pronoun (e.g., "They *are* digging") rather than a specific noun phrase, so we did not examine the children's BE productions as a function of the preceding context.

The results showed that nonstandard BE productions were produced across all forms and groups but were more frequent for *is* ($n = 34$) and *are* ($n = 55$) than for *am* ($n = 17$). As in the spontaneous language samples, the LM group exhibited the highest frequencies of these nonstandard forms across all of the BE forms ($n = 66$). They were followed by the SLI group ($n = 28$) and the AM group ($n = 12$).

Nonstandard dialect-appropriate productions for *am* included primarily the "I'm is" sequence, with a few instances of "I'm are." These productions were considered appropriate for AAE following work by Green (2002), who described these types of *I'm* productions as reflecting a single morpheme in AAE, rather than a contracted form of *I* + *am*. We were interested to observe that *I'ma* was not among the nonstandard forms produced during the elicitation task. Given the future aspectual nature of *I'ma* (i.e., "I'm going to …"), its production would have been inappropriate within the context of the present-tense probe. In addition to these nonstandard dialect-appropriate BE productions, one child in the LM group produced one nonstandard dialect-inappropriate form of *am*.

Table 7. Frequency counts and rates of overt marking: Elicitation probe.

Variable	SLI	AM	LM	Total
Am				
Standard marked	72	70	73	215
Nonstandard marked	2	0	15	17
Dialect appropriate	2	0	14	16
Dialect inappropriate	0	0	1	1
Nonstandard zero marked	26	30	13	69
No response	0	0	0	0
% marking *M* (*SD*)	74 (40)	70 (48)	87 (25)	77 (38)
Is				
Standard marked	38	69	57	164
Nonstandard marked	11	1	22	34
Dialect appropriate	0	0	0	0
Dialect inappropriate	11	1	22	34
Nonstandard zero marked	51	30	21	102
No response	0	0	0	0
% marking *M* (*SD*)	49 (44)	70 (48)	79 (35)	66 (43)
Are				
Standard marked	31	59	60	150
Nonstandard marked	15	11	29	55
Dialect appropriate	14	11	26	51
Dialect inappropriate	1	0	3	4
Nonstandard zero marked	54	30	10	94
No response	0	0	0	0
% marking *M* (*SD*)	44 (48)	70 (48)	90 (28)	68 (45)
Collapsed BE				
% marking *M* (*SD*)	57 (39)	70 (48)	85 (24)	71 (39)

All of the nonstandard dialect-appropriate productions for *are* were instances of "They is" and thus were representative of a type of subject–verb disagreement called *was leveling,* a pattern that has been identified as part of several dialects, including AAE (Oetting & Garrity, 2006). In addition to these dialect-appropriate BE productions, four nonstandard dialect-inappropriate BE forms were produced (e.g., "They am"). For *is,* all of the nonstandard productions were dialect inappropriate. Again, the LM group produced the most instances of these structures ($n = 22$), followed by the SLI group ($n = 11$) and the AM group ($n = 1$). Productions included primarily "He am" and "He are," both of which constitute subject–verb disagreement but not a type that is considered typical in AAE. Even though these nonstandard dialect-inappropriate forms were identified in the data, they still should be considered infrequently produced. This is because, across groups and forms, the nonstandard dialect-inappropriate BE forms totaled 39, which reflects 4% of the 900 tokens elicited.

Table 7 also shows the children's rates of overt marking for the targeted BE forms. For these rates, all nonstandard overt forms of BE were considered overtly marked. As can be seen, the children's rates of overt marking for the probe were higher than they were for the language samples (*M*s = 71% vs. 35%). Visual inspection of the data also indicates that the SLI group overtly marked the BE forms at a lower rate than their peers (SLI *M* = 45% vs. control *M* > 60%). However, we found an unexpected bimodal and invariant distribution for the AM group's data. This result occurred because seven of the children in this group overtly marked all items on the probe, and three zero marked all of the items. The bimodal distribution (and lack of variance) within the AM group's data precluded the inclusion of this group within the analyses.

Using data from the SLI and LM groups, we transformed the children's rates of overt marking to arcsines, and we conducted a mixed-model ANOVA with form (*am, is, are*) as a within-subject variable and group (SLI, LM) as a between-subjects variable. A main effect of group was detected, $F(1, 18) = 4.24$, $p = .05$, partial $\eta^2 = .19$, which indicated that the LM group's rate of marking (*M* = 85%) was significantly higher than the SLI group's (*M* = 57%). The main effect of group was not accompanied by a main effect of form, and it was not qualified by a Form × Group interaction.

We further examined data from the SLI and LM groups to determine whether any of the participants uniformly overtly marked or zero marked all of the items on the probe, as was the case with the AM group. When this was done, we observed that three children in the SLI group and five children in the LM group overtly marked all of the items, and two of the children in the SLI group zero marked all of the items. In other words, only five children from each of the SLI and LM groups (for a total of 10 across the two groups) performed at variable rates of marking on the task. When we examined the mean rates of marking for these 10 children, we observed that the SLI group again overtly marked the BE forms at a lower rate than the LM group (SLI *M* = 53% vs. LM *M* = 71%). We were not surprised, because of the small sample size, when a nonparametric analysis did not find a significant difference between the five children in each of these groups ($U = 6.50$, $p = .21$). However, these results visually support those of the earlier ANOVA that we ran on all of the participants in the SLI and LM groups.

Discussion

The primary goal of this study was to examine auxiliary BE production in AAE-speaking children with and without SLI while also examining the children's rates of marking as a function of the BE form. When possible, we also examined the effect of the preceding context on the children's marking of BE. Visual inspection of the data suggests that children with SLI overtly marked BE at lower rates than typically developing age-matched and language-matched control children, and all three groups of children overtly marked *am* at higher rates than *is* and *are*. Within the language samples, the children also overtly marked *is* at higher rates when preceded by *it/that/what* than when it was preceded by a personal pronoun. Finally, all three groups of children produced dialect-appropriate nonstandard forms of BE, without many dialect-inappropriate productions (i.e., errors of commission).

A subset of the preceding results was confirmed statistically. For the group variable, these included a statistical difference for the marking of *is* (with a marginal difference for *are*) between the SLI and AM groups within the language samples and a statistical difference for the marking of all BE forms combined between the SLI and LM groups within the elicitation probe. In addition, we examined preceding context in the language sample data and observed a statistically reliable difference within the AM group.

If we consider these statistical differences and the nonsignificant trends that aligned with these differences, we can conclude that this study shows some evidence of an SLI grammar deficit involving *am, is,* and *are* in AAE while also showing the children's marking of BE to be influenced by some of the same linguistic contexts/constraints that have been documented in adult AAE. These findings support the literature we reviewed and are consistent with our predictions that we would find across-dialect similarities and differences when examining the SLI grammar profile in AAE. That very few dialect-inappropriate productions of BE (i.e., errors of commission) were found in the children's data also shows across-dialect similarity between AAE and other dialects of English. Together, these findings (i.e., varied use of BE as a function of the children's clinical status and infrequent production of dialect-inappropriate forms of BE) support both linguistic-based and processing-based models of SLI.

These conclusions, however, would be incomplete if we did not also highlight the discrepancy that was found between the children's rates of marking for the language samples and for the elicitation probe. For the probe in particular, all of the children in the AM group, and half of the children in the SLI and LM groups, either overtly marked or zero marked the BE forms 100% of the time. This type of bimodal distribution was not evident in the language sample data, and it was not predicted by any of the literature we reviewed.

This is not to say that task effects have not been documented in previous studies. To the contrary, multiple studies involving children who speak various dialects of

English have shown task effects, but these effects generally lead to overall rates of marking that either increase or decrease for the group as a whole. In studies of children's past tense systems, for example, rates of overt marking have been repeatedly shown to be higher in spontaneous language samples than in elicitation probes (e.g., Leonard, 1992; Oetting & Horohov, 1997; Pruitt & Oetting, 2009; Rice & Wexler, 1996). Studies of children's overregularizations of plurals and past tense forms also routinely show task effects, with higher rates in elicitation tasks than in language samples (Oetting & Horohov, 1997; Oetting & Rice, 1993; see also Marcus et al., 1992).

Studies have also shown task effects for children's use of nonstandard AAE forms; these include children's zero marking and nonstandard productions of BE—the forms studied here (Connor & Craig, 2006; Thompson, Craig, & Washington, 2004; Washington, Craig, & Kushmaul, 1998). For example, Connor and Craig's (2006) study included two tasks: (a) a sentence imitation task involving standard school English stimuli and (b) an oral narrative task. Their results showed that the children produced higher rates of nonstandard English structures in the narrative task than in the imitation task, but again, these authors did not report a bimodal split in their data.

In an effort to explore our data further, we examined the relation between the children's performance on the elicitation probe and their AAE dialect ratings from the listener judgments. We did this because we had this descriptive dialect data on the children, and rates of AAE use have been correlated with other measures in some, but certainly not all, child language studies (for examples of studies that have shown a relation, see Craig & Washington, 1994; Ross et al., 2004; for a study that showed no relation, see Pruitt & Oetting, 2009). For the AM group, we found a large negative correlation between the two variables ($r = -.88$, $p < .01$). Further inspection of the data revealed that the seven AM children who overtly marked all of the items on the probe were also the children with the lowest AAE ratings, whereas the three who zero marked all of the items on the probe were the children with the highest AAE ratings. This analysis suggests that, for the AM group, their BE marking on the elicitation task was heavily tied to the density of their AAE use. It is interesting, though, that no such relationship was revealed for this group's rates of overt marking on the language samples ($r = .42$, $p > .05$).

For the SLI and LM children the results were less clear. In fact, correlations between these children's rates of AAE use and their rates of BE marking on the elicitation probe were low and nonsignificant (SLI, $r = .10$, $p > .05$; LM, $r = .08$, $p > .05$). We also found slightly higher but similarly nonsignificant correlations between these children's rates of AAE use and their rates of BE marking on the language samples (SLI, $r = .38$, $p > .05$; LM, $r = -.54$, $p > .05$). Inconsistent findings across groups indicate that the children's marking of BE across the two tasks cannot be readily explained by the dialect data we collected. Given this, these findings call for future studies to explore factors other than (or in addition to) a child's rate of AAE to explain these results. Matching children on their rates of AAE use while also collecting a number of other measures that are known to be important for the development and use of language seems ideally suited for this purpose.

To recap, the impetus for the present work and many of our previous studies has been to examine the SLI grammar profile in children who speak nonmainstream dialects of English. This work has theoretical importance because the viability of any SLI model rests on its cross-linguistic application and explanatory power. To that end, the findings from this work both support and fall outside the scope of current SLI models. The findings that support these models included the children's rates of BE marking as a function of their clinical status (with or without SLI) and their lack of dialect-inappropriate productions of BE (i.e., errors of commission). Recall that we have characterized both of these findings as showing across-dialect similarities between AAE and MAE. Also, across-dialect differences involving the type of BE form and the type of preceding context should not require current SLI models to be revised, because these effects were found to be a feature of the dialect being acquired rather than a feature of the SLI condition.

Findings that fall outside of the scope of current SLI models are the unexpected task effects, which included the bimodal distribution of the children's probe data, and the inconsistent relationships that we found between the children's rates of BE marking and their AAE dialect ratings. If these findings are replicated in future research, it is important to reiterate that they seem to fall outside the scope of current SLI models and may be best explained by sociolinguistic theories of language use rather than by psycholinguistic models of language acquisition and impairment.

Given these findings, researchers who want to use AAE to test various psycholinguistic models of SLI should carefully consider task effects as well as other pragmatic variables within a study that may influence a speaker's use of different grammatical options. In future studies, researchers should also measure the participants' nonmainstream AAE dialect densities to evaluate the influence of this variable on the results obtained. In spite of these cautionary statements, it is our opinion that pragmatic influences on AAE speakers' use of language should not preclude the study of SLI within this dialect. Instead, we believe that findings from a rigorous study of these pragmatic influences may actually serve as an important contrast to the types of differences that exist between

AAE-speaking children with and without SLI. This is because for both linguistic- and processing-based models of SLI, differences between children with and without this clinical condition are predicted to differ from those that can be characterized as pragmatic and/or dialectal in nature. For EOI and other linguistic accounts, differences between children with and without SLI are also predicted to be tied to underlying grammatical representations that are appropriate for characterizing AAE, whereas for processing-based accounts these differences are predicted to be related to processing load and/or the surface properties of AAE.

The results from this study also have practical importance because they should lead to a better understanding of the SLI grammar profile in AAE, and this should help us better identify and treat the children who need clinical services. To that end, the current findings indicate that grammar deficits involving auxiliary BE marking should not be ignored in AAE-speaking children with SLI, especially if the clinician's decision-making process has been facilitated by observations of the same dialect-speaking, typically developing control individuals. In addition, our findings indicate that clinicians who assess and treat AAE-speaking children with SLI should expect rates of BE marking to vary in ways that parallel those of their typically developing peers. Finally, clinicians should expect AAE-speaking children's nonstandard BE productions to be primarily dialect appropriate rather than dialect inappropriate.

Acknowledgments

The research reported in this article represents a portion of the first author's doctoral dissertation. This work was supported by departmental funding from the Louisiana State University (LSU) Department of Communication Sciences and Disorders as well as an academic enhancement award from the Life Course and Aging Center at LSU.

We extend our gratitude to the administrators, speech-language pathologists, teachers, and students of Ascension, East Baton Rouge, and St. Tammany Parishes. We also wish to thank the following past and present members of the LSU Language Development and Disorders Laboratory for their assistance: Sonja Pruitt-Lord, Lesli Cleveland, Lekeitha Hartfield Morris, Heidi Huckabee Michiels, Brandi Newkirk, Beth Wooden, and Christy Wynn Moland. The first author also wishes to thank Maya Reynolds Clark and Bradley R. Sturz for providing feedback and advisement on an earlier draft of this article.

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Received January 29, 2009

Revision received August 5, 2009

Accepted January 23, 2010

DOI: 10.1044/1092-4388(2010/09-0016)

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