Research Article

Effects of Specific Language Impairment on a Contrastive Dialect Structure: The Case of Infinitival TO Across Various Nonmainstream Dialects of English

Andrew M. Rivière,^a Janna B. Oetting,^a and Joseph Roy^b

Purpose: Using data from children who spoke various nonmainstream dialects of English and who were classified as either children with specific language impairment (SLI) or typically developing (TD) children, we examined children's marking of infinitival TO by their dialect and clinical status.

Method: The data came from 180 kindergartners (91 speakers of African American English, 60 speakers of Southern White English, 29 speakers of +Cajun); 53 were children with SLI, and 127 were TD children. Data included 4,537 infinitival TO contexts extracted from language samples; each was coded as zero or overtly marked and by preceding verb context (i.e., verbs of motion vs. other).

Results: Across dialects, overall rates of zero marking differed by the children's clinical status (SLI > TD), and other verb contexts accounted for this result. Across the TD and SLI groups, dialect variation was evident for verbs of motion contexts, and the effect was stronger for the TD than for the SLI groups, particularly if the TD children's dialects were classified as +Cajun.

Conclusion: Children's marking of infinitival TO can be affected by both their dialect and clinical status. Results support language assessments that include context-specific rate-based measures of infinitival TO and other contrastive structures when they prove useful for understanding the linguistic profile of SLI within a dialect.

In General American English (GAE), children with specific language impairment (SLI) have been reported to zero-mark infinitival TO (e.g., *I want Ø jump*) at higher rates than their typically developing (TD) peers (Fletcher & Frizelle, 2017).¹ Given the role of infinitival TO in children's expressions of verbal complements and other complex syntactic structures, there is a need to know if findings for SLI in GAE generalize to other dialects of English. Linguistically, infinitival TO is considered a contrastive structure, because it varies (i.e., contrasts) across dialects. For example, overt marking of infinitival TO is almost always obligatory (e.g., *I want to jump*) in GAE, but in some nonmainstream dialects, such as African American English (AAE) and Southern White English (SWE), infinitival

TO may be optionally marked with an overt form or zero form (e.g., *I want to jump* or *I want Ø jump*; Oetting & McDonald, 2001; Oetting & Pruitt, 2005; Van Hofwegen & Wolfram, 2010; Washington & Craig, 1994, 2002). In the nonmainstream dialect of Cajun English, zero marking of infinitival TO is also felicitous, but only when it is preceded by *go* or *come* (e.g., *She went Ø eat*; Cheramie, 1998; Cox, 1992).

Historically, speech-language pathologists have been encouraged to exclude the contrastive dialect structures from their language assessments of children who speak nonmainstream varieties of English. Excluding the contrastive structures reduces the likelihood that a clinician will misinterpret a child's nonmainstream dialect as a language impairment (Seymour, Bland-Stewart, & Green, 1998). However, the World Health Organization's (WHO) International Classification of Functioning, Disability and Health (ICF; Westby & Washington, 2017; see also WHO,

^aLouisiana State University, Baton Rouge

^bUniversity of Illinois at Urbana-Champaign

Correspondence to Andrew M. Rivière, who is now at Sentara Enterprises, Woodbridge, VA: andrew.riviere@gmail.com

Editor-in-Chief: Sean Redmond

Editor: GERALYN TIMLER

Received May 31, 2017

Revision received November 1, 2017

Accepted March 18, 2018

https://doi.org/10.1044/2018_JSLHR-L-17-0209

¹Sociolinguists prefer the term "zero-marked" to describe morphemes not produced within an utterance, whereas child language researchers prefer the term "omission." We use the term "zero marking" for consistency across studies and for ease of readability.

Disclosure: The authors have declared that no competing interests existed at the time of publication.

2001) requires clinicians to consider how a child's language impairment interacts with various person variables, and a child's dialect is a person variable, as is a child's age and gender. To understand how a language impairment manifests within a child's nonmainstream dialect, the contrastive structures (along with the noncontrastive structures) need to be evaluated.

In addition, in a study of kindergartners who spoke either AAE or SWE, Oetting and McDonald (2001) showed that the clinical status (SLI vs. TD) of 90% of the children could be accurately classified with an analysis of nothing more than the contrastive dialect structures. In at least nine other studies of the contrastive structures, reliable differences (with effect sizes ranging from small to large) have also been detected when nonmainstream English-speaking children with SLI have been compared to their same dialect-speaking, TD peers (Cleveland & Oetting, 2013; Garrity & Oetting, 2010; Oetting, Cantrell, & Horohov, 1999; Oetting & Garrity, 2006; Oetting & Newkirk, 2008; see also past-tense results reported in Seymour et al., 1998) or when different groups of TD children who speak the same non-mainstream dialect are compared to each other (Berry & Oetting, 2017; Newkirk-Turner, Oetting, & Stockman, 2014; Pruitt, Oetting, & Hegarty, 2011). These results have led Oetting and colleagues to advocate for a rigorous study of the contrastive structures and inclusion of these structures (along with the noncontrastive structures) within assessment, especially when they prove useful for understanding the nature of the SLI condition within a dialect (Oetting, Gregory, & Rivière, 2016; Oetting, Lee, & Porter, 2013; Oetting, McDonald, Seidel, & Hegarty, 2016).

Motivated by the American Speech-Language-Hearing Association's (2016) adoption of the ICF and findings from previous studies of the contrastive structures, the current study focuses on children's marking of infinitival TO. As a contrastive dialect structure, more information is needed to determine the relevance of this structure for clinical practice. If grammatical deficits associated with SLI are found to influence children's marking of infinitival TO within a particular dialect, then clinicians need to know not only that this contrastive dialect structure is important to assess but also how to assess this structure in dialect-appropriate ways. As background, we review studies of childhood SLI and dialect studies of infinitival TO.

Studies of Childhood SLI

SLI is a developmental language disorder involving receptive and expressive language impairments that cannot be explained by deficits in nonverbal intelligence, hearing, and vision or by frank neurological impairment (Leonard, 2014). Delayed onset and slower growth trajectories of grammar are characteristics of children with SLI, and repeated studies have shown tense-related grammar structures to be particularly difficult (Eadie, Fey, Douglas, & Parsons, 2002; Grela & Leonard, 1997; see also Oetting &

Hadley, 2017; Rice, Tomblin, Hoffman, Richman, & Marquis, 2004; Rice & Wexler, 1996; Rice, Wexler, & Cleave, 1995). Complex syntax, including the production of verbal complements, is also difficult for children with SLI (Fletcher & Frizelle, 2017). At least two studies have shown children with SLI to produce fewer utterances with infinitival TO complements and other clausal complements relative to TD controls (Conti-Ramsden & Jones, 1997; Steel, Rose, & Eadie, 2016). Eisenberg (2004) also reported that children with SLI made more errors (e.g., incorrect internal and external referents) than TD controls when asked to complete infinitival TO complements with a diverse set of verbs (e.g., *tell, remember, promise, threaten, shout*). Finally, in at least six studies, children with SLI zero-marked infinitival TO at higher rates than their TD peers or expected for their age (Barako Arndt & Schuele, 2012; Johnston & Kamhi, 1984; Leonard, 1995; Leonard, Eyer, Bedore, & Grela, 1997; Owen & Leonard, 2006; Schuele & Dykes, 2005).

As discussed by Barako Arndt and Schuele (2012), studies reporting higher-than-expected rates of zero marking by children with SLI also report variability within the SLI groups. In Barako Arndt and Schuele's study, the SLI group's rate of zero marking averaged 20% compared to 1% by the language-matched TD group, but only 13 of the 19 children with SLI, aged 5–7 years, zero-marked infinitival TO. Eisenberg's (2004) group of children with SLI were 5 years of age, and of the eight children studied, only four zero-marked infinitival TO. Together, these results suggest that, at least, for the dialect of GAE and for children aged 5–7 years, a higher-than-expected rate of zero marking for infinitival TO is diagnostically relevant for some, but not all, children with SLI.

Studies of Dialect Variation

Infinitival TO marking shows variation across a number of English dialects, including but not limited to those listed previously: Appalachian English (Johnson, in press, 2014), Belfast English (Henry, 1995), Gullah (Mufwene & Dijkhoff, 1989), and historically, Middle English (Mitchell, 1992; Viereck, 1984). In the current work, the child dialects of interest were GAE, AAE, SWE, and a dialect subgroup we classified as +Cajun. As detailed in the methods, the child dialects of AAE and SWE were the target of study because these dialects are well attested in the rural south; however, +Cajun was also examined because of the Cajun/Creole history of the target area and one community's particularly active promotion and celebration of Cajun identity (Rivière, 2016).

As noted earlier, overt marking of infinitival TO is almost always obligatory in GAE, but it can be zero-marked in AAE and SWE and zero-marked in Cajun English if it is preceded by *go* and *come*, two verbs of motion. For studies of children, knowledge about whether a dialect allows zero marking is only somewhat helpful. All child speakers of English, regardless of their dialect, zero-mark grammatical

structures when they are first learning to combine morphemes. Across all dialects of English, young children's rates of zero marking can also vary as a function of the task (e.g., Evans & Craig, 1992; Rice & Wexler, 1996; Washington, Craig, & Kushmaul, 1998). Given this, child language studies often examine the rates at which a target behavior occurs relative to a child's age and sampling context. Four studies provide this type of information for infinitival TO using data from school-based, examiner-elicited language samples. Barako Arndt and Schuele's (2012) TD group included 19 GAE-speaking children, aged 3–5 years. Their results indicated that only one (5%) of their TD children zero-marked infinitival TO. By comparison, in Washington and Craig's (1994) study of AAE-speaking TD preschoolers, 31% zero-marked infinitival TO at least once, and in Jackson and Roberts's (2001) study of AAE-speaking preschoolers, 26% of the 3-year-olds and 7% of the 4-year-olds zero-marked this structure at least once. Finally, in Oetting and McDonald's (2001) study of kindergartners who lived in the rural south, 67% of the AAE speakers and 26% of the SWE speakers zero-marked infinitival TO at least once.

Two of the studies also report the relative frequencies at which the TD groups zero-marked infinitival TO. Recall that, in Barako Arndt and Schuele (2012), the GAE group's percentage of zero marking was < 1. By comparison, in Oetting and McDonald (2001), the AAE and SWE groups' percentage of zero marking was 5.3 and 1.2, respectively. In a third AAE study, Washington and Craig (2002) examined 28 home-based play samples of caregivers and their children, aged 4–7 years. Visual inspection of the graphs from this study indicates that both the caregivers and their children averaged no more than five zero-marked infinitival TO forms within their samples. The number of utterances in the samples was not reported, but the sessions were 20 min in length and averaged ~500 words for boys, ~700 for girls, and 1,200 for caregivers. Results from these three studies demonstrate the contrastive nature of infinitival TO across the child dialects of GAE, AAE, and SWE, while also suggesting that zero marking is relatively infrequent in AAE and SWE, at least during school-based, examiner-elicited language samples and home-based, caregiver-child play samples.

Similar rate-based information for infinitival TO marking is not available for Cajun English or for AAE and SWE varieties that are influenced by a speaker's Cajun heritage. Instead, zero marking of infinitival TO is described and illustrated through examples in Cajun English studies (e.g., Cheramie, 1998; Cox, 1992) and dialect manuals (e.g., Henrickson, 2000; Herman & Herman, 1997). Both Cheramie (1998) and Cox (1992) also note the restrictive nature of zero marking for verbs of motion in Cajun English, with the verb *went* often included within the examples (e.g., *We went Ø go to the show*).

One previous study has examined AAE- and SWE-speaking children's use of Cajun English patterns as a function of their $\pm$ Cajun status (Oetting & Garrity, 2006). In this study, a child's Cajun status was determined through

listener judgments, a third of the children were classified as SLI, and the focus of the analysis was on 11 phonological and morphological patterns that were identified from the adult Cajun English literature. Most relevant for the current work are two findings involving the morphological patterns (i.e., zero regular past tense, zero verbal *-s*, zero copula/auxiliary *is* and *are*, *was* leveling).

First, although differences between the AAE and SWE speakers were detected for all five morphological patterns, none led to differences based on the children's $\pm$ Cajun status. In critique of this finding, Cajun status effects may not have been detected because the particular patterns examined are also frequently produced in AAE and SWE. In contrast to these patterns and as just reviewed, zero marking of infinitival TO is infrequent in AAE and SWE, and it is not known to be restricted to verbs of motion in either of these dialects or in GAE. In fact, in Washington and Craig (2002), the AAE-speaking caregivers zero-marked this structure most often with the verb *want*, and in Eisenberg (2003), the children's zero marking occurred most frequently with the verbs *want*, *have*, *go*, *get*, and *tell*. Second and perhaps most important, of the five Cajun English morphological patterns examined, two (i.e., zero regular past tense and zero copula/auxiliary *is*) showed rate-based effects for the children's clinical status (SLI > TD), with the effects observed in both AAE and SWE. Both of these effects for the clinical condition of SLI would have been missed had regular past tense and copula/auxiliary *is*—as contrastive dialect structures—been excluded from the analysis.

Summary and Research Questions

On average (but not across all children studied), GAE-speaking children with SLI zero-mark infinitival TO at higher rates than TD controls. The purpose of the current study was to determine if this finding generalizes to AAE, SWE, and a subdialect group classified as +Cajun. Although all three of these nonmainstream dialects allow zero marking of infinitival TO, previous studies show rates of zero marking to be low in AAE and SWE and restricted to two verbs of motion in Cajun English. Thus, infinitival TO provides an interesting test case for examining not only the clinical condition of SLI across dialects but also nonmainstream dialect variation in general and as specified by linguistic context (i.e., by the verb preceding the infinitival TO form). Also, for clinical practice, a clinical status effect within one or more of the dialects studied would support the inclusion of infinitival TO within an assessment, and a preceding verb effect would suggest the need for measures of this structure to be context-specific. The questions driving the study were as follows: (a) Are children's rates of infinitival TO zero marking influenced by their dialect (AAE vs. SWE vs. +Cajun) and/or clinical status (SLI vs. TD)? (b) If differences are found, are they affected by the type of preceding verb context (verbs of motion vs. other verbs)?

Method

The data were collected as part of a larger study of children's tense and agreement systems. Data from 106 (53 SLI and 53 TD) children were included in two previous studies that involved matching children on their dialect, age, nonverbal IQ score, and as much as possible maternal education level (McDonald, Seidel, Hammarlund, & Oetting, 2018; Oetting, McDonald, et al., 2016). The current set of analyses included those 106 children, along with an additional 74 who also met the criteria for TD as described below. Prior to the onset of the study, we obtained institutional review board approval and caregiver consent. The data presented in the current work were collected in three to four sessions, with each session lasting no more than 30 min. The children were tested individually in quiet rooms or areas at their schools, with child assent secured verbally or nonverbally prior to each session.

Participants

All participants attended public kindergartens. There were 89 boys and 91 girls, and their ages averaged 66.18 months ($SD = 3.85$, range: 59–76 months). The children's race as reported by their caregivers included African American or Black ($n = 86$), Caucasian or White ($n = 86$), Asian ($n = 1$), Native American ($n = 2$), mixed ($n = 1$), and not reported ($n = 4$, with school records classifying these children as African American). Of the 173 children who provided maternal education information, highest levels of education averaged 12.74 years ($SD = 2.62$, range: 6–17+ years, with 12 = high school degree). The participants were classified by their dialect as either AAE ($n = 91$), SWE ($n = 60$), or +Cajun ($n = 29$) and by their clinical status as SLI ($n = 53$) or TD ($n = 127$). Criteria for the SLI and TD groups are presented first (followed by the dialect classification procedures), because these criteria determined whether a child's data were included in the analysis.

Clinical Status Classification

The children with SLI met a number of exclusionary and inclusionary criteria. Children were excluded from the study if they were bilingual, enrolled in a French immersion class, presented with a developmental disability other than or in addition to childhood language impairment, failed a school-based hearing screening during the year of data collection, repeated a grade or participated in the study in a previous year, identified as a twin of a participant, transferred schools or missed school frequently, or there was insufficient time in the school year to complete data collection. Of those eligible, children were then included in the current analysis if they had a language sample that was reliably transcribed and coded at the time of the analysis, earned a standard score of > 85 on the Sounds-in-Words subtest from the Goldman-Fristoe Test of Articulation–Second Edition (GFTA-2; Goldman & Fristoe, 2000) and ≥ 76 on the Primary Test of Nonverbal

Intelligence (PTONI; Ehrler & McGhee, 2008)²; both of these tests have a normative mean of 100 ($SD = 15$). In addition, the children with SLI had to earn a standard score of ≤ 7 on the syntax subtest of the Diagnostic Evaluation of Language Variation–Norm Referenced (DELV-NR; Seymour, Roeper, & de Villiers, 2005); this subtest has a normative mean of 10 ($SD = 3$). This subtest was used as the primary language measure in this study because the DELV-NR is the only norm-referenced language test available in the field that has been developed for children who speak different dialects of English.

To describe the children's vocabulary abilities, we also administered the Peabody Picture Vocabulary Test–Fourth Edition (PPVT-4; Dunn & Dunn, 2007). Like the PTONI and GFTA-2, this test has a normative mean of 100 ($SD = 15$). On this test, 36 of the 53 children with SLI earned standard scores of ≤ 85 . Use of the PPVT-4 to describe but not necessarily classify a child's SLI status is consistent with a number of other studies (e.g., Fey, Leonard, Bredin-Oja, & Deevy, 2017; Hoover, Storkel, & Rice, 2012; McGregor, Newman, Reilly, & Capone, 2002; Montgomery & Evans, 2009). Thirteen (25%) of the children with SLI were receiving services by a speech-language pathologist at the time of the study, and 24 (45%) reported a positive family history of speech, language, or reading difficulties.

The 127 children classified as TD met all of the exclusionary and inclusionary criteria of those with SLI, except they had to earn a standard score of ≥ 8 on the syntax subtest of the DELV-NR and a standard score of ≥ 85 on the PPVT-4. In addition, none presented a history of receiving services by a speech-language pathologist, and only 27 (21%) of the 127 who reported family history information indicated a positive family history of speech, language, or reading difficulty.

Dialect Classification

The children's dialects were first classified as AAE or SWE with listener judgments. Three trained graduate students who were native to Louisiana independently rated the children's dialects after listening to a 1-min excerpt of conversational speech. During the task, the raters were blind to the children's race, gender, dialect, and clinical status, and the rating form included the options of AAE,

²Eighteen children (AAE SLI = 7, AAE TD = 4, SWE TD = 1, +Cajun SLI = 2, +Cajun TD = 4) earned PTONI standard scores of < 85 . We included these children because they had not been identified by their schools as presenting a low nonverbal IQ, and the children's PTONI scores did not correlate with their rates of zero-marked infinitival TO ($r \leq .13$). Also, although many studies of SLI use a -1 SD cut score for nonverbal IQ, some use a -1.3 , -1.5 , or -2.0 SD cut score (e.g., Anaya, Peña, & Bedore, 2017; Desmottes, Meulemans, Patinec, & Maillart, 2017; Kapa, Plante, & Doubleday, 2017; Montgomery, Gillam, Evans, & Sergeev, 2017; Sanjeevan & Mainela-Arnold, 2017; Van Horne, Fey, & Curran, 2017). Finally, the practice of cognitive referencing to select children for studies of SLI has been discussed and questioned in various publications (see Ebbles, 2014; Leonard, 2014; Rice, 2016).

SWE, and Other, as well as the option to indicate that no nonmainstream patterns of a dialect were perceived (for other studies that have classified a child's dialect type with a listener judgment task, see Berry & Oetting, 2017; Garrity & Oetting, 2010; Oetting & McDonald, 2002; Pruitt et al., 2011).

For 93% of the children, at least two of the three raters selected a dialect classification that matched the children's race classification as either African American (which included the African American and mixed-race categories; $n = 91$) or non-African American (which included the Caucasian, Asian, and Native American race categories; $n = 89$). Exceptions included the dialects of 10 African American children classified as SWE by two raters and two Caucasian children classified as AAE by two raters. To further check these 12 children's dialect classifications, raters completed the listener judgment task again with 10-min excerpts. Although it is certainly possible for a rural African American child to speak a dialect other than AAE and for a rural non-African American child to speak a dialect other than SWE, when the raters listened to the longer excerpts, they were 100% in agreement that the 10 African American children spoke AAE and the two non-African American children spoke SWE.

Next, the dialects of 29 children (1 AAE and 28 SWE) were further classified as +Cajun based on school attendance. Although not enrolled in a French immersion program, these children attended the only school in the area that maintained this type of program, and they lived in a community where 57% of the residents reported the ability to speak Cajun French (U.S. Census Bureau, 2013). Multiple examiners from the research team also reported hearing Cajun English phonology frequently when visiting the school and businesses in the area. Finally, signage at or around the children's school suggested the celebration and commodification of the community's Cajun heritage. By comparison, the other children whose dialects remained classified as AAE or SWE lived in one of three communities where the percentage of residents who reported the ability to speak Cajun French ranged from 1% to 34%, and multiple examiners from the research team reported hearing Cajun English phonology and seeing Cajun signage only occasionally when visiting the schools and businesses in these areas.

To further quantify the nonmainstream nature of the children's dialects, we also administered Part I of the Diagnostic Evaluation of Language Variation–Screening Test (Seymour, Roeper, & de Villiers, 2003). Part I consists of 15 items that target nonmainstream phonology and morphology. Using these items and following Terry, Connor, Thomas-Tate, and Love (2010), a nonmainstream dialect density measure was calculated by dividing the sum of the children's nonmainstream responses by the sum of their nonmainstream and mainstream responses.

To examine potential differences in the children's profiles by their dialect and clinical groupings, multiple 2×3 analyses of variance (ANOVAs) were completed, with interactions followed by univariate ANOVAs and main

effects for dialect followed by least significant difference t tests (see Tables 1 and 2). Results indicated that the unmatched nature of the dialect and clinical groups led to some unexpected differences in the children's socio-demographic and test profiles; however, the differences did not pattern consistently or in favor of one dialect over another. For example, the children's maternal education levels did not vary by their dialect ($p = .55$) or clinical status ($p = .14$), but their ages did. Specifically, age led to an interaction between the children's dialects and clinical status, which was related to the AAE TD group being ~2 months younger than the SWE and +Cajun TD groups.

In addition, a main effect for clinical status was found for the PTONI (SLI $M = 94.13$, $SD = 9.30 < TD M = 104.80$, $SD = 14.98$), GFTA-2 (SLI $M = 104.55$, $SD = 5.18 < TD M = 108.31$, $SD = 4.68$), and DELV-NR (SLI $M = 4.81$, $SD = 1.26 < TD M = 10.02$, $SD = 1.58$). The DELV-NR also showed an interaction between the children's clinical status and dialect. Within each dialect, DELV-NR scores earned by the SLI groups were lower than those of the TD groups, and for the SLI but not TD groups, DELV-NR scores earned by the SWE group were lower than those of the AAE and +Cajun groups. The PPVT-4 also showed a main effect for clinical status (SLI $M = 83.38$, $SD = 8.82 < TD M = 104.64$, $SD = 9.02$) and dialect (SWE $M = 104.60$, $SD = 11.22 > AAE M = 94.31$, $SD = 13.26$, and +Cajun $M = 98.28$, $SD = 12.15$). Finally, the children's Diagnostic Evaluation of Language Variation–Screening Test dialect density measure values varied by both their dialect and clinical status, and these main effects were qualified by an interaction that was related to dialect differences (AAE > +Cajun > SWE) within the TD but not SLI group. Within each dialect, a clinical status effect (SLI > TD) was also observed.

Language Samples

A language sample from each child was elicited by a trained graduate clinician or faculty member using toys (e.g., carwash, picnic set, dolls) and pictures of childhood scenes (e.g., washing a car, fishing, grocery shopping with mom; Arwood, 1985). The language samples were transcribed and coded using Systematic Analysis of Language Transcripts (Miller & Iglesias, 2012). Each sample was transcribed and coded using a three-pass system, with at least two different examiners completing the passes (Oetting et al., 2014). All complete and intelligible utterances from the samples were included within the analysis; excluded utterances were those abandoned, interrupted, or containing unintelligible content. The complete and intelligible utterances within the samples averaged 239.07 ($SD = 59.48$, total = 43,032), and the number per sample did not vary by the children's dialect ($p = .42$) or clinical status ($p = .13$).

Systematic Analysis of Language Transcripts was used to extract 4,537 infinitival TO contexts from the samples. This count did not include 1,601 prepositional TO contexts (e.g., *Shayne drove to his house*), 1,675 dialect-appropriate

Table 1. Participants' profiles by dialect and clinical status.

Measure	AAE		SWE		+Cajun	
	SLI (<i>n</i> = 34)	TD (<i>n</i> = 57)	SLI (<i>n</i> = 9)	TD (<i>n</i> = 51)	SLI (<i>n</i> = 10)	TD (<i>n</i> = 19)
MED	11.75 (2.26)	13.05 (2.79)	13.11 (3.70)	12.92 (2.52)	12.10 (3.50)	13.24 (3.05)
Age	67.12 (3.65)	65.00 ^{a,b} (3.44)	67.11 (3.89)	66.73 ^a (3.90)	64.70 (3.56)	66.89 ^b (4.62)
PTONI	93.35 (9.55)	100.98 (11.92)	96.11 (8.57)	110.45 (16.68)	95.00 (10.09)	101.05 (14.29)
GFTA-2	104.35 (5.75)	107.33 (4.52)	103.78 (4.41)	109.47 (3.91)	105.90 (3.73)	108.16 (6.34)
DELV-NR	4.85 ^{a,d} (1.02)	9.84 ^a (1.46)	3.89 ^{b,d,e} (1.69)	10.25 ^b (1.68)	5.50 ^{c,e} (1.18)	9.95 ^c (1.62)
PPVT-4	82.32 (9.56)	101.46 (9.45)	85.00 (7.87)	108.06 (7.57)	85.50 (6.90)	105.00 (8.21)
DDM	0.90 (0.13)	0.77 ^{a,b} (0.25)	0.81 (0.10)	0.35 ^{b,c} (0.26)	0.79 (0.22)	0.55 ^{a,c} (0.21)
C&I utterances	243.00 (58.64)	232.18 (50.34)	268.33 (69.01)	239.88 (69.03)	246.30 (73.35)	232.84 (47.72)

Note. *M* (*SD*) reported. Superscript letters (a-e) indicate a statistical difference between groups for that superscript letter. AAE = African American English; SWE = Southern White English; SLI = specific language impairment; TD = typically developing; MED = maternal education in years (12 = high school); Age = age in months; PTONI = Primary Test of Nonverbal Intelligence (*M* = 100, *SD* = 15); GFTA-2 = Goldman-Fristoe Test of Articulation–Second Edition (*M* = 100, *SD* = 15); DELV-NR = Syntax subtest of the Diagnostic Evaluation of Language Variation–Norm Referenced (*M* = 10, *SD* = 3); PPVT-4 = Peabody Picture Vocabulary Test–Fourth Edition (*M* = 100, *SD* = 15); DDM = nonmainstream dialect density measure; C&I utterances = complete and intelligible utterances analyzed in samples.

reduced forms (e.g., *gonna*, *wanna*, *gotta*, *hafta*, *fitna*, *sposta*, *I'ma*), 68 contexts that included a tensed verb within the infinitival clause (e.g., *He wants to tries the cake*), and 1,085 contexts in which the conjunction *and* was or could have been the intended structure (e.g., *They go Ø get the car*; *They go and get the car*). All dialects of English including GAE allow the verbs *go* and *come* to be immediately followed by a second verb when both verbs lack an inflectional affix. As discussed by Sugisaki and Snyder (2013), these constructions can occur within imperatives (e.g., *Come help me*), TO infinitive clauses (e.g., *I want to come ride your scooter*), modal complements (e.g., *My cousins*

will go play with him), subjunctive complements (e.g., *My mom demanded that she go eat with my daddy*), and non-third-singular present-tense environments (e.g., *We go feed the dogs every day*).

Each of the 4,537 infinitival TO contexts was coded as zero-marked (e.g., *We came Ø see Jude*) or overtly marked (e.g., *Tyler wants to eat some cereal*) and by preceding verb context (verb of motion vs. other). Verbs of motion included all forms of *go* and *come* (i.e., *go*, *goes*, *going*, *went*, *had gone*, *come*, *comes*, *coming*, *came*, *had come*). All other preceding verb contexts (e.g., *have*, *be*, *like*, *try*, *want*, *get*, *need*, *start*, *ask*) were classified as other.

Table 2. Statistical results from 2 (group) × 3 (dialect) analyses of variance.

Measure	Effect	Results
Age	Group × Dialect AAE < SWE & +Cajun	$F(2, 174) = 3.37, p = .04, \eta_p^2 = .04$ $F(2, 124) = 3.39, p = .037, \eta^2 = .05$
PTONI	Group	$F(1, 174) = 13.77, p < .001, \eta_p^2 = .07$
GFTA-2	Group	$F(1, 174) = 15.73, p < .001, \eta_p^2 = .08$
DELV-NR	Group	$F(1, 174) = 348.14, p < .001, \eta_p^2 = .67$
	Group × Dialect	$F(2, 174) = 3.46, p = .03, \eta_p^2 = .04$
	AAE: SLI < TD	$F(1, 89) = 306, p < .001, \eta^2 = .78$
	SWE: SLI < TD	$F(1, 58) = 109.26, p < .001, \eta^2 = .65$
	+Cajun: SLI < TD	$F(1, 27) = 58.86, p < .001, \eta^2 = .69$
	SLI: AAE & +Cajun > SWE	$F(2, 50) = 4.47, p = .016, \eta^2 = .15$
PPVT-4	Group	$F(1, 174) = 154.00, p < .001, \eta_p^2 = .43$
	Dialect	$F(2, 174) = 3.89, p = .022, \eta_p^2 = .04$
DDM	Group	$F(1, 174) = 37.95, p < .001, \eta_p^2 = .18$
	Dialect	$F(2, 174) = 17.59, p < .001, \eta_p^2 = .17$
	Group × Dialect	$F(2, 174) = 6.33, p = .002, \eta_p^2 = .07$
	AAE: SLI > TD	$F(1, 89) = 7.43, p = .008, \eta^2 = .08$
	SWE: SLI > TD	$F(1, 58) = 26.01, p < .001, \eta^2 = .31$
	+Cajun: SLI > TD	$F(1, 27) = .86, p = .007, \eta^2 = .24$
	TD: AAE > +Cajun > SWE	$F(2, 124) = 39.06, p < .001, \eta^2 = .39$

Note. AAE = African American English; SWE = Southern White English; SLI = specific language impairment; TD = typically developing; PTONI = Primary Test of Nonverbal Intelligence; GFTA-2 = Goldman-Fristoe Test of Articulation–Second Edition; DELV-NR = Syntax subtest of the Diagnostic Evaluation of Language Variation–Norm Referenced; PPVT-4 = Peabody Picture Vocabulary Test–Fourth Edition; DDM = nonmainstream dialect density measure.

Reliability

As part of the larger study, reliability of the language sample transcription and coding was confirmed by having a second set of examiners independently transcribe and code the 1-min excerpts that were used in the listener judgment task. The same three-pass transcription and coding system was followed for these excerpts. For the 3,893 utterances in the excerpts, the average rate of agreement for utterance boundary decisions was 93% ($SD = .07$, range: 80%–100%); for the 25,151 words transcribed within the excerpts, the average rate of agreement was 95% ($SD = .04$, range: 82%–100%); for the 27,351 morphemes within the excerpts that could have received a morpheme code, the average rate of agreement was 97% ($SD = .03$, range: 83%–100%).

Two raters also independently coded infinitival TO contexts from 48 (27%) of the 180 samples. There were 1,090 opportunities to agree on type of context (i.e., infinitival TO contexts, preposition TO contexts, excluded TO contexts), type of marking (i.e., zero vs. overt), and type of preceding verb context (i.e., verbs of motion vs. other). Overall agreement between raters was 98% (range: 90%–100%).

Results

The children's infinitival TO data are presented in Tables 3 and 4. We analyzed these data using ANOVA and mixed-effects logistic regression. The ANOVAs were completed with SPSS (IBM Corp., 2013), and the regression was completed with R (R Core Team, 2017).

Number of Infinitival TO Complements and Overall Rates of Zero Marking

As shown in Table 3, all children produced infinitival TO complements within their samples, with the number per child averaging 25.20 ($SD = 12.08$, range: 3–78). Nevertheless, the children with SLI produced fewer infinitival TO complements within the samples than their TD peers (SLI $M = 22.22$, $SD = 10.17$ < TD $M = 26.45$, $SD = 12.62$, Hedges' $g = .35$), $F(1,174) = 7.46$, $p < .007$, $\eta_p^2 = .02$. This difference was found even though, as reported in the

methods, the number of complete and intelligible utterances within the samples did not differ by the children's clinical group.

At least one zero-marked infinitival TO form also was produced by 83% of the children (percentage of children across dialect and clinical groups ranged from 71% to 95%). To examine the rates at which the children produced a zero-marked form, a percentage of zero marking for each child was calculated by dividing the number of zero-marked TO forms by the sum of the zero-marked and overtly marked forms (see Table 3). With all children included in the analysis and the percentages subjected to an arcsine transformation, results from a 3×2 ANOVA showed a clinical status effect, $F(1, 174) = 7.02$, $p = .009$, $\eta_p^2 = .04$, with higher percentages of zero marking produced by the SLI group than by the TD group (SLI $M = 17.11$, $SD = 13.05$ > TD $M = 9.70$, $SD = 10.85$, Hedges' $g = .64$). This clinical status effect (SLI > TD) was maintained even when we limited the analysis to the 168 children who produced at least 10 infinitival TO complements within their samples, $F(1,162) = 4.74$, $p = .03$, $\eta_p^2 = .03$. As before, higher percentages of zero marking were produced by the SLI group than by the TD group (SLI $M = 16.2$, $SD = 13.60$ > TD $M = 9.03$, $SD = 8.60$, Hedges' $g = .70$). Importantly, no dialect effect or dialect by clinical status interaction was observed as part of either analysis.

Number of Infinitival TO Complements and Rates of Zero Marking by Preceding Verb

Recall that the preceding contexts of the children's infinitival TO complements were classified as either a verb of motion (which included all forms of *go* and *come*) or other. Collapsed across the three dialects, the SLI group averaged 4.19 ($SD = 3.65$, range: 0–14) infinitival TO complements with the verbs *go* and *come*, and the TD group averaged 3.31 ($SD = 2.95$, range: 0–17). By comparison, both groups produced many more infinitival TO complements with the verbs classified as other, with the SLI and TD groups averaging 18.04 ($SD = 9.43$, range: 2–38) and 23.14 ($SD = 11.80$, range: 2–69), respectively. In addition, the other verb category included 87 different preceding verb contexts, with those most frequently produced including

Table 3. Participants' number of infinitival TO complements and rates of zero marking by dialect and clinical status.

Variable	AAE		SWE		+Cajun	
	SLI	TD	SLI	TD	SLI	TD
Number of infinitival TO complements in samples	24.56 (10.03)	26.18 (11.60)	17.44 (10.89)	26.75 (14.17)	18.60 (8.07)	26.47 (11.67)
Percentage of zero-marked TO ^a	18.47 (13.98)	10.37 (8.67)	16.43 (11.24)	8.98 (14.29)	13.10 (11.41)	9.76 (4.95)
Percentage of zero-marked TO with other verbs ^a	8.13 (11.57)	2.71 (5.14)	8.02 (10.67)	2.99 (7.51)	2.65 (3.83)	1.58 (2.59)

Note. M (SD) reported. AAE = African American English; SWE = Southern White English; SLI = specific language impairment; TD = typically developing.

^aPercentages calculated as the number of each child's zero-marked forms divided by the sum of each child's zero-marked and overtly marked forms.

Table 4. Test of differences by dialect, clinical status, and preceding verb context.

Term	<i>B</i>	<i>E</i>	<i>Z</i>	Change in odds
(Intercept)	-2.53	0.46	-5.55***	0.08
AAE	-0.11	0.50	-0.21	0.90
+Cajun	-1.39	0.75	-1.85	0.25
VOM	1.85	0.58	3.20**	6.37
TD	-1.69	0.52	-3.24**	0.18
AAE, VOM	1.10	0.63	1.75	3.01
+Cajun, VOM	2.05	0.88	2.31	7.75
AAE, TD	0.51	0.60	0.84	1.66
+Cajun, TD	1.18	0.91	1.30	3.27
VOM, TD	2.45	0.66	3.73***	11.54
AAE, VOM, TD	-1.41	0.74	-1.91	0.24
+Cajun, VOM, TD	-1.02	1.07	-0.96	0.36

Note. *B* indicates Beta estimate; *E* indicates *SD* of the estimate; *Z* indicates *z* score. AAE = African American English; VOM = verbs of motion; TD = typically developing.

p* < .01. *p* < .001.

have (*n* = 664), *be* (*n* = 255), *like* (*n* = 241), *try* (*n* = 227), *want* (*n* = 226), and *get* (*n* = 190). Finally, whereas 73% of children (range across groups: 56%–89%) produced at least one zero-marked infinitival TO with *go* or *come*, only 40% (range across groups: 32%–56%) produced a zero-marked form with the other verbs.

To examine the rates at which the children zero-marked infinitival TO by type of preceding verb, we considered a 3 × 2 × 2 (Dialect × Clinical status × Type of verb) ANOVA. Unfortunately, 79 children would have been excluded from the analysis, because they did not produce at least three infinitival TO complements with each type of verb. As an alternative, we ran a 3 × 2 (Dialect × Clinical status) ANOVA using only the other verb contexts with the 178 children who produced at least three infinitival TO complements with this type of verb. For this analysis, a percentage of zero marking for each child was again calculated and subjected to an arcsine transformation. Results from this ANOVA replicated the previous one, because there was a main effect for clinical status, $F(1, 172) = 10.63$, $p = .001$, $\eta_p^2 = .06$, but not dialect. Again, collapsed across the three dialects, rates of infinitival TO zero marking for the other verb contexts were higher for the SLI group than for the TD group (SLI $M = 7.14$, $SD = 10.07$ > TD $M = 2.29$, $SD = 5.94$, $Hedges' g = .66$).

An alternative approach to analyzing these same data without excluding the verbs of motion is to run a mixed-effects binary logistic regression. To many, a logistic regression is more appropriate for proportional data as it restricts the estimated effects to an interval between 0% and 100% (Hosmer, Lemeshow, & Sturdivant, 2013); it is also more powerful than traditional ANOVA to detect statistical differences when the observed percentages approach 0% or 100%. To do this, we ran a mixed-effects logistic regression with the statistical programming language R (R Core Team, 2017) and using the lme4 package (Bates, Maechler, Bolker, & Walker, 2015a, 2015b). The fixed effects included

dialect (AAE, SWE, +Cajun), clinical status (SLI, TD), and preceding verb context (verbs of motion, other), and the reference value for each of these was SWE, SLI, and Other, respectively.³ The model also included a random intercept for participant to control for within-subject variation (Baayen, 2008).

The results are interpreted as with a standard logistic regression and as followed by Jacobson and Levert (2010; see Table 4). Main effects for dialect, group, and verb type are displayed along with their higher-order interactions. The *z* score is approximately the estimate, *b*, divided by the standard error for each term, and the *z* score produces the *p* value (annotated to the *z* score). The last column, change in odds, reflects how much the odds change from the odds of the reference value (i.e., the levels not displayed) with the other levels in each term for the main effects.

As reported in the table, the TD group's change of odds is .18, which is less than 1.0 and indicates that this group was less likely, controlling for all other predictors, to zero-mark infinitival TO when preceded by a verb classified as other verb than those in the SLI group (with an 82% decrease in the odds of zero marking). This finding is consistent with the earlier ANOVA results, which showed a clinical status effect (SLI > TD) for zero marking infinitival TO when preceded by verbs classified as other. In addition, the verbs of motion category had a change in odds of 6.37, indicating that all of the children had 6.37 higher odds of producing a zero-marked infinitival TO with a verb of motion as compared to those classified as other.

Interaction terms can be interpreted compared to all other terms in the model. The TD × VOM (verbs of motion) interaction indicates that the TD group and verbs of motion have a 11.54 increase in odds of zero marking an infinitival TO as compared to the other verbs and all other levels of group and dialect. For the +Cajun × VOM interaction, the 7.75 change in odds indicates that, for verbs of motion within the +Cajun group, there is also 7.75 higher odds of zero marking infinitival TO than in either +Cajun or verbs of motion alone.

To further illustrate the effect of the higher-order interactions within the model, Figure 1 was created with 95% confidence limits for the probability of zero marking by the two verb types and the children's dialects and clinical groups. These are viewing the results from a different statistical perspective, but with the same model. As shown in the figure and for all dialect and clinical groups, the highest estimated probability of zero marking is observed for the verbs of motion. Minimal to no overlap in confidence intervals is detected when each group's verbs of motion and other verbs are examined. Also and as compared to the SLI groups, the TD groups show higher probabilities of zero marking the verbs of motion as well as a greater distance between the verbs of motion and other verbs. Finally, of the three TD groups, those classified as +Cajun show the highest probability of zero marking the verbs of motion

³Selection of a reference level does not change the effect size or statistical significance in a main effect.

Figure 1. Probability of zero marking by dialect, clinical status, and verb context for specific language impairment (SLI) and typically developing (TD) groups. Dialects include African American English (AAE), +Cajun English, and Southern White English (SWE).

and the greatest distance between the verbs of motion and the other verbs.

Discussion

In the dialect of GAE, multiple studies have shown that children with SLI (as a group) zero-mark infinitival TO at higher rates than TD controls. In the current study, we asked whether children who speak AAE, SWE, or a subdialect classified as +Cajun also zero-mark infinitival TO at higher rates than their same dialect-speaking TD peers. If they did, we wanted to know if the SLI effect varies as a function of the children's dialect and/or by the type of preceding verb context (verb of motion vs. other). We completed this work to determine if measures of infinitival TO, as a contrastive dialect structure, should be included within assessments of nonmainstream English-speaking children.

Results indicated that, across the three dialects, overall rates of zero marking differed by the children's clinical status (SLI > TD), and the preceding contexts classified as other accounted for this result. These findings were first documented through ANOVAs (with Hedges' *g* effect sizes of the group differences in the medium range) and further supported by a regression analysis, which showed the TD groups to have an 82% decreased odds of zero marking as compared to the SLI groups when infinitival TO was preceded by a verb classified as other. Across the TD and SLI groups, dialect variation was also evident for preceding contexts involving verbs of motion. This finding was demonstrated through the regression analysis, which showed infinitival TO forms to have a higher odds of being zero-marked when preceded by a verb of motion than by the other verbs. The odds of a child zero marking infinitival TO when preceded by a verb of motion were even

greater if the child was classified as TD and greatest if the TD child's dialect was classified as +Cajun.

Findings as Related to Previous Studies

The findings relate to previous studies of childhood SLI and dialect variation. Consider first the dialect literature. In previous studies, adult Cajun English speakers have been shown to zero-mark infinitival TO when this structure is preceded by the verbs *go* and *come* (Cheremie, 1998; Cox, 1992). Consistent with the adult Cajun literature, the probability that a child studied here would zero-mark was also greatest when infinitival TO was preceded by *go* or *come*. Although the +Cajun TD group's zero marking was most affected by the type of preceding verb (and for this group, 85% of their zero-marked forms were preceded by *go* or *come*), all of the dialect groups were more likely to zero-mark when the infinitival TO form was preceded by a verb of motion as compared to the others. In fact, of the 292 and 186 zero-marked infinitival TO forms produced by the TD and SLI groups, respectively, 77% and 63% were preceded by *go* or *come*. Recall also that 73% of the children (range across groups: 56%–89%) zero-marked an infinitival TO form at least once when preceded by *go* and *come*, whereas only 40% (range across groups: 32%–56%) zero-marked the form when preceded by the other verbs.

For the TD groups, the percentage of AAE, SWE, and +Cajun speakers who zero-marked an infinitival TO form can also be compared to previous studies. In GAE, 5% or less of the TD children studied by Eisenberg (2004) and Barako Arndt and Schuele (2012) zero-marked this structure. In AAE, 31% of Washington and Craig's (1994) TD sample and 7%–26% of Jackson and Roberts's (2001)

TD sample zero-marked this structure, and in Oetting and McDonald's (2001) study, 67% of the AAE TD speakers and 26% of the SWE TD speakers zero-marked this structure. By comparison, 80% (AAE = 84%, SWE = 71%, +Cajun = 95%) of the TD children studied here zero-marked infinitival TO. Thus, the percentage of children who zero-marked infinitival TO in the current study was much higher than what has been reported elsewhere, and the Cajun history of the area likely contributed to the differences. Interestingly, the participants in the current study and those studied by Oetting and McDonald (2001) lived in neighboring communities; however, the Mississippi River runs along much of the border between them, and rivers are well known to maintain dialect differences between communities (for discussion of geography and dialect maintenance, see Emmitte, 2013).

Next consider the SLI literature. Previous studies have reported that children with SLI produce fewer infinitival TO complements within their samples (Conti-Ramsden & Jones, 1997; Steel et al., 2016) and zero-mark infinitival TO at higher rates than their TD peers (Barako Arndt & Schuele, 2012; Johnston & Kamhi, 1984; Leonard, 1995; Leonard et al., 1997; Owen & Leonard, 2006; Schuele & Dykes, 2005; Steel et al., 2016). The majority of these studies have been conducted with children who speak GAE. The current findings support and extend these studies by showing that children with SLI who speak other dialects of English, such as AAE, SWE, and +Cajun, also find the production of infinitival TO complements and the overt marking of infinitival TO forms within complements to be difficult. However, for the dialects studied here, effects of SLI on the children's marking of infinitival TO must be considered within the context of the preceding verb, because higher rates of zero marking by the children with SLI were observed only when the preceding verb was not *go* or *come*.

Previous studies have also reported that not all GAE-speaking children with SLI zero-mark infinitival TO at higher rates than their TD peers (Barako Arndt & Schuele, 2012; Eisenberg, 2004). For the dialects studied here and excluding the *go* and *come* preceding verb contexts, 53% (28/53) of the SLI group zero-marked infinitival TO at least once, and 30% (16/53) zero-marked more than once. By comparison, only 35% (45/127) of the TD group zero-marked infinitival TO at least once, and only 9% (12/127) zero-marked this structure more than once. Although the percentage of AAE-, SWE-, and +Cajun-speaking children who zero-mark this structure is higher than what has been reported for GAE, the basic pattern of results is the same across dialects, that is, although all children with SLI do not zero-mark infinitival TO at higher rates than their TD peers, more children with SLI zero-mark this structure than is found in groups of same dialect-speaking children without SLI.

Findings as Related to the Inclusion of Contrastive Dialect Structures Within Assessment

Historically, clinicians have been encouraged to exclude the contrastive structures within assessment so that

nonmainstream dialects are not misinterpreted as language disorders. Yet the WHO's ICF requires clinicians to consider children's language disorders within the context of their dialects, and a small but growing number of studies (including the current one) have shown some contrastive structures to lead to reliable differences between children with SLI and their same dialect-speaking TD peers (Cleveland & Oetting, 2013; Garrity & Oetting, 2010; Oetting & Garrity, 2006; Oetting et al., 1999; Oetting & McDonald, 2001; Oetting & Newkirk, 2008; Seymour et al., 1998). In most of these contrastive dialect studies, differences between those with and without SLI have been tied to particular contexts of use. For example, in the current study, SLI effects were detected in the rates at which the children zero-marked infinitival TO when preceded by other verbs but not *go* or *come*; in Oetting and Garrity (2006), SLI effects were detected in the rates at which the children zero-marked *is* but not *are*; in Oetting and Newkirk (2008), SLI effects were detected in the rates at which children zero-marked relatives that served as the subject, but not object, of the relative clause.

Together, findings from these studies support the inclusion of infinitival TO and other contrastive dialect structures within assessment when they prove useful for understanding the nature of the SLI profile within a dialect. As was shown here, dialect-appropriate assessment of infinitival TO and any other grammatical structure requires knowledge about (a) a dialect's various marking options (e.g., overt forms, zero forms, etc.) and (b) the rates and contexts in which TD child speakers of that dialect produce each type of marking. For children whose context-specific rates of zero-marked forms are higher than those of their same dialect-speaking TD peers, their entire language system (including both the contrastive and non-contrastive structures) should be examined, especially when other sources of data (e.g., caregiver and teacher questionnaires, classroom observations, and culturally and linguistically appropriate tests) also suggest a language impairment.

Limitations

The study was based on language samples that were not designed to elicit infinitival TO complements from children. As such, the numbers of infinitival TO forms were unequal across the different verb contexts and low for the verb of motion contexts. To address this limitation, future studies should consider the use of a structured elicitation task (e.g., see Eisenberg, 2005). The study was also limited to one contrastive dialect structure. Future studies should consider other grammar structures (both the contrastive and noncontrastive) and move beyond analyses of SLI versus TD group differences. Although group difference studies are often necessary to determine the best items to include within an assessment protocol, once constructed, these protocols need to be evaluated for their diagnostic/classification accuracy.

Finally, the study was limited to nonmainstream dialects that are spoken by children in one rural area with a

Cajun/Creole history. Given this, the specific rates at which the SLI and TD groups zero-marked infinitival TO and the specific preceding context (verbs of motion vs. other) effects may not generalize to children who speak different nonmainstream dialects of English or who speak similar dialects but in different areas of the country. Nevertheless, what should generalize from the current study is the finding that, within any given dialect, some contrastive structures (and likely some noncontrastive structures) will also be affected by a child's SLI condition. Future studies are needed to identify these structures and the contexts in which measures of these structures are most useful for understanding the linguistic profile of SLI.

Conclusion

Marking of infinitival TO can be affected by both a child's dialect and clinical status. The current results support language assessments that include infinitival TO and other contrastive structures when they prove useful for understanding the linguistic profile of SLI within a dialect. When included, analyses of these structures should include context-specific rates of use and include normative data from TD children who speak the same dialect as the child being assessed. For infinitival TO and the nonmainstream dialects of English studied here, context-specific analyses would focus on children's rates of overt marking as a function of the preceding verb context (i.e., the verbs of motion *go* and *come* vs. other verbs).

Acknowledgments

This study represents a portion of the first author's doctoral dissertation, with data collection supported by National Institute on Deafness and Other Communication Disorders Grant RO1DC009811. We extend appreciation to Jessica Berry, Kyomi Gregory, Ryan James, Christy Moland, Christy Seidel, Tina Villa, and a number of other students who helped collect, transcribe, and code the language samples, and to the teachers, families, and children who participated in the study. Thank you to the Rivière's for your support throughout this journey. Last but not least, we would like to extend a special thanks to Aaron Emmitte for questioning why Cajuns use this structure.

References

- American Speech-Language-Hearing Association.** (2016). *Scope of practice in speech-language pathology* [Scope of practice]. Retrieved from <http://www.asha.org/policy>
- Anaya, J. B., Peña, E. D., & Bedore, L. M.** (2017). Conceptual scoring and classification accuracy of vocabulary testing in bilingual children. *Language, Speech, and Hearing Services in Schools, 49*, 85–97. https://doi.org/10.1044/2017_LSHSS-16-0081
- Arwood, E. L.** (1985). *Apricot I Language Kit*. Portland, OR: Apricot.
- Baayen, R. H.** (2008). *Analyzing linguistic data: A practical introduction to statistics using R*. Cambridge: Cambridge University Press.
- Barako Arndt, K., & Schuele, C. M.** (2012). Production of infinitival complements by children with specific language impairment. *Clinical Linguistics & Phonetics, 26*, 1–17.
- Bates, D., Maechler, M., Bolker, B., & Walker, S.** (2015a). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*, 1–48. Retrieved from <http://arxiv.org/abs/1406.5823>
- Bates, D., Maechler, M., Bolker, B., & Walker, S.** (2015b). *lme4: Linear mixed-effects models using Eigen and S4*. Retrieved from <http://CRAN.R-project.org/package=lme4>.
- Berry, J. R., & Oetting, J. B.** (2017). Use of copula and auxiliary BE by African American children with Gullah/Geechee heritage. *Journal of Speech, Language, and Hearing Research, 60*, 2557–2568.
- Cheremie, D. M.** (1998). *Cajun Vernacular English and the influence of vernacular on student writing in south Louisiana* (Unpublished doctoral dissertation). University of Southwestern Louisiana, Lafayette, LA.
- Cleveland, L. H., & Oetting, J. B.** (2013). Verbal –s marking by dialect and clinical status. *American Journal of Speech-Language Pathology, 22*, 604–614.
- Conti-Ramsden, G., & Jones, M.** (1997). Verb use in specific language impairment. *Journal of Speech, Language, and Hearing Research, 40*, 1298–1313.
- Cox, J.** (1992). *A study of the linguistic features of Cajun English*. Education Resources Information Center. Retrieved from <http://files.eric.ed.gov/fulltext/ED352840.pdf>
- Desmottes, L., Meulemans, T., Patinac, M., & Maillart, C.** (2017). Distributed training enhances implicit sequence acquisition in children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 60*, 2636–2647.
- Dunn, L., & Dunn, D.** (2007). *Peabody Picture Vocabulary Test—Fourth Edition*. Minneapolis, MN: Pearson.
- Eadie, P. A., Fey, M. E., Douglas, J. M. & Parsons, C. L.** (2002). Profiles of grammatical morphology and sentence imitation in children with specific language impairment and Down Syndrome. *Journal of Speech, Language, and Hearing Research, 45*, 720–732.
- Ebbles, S.** (2014). Introducing the SLI debate. *International Journal of Language and Communication Disorders, 49*, 377–380. <https://doi.org/10.1111/1460-6984.12119>
- Ehrler, D. J., & McGhee, R. L.** (2008). *Primary Test of Nonverbal Intelligence*. Austin, TX: Pro-Ed.
- Eisenberg, S. L.** (2003). Production of infinitival complements in the conversational speech of 5-year-old children with language impairment. *First Language, 23*, 327–341.
- Eisenberg, S. L.** (2004). Production of infinitives by 5-year-old children with language-impairment on an elicitation task. *First Language, 24*, 305–321.
- Eisenberg, S. L.** (2005). When conversation is not enough: Assessing infinitival complements through elicitation. *American Journal of Speech-Language Pathology, 14*, 92–106.
- Emmitte, A. C.** (2013). *Un Cadjin qui d'it cher bon dieu!: Assimilation and affrication in three generations of Cajun male speakers* (Unpublished doctoral dissertation). Louisiana State University, Baton Rouge, LA.
- Evans, J. L., & Craig, H. K.** (1992). Language sample collection and analysis: Interview compared to free play assessment contexts. *Journal of Speech and Hearing Research, 35*, 343–353.
- Fey, M. E., Leonard, L. B., Bredin-Oja, S. L., & Deevy, P.** (2017). A clinical evaluation of the competing sources of input hypothesis. *Journal of Speech, Language, and Hearing Research, 60*, 104–120.
- Fletcher, P., & Frizelle, P.** (2017). Syntax in child language disorders. In R. G. Schwartz (Ed.), *The handbook of child language disorders* (pp. 416–440). New York, NY: Psychological Press.

- Garrity, A. W., & Oetting, J. B.** (2010). Auxiliary BE production by AAE-speaking children with and without specific language impairment. *Journal of Speech, Language, and Hearing Research, 53*, 1307–1320.
- Goldman, R., & Fristoe, M.** (2000). *Goldman-Fristoe Test of Articulation—Second Edition (GFTA-2)*. Circle Pines, MN: AGS.
- Grela, B., & Leonard, L.** (1997). The use of subject arguments by children with specific language impairment. *Clinical Linguistics & Phonetics, 11*, 443–453.
- Henrickson, R.** (2000). *The facts on file dictionary of American regionalisms*. New York, NY: Facts on File.
- Henry, A.** (1995). *Belfast English and standard English: Dialect variation and parameter setting*. New York, NY: Oxford University Press.
- Herman, L., & Herman, M. S.** (1997). *American dialects: A manual for actors, directors, and writers*. New York, NY: Routledge.
- Hoover, J. R., Storkel, H. L., & Rice, M. L.** (2012). The interface between neighborhood density and optional infinitives: Normal development and specific language impairment. *Journal of Child Language, 46*, 835–862.
- Hosmer, D. W., Jr., Lemeshow, S., & Sturdivant, R. X.** (2013). *Applied logistic regression*. Hoboken, NJ: Wiley.
- IBM Corp.** (2013). *IBM SPSS statistics for Windows, Version 22.0*. Armonk, NY: Author.
- Jackson, S. C., & Roberts, J. E.** (2001). Complex syntax production of African American preschoolers. *Journal of Speech, Language, and Hearing Research, 44*, 1083–1096.
- Jacobson, P., & Levert, D.** (2010). English past tense as a clinical marker in older bilingual children with language impairment. *Clinical Linguistics and Phonetics, 21*, 101–121.
- Johnson, G.** (in press). The syntax of liketa. *Natural language and linguistics theory*. <https://doi.org/10.1007/s11049-018-9402-7>
- Johnson, G.** (2014). *Restructuring and infinitives: The view from Appalachia* (Unpublished doctoral dissertation). Michigan State University, East Lansing, MI.
- Johnston, J., & Kamhi, A.** (1984). Syntactic and semantic aspects of the utterances in language-impaired children: The same can be less. *Merrill-Palmer Quarterly, 30*, 65–86.
- Kapa, L. L., Plante, E., & Doubleday, K.** (2017). Applying an integrative framework of executive function to preschoolers with specific language impairment. *Journal of Speech, Language, and Hearing Research, 60*, 2170–2184.
- Leonard, L. B.** (1995). Functional categories in the grammars of children with specific language impairment. *Journal of Speech and Hearing Research, 38*, 1270–1282.
- Leonard, L. B.** (2014). *Children with specific language impairment*. Cambridge, MA: MIT Press.
- Leonard, L. B., Eyer, J., Bedore, L., & Grela, B.** (1997). Three accounts of the grammatical morpheme difficulties of English-speaking children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 40*, 741–753.
- McDonald, J., Seidel, C. M., Hammarlund, R., & Oetting, J. B.** (2018). Working memory performance in children with and without SLI in two nonmainstream dialects of English. *Applied Psycholinguistics, 39*, 145–167.
- McGregor, K. K., Newman, R. M., Reilly, R. M., & Capone, N. C.** (2002). Semantic representation and naming in children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 45*, 998–1014.
- Miller, J. F., & Iglesias, A.** (2012). Systematic analysis of language transcripts [Computer software]. Middleton, WI: SALT Software LLC.
- Mitchell, B.** (1992). How to study old English syntax. In M. Rissanen, O. Ihalainen, T. Nevalainen, & I. Taavitsainen (Eds.), *History of Englishes* (pp. 92–100). New York, NY: Mouton de Gruyter.
- Montgomery, J. W., & Evans, J. L.** (2009). Complex sentence comprehension and working memory in children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 52*, 269–288.
- Montgomery, J. W., Gillam, R. B., Evans, J. L., & Sergeev, A. V.** (2017). “whatdunit?” Sentence comprehension abilities of children with SLI: Sensitivity to word order in canonical and noncanonical structures. *Journal of Speech, Language, and Hearing Research, 60*, 2603–2618.
- Mufwene, S. S., & Dijkhoff, M. B.** (1989). On the so-called ‘infinitive’ in Atlantic creoles. *Lingua, 77*, 297–330.
- Newkirk-Turner, B. R., Oetting, J. B., & Stockman, I. J.** (2014). BE, DO, and modal auxiliaries of three-year-old African American English speakers. *Journal of Speech, Language, and Hearing Research, 57*, 1383–1393.
- Oetting, J. B., Cantrell, J., & Horohov, J.** (1999). A study of specific language impairment (SLI) in the context of non-standard dialect. *Clinical Linguistics & Phonetics, 13*, 25–44.
- Oetting, J. B., Cleveland, L., Garrity, A., Gregory, K., Lee-James, R., Moland, C., . . . Rodrigue, K.** (2014). *Language sample transcription and coding manual* (Unpublished manuscript). Language Development and Disorders Laboratory, Louisiana State University, Baton Rouge, LA.
- Oetting, J. B., & Garrity, A. W.** (2006). Variation within dialects: A case of Cajun/Creole influence within child SAAE and SWE. *Journal of Speech, Language, and Hearing Research, 49*, 16–26.
- Oetting, J. B., Gregory, K. D., & Rivière, A. M.** (2016). Changing how speech-language pathologists think and talk about dialect variation. *Perspectives of the ASHA Special Interest Groups, 1*, 28–37.
- Oetting, J. B., & Hadley, P.** (2017). Morphosyntax in child language disorders. In R. G. Schwartz (Ed.), *The handbook of child language disorders* (2nd ed., pp. 341–364). New York, NY: Psychological Press.
- Oetting, J. B., Lee, R., & Porter, K.** (2013). Evaluating the grammars of children who speak nonmainstream dialects of English. *Topics in Language Disorders, 33*, 140–151.
- Oetting, J. B., & McDonald, J. L.** (2001). Nonmainstream dialect use and specific language impairment. *Journal of Speech, Language, and Hearing Research, 44*, 207–223.
- Oetting, J. B., & McDonald, J. L.** (2002). Methods for characterizing participants’ nonmainstream dialect use within studies of child language. *Journal of Speech, Language, and Hearing Research, 45*, 505–518.
- Oetting, J. B., McDonald, J. L., Seidel, C. M., & Hegarty, M.** (2016). Sentence recall by children with SLI across two non-mainstream dialects of English. *Journal of Speech, Language, and Hearing Research, 59*, 83–94.
- Oetting, J. B., & Newkirk, B. L.** (2008). Subject relatives by children with and without SLI across different dialects of English. *Clinical Linguistics & Phonetics, 22*, 111–125.
- Oetting, J. B., & Pruitt, S. L.** (2005). Use of Southern African American English across groups. *International Journal of Multicultural Communication Disorders, 3*, 136–144.
- Owen, A. J., & Leonard, L. B.** (2006). The production of finite and nonfinite complement clauses by children with specific language impairment and their typically developing peers. *Journal of Speech, Language, and Hearing Research, 49*, 548–571.
- Pruitt, S. L., Oetting, J. B., & Hegarty, M.** (2011). Passive participle marking by African American English-speaking children

- reared in poverty. *Journal of Speech, Language, and Hearing Research*, 54, 598–607.
- R Core Team.** (2017). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <https://R-project.org/>
- Rice, M. L.** (2016). Specific language impairment, nonverbal iq, attention-deficit/hyperactivity disorder, autism spectrum disorder, cochlear implants, bilingualism, and dialectal variants: Defining the boundaries, clarifying clinical conditions, and sorting out causes. *Journal of Speech, Language, and Hearing Research*, 59, 122–132. https://doi.org/10.1044/2015_JSLHR-L-15-0255
- Rice, M. L., Tomblin, J. B., Hoffman, L., Richman, W. A., & Marquis, J.** (2004). Grammatical tense deficits in children with SLI and nonspecific language impairment: Relationships with nonverbal IQ over time. *Journal of Speech, Language, and Hearing Research*, 47, 816–834.
- Rice, M. L., & Wexler, K.** (1996). Toward tense as a clinical marker of specific language impairment in English-speaking children. *Journal of Speech and Hearing Research*, 39, 1239–1257.
- Rice, M. L., Wexler, K., & Cleave, P. L.** (1995). Specific language impairment as a period of extended optional infinitive. *Journal of Speech and Hearing Research*, 38, 850–863.
- Rivière, A. M.** (2016). *Va-T-Et-Vient, The Goin' and Comin' of infinitive TO: A study of children with and without specific language impairment in Cajun English* (Unpublished dissertation). Louisiana State University, Baton Rouge, LA.
- Sanjeevan, T., & Mainela-Arnold, E.** (2017). Procedural motor learning in children with specific language impairment. *Journal of Speech, Language, and Hearing Research*, 60, 3259–3269.
- Schuele, C. M., & Dykes, J. C.** (2005). Complex syntax acquisition: A longitudinal case study of a child with specific language impairment. *Clinical Linguistics & Phonetics*, 19, 295–318.
- Seymour, H. N., Bland-Stewart, L., & Green, L. J.** (1998). Difference versus deficit in child African American English. *Language, Speech, and Hearing Services in Schools*, 29, 96–108.
- Seymour, H. N., Roeper, T., & de Villiers, J.** (2003). *Diagnostic Evaluation of Language Variation–Screening Test*. San Antonio, TX: The Psychological Corporation.
- Seymour, H. N., Roeper, T., & de Villiers, J.** (2005). *Diagnostic Evaluation of Language Variation–Norm Referenced*. San Antonio, TX: The Psychological Corporation.
- Steel, G., Rose, M., & Eadie, P.** (2016). Production of complement clauses in children with language impairment. *Journal of Speech, Language, and Hearing Research*, 59, 330–341.
- Sugisaki, K., & Snyder, W.** (2013). Children's grammatical conservatism. In M. Becker, J. Grinstead, & J. Rothman (Eds.), *Generative linguistics and acquisition: Studies in honor of Nina M. Hyams* (pp. 291–308). Amsterdam, the Netherlands: Benjamins.
- United States Census Bureau.** (2013). *2009–2013 American community survey 5-year estimates: Languages spoken at home*. Washington, DC: U.S. Bureau of the Census.
- Terry, N. P., Connor, C. M., Thomas-Tate, S., & Love, M.** (2010). Examining relationships among dialect variation, literacy skills, and school context in first grade. *Journal of Speech, Language, and Hearing Research*, 53(1), 126–145.
- Van Horne, A. J. O., Fey, M., & Curran, M.** (2017). Do the hard things first: A randomized controlled trial testing the effects of exemplar selection on generalization following therapy for grammatical morphology. *Journal of Speech, Language, and Hearing Research*, 60, 2569–2588.
- Van Hofwegen, J., & Wolfram, W.** (2010). Coming of age in African American English: Longitudinal study. *Journal of Sociolinguistics*, 14, 27–52.
- Viereck, W.** (1984). On the interrelationship of British and American English: Morphological evidence. In W. Viereck (Ed.), *Focus on England and Wales* (pp. 247–300). Amsterdam, the Netherlands: Benjamins.
- Washington, J. A., & Craig, H. K.** (1994). Dialectal forms during discourse of poor, urban, African American preschoolers. *Journal of Speech and Hearing Research*, 37, 816–823.
- Washington, J. A., & Craig, H. K.** (2002). Morphosyntactic forms of African American English used by young children and their caregivers. *Applied Psycholinguistics*, 23, 209–231.
- Washington, J. A., Craig, H. K., & Kushmaul, A. J.** (1998). Variable use of African American English across two language sampling contexts. *Journal of Speech, Language, and Hearing Research*, 41, 1115–1124.
- Westby, C., & Washington, K. N.** (2017). Using the International Classification of Functioning, Disability and Health in assessment and intervention of school-age children with language impairments. *Language, Speech, and Hearing Services in Schools*, 48, 137–152.
- World Health Organization.** (2001). *International Classification of Functioning, Disability and Health (ICF)*. Geneva, Switzerland: Author.