12-18-2020

The examination of morpho-syntactic production in Bahamian children exposed to Bahamian Creole English and English

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The Examination of Morpho-Syntactic Production in Bahamian Children Exposed to Bahamian Creole English and English

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A dissertation submitted to the Graduate Faculty of

JAMES MADISON UNIVERSITY

In

Partial Fulfillment of the Requirements

for the degree of

Doctor of Philosophy

Communication Sciences and Disorders

December 2020

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To,

This dissertation is dedicated to the first and last official mentors of my educational journey, my parents, Cedric and Alexine Moss, and my Ph.D. mentor, Dr. Geralyn Timler.

Acknowledgments

Saying “thank you” when there are so many people to thank, and when “thank you” feels insufficient is a difficult task. I completed this journey with the help of so many along the way. Where does one begin?

Firstly, I thank God for providing me with the opportunity to pursue a doctoral degree, guiding me, and never leaving my side throughout. There were moments when I thought I would quit and change direction, but, God. Your grace is sufficient, and this accomplishment is all by Your grace.

Dr. Timler, you are perfection personified. I could not have gotten a better mentor even if I created one myself. Thank you for taking me under your wing, for protecting me, and pushing me when I needed it. Thank you for teaching, correcting, and uplifting me simultaneously. You are my role model, and I hope that I can continue to make you proud.

To my dissertation committee, thank you. Dr. DePaolis, thank you for your official and unofficial mentorship from the moment I reached out to you about JMU. Your passion for research and our field continues to inspire me Dr. Ingram, I have named you queen editor! Thank you so much for your insightful feedback. Dr. McPhee, thank you for taking me on even though you had no idea who I was and readily responding to any questions I had.

During my time at JMU, I had the privilege of being taught by many, but, Dr. Cynthia O’Donogue, Dr. Carol Dudding, Dr. Christina Kuo, Dr. Stacey Pavelko, Dr. Erin Kamarunas, Dr. Jeanne Horst, and Dr. Cara Meixner, you have all left a lasting impression on me. Thank you to all of you for taking the time to connect with me,

helping me however you could, and providing me with examples to embody as I begin to think about my identity as an instructor.

To additional mentors I have been to blessed to meet along the way outside of JMU- thank you. Dr. Kelly Farquharson, thank you so much for taking me on. Thank you for your support in embracing my clinical and research commitments and finding a writing schedule that works for me. Dr. Kimmerly Harrell, thank you for pushing me, reminding me of the talents I possess, and teaching me about self-care. Dr. Keisha Lindsay Nurse, thank you for reaching out and finding me! I appreciate our relationship and I am excited for future collaborations.

Cameron, Natalie, Laurel, Brielle, Hannah, and Madison, thank you so much for your help with transcribing and coding. Your work and support was the backbone of this project.

Lakshmi, Michelle, Julian, and Lindsey, you have been my family here! Thank you for being a sister when I missed mine. Lakshmi, thank you for being my first friend in Harrisonburg and helping me get my bearings when I first moved here. We have many wonderful memories and I appreciate our friendship that consists of support and respect for each other. Michelle, look how far we've come! We started this journey together and supported each other throughout. Thanks for being a listening ear for many unloading sessions. Julian, I can't exactly pinpoint when our relationship took off, but I'm so grateful for you! Thank you for including me in your family, teaching me how to be a cat mom, and always being a listening ear. Lindsey, thank you for always giving me advice, sharing resources, and reminding me to enjoy the small victories.

Linda and Marsha, thank you for taking me under your wing as I got my bearings as a new clinical instructor- I miss you both already! Cam, thank you for all that you do. I will miss our infrequent, but meaningful “catch up” chats.

To my family, thank you for being part of my “why” and keeping me grounded. To my father and mother, Cedric and Alexine, thank you for your love and support. Dad, your help during the research approval stage was instrumental. Mom, thank you for being my unofficial recruiter. To my brother and sister, thank you for the laughs and reminders to enjoy life during this journey. Abby, thank you for everything you have been to me during this process- an unofficial research coordinator, recruiter, proof-reader, and reality checker. My grandmothers, Angeline and Inez, Aunt Michelle, Aunt Rose, and the entire Moss and Swann families, thank you for your never-ending support, and help with recruitment and sharing my research participation flyer.

Hashaun, thank you for being whatever I need it when I needed it. Thank you for being my biggest supporter. I cannot thank you enough for the early morning wake up calls and encouraging notes to push through the day.

Allie, thank you for always being my cheerleader during mundane periods of my program, and always being ready with musical reminders before big days. You are a true bosom friend. Carla, thanks for always keeping me in the loop of happenings at home so I have never felt like I am missing out. Thank you for constant support and encouragement. Grace, thanks for always being my energy booster!

And to the participants and families who graciously gave me so much of their time- thank you. I will forever treasure our time together in my heart. None of this could be possible without you.

Finally, to anyone who has ever uttered a kind word, prayer, or positive thought in my direction, thank you. I may not be able to list you all by name, but your impact was felt, and will always be treasured in my heart. Thank you.

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Abstract

Purpose. Information on the morpho-syntax development of children who speak varieties of Bahamian English, such as Bahamian Creole English (BCE), remains understudied. Therefore, speech-language pathologists (SLPs) assessing the expressive language of children who speak BCE encounter challenges in making clinical judgments of language difference, developmental errors, and language disorder because they are unable to judge the morpho-syntactic features of this creole to the rules of another variety of Bahamian English, standard English (SE[1]), as both varieties, BCE and SE, are independently rule-governed. This dissertation study investigated the morpho-syntax of typically developing four and six-year-old Bahamian children who speak BCE and SE, addressing this overarching research question: What are the surface morpho-syntactic features of typically developing four and six-year-old children who speak BCE and SE?

Methods. A mixed group design was used to examine age and grade differences between and within groups. Data were collected from 20 typically developing participants; seven four-year-olds, and thirteen six-year-olds. Measures included the Children's Communication Checklist-2 (Bishop, 2003), an articulation screening, a hearing screening, two 10-minute language samples (one collected with the examiner modeling BCE, the second with the examiner modeling SE), two administrations of the Multilingual Assessment Instrument for Narratives (Gagarina et al., 2012) with the examiner modeling SE and then BCE, the Rice Wexler Test of Early Grammatical

[1] Standard English in The Bahamas, or Bahamian Standard English (BSE) has influence from British Standard English, as it was previously a British colony, and also from American Standard English, due to proximity. As the syntax of children who speak BSE, British Standard English, and American Standard English should not vary, the standard variety of English will be referred to as Standard English, or SE throughout this proposal.

Impairment Screening Test (Rice & Wexler, 2001), and sentence imitation subtest from the Test of Language Development (TOLDP-5; Newcomer & Hammill, 2019). Language samples and narrative tasks were transcribed and coded using the Systematic Analysis of Language Transcripts (Miller & Iglesias, 2016). BCE and SE morpho-syntactic features and differences across assessment methods were compared, the percentage of feature use across tasks was examined, and developmental differences between four and six-year-old children were investigated.

Results. When BCE feature production was examined following both BCE and SE modeling, four and six-year-olds did not significantly differ in the amount of BCE features used during the language sample, story retell, and story generation task; however, a subgroup of six-year-olds who were in second grade produced more BCE features during the story generation task when BCE was modeled than when SE was modeled. All other grade comparisons were not statistically significant. When BCE feature production was examined between tasks, both four-year-olds and six-year-olds used more BCE features during the sentence completion task than during the language sample. All other age and grade related comparisons were not statistically significant. Four and six-year-olds had variable marking of verb-related morpho-syntactic features.

Conclusions. Bahamian children's BCE feature use does not significantly vary between BCE and SE adult language models. However, task affected BCE use. The sentence completion test elicited more BCE use than conversation samples. Further, six-year-olds appear to be more sensitive to adult language use as they were more likely to use BCE when the adult used BCE. Age differences appeared in production of specific morpho-syntactic patterns. For example, six-year-olds produced *did + verb*, and *does +*

verb; these forms were not observed in younger children. Variable use of BCE features among four and six-year-olds support the need for further investigation of BCE forms that may indicate language disorder within BCE, rather than relying on SE forms to determine disorder.

Funding Source. This study was funded by The Graduate School at James Madison University and a *Language Learning* dissertation research grant.

CHAPTER ONE: THE PROBLEM

Introduction

Variation is present within any given language across countries, cities, and cultures. Within the English language, variation is typically referred to as a dialect. Dialects are associated with racial/ethnic groups, geographic regions, and socioeconomic status (Edwards et al., 2014). For example, in the United States, Standard American English (SAE), or General American English (GAE) are dialects which are spoken across the United States (Oetting, 2020). African American English (AAE) and Southern White English (SWE) are also dialects, often connected to a region, or social/racial/ethnic relations. Historically, dialects have been further defined as being mainstream or nonmainstream, and as such, this dissertation categorizes varieties as nonmainstream (e.g., AAE, SWE) and mainstream (SAE, GAE); however, it is important to note that all varieties of English, dialects and creoles, are independent and equal variations in their own right.

English-based creoles are additional language variations of English, but unlike dialects, creoles are considered a separate language. According to Holm (1982), a creole is a native language developed through the contact of two or more languages. Creoles frequently develop when people are displaced geographically, and their original language and socio-cultural identity are partly broken, as was the social condition of slavery (Holm, 1982). Many creoles are lexically based on British English and reflect West African, European, and Indic linguistic influences. English-based creole is the native language of many individuals from the Caribbean, such as Jamaican Creole and Guyanese Creole.

English dialects and English-based creoles are rule-governed language systems that have subsystems of *phonology* (i.e., sound system of a language), *morphology* (i.e., word forms), *syntax* (i.e., rules for combining words to form sentences), *semantics* (i.e., word meanings), and *pragmatics* (i.e., how language is used socially and appropriately). Like any other rule-governed system, rules can be broken due to unfamiliarity (i.e., learning) or disorder. For example, a three-year-old native GAE speaker might say, "I ga go to the store" as she is learning GAE. On the other hand, if a native seven-year-old GAE speaker said the same sentence, it would cause alarm as he should have said, "I will go the store." The latter example could be due to disorder.

Across all dialects and language varieties, children can struggle with learning language and performing well in school in comparison to their siblings or peers raised in similar environments (Oetting, 2020). A language disorder refers to "impaired comprehension and/or use of spoken, written, and/or other symbol systems" in the areas of phonology, morphology, syntax, semantics, and pragmatics (American Speech-Language-Hearing Association, 1993, para.2). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines language disorder as "persistent difficulties in the acquisition and use of language across modalities (i.e., spoken, written, sign language, or other) due to deficits in comprehension or production" in the areas of vocabulary, syntax, and discourse (American Psychological Association, 2013). A language disorder that cannot be explained by intellectual disability, hearing loss, or neurological damage (Leonard, 2014; Bishop, 2017) is typically called specific language impairment (SLI[2]) in

[2] The DSM-5 description of language disorder focuses on the structural aspects of language, characterized by deficits in vocabulary and grammatical knowledge and use, with subsequent impairment in discourse activities including difficulty sequencing events in a conversation so that the intended meaning is unclear to

the CSD literature. SLI has a prevalence of 7.4% in the United States (Tomblin et al., 1997). Clinical markers of SLI in spoken language are contingent upon the variation of language spoken by the individual, often evident in the morpho-syntax, which refers to word structure and how sentences are formed. For consistency, however, I use the DSM-5 term Language Disorder (LD) throughout this dissertation.

In GAE, a child with LD can demonstrate inconsistent use of tense markers such as past tense -ed and auxiliary BE (e.g., am, is) in obligatory contexts. As such, tense marking is a robust clinical marker of LD. On the other hand, the omission or inconsistent use of some obligatory grammatical markers is acceptable in nonmainstream dialects (Newkirk-Turner & Green, 2017). Thus, two children might exhibit similar morpho-syntactic use; however, the reasons could vary. One child could have an impaired system, whereas another child has appropriate mastery of the nonmainstream system in which grammatical marker use is variable. This is an example of a language difference. Distinguishing language difference from LD can be difficult when the morpho-syntactic features of a nonmainstream dialect are similar to features of disorder within a mainstream dialect (Seymour, 2004; Newkirk-Turner & Green, 2017; Leonard, 2014). Therefore, the identification of LD in a child who speaks a nonmainstream dialect or creole requires much consideration.

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a communication partner (American Psychiatric Association, 2013). A recent international team of 57 experts has recommended the adoption of the term Developmental Language Disorder (DLD) to reference children and adults who have these linguistic deficits in the absence of accompanying intellectual disabilities, sensory deficits, or genetic syndromes (Bishop et al., 2017). Other terms for language disorder include specific language impairment (SLI) and language impairment (LI). For consistency, I use the DSM-5 term Language Disorder (LD), but also provide the specific diagnostic label used by the authors of research studies reviewed in this chapter.

LD is identified by a speech-language pathologist (SLP), as SLPs prevent, assess, and treat disorders of speech, language, and swallowing subsystems in adults and children (American Speech-Language-Hearing Association, n.d.). In terms of spoken language, the SLP is responsible for identifying characteristics of an individual's expressive language that deviates from what is typical within the context of the child's development and culture. The SLP is entrusted with the responsibility to differentiate a language difference from a language disorder, as well as to identify a language disorder within a language difference (Oetting, Gregory & Rivière, 2016). If the difference between the nonmainstream dialect/creole and the mainstream dialect/creole is misunderstood, children who speak nonmainstream dialects/creoles are at risk of being underdiagnosed or overdiagnosed. Overdiagnosing refers to misclassifying typically developing children as language disordered based on a language difference, and underdiagnosing involves misclassifying children with language disorders as presenting as only having a difference (Oetting, Lee, & Porter, 2013). One way to distinguish a difference from a disorder, or identify a disorder amongst diversity, is to know and understand the typical linguistic variation or features of that given dialect or creole system (Bland-Stewart, 2005; Oetting, 2018).

Therefore, it is important for the SLP to consult the typical features and patterns of the language variant when determining or ruling out LD. However, this is only possible for well-investigated variations that have been studied in the speech-language pathology literature, such as AAE and SWE (Washington, McDonald, McLeod, Crowe, & Devonish, 2017; Oetting, Lee, & Porter, 2013). The clinical practice of consulting dialect features to identify- or rule out- disorder within diversity (Oetting, 2018) is

difficult to adhere to for SLPs servicing children who speak understudied English dialects or creoles. Such is the case for SLPs servicing children in The Commonwealth of The Bahamas.

The Bahamas is an archipelago of 700 islands and cays situated southeast of the United States of America (USA). Approximately 30 islands are inhabited, and according to the 2010 census, the population of The Bahamas consists of approximately 350,000 people, of which 70% lives on the island of New Providence (Department of Statistics of The Bahamas, 2012). The official language of The Bahamas is English and there is British English influence by Great Britain, as The Bahamas was previously a British colony, and American English, due to proximity to the United States of America. However, the majority of Bahamians speak a variation that is locally called Bahamian dialect. Linguists, on the other hand, consider the variation to be Bahamian Creole English (BCE), an intermediate Caribbean English creole (Seymour, 2009). Therefore, the majority of Bahamians speak BCE and standard English (SE). Example features of BCE are highlighted in Table 1.

In the linguistics literature, creoles and creole speakers can be defined differently. For example, creoles can be defined as having a continuum that contains three levels: acrolect, mesolect, and basilect (McPhee, 2006; Seymour, 2009). Acrolect, at one end, refers to the variety that closely resembles the standard form of the language base. Basilect, at the other end, refers to the variety that contains features contrastive to the standard, and represents the true characteristics of the creole. Mesolect combines the two ends, as it is situated in the center of the continuum and represents intermediate varieties that involve systematic use of standard features/non-creole features and creole features

(McPhee, 2006). Most Bahamians speak a mesolectal variety (Seymour, 2009). Bahamians who speak the acrolect do so in formal contexts, whereas the mesolect and basilect are spoken by Bahamians who solely speak that variety or who choose to do so depending on the context if they speak more than one variety. Thus, many Bahamians speak a BCE mesolect and/or basilect and/or acrolect varieties of Bahamian Creole English. Another classifying perspective is to consider BCE speakers as balanced bilinguals, as they have a wide understanding of two or more codes (e.g., mesolect and acrolect or broadly BCE and English) and can code-switch between varieties (Washington, Fritz, Crowe, Kelly, & Wright Karem, 2019). For the purpose of this study, I consider generally Bahamians to be bilinguals, speaking both BCE and standard English; however, as BCE is on a continuum (i.e., acrolect, mesolect, basilect), it is important to determine which BCE variety closely characterizes each participant.

Language variation in The Bahamas has received some attention in the field of linguistics; however, much of the emphasis has been placed on summarizing and understanding the system's features in adult speakers and creole classification (Donnelly, 1997; Seymour, 2009; Hackert, 2013). Despite the efforts to summarize features of BCE, little is known about the developmental nature of BCE speaking children as the majority of participants included in these linguistic studies were adult speakers.

Similar to the linguistics literature, there is limited research of BCE in children within the speech-language pathology literature. Therefore, SLPs assessing the language of children who speak BCE encounter challenges in making clinical judgments about language difference, developmental errors, and/or language disorder as they are ethically unable to judge the morpho-syntactic features, or grammar, of BCE by the rules of

standard English. Unfortunately, because BCE is understudied, children with language disorders are at risk for being misdiagnosed (Oetting, Lee, & Porter, 2013). Although no studies of language disorder have been conducted among BCE speaking children, it can be expected that the prevalence of language disorder may be similar to prevalence estimates in the U.S, that is approximately 7% of the school-age population (Tomblin et al., 1997; Laasonen et al., 2018). According to Oetting, Cantrell, and Horohov (1999), one of the fundamental issues that need to be explored to bring LD research and dialect diversity together is to learn "more about children's use of nonstandard forms within and across different dialects" (p. 26). Thus, in order to identify LD in children who speak BCE, the general patterns in the surface morpho-syntax of typically developing BCE speaking children first need to be identified and described. As information on the morpho-syntax of children who speak BCE remains understudied, this dissertation study investigated the morpho-syntax of BCE-speaking children without language disorder.

Purpose

The purpose of this investigation was to examine the language skills of Bahamian children without language disorder. Therefore, the current study addressed the following overarching research question: What are the surface morpho-syntactic features of children, without suspected language disorder, who speak BCE? This study addressed the following specific aims:

Specific Aim 1: Describe age-related use of code-switching and rate of morpheme use based on adult language modeling.

Specific Aim 2: Describe grade-related use of code-switching and rate of morpheme use based on adult language modeling.

Specific Aim 3: Determine if tasks (i.e., conversation sample, narrative sample, sentence completion elicit more or fewer BCE features within four and six-year-olds age groups.

Specific Aim 4: Describe children's use of code-switching and rate of morpheme use across grades.

Specific Aim 5: Establish children's use of BCE morpho-syntactic features.

The long-term goal of this program of research is to inform best practice for the diagnostic procedures of children who speak BCE. Before the methods of this study are described, a comprehensive review of the literature is provided followed by a description and report of results from a pilot study of 21 Bahamian preschoolers, which motivated the aims and tasks of the current study.

CHAPTER TWO: LITERATURE REVIEW

Introduction to the Literature Review

This literature review addresses three areas: (a) current knowledge and understanding of BCE; (b) approaches to the study of language variation in the field of CSD; and (c) research of nonmainstream English dialects in the field of CSD. Due to the limited investigations of BCE, inclusion criteria for this review include a broad range of available literature (e.g., unpublished dissertations, conference papers, book chapters) and studies of nonmainstream English dialects published in peer-reviewed journals in the past 25 years. Inclusion criteria of 25 years allowed for the review of seminal studies to inform the exploration of BCE and extend it to the CSD profession.

Current knowledge and understanding of BCE

The current literature of BCE varies from unpublished dissertations, conference papers, published articles, book chapters, to books. As stated previously, most of the work has a primary focus of understanding the creole system in adults. For example, Seymour (2009) examined Urban Bahamian Creole English in 39 adult BCE speakers from the island of New Providence. In this dissertation, Seymour presented meticulous examples of the imperfective aspectual system (i.e., continuous progressiveness and continuous non-progressiveness with verbs). Seymour found that adult BCE speakers used zero auxiliary *be* 93% of the time, and thus, the distribution of use of auxiliary *be* was rare before creole future markers (go, goon, gern/guyn) and progressive (v-ing) verbs. Additionally, BCE speakers used more creole markers (e.g., zero-marking) than English verbal ‘s’ in non-past third-person singular contexts and habitual third-person singular contexts. Findings from this study also provided support to categorize BCE as a

creole, as it characterized an independent system, and reported that BCE speakers appeared to acquire English features without losing creole ones, also supporting the argument of a bilingualism paradigm to describe these speakers. Though Seymour's work is no doubt important to the categorization of BCE, the work was conducted on fully developed adult language systems, which is not appropriate for informing developmental trends.

Several studies have provided additional descriptions of BCE, simultaneously summarizing the features of BCE, and explaining the grammatical system. For example, McPhee (2003) described the grammatical features of tense (i.e., time of the situation), mood (i.e., modality, such as interrogative or imperative), and aspect (i.e., temporal viewpoint of a situation) auxiliaries. McPhee (2003) discussed tense issues in BCE, such as the use of "been" and "did", which are preverbal markers that indicate relative past tense (e.g., BCE: "I did feel so good"; Standard English: "I felt so good" (p. 30). In addition to the feature summary, McPhee examined the syntax of "been" and "did." For example, she indicated that "been" and "did" can precede a main verb clause, or a noun phrase. There are also instances where "been" and "did" can co-occur; however, in these instances, "did" precedes "been" (p.31). The unique feature of McPhee's work is the provision of features, examples, and grammatical explanation.

Although McPhee (2003) and Seymour (2009) provided important information about BCE, these studies are generally unavailable to the public. Scholars such as Donnelly (1997) provided a narrative review of the literature on BCE, predating Seymour's (2009) work, with the goal to "move toward a more comprehensive description which will make the rules of the basilect more accessible not only to

linguists/creolists, but also to the speakers- as well as those involved in the teaching of the language arts" (p. 20). Using sources such as the Dictionary of Bahamian English (Holm & Shilling, 1982), and unpublished dissertations and theses ranging from 1978 to 1986, Donnelly summarized the basilectal features of BCE. At that time, these unpublished manuscripts were unavailable to the public, as they were only available in special collections at The College of The Bahamas, and the Dictionary of Bahamian English only had limited copies available in print. Due to the current technology, however, these sources are now available through scholarly journal access.

Donnelly's summary (1997) was one of the first of its kind to concisely characterize features of BCE. In terms of specific features, the author's outline included some "of the more basilectal features of the morpho-syntax" (p. 24) and avoided features that were considered more mesolectal. The author indicated that though it was her intent, there were instances where this was hard to abide by, as "it is difficult to find a speaker who doesn't vary between basilectal and mesolectal speech" (p. 24). Categories (e.g., articles, plurals, verb tenses) and examples of features were listed. Though Donnelly's summary can be beneficial to SLPs seeking BCE feature information, like the other texts reviewed thus far, it is not appropriate for informing the assessment of children learning BCE.

With the goal to provide a succinct summary of current knowledge regarding BCE, Hackert (2013) wrote a chapter on BCE, extending Donnelly's work. In this chapter, Hackert provided a comprehensive overview of the variation, providing information on the country's sociohistorical and sociolinguistic background and phonology before providing specific details related to the morpho-syntax. Hackert

provided details related to the lexicon, noun phrase (e.g., pronouns), verb phrases (e.g., past tense), and complex sentences. Hackert's work differs from Donnelly (1997) in that she includes features from the acrolect, mesolect, and basilect, where Donnelly primarily addressed the basilect. However, a limitation of Hackert's overview is that she does not provide the inclusion criteria for the sources she chose to include in her chapter, and there is no explicit information regarding the participants from whom the features were obtained. Although Hackert extended Donnelly's initial work and provided a thorough overview of BCE, it is difficult to gain a sense of developmental trends as the features were not associated with age in Hackert's synthesis.

The work conducted by Donnelly (1997), Hackert (2013), McPhee (2003), and Seymour (2009) provide comprehensive examples of surface BCE morpho-syntax. However, these examples were primarily extracted from established adult language systems. For the purposes of understanding typically developing BCE, samples of morpho-syntax from BCE speaking children are needed. Obtaining developmental morpho-syntax of BCE can serve as the starting point to extend the literature to the field of speech-language pathology and child language research. Gaining a general sense of typical developmental patterns of BCE will also inform the assessment procedures of those servicing child BCE speakers, reducing the risk of overdiagnosis and underdiagnosis of LD in this population. As the research thus far has focused primarily on adult speakers, it is important to now focus on child speakers to explore the developmental nature of the surface morpho-syntax features. However, as the nonmainstream English dialect literature within the CSD field is not specific to BCE, research that has investigated other varieties, such as AAE, will be reviewed.

Approaches to studying language variation in the field of CSD

In 1983, the American Speech-Language-Hearing Association (ASHA) released a position statement on social dialects, clarifying the status of nonmainstream English dialects as a functional variety of English, and not a disordered form of speech or language (American Speech-Language-Hearing Association, 1983). Since ASHA's position statement, the study of language development and disorders in nonmainstream English-speaking children has received much attention (Stockman, 2010). Issues of interest include typical acquisition of language, use of language, language assessments, and language interventions (Stockman, 2010). As more information about nonmainstream English dialects became available, so did the methods and approaches used to research them. As such, varying approaches exist to examine nonmainstream dialects. Specific to morpho-syntax, researchers generally adopted one of three frameworks: features approach, dual components approach, and patterns and systems approach.

Features-based approach

The features-based approach focuses on aspects of the language variant/dialect that are contrastive from the mainstream variation; that is, this approach focuses on what is thought to characterize the language variation/dialect. This approach is illustrated by Oetting and McDonald (2001) in their investigation of the surface effects of SLI on the contrastive features of nonmainstream English dialects. Oetting and McDonald (2001) compared 35 unique types of nonmainstream features of Southern African American English (SAAE) and SWE. Children, aged four and six years old, were placed in three groups: six-year-olds with SLI (SLI), typically developing chronological age matched peers (6N), and typically developing language ability matched peers (4N). Results

identified six features with significant group effects. Of that six, four patterns (i.e., zero marking of be forms, zero marking of irregular past, omission of auxiliary do, and noninversion of Wh-questions) were sensitive to diagnostic group, as the patterns distinguished the SLI group from the 6N group. Four patterns (i.e., auxiliary do omission, zero marking of irregular past, zero marking of present progressive, and appositive use) demonstrated possible developmental trends, as the patterns distinguished the 4N group from the 6N group. Children with SLI and the 4N group demonstrated greater rates of pattern occurrence than the 6N group. In summary, Oetting and McDonald (2001) demonstrated that dialect features were clinically useful features to analyze as some features, although not all, distinguished group classification and age-related change.

Dual components approach

In the CSD literature, the dual-components approach views AAE as having two components: a General American English (GAE) component, which can stand alone, and an African American (AA) component, which cannot stand alone; that is, AA requires components of GAE (Green, 2011; Newkirk-Turner & Green, 2017).

One type of dual-components model is the non-contrastive approach. As the name suggests, the non-contrastive approach focuses on AAE and GAE features that are shared (non-contrastive). Although there is a focus on one component, it acknowledges that there are two components to AAE. This approach is best demonstrated by Seymour, Bland-Stewart, and Green (1998). The authors used the example of the copula in "John is a boy," and zero-copula in "John _ a boy" both being acceptable in AAE, though the latter is a feature of AAE, and can also be spoken by a child with a language impairment.

In this example, the disorder versus difference dilemma was only relevant for the zero-copula structure. On the other hand, the authors presented the sentence, "John is __ boy" which omits the article "a." The article "a", however, is a shared feature between AAE and GAE, and omitting the article "a" would not be acceptable in either AAE or GAE. The rationale to using this approach is that it is difficult to distinguish grammatical structures as dialect or disorder without a complete description of governing rules pertaining to AAE. This dilemma, however, is not present when focusing on the non-contrastive features of AAE.

Seymour, Bland-Stewart, and Green (1998) examined the non-contrastive syntactic features of 14 AAE speaking children with language disorders (LD) and without language impairment (TD) to determine if non-contrastive features contained more diagnostic information than contrastive features in identifying children with. Of the 11 non-contrastive features (i.e., articles, complex sentences, conjunctions, demonstrative, locative, modals, negation, verb particle, preposition, present progressive, and pronouns), two of them (i.e., prepositions and pronouns) were produced more frequently by the TD group. However, none of these features reached clinical significance, that is the use or nonuse of these features did not distinguish the atypical and typical groups.

The authors also utilized a 90% criterion of mastery for non-contrastive and contrastive features of AAE. Both groups produced more non-contrastive features that reached 90% mastery than contrastive features. The TD group produced more non-contrastive features reaching or exceeding 90%, whereas children with language impairment approximated 80%. Conversely, children with LD produced more contrastive features at 90% criterion than did the TD group, indicating that they had stronger SAE

patterns than their typically developing peers. Group differences were present for all contrastive features, except the past tense /ed/. On this measure, the TD group had more SAE feature productions. Because AAE and SAE non-contrastive feature use differed between children with and without LD, the authors argue that a more effective approach to assessment would be to focus on non-contrastive features, however, a closer examination of the data suggest that a focus on non-contrastive features cannot be applied to all AAE speakers. As the authors noted, there were inconsistencies in the frequency of contrastive and non-contrastive feature use between the LD and TD groups. These inconsistencies were attributed to: 1) frequency of AAE features; 2) variability in typical and LD profiles; and 3) possible intervention effects from use of an SAE model. Firstly, the authors noted inconsistencies in the use of several of AAE features, including an infrequent pattern of zero plural /s/ and past tense /ed/. However, this finding was not unexpected due to the variability among AAE features. For these participants, plural /s/ and past tense /ed/ could have functioned as non-contrastive in terms of diagnostic importance (i.e., be categorized as a non-contrastive feature and analyzed) as the participants rarely zero marked these morphemes. Secondly, the performance profiles (i.e., clinical status/profiles) were not mutually exclusive. TD status was not verified by the researchers; rather, it was determined by the school via routine speech, language, hearing and cognitive screenings. Therefore, the authors note the possibility of misdiagnosis due to limited standardized evaluations (or screenings) for AAE speakers. The performance of three participants in the TD group was suggestive of possible language impairment. Of note, one TD participant had difficulty in comprehension and two TD participants failed to reach 90% criterion on conjunctions and present progressive

/ing/. Further, for students who were correctly diagnosed as LD, the difficulties exhibited from each participant varied. Some participants had difficulty with articles, whilst others had trouble with prepositions. This variability, however, is consistent with the LD literature. Finally, the authors reported that the LD group produced a larger proportion of contrastive features at the SAE 90% criterion than the TD group. The unexpected use of SAE features in the LD group may have been due to ongoing receipt of speech and language services emphasizing SAE features. As such, there is likely to be SAE influence on use of some AAE features.

One limitation highlighted by the authors, but not heavily considered in the analysis, is the variability of tense marking in AAE speakers. The authors expected participants to produce contrastive or non-contrastive features at a rate of 90% across total opportunities using the 90% mastery criterion, suggesting that AAE speakers would use either GAE or AAE to demonstrate mastery of a morpheme. There are two issues that arise from this. First, AAE features are not all or none; some morphemes are affected by the phonological environment of a word. In the case of regular past tense /ed/, typical speakers are more likely to overtly mark when a verb ends in a vowel (Pruitt & Oetting, 2009). Additionally, contrastive features can be marked variably, even if the speaker uses AAE. For example, two participants might speak AAE but one uses a few features, whilst another uses more. The calculation of dialect density, which is a measure to quantify the overall rate of dialect features, could have better informed the clinical comparison profiles than the 90% criterion. Dialect density measures could have captured the variability of feature use among participants. As such, dialect density may have informed profile comparisons and matching (e.g., comparing morpheme use of two students with a

low dialect density, one with LD and one TD). Despite these limitations, the authors demonstrated that non-contrastive features can be diagnostically salient for some (but certainly not all) AAE speakers, and a plausible approach for language variations that do not have a complete description.

Patterns and systems approach

There is no doubt that the research of both contrastive and non-contrastive features informed the current understanding and practices of typically developing children and children with language impairments who speak nonmainstream English dialects in the USA. However, both approaches have limitations. One limitation includes lack of examination of feature frequency use and experimental task (Newkirk-Turner & Green, 2017). For example, Craig, Kolenic, and Hensel (2014) examined the relationship of codeswitching of AAE speakers during early literacy between kindergarten and second grade. Following a quantitative analysis, Craig et al. (2014) found that codeswitching was related to the tasks, and not grades. Very young AAE speakers switched from AAE to GAE depending on the context (i.e., picture description versus story retell). In other words, task demands, or context affected the frequency of features, regardless of contrastive or non-contrastive focus. A second limitation is the criteria for classifying a feature as contrastive or non-contrastive. For example, Seymour, Bland-Stewart, and Green (1998) identified prepositions and progressive –ing as non-contrastive, but Oetting and McDonald identified the same features as contrastive.

In response to the limitations of a non-contrastive or contrastive focus, research on nonmainstream dialects have shifted to a patterns or systems approach in recent years, which moves away from categorizing children's morpho-syntax as either contrastive or

non-contrastive. Rather, the patterns and systems approach considers nonmainstream dialects to be made up of dialect-specific and dialect-universal features (Oetting, Lee, & Porter, 2013). For example, instead of viewing productions of an AAE speaking child such as “He crying” and “He is crying” as being either contrastive or non-contrastive to GAE, both are AAE (i.e., “He crying” [i.e., dialect-specific] and “He is crying” [i.e., dialect-universal]). As such, both productions are considered correct. This approach goes beyond looking at features as just dialectal, or nondialectal, but by considering the language system as a whole with varying parts.

A recent example of use of the systems approach is demonstrated by Newkirk-Turner, Oetting, and Stockman (2014), who examined young AAE speaking children’s use of auxiliaries (i.e., auxiliary BE, auxiliary DO, and modal auxiliaries). Specifically, the authors investigated progressive and passive forms of BE (e.g., is, am, are, was), auxiliary DO (e.g., do, does, did), and auxiliary modals (e.g., can, could, will, would, must) (p. 1383). They found that young AAE speaking children initially produced auxiliaries between the ages of 19 and 24 months, and that the development of auxiliaries demonstrated both dialect-universal and dialect-specific effects. For example, children’s earliest BE auxiliaries involved first person contractible forms (i.e., dialect-universal). Like adult speakers and older children, young children learning AAE variably marked auxiliary BE and DO but were consistent with modal auxiliaries. This finding from Newkirk-Turner et al. (2014) reveals that AAE speaking children do not develop dialect-specific features only, or dialect-universal features only, but use both. This finding is consistent with the limitations found in approaches that focus on features, because feature frequency use is moderated by variables such as dialect density, setting, task, and

communication partner. These findings suggest that investigations of language development in BCE children must account for creole-universal and creole-specific features within context. That is, the influence of setting, task, and the communication partner must be examined.

Research of nonmainstream English dialects in the field of CSD

As reviewed, multiple approaches to studying language variation exists. Regardless of the approach utilized, research demonstrates the utility of investigating these language variations when identifying or ruling out disorder within diversity. For example, Garrity and Oetting (2010) used language samples and an experimental sentence imitation probe to investigate three forms of auxiliary BE productions (i.e., am, is, are) in AAE-speaking children with typically developing language and specific language impairment. Participants included three groups of AAE speaking children: 10 six-year-olds with SLI, 10 age-matched (AM) peers, and 10 language-matched (LM) controls. During the spontaneous language sample, results for overall marking of all three BE forms indicated that the AM group produced the highest rate of dialect-appropriate overt marking compared to the LM group and the SLI group; however, this difference was not statistically significant. In terms of each independent BE form, the AM group overtly marked (i.e., standard and dialect-appropriate) *is* significantly more than the SLI group and the AM group overtly marked (i.e., standard and dialect-appropriate) *are* significantly more than the LM group. Descriptive results for the elicited sentence imitation probe revealed that the SLI group overtly marked (i.e., standard and dialect-appropriate) all BE forms at a lower rate than their age-matched peers. In conclusion, the authors state that the results revealed statistical trends, which support evidence of an SLI

grammar deficit involving auxiliary BE forms *am, is,* and *are.*

Though group trends were identified, the authors reported several considerations when interpreting these findings. One consideration is that overt marking was associated with dialect density, as half of the children in SLI and LM groups either overtly marked or zero marked BE forms 100% of the time in sentence imitation tasks. Further analysis revealed that AM children who overtly marked BE forms had the lowest dialect ratings, and children who zero marked consistently had the highest AAE ratings. Therefore, professionals should be mindful of dialect density when comparing SLI and LM group performance. A second consideration is the interaction of task and AAE use. Specifically, higher rates of AAE were produced during the spontaneous language sample than in the sentence imitation tasks.

Another approach to informing understanding of morphological development is to examine the language of young AAE speakers (rather than simultaneously contrasting AAE and SAE development). Newkirk-Turner, Oetting, and Stockman (2014) collected language samples from 48 three-year-old AAE speakers to investigate dialect-universal and dialect-specific developmental aspects of auxiliaries in children. The authors investigated progressive and passive forms of BE (e.g., is, am, are, was), auxiliary DO (e.g., do, does, did), and auxiliary modals (e.g., can, could, will, would, must) (p.1383). Language samples were elicited through a play session, samples were transcribed, and auxiliaries were coded for type (BE, DO, modal) and marking option (e.g., mainstream marked, nonmainstream marked). The authors found that the types of marking (e.g., mainstream, nonmainstream) differed for auxiliaries. Further, it was found that nonmainstream marking was related to a higher dialect density (i.e., more use of

nonmainstream features per sentence) for auxiliary BE and auxiliary DO, but not modal auxiliaries. Given the findings of variability demonstrated in the study, the authors suspected that similar variability could be present in other nonmainstream dialect speakers within and outside the United States. In terms of generalizability of results, Newkirk-Turner and colleagues (2014) highlighted the importance of calculating the dialect density (i.e., percentage of utterances containing one or more nonmainstream features) of children in similar studies to compare results with other nonmainstream dialects.

Findings from these studies can inform other language tasks used to identify or rule-out language disorder. Oetting, McDonald, Seidel, and Hegarty (2016) illustrate this by implementing a modified dialect-strategic scoring system for a sentence recall task. The rationale behind this approach is that difficulty with sentence recall has proven to be a clinical marker of SLI. Sentence recall is influenced by dialect use thus limiting the use of sentence recall tasks for dialect speakers (Oetting et al., 2016). For example, AAE speaking children's performance is reduced on sentence recall tasks in comparison to children who spoke GAE if dialect-appropriate productions are counted as errors. To address this issue, Oetting and colleagues developed a sentence recall task with 36 items for children who speak AAE and SWE and implemented dialect-strategic scoring to determine possible performance differences between the SLI and the TD groups. Participants included 106 children between the ages of 59 to 74 months. During scoring, three dialect strategic modifications were made: "*is* for third person plural present progressive verbs (e.g., Bert and Ernie is singing a new rap song), *was* for third person plural past progressive verbs (e.g., Yesterday, Bert and Ernie was cooking a hamburger)

and zero marking of verbal –s (e.g., Big Bird wonder when Bert and Ernie are not singing)" (Oetting et al., 2016, p. 188). Using the dialect-strategic modification scoring method, responses were classified as exact recall, nonexact grammatical recall, ungrammatical recall, unscorable, or missing. It was found that the TD group had higher sentence recall scores than their SLI peers. With a cut point of 40/72 points, 88% percent of children were correctly identified by their clinical status, yielding a sensitivity of .91 and a specificity of .85. In terms of grammaticality, exact recalls were higher for the TD group than the SLI group, and the grammatical nonexact recalls were equal across groups. Further, ungrammatical and unscorable recalls were greater in the SLI group than the TD group. When alternative methods of calculating the number of exact repetitions were adopted, it was found that a cut point of 12 or fewer exact repetitions correctly identified children in the SLI group with a specificity of .87. With the use of dialect-strategic scoring, children who spoke nonmainstream dialects were not penalized for their dialect productions. The results of this study demonstrate powerful clinical implications that can be achieved when classic language measures are informed or modified by known dialectal features.

In recent years, research on nonmainstream variations has expanded to the English-speaking Caribbean. As mentioned previously, Caribbean English (CE) is an umbrella term used for the standard and creole language varieties spoken in the English-speaking Caribbean region. As the field of SLP develops in countries outside of the United States and immigration continues to fuel increased diversity within the United States, the need to extend research to children who speak CE has also increased. Washington, Fritz, Crowe, Kelly, and Wright Karem (2019) have pioneered this body of

work in their characterization of Jamaican Creole and English, using the Index of Productive Syntax (IPSyn), which is a analysis approach for identifying use of specific grammatical structures in preschoolers' spontaneous language samples (Scarborough, 1990). The IPSyn has been used to describe the spontaneous language of typically and atypically developing monolingual children, but there is limited evidence in its use to characterize grammatical productions in multilingual children (Washington et al., 2019). As such, the purpose of their study was to determine if the IPSyn is a useful tool to characterize the grammatical development of typically developing bilingual children who speak Jamaican Creole and English.

Language samples were collected in Jamaican Creole and English by language-specific SLPs (i.e., one SLP testing in English, and one SLP testing in Jamaican Creole) from 62 bilingual four to six-year-old Jamaican Creole and English-speaking children (Washington, Fritz, Crowe, Kelly, & Wright Karem, 2019). The researchers sought to determine if IPSyn results would differ depending on English or Jamaican Creole use. IPSyn scores for both samples were significantly correlated with mean length of utterance in morphemes (MLU-M) and number of different words, indicating that both languages (i.e., Jamaican Creole and English) have similar grammatical structures, and that children's development of these grammatical structures was similar across both languages. As such, these results support the use of the IPSyn to measure the language complexity of children who speak Jamaican Creole and English.

CHAPTER THREE: METHODOLOGY

The methodology for this dissertation was informed by a pilot study of 21 Bahamian four and six-year-old children. Therefore, this chapter will first describe the methodology and results of the pilot study. The methods and data analysis plans of the dissertation study will then be presented.

Bahamian Preschoolers' Spontaneous and Elicited Language: A Pilot Study

As stated previously, there is limited research examining the morpho-syntax of children who speak BCE. Therefore, an initial pilot study was conducted to inform the dissertation research questions and determine the feasibility of the methodology and data analysis. The pilot study investigated the morpho-syntax of four and six-year old children who speak BCE, addressing the following research question: What are the surface morpho-syntactic features of children who speak BCE? It was hypothesized that differences in BCE morpho-syntax development will be observed between four- and six-year old children. Further, we predicted that creole-specific use (i.e., creole-specific feature per utterance) would vary based on task demands (e.g., sentence completion task versus conversation sample) and that the overall frequency (i.e., the overall number of a particular feature or grammatical morpheme) would vary based on the age of the child.

Design

The nature of this pilot study was exploratory. A between group design was used to examine differences in four and six-year-olds' BCE use. In addition to group differences, developmental trends and the relationship between BCE use and language task was examined (Orlikoff, Schiavetti, & Metz, 2015).

Ethics Approval

IRB approval was obtained from the principal investigator's (PI's) university, James Madison University. Ethics approval was also obtained from The Bahamas' Ministry of Health, and the Public Health Authority/University of West Indies Ethics Board. After approval was obtained, potential participants were recruited through distribution of flyers and word-of-mouth through the author's professional contacts with teachers and parents.

Methods

Participants

Data were collected between August 2018 and August 2019. A convenience sample of 11 four-year-olds (M = 4 years, 5 months, SD = 3.6 months) and 10 six-year-olds (M = 6 years, 3 months, SD = 2.5 months) was recruited. Inclusionary criteria included Bahamian children living in The Bahamas. Exclusionary criteria included existing diagnoses (i.e., language disorder, hearing impairment, developmental disorder, and cognitive impairment) or unwillingness to being audio and video recorded.

Clinical status was determined by 1) reported history of speech-language therapy or language difficulties; 2) failing one or both of two classification measures (i.e., a norm-referenced caregiver report measure and/or nonword repetition task, both described in the next section.). Two four-year-olds and three six-year-olds, who failed one or both of these measures, were excluded due to suspected language disorder. As such, data were analyzed for a total of 21 typically developing children including 11 four-year-olds and 10 six-year-olds. See Table 2 for participant and classification information.

Classification Measures

Children's Communication Checklist-2 (CCC-2; Bishop, 2006): The CCC-2 is a caregiver report measure designed to assess children's communication skills in the areas of pragmatics, syntax, morphology, semantics, and speech. It is administered using a Caregiver Response Form on which the caregiver rates the frequency that the child demonstrates 70 communication behaviors. It can be used to screen for general language impairments, identify children with pragmatic language impairment, and determine if children may benefit from further assessment. The General Communication Composite (GCC) on the CCC-2 is an index of overall communicative competence. This score has a mean of 100, and a standard deviation of 15 (Bishop, 2006). As per the CCC-2 examiner's manual, a GCC score of 85 or lower has 70% sensitivity (i.e., 70% of children with language impairment were correctly identified) and a specificity of 85% (i.e., 85% of children without language impairment were identified as not having a language impairment). Children with a General Composite Score of < 85 were classified as having a suspected language disorder (LD).

Quasi-universal nonword repetition task (Q-NWRT; Chiat, 2015): The Q-NWRT contains 16 items that vary in length from two to five syllables. This measure examines the ability of the respondent to repeat multi-syllable nonsense words and reflects an individual's ability to code and temporarily store information phonologically. It has been used as a screening measure for the identification of children with language disorder. The items for this measure were scored as the percentage of items correct. Item accuracy was classified by an all or nothing score of either correct or incorrect response. Participant responses were recorded but scored on-line; in the cases of uncertainty, the recording was

consulted. Instances of omission and substitution were counted as errors unless the errors were consistent with articulation difficulty. The cut score for this study was informed by means and standard deviations reported by Boerma et al. (2015). Using percentage of items correct, Boerma et al. 2015 reported the mean and standard deviation of bilingual children on this measure. Typically developing children had a mean of 55.1% and a standard deviation of 13.7%, and children with language impairment had a mean of 28.6% and a standard deviation of 17.1%. These means were used to classify participants in the pilot study. The cut score for this 16-item measure was 41.4% (one standard deviation below the mean of 55.1%). Children with accuracy scores below 41.4% were classified as having potential language disorder and as such, were excluded from this study. See Table 2 and Table 3 for participant performance on classification measures.

Dependent Measures

Multilingual Assessment Instrument for Narratives (MAIN; Gagarina et al., 2012): The MAIN is a test designed to assess narrative skills in children who acquire one or more languages from birth or from an early age. The MAIN is suitable for children from three to ten years and evaluates both comprehension and production of narratives. Participants retold one story and generated a story using six sequenced pictures per story. The story generation and retell narratives were transcribed using Systematic Analysis of Language Transcripts (SALT 16; Miller & Iglesias, 2016) and features of interest were coded (see page 31 for coding procedures).

Language sample: A spontaneous language sample was collected during a 30-minute play-based interaction with the participant and the examiner. The examiner and participant played with objects of interest (e.g., play dough, dinosaurs, cars and ramp)

and the utterances elicited during this interaction were analyzed. The samples were also transcribed and coded in SALT.

Rice Wexler Test of Early Grammatical Impairment Screening Test (TEGI-ST; Rice & Wexler, 2001): The TEGI-ST is a norm-referenced test of grammatical ability in Standard American English. The child is required to produce English words in sentences that include target morpho-syntactic features. The TEGI-ST specifically targets the third person singular -s and past tense morpho-syntactic features. First, a phonological probe is used to verify that children are capable of producing the word-final consonants that are being tested. Then, the third person singular probe test is administered, followed by the past tense probe. The third person singular probe examines children's ability to produce–*s*, as in *she plays* and *he sings*. The past tense probe examines children's ability to produce regular and irregular past tense forms, as in *he played* and *she gave*. A total raw score is calculated by combining results of the third person singular and past tense probe measures.

The examiner administered the TEGI-ST as outlined in the manual, and did not specifically instruct participants to produce sentences in SAE or BCE, however, due to the nature of the TEGI-ST, all practice items and probes were presented using SAE. Participant responses were video or audio recorded but scored on-line; in the cases of uncertainty, the video/audio recording was consulted. The morpho-syntactic features produced in participant responses were then coded in Microsoft Excel using Systematic Analysis of Language Transcripts (SALT 16; Miller & Iglesias, 2016) conventions (see page 31 for coding procedures).

Conventional scoring and creole-appropriate scoring were utilized. Creole-appropriate scoring refers to accepting responses that contain both creole-universal and/or creole-specific features that are grammatically correct in BCE. Participants received two scores; one score that reflected correct (i.e., conventional) mainstream SE productions (as determined by the test manual) and another score that reflected correct creole appropriate productions. With the conventional SE scoring, participants received credit for responses that contained third person singular *-s* (e.g., she flies) during administration of the third person singular probe, and also received credit for regular and irregular past tense responses during administration of the past tense probe (e.g., he raked, he ate). The creole-appropriate scoring was developed by the author. This scoring method did not penalize participants for BCE productions including use of code switching and mixing, but rather counted such productions as correct. As such, responses that reflected SE, BCE or a combination were considered to be correct. For example, correct responses on the third person singular probe included: she checks, she check, and she does check. On the past tense probe, the following responses were considered to be correct: he raked, he rake, he did rake, and he ate, he eat, he done eat, and he did eat. See Table 4 and Table 5 for participant performance on the TEGI-ST.

Study Procedures

Study measures were administered during one 90-minute audio and video recorded assessment session at participant homes, schools, or a community center. Parents first completed the consent form, case history form, and the Children's Communication Checklist-2 (CCC-2; Bishop, 2003). The order of administration of the child measures included the Multilingual Assessment Instrument for Narratives

(Gagarina et al., 2012), a 30-minute language sample, the Quasi-universal nonword repetition task (QNWRT Chiat, 2015), and the Rice Wexler Test of Early Grammatical Impairment Screening Test (TEGI-ST; Rice & Wexler, 2001).

Analysis Plan

Transcription. The language samples and the MAIN narrative tasks were transcribed in Systematic Analysis of Language Transcripts (SALT 16; Miller & Iglesias, 2016) software. The TEGI-ST sentence completion responses were transcribed using Microsoft Excel. Samples were transcribed verbatim independently by two SAE-speaking American student research assistants due to the limited availability of native BCE speakers. To improve transcription of BCE, research assistants received training by the first author, comprised of weekly meetings where they practiced transcription of BCE. Following transcription by research assistants, transcripts were then reviewed by the first author as she is a native BCE speaker. Interrater reliability was conducted for 10% of language samples, MAIN narrative tasks, and TEGI-ST sentence completion responses. Inter-transcription agreement was calculated by dividing the number of agreements by the total number of agreements and disagreements. Inter-transcription agreement for language samples was 94.48%, MAIN narrative tasks was 94.64%, and TEGI-ST sentence completion responses was 80.56%. All disagreements were settled by listening to each segment and agreeing on what was said.

Coding. Morpho-syntactic features of interest from the language sample, MAIN narrative tasks, and TEGI-ST sentence completion response transcripts were coded and classified as creole-specific (BCE) or creole-universal (standard English). For example, using the sentence, “he write a book” the code “BCE: zeroirregularpast” was used for

write (i.e., BCE zero marking for irregular past tense verbs) and categorized as creole-specific. It is important to note that children who speak SE and BCE can use SE, BCE, and codeswitch, or a combination of both. As such, all target morpho-syntactic features were categorized as creole-specific or creole-universal. The first author developed a codebook with definitions of 52 codes and examples for each morpho-syntactic feature of interest. Morpho-syntactic features related to past tense, plurals, verb forms (i.e., third person singular, copula- be, auxiliary-be, and auxiliary- will), and possession were selected. These morph-syntactic features were selected after a comprehensive literature review of previously studied features identified as diagnostically useful in the initial stages of investigation for other languages and dialects. In addition, these features were identified as having both creole-universal and creole-specific options for marking (Donnelly, 1997; Oetting & McDonald, 2001; Seymour, Bland-Stewart, & Green 1998). Research assistants read the codebook and received training by the first author, comprised of weekly meetings where they practiced coding of BCE. Interrater reliability was conducted for 10% of language samples, MAIN narrative tasks, and TEGI-ST sentence completion responses.

Inter-coder agreement was calculated by dividing the number of agreements by the total number of agreements and disagreements. All disagreements were settled by consensus. Inter-coder agreement for language samples was 92.24%, MAIN narrative tasks was 93.68%, and TEGI-ST sentence completion responses was 88.50%. Table 6 presents a complete list of morpho-syntactic features codes and examples. It is important to note that two codes (i.e., “Copula: Was” and “Irregular plural”) received a reliability percentage of $\leq$80%. Errors consisted of coding a copula as an auxiliary, and omission of

codes for irregular plurals (e.g., children, women). Coders were retrained to correctly identify these morpho-syntactic features. The first author reviewed all transcription coding for 100% of the transcripts to verify coding accuracy.

Creole density. Following feature coding, a percentage of feature use across utterances produced was calculated for each participant. (i.e., creole density). Creole density is a metric used to describe the frequency of language variation use. In this case, creole density reflects BCE use. Creole density was calculated by dividing the number of utterances with at least one creole-specific feature (Oetting & McDonald, 2002) by the number of total utterances produced during the 30-minute language sample. Participants' BCE use was then categorized by using values from Newkirk-Turner, Oetting, and Stockman (2014): 1) no use (less than 1%) ; 2) low use of BCE (density value ranging from 1% to 11%); 3) medium use (density value ranged from 11% to 20%) and 4) high use (density value greater than 20%). The categories were slightly modified to accommodate participants who used less than 1% of BCE features. Table 7 presents a creole density and classification determined by productions during the language sample.

Creole feature use across tasks. To describe how creole-specific feature use varied across tasks, the number of utterances or responses containing at least one creole-specific feature was divided by the number of total utterances or responses in the MAIN narrative tasks and TEGI-ST sentence completion responses. Although this is the same calculation for creole density, the classification (i.e., low user, medium user, high user) for creole density was only used for the language sample due to sample length (i.e., more than 100 utterances). Therefore, the term creole density is related only to performance on the language sample, and the term creole-specific feature use (CSFU) describes the use of

creole-specific features across the MAIN narrative tasks (i.e., story retell and story generation) and TEGI-ST sentence completion responses. Table 8 presents creole-specific feature use by task.

Results

The analysis for the pilot study consisted of establishing the creole density for each child (i.e., use classification determined by percentage of utterances that contained a creole-specific feature during the language sample), the creole-specific feature use across tasks (i.e., percentage of utterances that contained a creole-specific feature during the story retell, story generation, and TEGI-ST sentence completion), and the total frequency of creole-feature use during the language sample (i.e., number of times a specific feature was used) by four-year-olds and six-year-olds.

Due to the sample size (i.e., $N = 11$ four-year-olds and $N = 10$ six-year-olds) and lack of power, a nonparametric statistical test, the Mann-Whitney U test and the Friedman's Two-way Analysis of Variance by Ranks test were used to examine differences between typically developing four and six-year-olds ($N = 21$). Statistical significance was set at $p < .05$. Additionally, descriptive statistics were calculated to describe group mean performance and mean difference. From this point forward, groups will be referred to as 4TD and 6TD, when discussing four-year-olds and six-year-olds with typically developing language, respectively.

Creole Density

Creole density. The first statistical analysis determined if creole density differed between the groups. As a group, four-year-olds ($Mdn = 9.93$) had higher creole density than six year olds ($Mdn = 5.15$), but this difference was not statistically significant,

$U(N_{4TD} = 11, N_{6TD} = 10,) = 37.0$, $z = -1.268$, $p = .223$. Figure 1 presents the distribution of creole density for both groups.

Creole-Specific Feature Use Across Three Discourse Tasks

The proportion of creole-specific morpho-syntactic feature production per utterance across individual tasks during the story retell, story generation and sentence completion tasks was examined. Creole-specific feature use (CSFU) was calculated as the percentage of utterances or sentences (for the sentence completion TEGI-ST task) that contained a creole-specific feature. Table 9 presents Mann-Whitney *U* tests between the 4TD and 6TD groups. Asterisks in the table denote statistically significant differences.

Story Retell. Four-year-olds (*Mdn* = 37.89) produced significantly more creole-specific features than six-year-olds (*Mdn* = 5.97), $U(N_{4TD} = 11, N_{6TD} = 10,) = 10.5$, $z = -3.145$, $p = .002$. Figure 2 presents creole-specific feature use of both groups during the story retell.

Story Generation. Four-year-olds (*Mdn* = 35.28) produced significantly more creole-specific features than six-year-olds (*Mdn* = 10.10), $U(N_{4TD} = 11, N_{6TD} = 10,) = 22.0$, $z = -2.327$, $p = .02$. Figure 3 presents CSFU of both groups during the story generation task.

Sentence Completion (TEGI-ST). Four-year-olds (*Mdn* = 85.72) produced significantly more creole-specific features than six-year-olds (*Mdn* = 22.30), $U(N_{4TD} = 11, N_{6TD} = 10,) = 10.0$, $z = -3.170$, $p = .001$. Figure 4 presents CSFU of both groups during the sentence completion task (TEGI-ST).

Task Differences (both groups combined). A Friedman test was conducted to determine if there were differences in CSFU between the story retell, story generation,

and sentence completion. Pairwise comparisons were performed with a Bonferroni correction for multiple comparisons. CSFU was statistically significant between tasks, $X^2_F(2) = 16.85$, $p = < .01$. Post hoc analysis revealed statistically significant differences in CSFU between the story retell (*Mdn* = 20.00) and sentence completion task (*Mdn* = 44.45). CSFU did not significantly differ between any other tasks. Figure 5 presents CSFU of all groups across tasks.

Morpho-syntactic Production During Language Sample

The next statistical analysis examined specific morpho-syntactic features elicited during the language sample. Morpho-syntactic feature production was only examined in the language sample because the other sample tasks were too brief. As a reminder, conversation language samples were elicited using a natural, play-based conversation context.

In addition to the Mann-Whitney *U* test, group mean averages and percentage of opportunity were compared to examine differences in morpho-syntactic feature use between typically developing four and six-year-olds. Use of selected morpho-syntactic features are listed in Table 10.

Language Sample length.

As the purpose of this study is exploratory and examines multiple morpho-syntactic features, all utterances produced by children in the language samples were analyzed. In other words, the language samples were not equated for length. This practice has been used in the initial investigation stages of other dialects (for example, see Oetting & McDonald, 2001). The total number of verbal utterances was compared between four-year-olds (*M* = 257.27, *SD* = 91.19) and 6-year-olds (*M* = 339.5, *SD* = 102.40). Six year-

year-olds (*Mdn* = 308.50) produced more utterances than four-year-olds (*Mdn* = 254.0), but this difference was not statistically significant, $U(N_{4TD} = 11, N_{6TD} = 10,) = 80.0$, $z = 1.761$, $p = .085$. Figure 6 presents the distribution of language sample length for 4TD and 6TD.

Frequency of BCE Morpho-syntactic features.

The occurrence of all morpho-syntactic features are presented in Table 10 as total frequency and percentage of opportunity (that is, the number of times a specific feature was used divided by the number of opportunities for that feature to occur). For example, during one of the language samples, a participant looked at a picture of a girl eating ice cream. Given this opportunity, a participant could have produced a sentence *marking the auxiliary is* (e.g., The girl is eating ice cream) or *zero marking the auxiliary is* (e.g., The girl eating ice cream).

Selected features: Plurals (Language Sample).

Creole-universal and creole-specific features related to plurals were selected for group comparison. Table 11 lists the selected codes and examples. The 6TD group produced significantly more *marked regular plurals* (*Mdn* = 39.00) than the 4TD group (*Mdn* = 18.00), $U(N_{4TD} = 11, N_{6TD} = 10,) = 90.50$, $z = 2.505$, $p = .012$. Figure 7 shows the distribution of *marked regular plural*. Though, on average, 6TD children produced more *marked regular plurals* as a group, when examining the percentage of opportunities, 4TD and 6TD performed similarly. The 4TD group produced *marked regular plurals* 93.21% of the time, and the 6TD group *marked regular plurals* 95% of the time. Table 12 presents Mann-Whitney *U* results and Table 13 has percentage of opportunity.

Comparisons for *zero regular plural* were also conducted, with 4TD (*Mdn* = 1.0) and 6TD (*Mdn* = .5) using a similar amount of *zero regular plural* morpho-syntactic features, $U(N_{4TD} = 11, N_{6TD} = 10,) = 52.00$, $z = -.225$, $p = .863$. Figure 8 shows the distribution of counts for *zero regular plural*. Percentage of opportunity also revealed similar performance. The 4TD group produced *zero marked regular plurals* 6.79% of the time, whereas the 6TD produced *zero marked regular plurals* 3.26% of the time. See Table 13 for percentage of opportunity.

Group differences for *irregular plural* $U(N_{4TD} = 11, N_{6TD} = 10,) = 60.50$, $z = 1.049$, $p = .705$, and *zero irregular plural* $U(N_{4TD} = 11, N_{6TD} = 10,) = 60.50$, $z = 1.049$, $p = .705$ use were not statistically significant. However, it is important to note that overall counts for irregular plural production were low for both groups; therefore, these morpho-syntactic features were not graphed. The percentage of opportunity is listed in Table 13.

Selected features: Active Past Tense (Language Sample).

Creole-universal and creole-specific features related to past tense were selected for group comparison. Table 14 lists the selected codes and examples. Six-year-olds (*Mdn* = 6.50) produced significantly more *marked irregular past tense* than four-year-olds (*Mdn* = 3.00), $U(N_{4TD} = 11, N_{6TD} = 10,) = 22.50$, $z = -2.310$, $p = .020$. Figure 9 shows the distribution of counts for *marked irregular past tense*. Though significant in terms of overall production difference, both groups performed similarly when the opportunity was examined; the 6TD produced *marked regular past tense* in 31.84% of opportunities, and the 4TD group produced *marked irregular past* in 26.28% of opportunities.

Though *regular past tense* was not statistically significant, a trend for significance was noted $U(N_{4TD} = 11, N_{6TD} = 10,) = 27.50$, $z = -1.95$, $p = .051$, with six-year-olds (*Mdn*

= 8.0) using more *marked regular past tense* than four-year-olds (*Mdn* = 2.00). A difference was also noted in terms of opportunities. The 6TD produced *marked regular past tense* 40.30% of the time children, whereas the 4TD group produced *marked regular past tense* 29.20% of the time.

Comparisons for *zero regular past* $U(N_{4TD} = 11, N_{6TD} = 10,) = 44.50$, $z = -.751$, $p = .468$, *zero irregular past* $U(N_{4TD} = 11, N_{6TD} = 10,) = 40.50$, $z = -1.044$, $p = .297$, and *did + verb* $U(N_{4TD} = 11, N_{6TD} = 10,) = 49.50$, $z = -1.049$, $p = .705$, did not yield statistically significant differences. Consistent with overall count differences, the 6TD produced *zero regular past* in 15.42% of opportunities, and the 4TD group in 18.98% of opportunities. However, there was a difference in *zero irregular past* production, as the 6TD produced *zero irregular past* in 10.95% of opportunities, and the 4TD group produced *zero irregular past* in 25.55% of opportunities. The 6TD group produced *did + verb* in 1.49% of opportunities, but the 4TD group did not produce any *did + verb* features. Table 15 presents Mann-Whitney *U* results. Figure 10 shows the distribution of counts for *regular past*, *zero regular past*, *did + verb*, and *zero irregular past*. The percentage of opportunity is listed in Table 16.

Selected features: Possession

Creole-universal and creole-specific features that indicated possession were selected for group comparison. Table 17 lists the selected codes and examples. Six-year-olds produced more *marked possessive* morpho-syntactic features (*Mdn* = 7.5) than four-year-olds (*Mdn* = 2.0); however, this difference did not yield a significant result $U(N_{4TD} = 11, N_{6TD} = 10,) = 34.00$, $z = -.1.49$, $p = .152$. When percentage of opportunity was

assessed, 6TD and 4TD produced *marked possessive* at similar rates, 72.63% and 70.77% respectively.

Six-year-olds produced similar counts of *zero marked possessive* morpho-syntactic features (*Mdn* = 1.5) as four-year-olds (*Mdn* = 1.0), $U(N_{4TD} = 11, N_{6TD} = 10,) = 46.40$, $z = -.622$, $p = .557$. However, differences were noted between groups in terms of production given the opportunity, as six-year-olds *zero marked possessive* 15.79% of the time, whereas four-year-olds *zero marked possessive* 29.23% of the time.

Six-year-olds produced more *noun/pronoun/possessive + own* morpho-syntactic features (*Mdn* = 1.5) than four-year-olds (*Mdn* = 0.0), who did not produce this feature at all, but this difference was not significant $U(N_{4TD} = 11, N_{6TD} = 10,) = 38.50$, $z = -1.908$, $p = .251$. In terms of percentage of opportunity, the 6TD group produced *possessive + own* features 11.58% of the time, whereas the 4TD group produced *possessive + own* features 0% of the time. Table 18 presents Mann-Whitney *U* results and Figure 11 presents differences between four and six-year-olds on all possessive morpho-syntactic features. The percentage of opportunity is listed in Table 19.

Selected features: Third person singular

Table 20 lists the selected codes and examples for third person singular. Six-year-olds had significantly more *marked third person singular* production (*Mdn* = 9.50) than four-year-olds (*Mdn* = 2.00), $U(N_{4TD} = 11, N_{6TD} = 10,) = 20.50$, $z = -2.438$, $p = .013$. Figure 12 shows the distribution of counts for *marked third person singular*. This trend was similar when percentage of opportunities was examined, as the 6TD group produced *marked third person singular* in 72.73% of opportunities, and the 4TD group produced *marked third person singular* in 58.02% of opportunities.

The 4TD (*Mdn* = 1.0) and 6TD (*Mdn* = 2.0) groups had similar counts of *zero third person singular*, $U(N_{4TD} = 11, N_{6TD} = 10,) = 49.50$, $z = -.395$, $p = .705$. The 6TD group produced *zero marked third person singular* in 27.27% of opportunities, and the 4TD group produced *zero marked third person singular* in 41.98% of opportunities. Table 21 presents Mann-Whitney *U* tests and Figure 13 shows the distribution of counts for *zero marked third person singular*. See Table 22 for percentage of opportunity.

Selected features: Copula-Be (Language Sample).

Table 23 lists the selected codes and examples for *copula: be*. Six-year-olds produced statistically significantly more *marked copula: is (uncontracted)* (*Mdn* = 9.50) than four-year-olds (*Mdn* = 4.54), $U(N_{4TD} = 11, N_{6TD} = 10,) = 11.00$, $z = -3.113$, $p = .001$. Figure 14 shows the distribution of counts for *marked copula: is (uncontracted)*. Percentage of opportunity revealed a similar trend, as the 6TD group produced *marked copula: is (uncontracted)* in 35.94% of opportunities, whereas the 4TD produced *marked copula: is (uncontracted*) in 20.08% of opportunities. See Table 24 for Mann-Whitney *U* tests and Table 25 for percentage of opportunity.

Six-year-olds also produced more *marked copula: is (contracted)* (*Mdn* = 24.0) than four year olds (*Mdn* = 13.0), which was statistically significant $U(N_{4TD} = 11, N_{6TD} = 10,) = 23.50$, $z = -2.22$, $p = .024$. Figure 15 shows the distribution of counts for *marked copula: is (contracted)*. Though the overall difference of production between the two groups was statistically significant, children in both groups produced *marked copula: is (contracted)* at similar rates (4TD = 61.04%) and (6TD = 59.90%).

Four-year-olds had more *zero marked copula: is* production (*Mdn* = 4.0) than six year olds (*Mdn* = 1.0), which was statistically significant $U(N_{4TD} = 11, N_{6TD} = 10,) =$

25.50, z = -2.113, p = .036. Figure 16 shows the distribution of counts for *zero marked copula: is*. When opportunity was examined, 4TD children produced *zero marked copula: is* in 18.07% of opportunities, whereas 6TD children produced *zero marked copula: is in* 3.13% of opportunities. See Table 25 for percentage of opportunity.

A total of 23 codes were examined for the copula. However, no other differences were statistically significant. In terms of performance given the opportunity, both groups performed similarly for production of: *copula: am* with the 4TD group producing *marked copula: am (uncontracted)* 7.69% of the time, *marked copula: am (contracted)* 69.23% of the time, and *zero marked copula: am* 23.08% of the time and the 6TD group producing *marked copula: am* (*uncontracted)* 4.76% of the time, *marked contracted copula: am* 80.95% of the time, and *zero marked copula: am* 14.29% of the time.

Both groups produced creole-specific *copula: is (leveled)* at low rates, but had similar percentage of opportunity (4TD = .4%; 6TD = 1.05%). The 6TD group (35.94%) produced *marked copula: is(uncontracted)* in more opportunities than 4TD (20.08%). When *creole-specific zero marked copula: is* was examined, 4TD children produced *zero marked copula: is* in 18.07% of opportunities, whereas 6TD children produced *zero marked copula: is* in 3.13% of opportunities. See Table 25 for percentage of opportunity.

Copula: are was examined to determine performance in terms of opportunity. Though the overall difference in frequency production was not statistically significant, the groups performed differently. The 4TD group produced *zero marked copula: are* in 51.43% of opportunities, produced *marked copula: are(uncontracted)* in 17.14% of opportunities, and produced *copula: are(contracted)* in 31.43% of opportunities. On the other hand, the 6TD group produced *zero marked copula: are* in 6.25% of opportunities,

produced *marked copula: are (uncontracted)* in 28.13% of opportunities, and produced *copula: are (contracted)* in 65.63% of opportunities. Refer to Table 25 for percentage of opportunity.

Copula: was was examined. Though the overall difference in frequency production was not statistically significant, the groups performed differently. The 4TD group produced the *copula: was* at an overall low count, but produced *marked copula: was* in 100% of opportunities. Similarly, the 6TD group also produced past tense *copula: was* at an overall low count, but produced *marked copula: was* in 88.37% of opportunities, and produced *copula: was (leveled)* in 11.63% of opportunities. See Table 25 for percentage of opportunity.

Copula: were had a very low frequency count overall, with only the 4TD group producing it on one occasion, and marking it.

Selected features: Auxiliary (Language Sample).

Table 26 lists the selected codes and examples for *auxiliary.* A total of 23 codes were examined for the auxiliary; however, only two morpho-syntactic features were statistically significant. Six-year-olds had more *auxiliary: am (contracted)* production (*Mdn* = 4.5) than four-year-olds (*Mdn* = 1.0), which was statistically significant $U(N_{4TD} = 11, N_{6TD} = 10,) = 20.50$, $z = -2.464$, $p = .014$. Figure 17 shows the distribution of counts for *auxiliary: am (contracted)*. There was also a slight difference in terms of production when opportunity was examined. The 6TD group produced *marked auxiliary: am (contracted)* in 63.81% of opportunities, and the 4TD group produced *marked auxiliary: am (contracted)* in 51.16% of opportunities.

Six-year-olds had significantly more *auxiliary: is (uncontracted)* production (*Mdn* = 7.5) than four-year-olds (*Mdn* = 2.0), $U(N_{4TD} = 11, N_{6TD} = 10,) = 15.0$, $z = -2.855$, $p = .004$. Figure 18 shows the distribution of counts for *auxiliary: is (uncontracted).* The 6TD group (48.36%) produced more *marked auxiliary: is (uncontracted)* in more opportunities than the 4TD group (18.92%). Table 27 presents all Mann-Whitney *U* tests results for four and six-year-olds and Table 28 displays percentage of opportunity.

Although the remaining morpho-syntactic features related to the *auxiliary* did not have any significant differences in terms of overall count production, the percentage of use divided by opportunity was examined.

Examination of *auxiliary: am* noted different profiles between groups. The 6TD group produced fewer *zero marked auxiliary: am* features, producing *zero marked auxiliary: am* in (10.48%) of opportunities, whereas the 4TD group produced *zero marked auxiliary: am* in 44.19% of opportunities. The 6TD group produced more *marked auxiliary: am (uncontracted)* features, as they produced *marked auxiliary: am(uncontracted)* in 25.71% of opportunities, and the 4TD group produced *marked auxiliary: am (uncontracted)* in 4.65% of opportunities.

Another notable difference was observed in *zero auxiliary: is* production, where 4TD produced more *zero auxiliary: is* in 32.43% of opportunities, and 6TD produced *zero auxiliary: is* in 9.43% of opportunities.

Comparisons of *auxiliary: are* did not yield significant differences between the two groups in terms of overall frequency; and similar performance profiles were noted when opportunities were examined. The 4TD group produced *marked auxiliary: are(uncontracted)* in 23.19% of opportunities, produced *marked auxiliary:*

are(contracted) in 43.48% of opportunities, and produced *zero marked auxiliary: are* in 33.33% of opportunities. The 6TD group similarly produced *zero marked auxiliary: are* in 32.81% of opportunities, but produced *marked auxiliary: are (uncontracted)* in 46.88% of opportunities, and produced *marked auxiliary: are(contracted)* in 20.31% of opportunities. See Table 28 for percentage of opportunity.

Auxiliary: was did not yield significant differences between the two groups in terms of overall occurrence. Differences, however, were noted when opportunities were examined. The 4TD group produced *marked auxiliary: was* in 97.05% of opportunities, and produced *zero marked auxiliary: was* in 2.94% of opportunities; however, the 6TD group produced *marked auxiliary: was* in 80.43% of opportunities and produced *zero marked auxiliary: was* in 2.17% of opportunities, but also produced *leveled auxiliary: was* in 17.39% of opportunities. Refer to Table 28 for percentage of opportunity.

Morpho-syntactic features related to *auxiliary: were* had a very low frequency rate overall, but in the presented opportunities, the 4TD group produced *zero marked auxiliary: were* in 80% of opportunities and produced *marked auxiliary: were* in 20% of presented opportunities; however, the 6TD group produced *marked auxiliary: were* in 100% of presented opportunities. Refer to Table 28 for percentage of opportunity.

Morpho-syntactic features related to *modals* had a very low frequency rate overall, however, the 6TD group produced *marked auxiliary: will (contracted)* in 93.33% of opportunities and the 4TD group produced *marked auxiliary: will (contracted)* in 50% of opportunities. The 4TD group produced creole-specific features *zero marked auxiliary: will* in 17.67% of opportunities, produced *gin/gon* in 22.22% of opportunities, and produced *ga* in 5.56% of opportunities. The 6TD group produced *zero marked*

auxiliary: will in 6.67%of opportunities but did not produce *gin/gon or ga* features. Refer to Table 28 for percentage of opportunity.

Impact of creole density (language sample).

The pilot study based creole density as a percentage of creole-specific feature use across utterances produced and the impact of creole density was assessed on how many different creole-specific features participants used. Language use among six participants with the highest creole density (three per group) was examined. The three four-year-olds who had the highest creole density produced the following creole-specific features: *zero marked regular plural, zero marked regular past, zero marked irregular past, zero third person singular, zero marked possessive, zero copula am, zero copula is, copula- is (leveled), zero copula are, zero auxiliary am, zero auxiliary is, auxiliary- is (leveled), zero auxiliary are, zero auxiliary will,* and *gin*. The three six-year-olds who had the highest creole density produced the following creole-specific features: *zero marked regular plural, zero marked regular past, did + verb, zero marked irregular past, zero marked third person singular, zero possessive, zero copula is, copula is (leveled), zero copula are, copula was (leveled), zero auxiliary is, zero auxiliary am, is + verb, is + be+ verb, zero auxiliary are, zero auxiliary was,* and *auxiliary was (leveled).* Overall, the three participants from the 4TD group, had a combined creole-density of 17.56%, and produced 15 different creole-specific features. The three participants of the 6TD group had a combined creole density of 10.74% and produced 17 different creole-specific features. These findings suggest potential developmental differences between four and six-year-olds. Although the 4TD children had a higher frequency of creole-specific

features, there were two features, used by the 6TD children, that were not observed (e.g., *possessive* + *own*, *did* + *verb*).

Summary

The overarching research question for this pilot study was: What are the surface morpho-syntactic features of children who speak BCE? It was hypothesized that differences in BCE syntax development would be noted between four- and six-year old children. Further, we predicted that the frequency of creole-specific features would vary based on task demands (e.g., story retell versus sentence completion task) and creole density (i.e., measure of child's BCE feature use in the language samples).

Creole-Specific Feature Use Across Three Discourse Tasks

Preliminary data suggest that, overall, four-year-olds had a higher creole density than six-year-olds. Additionally, four-year-olds produced higher levels of creole-specific features than six-year-olds, regardless of the task. Statistically significant differences were detected for the story retell, story generation, and sentence completion tasks. These results suggest that as children's language develops from ages four to six, they are likely using more creole-universal and fewer BCE features. One possible contribution to these changes may be related to academic instruction. Older children may have had more experience with academic-related tasks such as narrative production and narratives are likely taught by teachers using creole-universal features. One limitation of this study is that the six-year-olds were not all in the same grade. Future studies should control for both children's age and grade placement, so that potential differences in the frequency of creole-feature use could be examined across multiple grades.

It was also hypothesized that frequency of creole-specific morpho-syntactic use would vary depending on the task; however, groups had different performance profiles. Children in the 4TD group had similar amounts of creole-specific features during the story generation and the story retell, and used more creole-specific features during the sentence completion task (TEGI-ST). On the other hand, children in the 6TD group used incrementally more creole-specific features, with the fewest features used during the story retell, slightly more in the story generation, and the most in the sentence completion task (TEGI-ST).

Developmental trends: What warrants further investigation?

As a group, 4TD children had a higher creole density than 6TD children. It was hypothesized that creole-specific morpho-syntactic features use would vary by creole density. When all morpho-features were assessed, 4TD children did not have any instances of *marked irregular plural, zero marked irregular plural, did + verb, possessive + own, copula- was (leveled), is + be +verb,* and *auxiliary-was (leveled)*. On the other hand, 6TD children did not have any instances of *gin, ga, zero marked auxiliary: were, be + verb,* and *copula- were*. However, children with a higher creole-density classification did not necessarily use all identified creole-specific morphemes.

Difference in use was noted for active past tense, and groups varied in terms of overall production (i.e., the total number of a selected morpheme), the proportion of individual feature use (i.e., the number of times used divided by the number of opportunities to use this feature), as well as morpheme presence (i.e., any identifiable instances of a morpheme). The pilot data suggest that *did + verb* feature could be a later acquired morpho-syntactic feature in Bahamian children. Similarly, groups had

differences in overall production (i.e., the total number of a selected morpheme) and proportion of use (i.e., the number of times used divided by the number of opportunities to use this feature) for *marked third person singular,* indicating that *marked third person singular* is still developing in four-year-olds. There was also much variability in *copula be* and *auxiliary be* between groups. This variability warrants further study because this finding may reflect developmental differences between four and six-year olds. As such these morpho-syntactic features, were examined in the dissertation study.

Both groups produced *marked regular plurals* more than 90% of the time. Preliminary data suggest that 4-year-old and 6-year-old Bahamian children will have variable use of creole-universal and creole-specific features, however, there is a preference for creole-universal *marked regular plural* for both groups. As both groups performed similarly, plurals were not examined in the dissertation study.

Possessive features yielded significant differences in terms of overall production, and there were slight differences noted between frequency use given the opportunity. The creole-specific pattern *possessive + own* was only observed in 6TD; however, the overall frequency was low. As such, possessives were not examined in the dissertation study.

Additionally, though there was much variability in *auxiliary-will, ga, and gin* pattern use, due to the overall low counts of production, these modals were not examined in the dissertation study.

It is important to note that the frequency of some morpho-syntactic features was generally low. In the dissertation study, the number of children who produced each targeted morpho-syntactic feature, or pattern, was examined in addition to the overall frequency per group. Groups were divided into six-month age ranges to examine

potential differences in younger versus older four and six year olds (i.e., 4:0-4:5; 4:6-4:11; 6:0-6:5; 6:6-6:11).

Limitations

As this study was exploratory, limitations for this study generally include the small sample size. In addition, the language sample, which served as the primary data source, was collected in a natural context. Therefore, specific morpho-syntactic features, or patterns, were not elicited. Nevertheless, because differences were found in four and six-year olds for morphemes related to verb tense, the findings support further examination of features related to verb tense including third person singular, past tense, auxiliary, and copula. Further, within group comparisons should be conducted to determine if marking trends differ within an age group rather than between age groups. In addition, the effects of adult use on children's production was not examined, as the pilot study did not control for language use by the examiner when collecting the language and narrative samples. The examiner mostly used English but occasionally code-switched to BCE as she is a Bahamian native. Future investigations should examine the effects of the examiner's language model on children's productions.

Dissertation Methodology

Overview

The literature on BCE, Caribbean English, and nonmainstream English dialects reviewed from the fields of linguistics and CSD, and results from the pilot study informed the research questions, design, and methods of the dissertation study. Given the state of BCE research, the dissertation study sought to fill content-specific gaps. This study identified the surface morpho-syntax features of children without suspected language disorder and explored developmental trends of BCE.

As stated previously, there is a dearth of research on nonmainstream English dialects and Caribbean English such as BCE. Although BCE use in adults has received some attention, language characteristics of children with and without language disorder are understudied. Studies that address well-investigated nonmainstream dialects (i.e., AAE) in children first seek to identify the features unique to typical developing children, before examining these same features in children with DLD (Seymour, Bland-Stewart, & Green, 1998; Oetting & McDonald, 2001). More recent studies have extended this focus by including the dialect density in the analysis (Newkirk-Turner, Oetting, & Stockman, 2016) and accounting for the phenomenon of code switching (Craig, Kolenic, & Hensel, 2014). Though the focus of this research area has expanded over the years, what remains consistent across studies, however, is the use of quantitative methods for analysis.

Although the methods of obtaining, transcribing, and analyzing language samples are common within qualitative research, CSD researchers investigating dialectal features typically analyze language samples quantitatively (e.g., testing for statistical significance, discriminant analyses, etc.). Specific to nonmainstream English dialects, quantitative data

analysis provides information regarding frequently occurring features, how to distinguish typical development from language impairment given dialect features, and the effect of tasks on dialect use.

In extending this field of work to BCE, samples of language were gathered via language samples, sentence elicitation tasks, a narrative generation task, and a story retell task, as conducted in the pilot study. Language samples were then transcribed, coded, and comparisons between groups were made. As information on the morpho-syntax of children who speak BCE remains understudied, this dissertation investigated the morpho-syntax of typically developing BCE-speaking children, addressing research questions and specific aims derived from the pilot study.

Research Questions

The current study seeks to answer the following research questions, specific aims and hypotheses:

Research Question 1: Does code-switching, or use of BCE, vary with the adult's language model (i.e., BCE or SE) in four and six-year-olds?

Specific Aim 1: Describe age-related use of code-switching and rate of BCE and SE feature use across adult language models.

Hypothesis: It was hypothesized that the rate of BCE feature use will be higher when the adult models BCE than when the adult models SE.

Research Question 2: Does code-switching, or use of BCE, vary with the adult's language model (i.e., BCE or SE) in first graders and second graders?

Specific Aim 2: Describe grade-related use of code-switching and rate of BCE and SE feature use based on adult language modeling.

Hypothesis: It was hypothesized that the rate of BCE feature use will be higher when the adult models BCE than when the adult models SE.

Research Question 3: Does BCE feature use vary by task (i.e., conversation, narrative retell, narrative generation, sentence completion) in four and six-year-olds?

Specific Aim 3: Determine if tasks (i.e., conversation, narrative tasks, sentence completion) elicit more or fewer BCE features within four and six-year-olds age groups.

Hypothesis: It was hypothesized that higher rates of BCE features will be observed on tasks that require a higher cognitive demand, or language capacity such as in narrative production. However, there will be different trends depending on the age.

Research Question 4: Does BCE feature use vary by task (i.e., conversation, narrative retell, narrative generation, sentence completion) in first graders and second graders?

Specific Aim 4: Describe children's use of code-switching and rate of morpheme use across grades.

Hypothesis: It was hypothesized that the rate of BCE feature use will be smaller in children from higher grades than in children from lower graders.

Research Question 5: What morpho-syntactic features related to verb tense are used by four and six-year old BCE speaking children, who are simultaneously

exposed to SE?

Specific Aim 5: Establish children's use of BCE morpho-syntactic features.

Hypothesis: It was hypothesized that specific morpho-syntactic features , such as *active past tense, third person singular, copula be,* and *auxiliary be* will have variations that can be associated with development.

Design

The nature of this dissertation study was exploratory. A mixed group design was used to examine differences within and between four and six-year-olds' BCE use. Study measures included screening measures to rule out language disorder and dependent measures to examine language use. Several dependent measures were administered with BCE language modeling and then SE language modeling. That is, the examiner exclusively used BCE or SE during a particular task. Group differences, within group differences, developmental trends, and the relationships between BCE use and language task was then examined. Figure 19 provides a graphic representation of the measures and their aims.

Ethics Approval

As stated previously, IRB approval was obtained from the principal investigator's (PI's) university, James Madison University. Ethics approval was also obtained from The Bahamas' Ministry of Health, and the Public Health Authority/University of West Indies Ethics Board.

Setting and Procedures

It is important to note that the data for the dissertation study were collected during the COVID-19 pandemic. As such, in-person research activity was suspended early in the

participant recruitment phase. After a revision and approval of the IRB proposal, the protocol was adjusted to accommodate remote data collection. Each child was seen for two test sessions. Prior to COVID-19, face-to-face sessions were conducted for approximately 90 minutes plus breaks. After the COVID-19 modifications, remote sessions were conducted for approximately 65 minutes plus breaks. Order of administration varied depending on format (i.e., in-person vs. remote). BCE was used after screening measures were administered on the first day, and SE was modeled exclusively on the second day. Administration of tests was given in SE. See Tables 29 and 30 for procedures for face-to-face and remote data collection.

Parents first completed the consent form, case history form, and The Children's Communication Checklist-2 (CCC-2; Bishop, 2003). These forms were 1) completed and submitted in person; 2) completed, scanned ,and submitted to the PI; or 3) completed via Adobe Sign.

Data from two participants were collected face-to-face at a community center in Nassau (New Providence), Bahamas. JMU's site permission template was used to receive permission to conduct research at the community center. Data from the remaining participants were collected remotely via Google Meet. Two examiners collected data for this study, the PI and a research assistant. Both examiners are native BCE speakers.

It is important to note that alternative administration was utilized due to remote data collection. Specifically, children pointed to pictures on their end of the screens, and parents reported the number of the picture that the child pointed to. If the child was able, s/he told the examiner the number of the corresponding item.

Participants

Participants were recruited via flyers and word of mouth. Inclusionary criteria included Bahamian children living in The Bahamas. Exclusionary criteria included existing diagnoses (i.e., language disorder, hearing impairment, developmental disorder, and cognitive impairment) or unwillingness to being audio and video recorded.

Twenty-seven participants were recruited. Data were collected from two participants in March 2020 prior to the suspension of research activity, and then from 25 participants between July 2020 and September 2020 via telepractice. Seven participants were excluded from this study; one four-year-old due to attrition, three four-year-olds due to moderate language difficulty who were unable to complete language tasks or engage in conversation, one four-year-old with a suspected language disorder, and two six-year-olds who had suspected language disorder. The final sample included twenty typically developing children; seven four-year-olds (M = 4 years, 3 months, SD = 2.0 months) and thirteen six-year-olds (M = 6 years, 5 months, SD = 4.0 months). See Table 31 for participant information.

Screening Measures

Hearing screening: A hearing screening was only conducted for the two participants seen face-to-face. Participant 01 and Participant 02 passed their hearing screening at 20 dB and 500 Hz, 1000 Hz, 2000 Hz, and 4000 Hz tones. Hearing was judged to be adequate based on parent report, as parents were asked about concerns with hearing on the case history form.

Oral Motor & Articulation Screening: The phonological subtest of the Rice Wexler Test of Early Grammatical Impairment- Screening Test (TEGI-ST; Rice &

Wexler, 2001) was administered to screen for articulation impairments. There are 20 items in this probe and it is used to determine if children can produce /z/, /s/, /t/ and /d/. To pass, each participant had to score 4-5/5 on /z/, /s/, /t/, and /d/ phonemes in the final position of words. Participants were shown pictures and directed to respond using test prompts (e.g., "What is this?). Twenty-four participants passed the articulation screening; three participants who did not pass this screening were already excluded due to low language skills. Additionally, participants' oral motor mechanism was assessed for gross structure, lingual mobility, labial mobility, and diadochokinesis. Twenty-five participants passed the oral motor mechanism screening; two participants who did not pass the oral mechanism screening were already excluded due to low language skills.

The Primary Test of Nonverbal Intelligence Test (PTONI; Ehrler & McGhee, 2008): The PTONI was used to rule out intellectual disability. The PTONI assesses reasoning abilities in children ages 3 through 11. The PTONI requires the child to look at a series of pictures and designs on a page, to think of a rule for organizing the pictures and designs so as to exclude one, and then point to the option that does not belong with the others. The PTONI has a mean of 100 and a standard deviation of 15. The sensitivity and specificity for this test was not readily located, however, this test is commonly used due to the diverse normative sample. All participants obtained standard scores above a standard score of above 85. See Table 29 and Table 30 for participant performance on screening and classification measures.

Teacher Questionnaire: A teacher questionnaire was developed for teachers to report potential language difficulty observed within the classroom. However, this

measure was not administered due to the COVID-19 pandemic and subsequent school closures.

Children's Communication Checklist-2 (CCC-2; Bishop, 2006): The CCC-2 is a caregiver report measure designed to assess children's communication skills in the areas of pragmatics, syntax, morphology, semantics, and speech. Specific details regarding this measure can be found on page 27 as it was used for the pilot study. Children with a General Composite Score of < 85 were classified as having a suspected language disorder (LD); 3 children were excluded.

Sentence Imitation (SI) Subtest of the Test of Language Development, Primary (TOLDP-5; Newcomer & Hammill, 2019): This measure examines the ability of the respondent to repeat sentences of varying length. Repetition tasks are used as a screening measure for the identification of children with language disorder. However, it is important to note that the TOLDP-5 standardization sample did not include Bahamian children. As such, the PI used strategic dialectal scoring (see McDonald, Seidel, & Hegarty, 2016); that is, awarding points for exact repetitions that contained creole-specific features. The SI contains 37 items, and this standardized subtest has a mean of 10 and a standard deviation of 3 (Newcomer & Hammill, 2019). As per the TOLDP-5 examiner's manual, sensitivity (i.e., percentage children with language disorder were correctly identified) and specificity (i.e., children without language disorder were identified as not having a language impairment) were calculated for composite scores only. Though used descriptively to compare language ability, composites were not used for clinical classification due to the normative sample. Therefore, we decided that children with a Sentence Imitation of ≤ 7 would be classified as having a suspected

language disorder (LD). However, no participants received a standard score of 7 or less. See Table 31 and Table 32 for participant performance on screening and classification measures.

Dependent Measures

Multilingual Assessment Instrument for Narratives (MAIN; Gagarina et al., 2012): The MAIN is a narrative assessment designed for children from 3 to 10 years and evaluates both comprehension and production of narratives. As the MAIN has two parallel retell and story generation tasks, participants were administered one story retell and story generation by the examiner using BCE and the other set by the same examiner using SE. The stories for the MAIN were recorded and played aloud for the participant to ensure all participants are presented with the same stimuli. The story generation and retell narratives were transcribed using Systematic Analysis of Language Transcripts (SALT 16; Miller & Iglesias, 2016) and features of interest were coded (see page 61 for coding procedures).

Language sample: Two, 10-minute language samples were conducted with the participant and the examiner engaging in conversation without toys. Similar to procedures described by Washington, Fritz, Crowe, Kelly, & Wright Karem (2019), one sample was collected with the examiner using BCE and one with the examiner using SE. Children were asked open-ended questions to engage in conversation (e.g., Tell me about your family, tell me about your favorite game to play). There were instances where children were reluctant to engage in conversation. In these instances, a share and tell method was utilized to elicit more conversation (Timler, 2018). Specifically, the examiner shared memorized personal stories with the participant, in an attempt to

generate language. For example, the examiner told a story about a problem with a sibling or family member and asked the participant if they experienced something similar. The samples were transcribed and coded in SALT. All utterances produced by children in the language samples were analyzed; the language samples were not equated for length. As such, before the samples were coded for BCE feature use, the language sample length between the groups was examined for potential differences. The total number of verbal utterances was compared between four-year-olds (M = 100.29, SD = 45.11) and 6-year-olds (M = 119.38, SD = 49.28) in the BCE-modeled samples. Six-year-olds (Mdn = 157.00) produced more utterances than four-year-olds (Mdn = 111.00), but a Mann-Whitney U test determined that this difference was not statistically significant, $U(N_{4TD} = 7, N_{6TD} = 13,) = 54.00$, $z = .674$, $p = .536$. The total number of verbal utterances elicited during the SE-modeled samples was compared between four-year-olds (M = 84.86, SD = 38.82) and 6-year-olds (M = 99.53, SD = 31.82). Six-year-olds (Mdn = 97.00) produced more utterances than four-year-olds (Mdn = 75.00), but this difference was not statistically significant, $U(N_{4TD} = 7, N_{6TD} = 13,) = 51.00$, $z = .436$, $p = .699$.

Within group sample length was also examined to determine if language model affected sample length. Four-year-olds produced more utterances during the BCE-modeled language sample (Mdn = 111.00) than the SE-modeled language sample (Mdn = 75.00), but this difference was not statistically significant, $T = 3.00$, $z = -1.859$, $p = .063$. Six-year-olds did not differ in median values for language sample length with BCE-modeling (Mdn = 98.00) and SE-modeling (Mdn = 98.00), $T = 14.00$, $z = -1.962$, $p = .050$. Figure 20 presents the distribution of language sample length for 4TD and 6TD.

Rice Wexler Test of Early Grammatical Impairment Screening Test (TEGI-ST; Rice & Wexler, 2001): The TEGI-ST is a norm-referenced test of grammatical ability in Standard American English; third person singular and regular and irregular past tense morpho-syntactic features were elicited during this test. The TEGI-ST was administered and analyzed in the same manner as the pilot study. Specific details regarding this measure can be found on page 29. However, as a reminder, two scoring methods were utilized, one where only SE morpho-syntactic features were accepted as correct responses, and one where both SE and BCE morpho-syntactic features were accepted as correct responses. See Tables 33 and 34 for participant performance on the TEGI-ST.

Analysis Plan

Transcription. The two conversation samples and the four MAIN narrative samples were transcribed in Systematic Analysis of Language Transcripts (SALT 16; Miller & Iglesias, 2016) software. TEGI-ST responses were transcribed using Microsoft Excel. Samples were transcribed verbatim independently by two BCE-speaking research assistants (one a speech-language pathology assistant, one a speech-language pathologist) and one Standard American English-speaking graduate student research assistant.

The two BCE-speaking research assistants received two training sessions by the first author, reviewing the SALT conventions and study procedures with the PI. The graduate student research assistant previously received training during the pilot study data analysis; training wascomprised of weekly meetings where they practiced transcription of BCE.

Interrater reliability was conducted for 10% of both BCE and SE conversation samples, BCE and SE MAIN narrative samples, and sentence completion TEGI

responses. Inter-transcription agreement was calculated by dividing the number of agreements by the total number of agreements and disagreements. Inter-transcription agreement for the BCE language sample was 95.71%, SE language sample was 97.34%, BCE MAIN Story Retell was 100%, BCE MAIN Story Generation was 100%, SE MAIN Story Retell was 93.33% , SE MAIN Story Generation was 94.12%, and TEGI-ST sentence completion responses was 100%. All disagreements were settled by listening to each segment and agreeing on what was said. Following transcriptions, all transcripts transcribed by the native English speaker were checked by the PI to ensure that creole-specific productions were correctly transcribed.

Coding. Morpho-syntactic features of interest from the language samples, MAIN narratives, and TEGI-ST sentence completion responses transcripts were coded and classified as creole-specific (BCE) or creole-universal (standard English). For example, using the sentence, "I did eat my lunch" the code "BCE: did verb" was used for *did eat* (i.e., BCE marking option for past tense) and categorized as creole-specific (i.e., specific to BCE). It is important to note that children who speak English and BCE can use English (creole-universal), BCE (creole-specific), codeswitch, or use a combination of both in a single utterance. As such, all target morpho-syntactic features were categorized as creole-specific or creole-universal to truly capture the balanced nature of language use in Bahamian children.

The PI developed a codebook with definitions of 52 codes and examples for each morpho-syntactic feature of interest. The goal of this dissertation was to further investigate morpho-syntactic features identified from the pilot data. Morpho-syntactic

features related to verb forms (i.e., regular past tense, irregular past tense, third person singular, copula- be, auxiliary-be) were selected.

Coding was conducted by the PI, one BCE-speaking research assistant, and one graduate student research assistant. The BCE-speaking research assistant received two training sessions by the first author, reviewing the SALT conventions and study procedures with the PI. The graduate student research assistant previously received training during the pilot study data analysis; training received comprised of weekly meetings where they practiced coding of BCE.

Inter-coder reliability was conducted for 10% of BCE and SE conversation samples, BCE and SE MAIN narrative samples, and TEGI responses. Inter-coder agreement was calculated by dividing the number of agreements by the total number of agreements and disagreements. All disagreements were settled by consensus. Inter-coder agreement for the BCE language sample was 96.80%, SE language sample was 95.52%, BCE MAIN Story Retell was 100%, BCE MAIN Story Generation was 100%, SE MAIN Story Retell was 100% , SE MAIN Story Generation was 100%, and TEGI-ST sentence completion was 100%. Table 35 presents a complete list of morpho-syntactic feature morphemes, examples, and coded feature reliability. Following transcription coding by research assistants, all coded transcripts were reviewed by the first author.

Creole density. Following feature coding, the creole density, which is a percentage of feature use across utterances produced, was calculated for each participant. This is a metric used to describe how much BCE each participant uses. Creole density was calculated by taking the number of utterances containing at least one creole-specific feature divided by the total number of utterances (Oetting & McDonald, 2002).

Participant creole density was determined by averaging creole density from each language sample (one with BCE language modeling, one with SE modeling) (Craig, Kolenic, & Hensel, 2014). Participant creole density was then categorized using cut off values from Newkirk-Turner, Oetting, and Stockman (2014): 1) no use of BCE (density value of < 1%); 2) low use of BCE (density value ranged from 1% to 11%); 3) *medium* use (density value ranged from 11% to 20%); and 4) *high* use (density value greater than 20%). Table 36 presents a creole density by task, and overall average. Before any analyses were conducted, the creole density between groups was examined to determine significant differences. As a group, six-year-olds were categorized as *medium* users (M = 14.14), and four-year-olds were categorized as *low* users (M = 7.40). Six-year-olds had higher creole density than four-year olds, but this difference was not statistically significant, $U(N_{4TD} = 7, N_{6TD} = 13,) = 27.0$, $z = -1.466$, $p = .157$. Figure 21 presents creole density of both groups.

Statistical Tests. The goal of the dissertation proposal was to recruit a sample of 42 participants, which would have enabled between group comparisons (i.e., 4TD and 6TD) with a power of .80, an alpha level of 0.05, and an effect size of .8. Analysis of Variance (ANOVA) was also proposed as the statistical method to examine potential differences within and between groups. However, due to research activity restrictions during the COVID-19 pandemic, only 27 participants were recruited and seven participants were excluded. Therefore, data from twenty participants is presented.

Due to the small sample size (i.e., $N = 7$ four-year-olds and $N = 13$ six-year-olds) and lack of power, nonparametric statistical tests were used. For comparisons between two groups, the Mann-Whitney U test was used to examine differences between typically

developing four-year-olds ($N = 7$) and six-year-olds ($N = 13$). For within group comparisons, the Friedman's Two-way Analysis of Variance by Ranks test and the Wilcoxon signed-rank test were used to examine differences within each age group and grade. Statistical significance was set at $p < .05$.

Additionally, descriptive statistics were conducted to describe group mean performance, mean difference, and percentage. As a reminder, groups will be referred to as 4TD and 6TD, when discussing four-year-olds and six-year-olds with typically developing language, respectively. Additionally, when making grade comparisons, children will be referred to first graders ($N = 5$), and second graders ($N = 7$). Preschoolers ($N = 7$) were not included in the grade analysis, as the participants in the 4TD group and preschool group were nearly identical; grade comparisons were made only between first and second graders from the 6TD group.

CHAPTER FOUR: RESULTS

Research Question 1: Does code-switching, or use of BCE, vary with the adult's language model (i.e., BCE or SE) in four and six-year-olds?

Age: 4TD (N = 7)

Creole-specific feature use **(**CSFU) was compared between BCE modeled and SE modeled language samples, story retell tasks, and story generation tasks. On average, four-year-olds used more creole-specific features during the SE modeled tasks than the BCE modeled samples, but the difference was not statistically significant for any task. Figure 22 presents CSFU of four-year-olds across tasks. Table 37 presents Wilcoxon signed-rank tests for CSFU.

Age: 6TD (N = 13)

CSFU was compared between BCE modeled and English modeled language samples, story retell tasks, and story generation tasks. On average, six-year-olds used more creole-specific features during the BCE modeled tasks than the SE modeled samples, but the difference was not statistically significant for any task. Figure 23 presents CSFU of six-year-olds across tasks. Table 38 presents Wilcoxon signed-rank tests for CSFU.

Research Question 2: Does code-switching, or use of BCE, vary with the adult's language model (i.e., BCE or SE) in first graders and second graders?

Grade: First Grade (N = 5)

CSFU was compared between BCE modeled and SE modeled language samples, story retell tasks, and story generation tasks. First graders used more creole-specific features during the BCE modeled tasks than the SE modeled samples, but the difference

was not statistically significant for any task. Figure 24 presents CSFU of first graders across tasks. Table 39 presents Wilcoxon signed-rank tests.

Grade: Second Grade (N =7)

CSFU was compared between BCE modeled and SE modeled language samples, story retell tasks, and story generation tasks. On average, second graders used more creole-specific features during the BCE modeled tasks than the SE modeled samples. However, only the story generation task was statistically significant. Second graders used significantly more creole-specific features during the BCE story generation (*Mdn* = 40.90) than the SE modeled story generation task (*Mdn* = 11.11), $T = .00$, $z = -2.371$, $p = .018$. Figure 25 presents CSFU of second graders across tasks and Table 40 presents Wilcoxon signed-rank tests.

Research Question 3: Does BCE feature use vary by task (i.e., conversation, narrative retell, narrative generation sentence completion) in four and six-year-olds?

4TD (N = 7)

A Friedman test was conducted to determine if there were within group differences in BCE feature use among the language sample, story retell, story generation, and sentence completion tasks. Pairwise comparisons were performed with a Bonferroni correction for multiple comparisons. CSFU was statistically significant across tasks, $X^2_F(3) = 10.059$, $p = .018$. Post hoc analysis revealed statistically significant differences in CSFU between the language sample (*Mdn* = 15.46) and sentence completion task (*Mdn* = 62.50). CSFU did not significantly differ between any other tasks. Figure 26 presents

CSFU of four-year-olds across all tasks. Table 41 presents post-hoc analysis results for CSFU.

6TD (N = 13)

A Friedman test was conducted to determine if there were differences in BCE feature use across tasks in the six-year-olds. Pairwise comparisons were performed with a Bonferroni correction for multiple comparisons. CSFU was statistically significant across tasks, $X^2_F(3) = 13.72$, $p = .003$. Post hoc analysis revealed statistically significant differences in CSFU between the story retell (*Mdn* = 6.25) and sentence completion task (*Mdn* = 25.50). CSFU did not significantly differ between any other tasks. Figure 27 presents CSFU of six-year-olds across all tasks. Table 42 presents post-hoc analysis for CSFU.

Research Question 4: Does BCE feature use vary by task (i.e., conversation, narrative retell, narrative generation, sentence completion) vary in first graders and second graders?

Grade 1 (N = 5)

A Friedman test was conducted to determine if there were within group differences in BCE feature use among the language sample, story retell, story generation, and sentence completion tasks in first graders. First graders used the least amount of creole-specific features during the story retell, and the most on the sentence completion task; however, the differences were not statistically significant between tasks, $X^2_F(3) = 4.47$, $p = .215$. Figure 28 and Table 43 presents CSFU of first graders across all tasks.

Grade 2 (N = 7)

CSFU among the language sample, story retell, story generation, and sentence completion tasks was compared in second graders. A Friedman test found statistically significant differences between tasks, $X^2_F(3) = 9.83$, $p = .020$; however, no pairwise comparisons were statistically significant following the Bonferroni adjustment. Figure 29 and Table 43 presents CSFU of second graders across all tasks.

Research Question 5: What morpho-syntactic features related to verb tense are used by four and six-year old BCE speaking children, who are simultaneously exposed to SE?

Morpho-syntactic Production of Bahamian Children

Target morpho-syntactic feature production was examined in the context of the TEGI sentence completion task, (note that not only morphemes described below were tested on the TEGI) and the BCE and SE modeled language samples. For the sentence completion task, verb tense use was calculated by taking a percentage of the number of items that were either marked regular or irregular past tense by the total number of items presented.

The total number of target morpho-syntactic features was examined during the language samples. Additionally, the percentage of opportunity (that is, the number of times a specific feature was used divided by the number of opportunities that the morpheme occurred, no matter how it was marked to occur) was also examined.

Selected features: Past Tense

Creole-universal and creole-specific features related to past tense were selected for group comparison. Table 14 lists the selected codes and examples. Past tense marking

was separated into regular and irregular past tense to determine trends specific to regular and irregular instances.

Sentence Completion (TEGI). Six-year-olds (*Mdn* = 63.15) produced more creole-universal morpho-syntactic features (i.e., producing marked regular past or irregular past) than four-year-olds (*Mdn* = 25.00), however, this difference was not statistically significant $U(N_{4TD}=7, N_{6TD}=13,) = 68.500$, $z = 1.827$, $p = .067$. Figure 30 shows the distribution of creole-universal marking of past tense morpho-syntactic features.

BCE Modeled Samples. The 6TD group produced creole-specific morpho-syntactic features 39.31% of the time, and creole-universal morpho-syntactic features 60.69% of the time. The 4TD group produced creole-specific morpho-syntactic features 52.27% of the time and creole-universal morphemes 47.73% of the time. Six-year-olds (*Mdn* = 2.00) produced significantly more *zero regular past tense* than four-year-olds (*Mdn* = 0.00), $U(N_{4TD} = 7, N_{6TD} = 13,) = 17.50$, $z = -2.270$, $p = .024$. Figure 31 shows the distribution of counts for *zero regular past tense*. Though significant in terms of overall production difference, when the opportunity was examined, the 6TD produced *zero regular past tense* in 41.35% of opportunities, and the 4TD group produced *zero regular past tense* in 66.66% of opportunities. Comparisons for *regular past* $U(N_{4TD} = 7, N_{6TD} = 13,) = 25.00$, $z = -1.697$, $p = .115$, *did + verb* $U(N_{4TD} = 7, N_{6TD} = 13,) = 35.00$, $z = -1.338$, $p = .438$, *irregular past* $U(N_{4TD} = 7, N_{6TD} = 13,) = 23.50$, $z = -1.760$, $p = .081$, and *zero irregular past* $U(N_{4TD} = 7, N_{6TD} = 13,) = 40.00$, $z = -.448$, $p = .699$, did not yield statistically significant differences in terms of overall production.

Differences in trends were observed given the opportunity. For regular past tense, the 6TD group produced *marked regular past* in 58.65% of opportunities, and the 4TD group in 33.33% of opportunities. For irregular past, with 6TD producing *marked irregular past* in 70% of opportunities, and the 4TD group produced *irregular past* in 51.42% of opportunities. As expected, based on the marked patterns, 6TD children produced *zero marked irregular past* 30% of the time, and the 4TD group produced *zero marked irregular past* 48.57% of the time.

As children can use the *did + verb* pattern for irregular or regular verbs, *did + verb* was examined given all opportunities. The 6TD group produced *did + verb* in 6.87% of opportunities, but the 4TD group did not produce any *did + verb* features. Table 44 presents Mann-Whitney *U* results. Figure 32 shows the distribution of counts for *regular past*, *zero regular past*, *did + verb*, and *zero irregular past*. The percentage of opportunity is listed in table 45.

SE Modeled Samples. The 6 TD group produced creole-specific morpho-syntactic features 27.83% of the time and creole-universal features 72.17% of the time. The 4TD group produced creole-specific morpho-syntactic features 51.11% of the time and creole-universal features 48.89% of the time given SE language modeling.

Six-year-olds (*Mdn* = 3.00) produced significantly more *marked regular past tense* than four-year-olds (*Mdn* = 0.00), $U(N_{4TD} = 7, N_{6TD} = 13,) = 19.00$, $z = -2.207$, $p = .037$. Figure 33 shows the distribution of counts for *marked regular past tense*. Similar in terms of overall production difference, when the opportunity was examined, the 6TD produced *marked regular past tense* in 69.23% of opportunities, and the 4TD group produced *marked regular past tense* in 16.67% of opportunities.

Comparisons for *zero regular past* $U(N_{4TD} = 7, N_{6TD} = 13,) = 45.00$, $z = -.041$, $p = 1.00$, *did + verb* $U(N_{4TD} = 7, N_{6TD} = 13,) = 31.50$, $z = -1.588$, $p = .275$, *irregular past* $U(N_{4TD} = 7, N_{6TD} = 13,) = 25.500$, $z = -1.593$, $p = .115$, and *zero irregular past* $U(N_{4TD} = 7, N_{6TD} = 13,) = 41.00$, $z = -.371$, $p = .757$, did not yield statistically significant differences. However, there were differences in the morpho-syntax marking. The 6TD group produced *zero marked regular past* in 30.77% of opportunities, and the 4TD group produced *zero marked regular past* in 83.33% of opportunities. The 6TD group produced *marked irregular past* in 79.84% of opportunities, and the 4TD group produced *irregular past* in 60.60% of opportunities. Differences were noted in *zero marked irregular past,* with the 6TD group producing them 31.31% of the time, and the 4TD group producing *zero marked irregular past* 39.39% of the time.

As children can use the *did + verb* pattern for irregular and regular verbs, *did + verb* was examined given all opportunities. The 6TD group produced *did + verb* in 4.72% of opportunities, but the 4TD group did not produce any *did + verb* features. Table 46 presents Mann-Whitney *U* results. Figure 34 shows the distribution of counts for *regular past*, *zero regular past*, *did + verb*, and *zero irregular past*. The percentage of opportunity is listed in table 47.

Selected features: Third Person Singular

Creole-universal and creole-specific features related to third person singular were examined. Table 20 lists the selected codes and examples.

Sentence Completion (TEGI). Six-year-olds (*Mdn* = 80.00) produced more creole-universal morpho-syntactic features than four-year-olds (*Mdn* = 25.00), however, this difference was not statistically significant $U(N_{4TD} = 7, N_{6TD} = 13,) = 68.500$, $z = 1.842$,

p = .067. Figure 35 shows the distribution of creole-universal marking of third person singular morpho-syntactic features.

BCE Modeled Samples. The 6TD group produced creole-specific morpho-syntactic features 29.41% of the time, and creole-universal morpho-syntactic features 70.59% of the time. The 4TD group produced creole-specific morpho-syntactic features 25.64% of the time and creole-universal morphemes 74.35% of the time.

Comparisons for *marked third person singular* $U(N_{4TD} = 7, N_{6TD} = 13,) = 48.500$, $z = .240$, $p = .817$, *zero third person singular* $U(N_{4TD} = 7, N_{6TD} = 13,) = 33.00$, $z = -1.102$, $p = .351$, and *does + verb* $U(N_{4TD} = 7, N_{6TD} = 13,) = 52.50$, $z = 1.065$, $p = .588$, did not yield statistically significant differences in terms of overall production. Table 48 presents Mann-Whitney *U* test results.

For third person singular, the 4TD group produced *marked third person singular* morpho-syntactic features in 76.32% of opportunities, and the 6TD group in 70.60% of opportunities. In terms of creole-specific morphemes, the 4TD group produced more *zero marked third person singular* in 23.68% of opportunities, whereas the 6TD group produced *zero marked third person singular* in 12.94% of opportunities. However, children in the 6TD group also produced the creole-specific *does + verb* pattern in 16.47% of opportunities; children in the 4TD group did not produce any *does + verb* patterns. Figure 36 shows the distribution of counts for *marked third person singular, zero marked third person singular, and does + verb*. The percentage of opportunity is listed in table 49.

SE Modeled Samples. The 6TD group produced creole-specific morpho-syntactic features 40.58% of the time, and creole-universal morpho-syntactic features

59.42% of the time. The 4TD group produced creole-specific morpho-syntactic features 12.50% of the time and creole-universal morphemes 87.50% of the time.

Comparisons for *marked third person singular* $U(N_{4TD} = 7, N_{6TD} = 13,) = 55.500$, $z = .777$, $p = .485$, *zero third person singular* $U(N_{4TD} = 7, N_{6TD} = 13,) = 52.50$, $z = .651$, $p = .588$, and *does + verb* $U(N_{4TD} = 7, N_{6TD} = 13,) = 52.50$, $z = 1.065$, $p = .588$, did not yield statistically significant differences in terms of overall production. Table 50 presents Mann-Whitney *U* test results.

Differences in trends were observed given the opportunity. For third person singular, the 4TD group produced *marked third person singular* morpho-syntactic features in 87.50% of opportunities, and the 6TD group in 59.42% of opportunities. In terms of creole-specific morphemes, the 4TD group produced fewer *zero marked third person singular* in 12.50% of opportunities, whereas the 6TD group produced *zero marked third person singular* in 30.43% of opportunities. However, children in the 6TD group also produced the creole-specific *does + verb* pattern in 10.14% of opportunities; children in the 4TD group did not produce any *does + verb* patterns. Figure 37 shows the distribution of counts for *marked third person singular, zero marked third person singular, and does +verb*. The percentage of opportunity is listed in Table 51.

Selected features: Copula be

Creole-universal and creole-specific features related to copula be were selected for group comparison. Table 25 lists the selected codes and examples. Due to clear overall production differences between groups, the overall production between six-year-olds and four-year-olds was not compared. Instead, the percentage of opportunities was examined. Additionally, due to a limited frequency (< 5 for a morpho-syntactic feature

for one age group), *copula: am* and *copula: were* were not examined. *Copula: is, copula: are, and copula: was* were examined.

BCE Modeled Samples. The 6TD group produced creole-specific morpho-syntactic features 18.40% of the time, and creole-universal morpho-syntactic features 81.60% of the time. The 4TD group produced creole-specific morpho-syntactic features 14.71% of the time and creole-universal morphemes 85.29% of the time.

When *copula: is* was examined, both groups produced *marked copula :is* similarly given the opportunity, with 4TD doing so in 76.92% of opportunities and 6TD doing so in 80.49% of opportunities. Both groups produced *zero marked copula: is* similarly as well, with 4TD producing *zero marked copula: is* in 23.08% of opportunities, and 6TD producing *zero marked copula: is* in 19.51% of opportunities.

A difference in profiles was observed for *copula: are.* The 4TD group produced *marked copula: are* in 87.50% of opportunities, and produced *zero marked copula: are* in 12.50% of opportunities. Given the opportunity, children in the 6TD group produced *marked copula: are* in 46.15% of opportunities, *zero marked copula: are* in 46.15% of opportunities, and *leveled copula is* 7.69% of opportunities (i.e., instead of marking or zero marking 'are' to indicate a plural, produced *is*).

Examining *copula: was* yielded similar results; the 4TD group produced *marked copula: was* in 100% of opportunities. The 6TD group produced *marked copula: was* in 98.21% of opportunities and *zero marked copula: was* in 1.79% of opportunities. The percentage of opportunity is listed in Table 52.

SE Modeled Samples. The 6TD group produced creole-specific morpho-syntactic features 12.32% of the time, and creole-universal morpho-syntactic features

87.68% of the time. The 4TD group produced creole-specific morpho-syntactic features 19.05% of the time and creole-universal morphemes 80.96% of the time.

When *copula: is* was examined, both groups produced *marked copula: is* similarly given the opportunity, with 4TD doing so in 88% of opportunities and 6TD doing so in 84.62% of opportunities. Both groups produced *zero marked copula: is* similarly as well, with 4TD producing *zero marked copula: is* in 12.00% of opportunities, and 6TD producing *zero marked copula: is* in 18.46% of opportunities.

A difference in profiles was observed for *copula: are.* The 4TD group produced *marked copula: are* in 50% of opportunities, and produced *zero marked copula: are* in 33.33% of opportunities. Given the opportunity, children in the 6TD group produced *marked copula: are* in 33.33% of opportunities, *zero marked copula: are* in 50.00% of opportunities. Both groups produced an instance of *leveled copula: is* (i.e., instead of marking or zero marking '*are*' to indicate a plural, produced *is*), with both the 4TD and 6TD groups produced *leveled copula: is* in16.67% of opportunities

Examining *copula: was* yielded similar results; both groups produced *marked copula: was* in 100% of opportunities. The percentage of opportunity is listed in Table 53.

Selected features: Auxiliary: be

Creole-universal and creole-specific features related to *auxiliary: be* were selected for group comparison. Table 26 lists the selected codes and examples. Due to clear overall production differences between groups, the overall production between six-year-olds and four-year-olds was not compared. Instead, the percentage of opportunities was examined. Additionally, due to a limited frequency (< 5 for a morpho-syntactic feature

for one age group), *auxiliary: am, auxiliary: are,* and *auxiliary: were* were not examined due to limited occurrence. *Auxiliary: is, and auxiliary: was* were examined.

BCE Modeled Samples. The 6TD group produced creole-specific morpho-syntactic features 68.24% of the time, and creole-universal morpho-syntactic features 31.77% of the time. The 4TD group produced creole-specific morpho-syntactic features 73.68% of the time and creole-universal morphemes 26.32% of the time.

When *auxiliary: is* was examined, the 4TD only produced creole-specific morpho-syntactic features. The 4TD group produced *zero marked auxiliary: is* in 60% of opportunities, *be + verb* in 20% of opportunities, and *is + verb* in 20% of opportunities. The 6TD group produced *marked auxiliary: is in* in 9.86% of opportunities, and produced *zero auxiliary: is* in 7.04% of opportunities, *be + verb* in 1.41% of opportunities, *is + be + verb* in 1.41% of opportunities, and *is + verb* in 80.28% of opportunities.

Auxiliary: was was produced differently depending on the group. Given the opportunity, the 4TD group produced *marked auxiliary: was* in 66.67% of opportunities and *zero marked auxiliary: was* in 33.33% of opportunities. The 6TD group had a clear preference for *marked auxiliary: was,* as they produced *marked auxiliary: was* in 91.30% of opportunities and *zero marked auxiliary: was* in 8.70% of opportunities. The percentage of opportunity is listed in Table 54.

SE Modeled Samples. The 6TD group produced creole-specific morpho-syntactic features 51.69% of the time, and creole-universal morpho-syntactic features 48.31% of the time. The 4TD group produced creole-specific morpho-syntactic features 50% of the time and creole-universal morphemes 50% of the time.

When *auxiliary: is* was examined, the 4TD only produced creole-specific morpho-syntactic features. The 4TD group produced *zero marked auxiliary: is* in 11.11% of opportunities, and *is + verb* in 88.89% of opportunities. The 6TD group produced *marked auxiliary: is* in in 10.26% of opportunities, and produced *zero auxiliary: is* in 12.82% of opportunities, *is + be + verb* in 5.13% of opportunities, and *is + verb* in 71.79% of opportunities.

Examining *auxiliary: was* yielded similar results; the 4TD group produced *marked auxiliary: was* in 100% of opportunities, and the 6TD group produced *marked auxiliary: was* in 94.29% of opportunities and *zero marked auxiliary: was* in 5.71% of opportunities. The percentage of opportunity is listed in Table 55.

CHAPTER FIVE: DISCUSSION

The surface morpho-syntactic features of children who are simultaneously exposed to Bahamian Creole English and Standard English is understudied. As such, speech-language pathologists examining the morpho-syntax of Bahamian children might encounter difficulty making informed decisions regarding development, difference, or disorder. The first step to address this difficulty in the assessment of Bahamian children is to document the morpho-syntax of typically developing children. Informed by the author's pilot study, this dissertation investigated BCE-feature use across different tasks and under different conditions of adult language modeling in an effort to document marking and verb-related morpho-syntactic patterns of typically developing four and six-year-old Bahamian children.

BCE Use and Adult Language Modeling (Age and Grade Related)

The first two aims of this study sought to describe children's use of creole-specific features when the adult models BCE or SE. Children's creole-specific feature use was examined for each age group and grade.

The language model did not significantly influence the productions of four and six-year-olds; however, when trends were examined, four-year-olds consistently used more creole-specific features, or BCE, during the SE modeled samples. This finding could be a result of familiarity; SE samples were elicited on the second day of testing, and participants could have felt more comfortable and as a result used more BCE features. The six-year-olds demonstrated the opposite pattern; the 6TD group consistently used more creole-specific features during the BCE modeled sample. This finding suggests that 6TD children are more sensitive to the adult's language use and are aware

of language demands, thus shifting to the code used by the adult. Figure 38 presents the trends of creole-specific feature use given language modeling for both age groups.

Creole-specific feature use was also examined for grades, as it has been found in the literature that differences tend to be grade-related and not necessarily age related. The only statistically significant finding observed was that second graders used more creole-specific feature during the BCE-modeled story generation task. Overall, first and second graders used more creole-specific features when the adult used BCE. However, they had different trends. First graders consistently produced almost twice as many creole-specific features when BCE was modeled. Second graders, however, used similar number during the language sample, and twice the number during the story retell, and four times the number during the story generation, making the difference between the story generation between the two tasks statistically significant. Figure 39 presents the trends of creole-specific feature and language model for all grades.

Overall, findings suggest that four-year-olds use of BCE is not affected by language modeling. On the other hand, six-year-olds' use of BCE can be affected by language modeling. First and second graders' use of BCE can also be affected by language modeling, but at higher rates in second graders. Though the majority of these comparisons were not statistically significant, it may be that the small sample reduced the power to detect these differences.

BCE Use During SE Administered Tasks and Child's Age

The third specific aim sought to determine which tasks, if any, elicit more or fewer BCE features. SE language modeling was used for two reasons 1) it enabled

comparison across four tasks, and 2) speech-language pathologists and teachers tend to use more Standard English modeling in formal testing settings.

Children in the 4TD group used significantly more creole-specific features in the story retell and sentence completion tasks than in the language sample. In terms of trends, the 4TD group used the least amount of creole-specific features during the language sample, similar amounts during the story retell and story generation, and the most during the sentence completion.

Children in the 6TD group significantly used more creole-specific features during the sentence completion task than in the story generation. In terms of trends, the 6TD group incrementally used more features depending on the task, with the least amount being used during the story retell, increasing CSFU during the story generation, increasing CSFU during the language sample, and the most CSFU during the sentence completion.

Differences between the four and six-year-olds suggest that 6TD participants were sensitive to expected performance during more academic tasks, which explains the decrease of creole-specific feature use during the retell. The 6TD ability to code-switch is still developing; however, because as the language demands increased, to generating a story and using a specific morpheme in a sentence production task, more creole-specific features were used. The 4TD had a similar trend, however, four-year-olds used similar amounts of creole-specific features during the story retell and story generation tasks. The difference in performance can be attributed to difficulty level (i.e., both tasks were equally difficult for four-year-olds), and/or not being sensitive to the language modeled by the examiner in the story retell. Figure 40 presents the performance profiles by age.

BCE Use During SE Administered Tasks and Child's Grade

The fourth aim sought to determine which SE modeled tasks, if any, elicit fewer BCE features in first and second graders.

First graders used the least amount of BCE during the story retell, more during the story generation, more during the language sample, and the most during the sentence completion task. First graders used significantly more creole-specific features during the language sample than during the story retell. It is hypothesized that first graders were sensitive to formal compared to informal tasks (i.e., story retell compared to language sample), but incrementally used more creole-specific features when tasks had a higher cognitive demand.

Second graders performed similarly to first graders; however, second graders used more creole-specific during the language sample. Second graders used the least amount of creole-specific features during the story retell, and incrementally used more creole-specific features from the story retell, to the story generation, to sentence completion tasks, and language sample suggesting that they are sensitive to informal (i.e., conversation) vs. academic tasks, but use more creole-specific features when a higher cognitive load is present. Figure 41 presents the performance profiles by grade.

Developmental trends: 4TD and 6TD Use of Past Tense, Third Person Singular, Copula-Be, and Auxiliary- Be

The fifth aim examined production of specific morphemes. The influence of language model was examined for past tense, third person singular, and the copula and auxiliary "to be" verb. As we hypothesized, both age groups had similar and different trends; however, these trends varied by verb category. Four-year-olds had a clear

preference for creole-specific marking of regular past tense, and a slight preference for creole-universal marking of irregular past, whereas six-year-olds had a slight preference for creole-universal marking of regular past tense and a clear preference for creole-universal marking of irregular past tense. Both groups had a clear preference for creole-universal marking of third person singular. Copula and auxiliary "to be" verb were variable between the groups. Broadly speaking, with the exception of third person singular, regardless of the modeled language, four-year-olds demonstrated preference for creole-specific marking. Six-year-olds were the opposite, as they generally demonstrated preference for creole-universal marking; however, they varied in the amounts of creole-specific and creole-universal marking given language modeling (used more creole-specific marking when BCE was modeled). This finding is particularly interesting, because, as a group, the six-year-olds were classified as having a higher creole density than four-year-olds, and it could be expected that six-year-olds would have a higher preference for creole-specific marking. However, their language use varied based on the adult model.

The current data suggests three creole-specific morphosyntactic features may be acquired later in development: *did + verb, does +verb,* and *is + verb.* Children in the 4TD group did not produce *did + verb*; however, this morpho-syntactic pattern was observed in the 6TD group. This finding is consistent with the results of the pilot study, suggesting that the *did + verb* pattern is a later acquired past tense marker for Bahamian children. Four out of thirteen 6TD participants produced *did + verb*; their ages ranged from 6:00 to 6:11 and their creole density ranged from low to high.

Participants in the 4TD group did not produce *does + verb*, but this morpho-syntactic pattern was observed in the 6TD group. This pattern was not examined during the pilot study. However, this finding suggests that *does + verb* is a later acquired pattern in Bahamian children. Two out of thirteen 6TD participants produced *does + verb*; their ages ranged from 6:00 to 6:50 and their creole density ranged from medium to high.

One participant in the 4TD group produced the *is + verb* pattern, suggesting that this could be a later acquired creole-specific pattern in Bahamian children. Six out of thirteen 6TD children produced *is + verb* pattern, ages ranging from 6:3-6:11 and creole-density use ranging from low to high. However, it is important to note that the 4TD group had a higher *is + verb* frequency production in the pilot study.

Conclusion

Use of creole-specific feature use varies with adult language models and task type; however, the creole-specific feature production pattern depends on the age and/or grade of the child. Younger children appeared to be more sensitive to familiarity with the examiner, and older children appeared to be more sensitive to the adult's language model. Further, younger children incrementally used more creole-specific feature tasks given task demands, whereas older children's creole-specific feature use changed across language sampling conversational tasks and the standardized test that required sentence completion.

Three morpho-syntactic feature patterns, *did + verb, does + verb, is + verb,* were found to be used by older children, suggesting that these patterns are generally acquired in children older than four-years-old, and as such, have reduced frequency in younger children.

The results of this study support a patterns and systems-based approach (i.e., considers language systems to be made up of dialect/creole-specific and dialect/dialect/creole-universal features) when investigating the language system of children who speak more than one language variation. Bahamian children who spoke both BCE and SE were found to be variable, and used both creole-specific and creole-universal marking throughout their interactions. The results of this study also support using multiple contexts to assess the language of Bahamian children, as they may vary in their creole-specific and creole-universal production depending on the task. As such, multiple contexts can provide speech-language pathologists with important information regarding a child's grammatical system repertoire.

Limitations

Limitations for this study generally include the small sample size. Further, due to COVID-19 restrictions on data activity, telepractice and alternative testing methods were utilized. Additionally, order effects are also a limitation as the order of tasks was not randomized. In addition, the primary data sources were open ended (i.e., language sample), and therefore, specific morpho-syntactic features, or patterns, were not elicited. As a result, some comparisons could not be made due to overall low production.

Future Research

Future investigations should include a larger sample, examine creole-specific feature use following randomization of tasks and examiner language models to control for order effects, and utilize probes for eliciting specific morpho-syntactic targets to increase opportunities for production. Additionally, comparisons should be made with

typically developing age-matched and creole-density matched groups to further investigate potential trends in variable marking.

In terms of using language modeling (BCE vs. SE) when investigating or assessing the morpho-syntax of Bahamian children, recommendations vary depending on the child's age. For older children, it is recommended that investigations elicit samples of language using both BCE and SE modeling, as older children appear to be sensitive to language models. This would enable the examiner to better describe children's language system and ability to code-switch. Further, studies should examine morpho-syntax across a wider range of grade levels. In the case of younger children, it is hypothesized that assessment conducted with the language variation most used at home would be sufficient for assessment purposes. Regardless of the language modeled however, both creole-specific and creole-universal marking should be examined, as the goal is to identify or rule out disorder within diversity, and the marking of morpho-syntactic features are variable in Bahamian children.

When assessing the morpho-syntax of Bahamian children, samples of language use in multiple contexts, including conversation, narration, and sentence completion, should be obtained as the results from this study demonstrated variable grammatical marking for both age groups across tasks. In addition to providing meaningful information regarding the morpho-syntactic development of a child, these contexts can be used to assess other language areas simultaneously (e.g., conversation for pragmatic language, narrative sample for story grammar).

In addition to increasing the sample size, the creation of an elicitation task, perhaps developed in a manner that could be seen as less academic (e.g., video probe)

would be helpful. In addition, the age groups should be expanded to include five and seven-year olds. This data could then be used to correlate performance with creole density. Analyses for these tasks could focus on investigation of morphosyntactic patterns only observed in the six-year-olds including *did + verb, does + verb, and is + verb.* The variability present in the current study raises questions about profiles of children with suspected language disorder- perhaps they are just as variable? More variable? Or perhaps they are not variable due to difficulty with language skills? As such, further investigations should examine the variability in marking of children with suspected language disorder and make comparisons with language and creole-density matched peers. The goal of these investigations should be to improve the ability to identify disorder within diversity. Speech-language pathologists who are assessing the language of children with suspected language disorder should incorporate a robust line of assessment procedures, inclusive of teacher and parent questionnaires and sampling of multiple language contexts. Additionally, creole-appropriate scoring should be used for known acceptable variations, and unknown creole productions can be verified with resources such as the target morpho-syntactic feature list and examples included in this dissertation, as well as checking use with native BCE speakers.

Appendix 1: Tables

Table 1
Select Documented Features of Adult BCE Speakers (Hackert, 2013; Seymour, 2009)

BCE Feature	Example
Zero plural	I have two *cat*.
Zero third person singular	My brother *live* in Abaco.
Possessive *own*	The dog is *her sister own.*
Zero copula	She in the house.
Demonstrative + copula	*Das* a big house.
Zero regular past	I *walk* the dog.
Copula *is* (leveled)	*I's* a teacher OR *I is* a teacher.

Table 2

Descriptive and Classification Information of Participants by Gender (N=21)

Group	*N*	F	M	Avg. age in months	CCC-2	QNWRT
4TD	11	4	7	53 (*3.6*)	105.27(*14.49*)	65.34(*8.55*)
6TD	10	6	4	75 (*2.5*)	118.00(*16.98*)	76.25(10.95)

Note. CCC-2= Children's Communication Checklist-2; QNWRT= Quasi-universal nonword repetition task.

Table 3
Classification Measures Performance of All Participants (N=21)

Participant ID	Gender	Age Group	CCC-2	QNWRT
Participant01	M	6 y.o	95	93.75
Participant02	F	4 y.o	101	68.75
Participant03	M	4 y.o	94	62.5
Participant04	M	6 y.o	120	87.5
Participant05	M	6 y.o	112	81.25
Participant06	F	4 y.o	143	62.5
Participant07	M	4 y.o	93	68.75
Participant09	F	6 y.o	132	62.5
Participant10	M	4 y.o	104	62.5
Participant11	F	4 y.o	92	68.75
Participant12	F	4 y.o	148	81.25
Participant13	F	6 y.o	125	62.5
Participant14	M	4 y.o	110	75
Participant16	F	4 y.o	105	75
Participant17	M	4 y.o	96	62.5
Participant19	M	4 y.o	115	43.75
Participant21	F	6 y.o	120	81.25
Participant22	F	6 y.o	108	75
Participant23	F	6 y.o	92	75
Participant24	M	6 y.o	128	62.5
Participant25	M	4 y.o	105	68.75

Note. CCC-2 = Children's Communication Checklist-2; QNWRT = Quasi-universal nonword repetition task.

Table 4
Mean and Standard Deviation for TEGI-ST by Age (N=21)

Group	*N*	TEGI-SE	TEGI-BCE
4TD	11	26.95(*29.79*)	95.00(*15.00*)
6TD	10	63.80(*27.27*)	90.00(*21.08*)

Note. TEGI= Test of Early Grammatical Impairment Screening Test.

Table 5
Performance on Test of Early Grammatical Impairment Screening Test of All Participants (N=21)

Participant ID	*Clinical Status*	Gender	Age Group	TEGI-SE	TEGI-BCE
Participant01	TD	M	6 y.o	12.50	50.00
Participant02	TD	F	4 y.o	8.33	100.00
Participant03	TD	M	4 y.o	51.39	100.00
Participant04	TD	M	6 y.o	100.00	100.00
Participant05	TD	M	6 y.o	88.89	100.00
Participant06	TD	F	4 y.o	36.67	100.00
Participant07	TD	M	4 y.o	93.75	100.00
Participant09	TD	F	6 y.o	86.11	100.00
Participant10	TD	M	4 y.o	7.14	100.00
Participant11	TD	F	4 y.o	6.25	100.00
Participant12	TD	F	4 y.o	75.25	100.00
Participant13	TD	F	6 y.o	81.43	100.00
Participant14	TD	M	4 y.o	5.00	95.00
Participant16	TD	F	4 y.o	11.11	100.00
Participant17	TD	M	4 y.o	58.82	100.00
Participant19	LD	M	4 y.o	.00	50.00
Participant21	TD	F	6 y.o	45.00	50.00
Participant22	TD	F	6 y.o	57.86	100.00
Participant23	TD	F	6 y.o	53.33	100.00
Participant24	TD	M	6 y.o	37.65	100.00
Participant25	TD	M	4 y.o	18.01	100.00

Note. TEGI = Test of Early Grammatical Impairment.

Table 6

Examples and Reliability for Morpho-Syntactic Codes (Pilot Study)

Morpho-syntactic feature	CU Morpheme	CU Example	Reliability	CS Morpheme	CS Example	Reliability
			Plurals			
Regular plural	Marked	I don't like **dinosaurs**.	95.34%	Zero marked	She swinging with her **leg_**.	100%
Irregular plural	Marked	Look at the hundreds of **children**.	75%	Zero marked	I see three **mouse** over there.	100%
			Past Tense			
Regular Past Tense	Marked	I got that for my birthday when I **turned** six.	100%	Zero marked	You **bake** before?	86.21%
Irregular Past Tense	Marked	Because they never **told** her.	92.31%	Zero marked	My grammy used candles when she **make** a cake for my birthday.	91.67%
				Did + verb	I already **did eat**.	90.48%
			Third Person Singular			
Third Person Singular	Marked	It **looks** yummy.	100%	Zero marked	And then she **mix** it.	88%
			Possessive			

Possessive	Marked	The plate is **hers.** The **girl's** food.	100%	Zero marked	The **boy_** oatmeal.	100%
				Noun/Pronoun + own	That's the **boy_ own**. That's **he** own.	100%
				Possessive + own	That's the **boy's own**.	83%
			Copula			
Copula: Am	Marked	I **am** done.	100%	Zero Uncontracted/Contracted marked Copula: Am	I _ going to Orlando.	100%
Copula: Am	Contracted	**I'm** finished.	100%			
Copula: Is	Marked	Latoya **is** mad.	100%	Zero Uncontracted/Contracted Copula: Is	Latoya _ mad.	100%
Copula: Is	Contracted	Wow **that's** beautiful.	100%			
Copula: Is				Leveled Copula: Is	They **is** beautiful.	100%
				Leveled Copula: Contracted Is	They**'s** beautiful	100%
Copula: Are	Marked	They **are** happy.	100%	Zero Uncontracted/Contracted Copula: Are	They _ happy.	100%
Copula: Are	Contracted	**They're** over there.	100%			

Copula: Was	Marked	And plus, it **was** too dirty.	73.33%	Zero Copula: Was	The dog _ too dirty	--
				Leveled Copula: Was	The dogs **was** too dirty	100%
Copula: Were	Marked	They **were** very sad	100%	Zero Copula: Were	They _ very sad.	--
			Auxiliary To Be			
Auxiliary: Am	Marked	I **am** doing it.	100%	Zero Uncontracted/Contracted marked Auxiliary: Am	I _ doing it.	100%
Auxiliary: Am	Contracted	**I'm** finished.	100%			
Auxiliary: Is	Marked	He **is** walking his dog.	100%	Zero Uncontracted/Contracted marked Auxiliary: Is	He _ walking his dog.	90%
Auxiliary: Is	Contracted	**He's** walking his dog.	100%			
				Leveled Auxiliary: Is	They **is** eating a lot.	100%
				Be + Verb	She **be** rude sometimes.	100%
				Is + Be + Verb	She **is be playing** all day.	100%
				Is + Verb	She **is play** all day.	100%

Auxiliary: Are	Marked	Tamika and Travis **are** coming.	100%	Zero Uncontracted/Contracted marked Auxiliary: Are	Tamika and Travis _ coming.	100%
Auxiliary: Are	Contracted	They**'re** coming.	100%			
Auxiliary: Was	Marked	One cat **was** looking at the bowl.	100%	Zero Auxiliary: Was	One cat _ looking at the bowl.	100%
				Leveled Auxiliary: Was	A dog and cat **was** looking at the bowl.	90%
Auxiliary: Were	Marked	One cat and one dog **were** looking at the bowl.	90%	Zero Auxiliary: Were	A cat and one dog _ at the bowl.	90%
		Auxiliary Will				
Auxiliary: Will	Marked	I **will** do it.	100%	Zero Uncontracted/Contracted marked Auxiliary: Will	I _ make it for you.	80.95%
Auxiliary: Will	Contracted	**I'll** make you some cereal.	100%			
				Gin/Gon	I **gin** make it for you.	90%
				Ga	I **ga** make it for you.	100%

Note. CU = creole-universal; CS = creole-specific

Table 7
Creole Density Classification of Participants (N=21)

Participant ID	Conversation	Classification
Participant01	12.70	Medium user
Participant02	24.46	High user
Participant03	13.91	Medium user
Participant04	3.02	Low user
Participant05	4.50	Low user
Participant06	4.17	Low user
Participant07	3.56	Low user
Participant09	4.90	Low user
Participant10	4.55	Low user
Participant11	13.29	Medium user
Participant12	5.86	Low user
Participant13	9.12	Low user
Participant14	12.55	Medium user
Participant16	5.74	Low user
Participant17	9.93	Low user
Participant19	11.25	Medium user
Participant21	0.89	No use
Participant22	2.99	Low user
Participant23	5.41	Low user
Participant24	10.40	Low user
Participant25	2.56	Low user

Note. Classification determined by creole density of conversation sample. No use = less than 1%; Low user = density values range from 1% to 11%; Medium user = density value ranged from 11% to 20%; High user = density value greater than 20%.

Table 8
Creole Feature Use of All Participants Across Three Tasks (N=21)

Participant ID	Story Retell	Story Generation	Sentence Completion
Participant01	66.67	83.33	37.50
Participant02	66.67	78.57	95.84
Participant03	30.00	30.00	44.45
Participant04	0.00	11.11	0.00
Participant05	0.00	20.00	16.11
Participant06	44.44	26.67	64.59
Participant07	33.33	36.36	31.25
Participant09	0.00	6.67	13.89
Participant10	52.38	80.00	85.72
Participant11	38.89	55.56	94.45
Participant12	7.14	7.69	21.04
Participant13	5.88	13.33	23.57
Participant14	46.15	13.33	95.00
Participant16	22.22	0.00	87.50
Participant17	26.67	36.36	44.12
Participant19	37.89	35.28	50.00
Participant21	0.00	0.00	0.00
Participant22	7.14	6.45	26.48
Participant23	6.06	9.09	52.22
Participant24	12.50	20.00	67.36
Participant25	20.00	27.91	88.89

Table 9
Mann-Whitney U Test for Creole-Specific Feature Use Across Tasks (N =21)

Measure/Task	4TD (*Mdn*)	6TD (*Mdn*)	*U*	*z*	*p*
Story Retell	37.89	5.97	10.5	-3.145	.002*
Story Generation	35.27	10.10	22.0	-2.237	.02*
Sentence Completion	85.72	22.30	10.0	-3.170	.001**

Note. One asterisk * note statistical significance of $p < .05$ and two asterisks ** note statistical significance of $p < .01$.

Table 10
Total Frequency and Percentage of Opportunity of Each Creole-Universal and Creole-Specific Features Per Group (N=21)

Feature	4TD (*N*=11)	6TD (*N*=10)	% of Op. (4TD)	% of Op. (6TD)
CU: Regular Plural	261.00	437.00	93.21	95.00
CS: Ø Regular Plural	19	15	6.79	3.26
CU: Irregular Plural	0	3	0.00	0.65
CS: Ø Irregular Plural	0	5	0.00	1.09
CU: Regular Past	40	81	29.20	40.30
CS: Ø Regular Past	26	31	18.98	15.42
CS: Did+verb	0.00	3.00	0.00	1.49
CU: Irregular Past	36	64	26.28	31.84
CS: Ø Irregular Past	35.00	22.00	25.55	10.95
CU: Third Person Singular	47	88	58.02	72.73
CS: Ø Third Person Singular	34.00	33.00	41.98	27.27
CU: Possessive	46	69	70.77	72.63
CS: Ø Possessive	19	15	29.23	15.79
CS: Possessive+own/ Ø Possessive own	0	11	0.00	11.58
CU: Copula: Am	1.00	1.00	7.69	4.76
CU: Contractible Copula: Am	9	17	69.23	80.95
CS: Copula: Ø Am	3	3	23.08	14.29
CU: Copula: Is	50.00	138.00	20.08	35.94
CU: Contractible Copula: Is	152.00	230.00	61.04	59.90
CS: Copula: Ø Is	45	12	18.07	3.13
CS: Copula: Leveled Is	1	4	0.40	1.04
CS: Copula: Contractible Leveled Is	1	0	0.40	0.00
CU: Copula: Are	6	9	17.14	28.13
CU: Contractible Copula: Are	11	21	31.43	65.63
CS: Copula: Ø Are	18.00	2.00	51.43	6.25
CU: Copula: Was	14	38	100.00	88.37
CS: Copula: Ø Was	0	0	0.00	0.00
CS: Copula: Leveled Was	0	5	0.00	11.63
CU: Copula: Were	1	0	1.00	0.00
CS: Copula: Ø Were	0	0	0.00	0.00

CU: Auxiliary: Am	2	27	4.65	25.71
CU: Contractible Auxiliary: Am	22	67	51.16	63.81
CS: Auxiliary: Ø Am	19	11	44.19	10.48
CU: Auxiliary: Is	21	118	18.92	48.36
CU: Contractible Auxiliary: Is	47	84	42.34	34.43
CS: Auxiliary: Ø Is	36.00	23.00	32.43	9.43
CS: Auxiliary: Leveled Is	1.00	2.00	0.90	0.82
CS: Be+verb	1.00	0.00	0.90	0.00
CS: Is+Be+Verb	0.00	5.00	0.00	2.05
CS: Is+Verb	5.00	12.00	4.50	4.92
CU: Auxiliary: Are	16.00	30.00	23.19	46.88
CU: Contractible Auxiliary: Are	30.00	13.00	43.48	20.31
CS: Auxiliary: Ø Are	23.00	21.00	33.33	32.81
CU: Auxiliary: Was	33.00	37.00	97.06	80.43
CS: Auxiliary: Ø Was	1.00	1.00	2.94	2.17
CS: Auxiliary: Leveled Was	0.00	8.00	0.00	17.39
CU: Auxiliary: Were	1.00	3.00	20.00	100.00
CS: Auxiliary: Ø Were	4.00	0.00	80.00	0.00
CU: Auxiliary: Will	1.00	0.00	5.56	0.00
CU: Contractible Auxiliary: Will	9.00	14.00	50.00	93.33
CS: Auxiliary: Ø Will	3.00	1.00	16.67	6.67
CS: Gin	4.00	0.00	22.22	0.00
CS: Ga	1.00	0.00	5.56	0.00

Note. Op = Opportunities.

Table 11
Select Plural Features and Examples

Feature	Example
Regular plural	I don't like **dinosaurs**.
Zero regular plural	She swinging with her **leg_**.
Irregular plural	Look at the hundreds of **children**.
Zero regular plural	I see three **mouse** over three.

Table 12
Mann-Whitney U test for Plural Use During Language Sample (N=21)

Morpheme	4 y.o (Mdn)	6 y.o (Mdn)	*U*	*z*	*p*
Regular Plural	18.00	39.00	90.50	2.505	.012*
Zero regular plural	1.0	.5	52.00	.225	.863
Irregular plural	.00	.00	60.50	1.049	.705
Zero irregular plural	.00	.00	60.50	1.049	.705

Note. Asterisks note statistical significance.

Table 13
Descriptive Information for Plural Use During Language Sample (N=21)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	%Op. 6TD	Mean Difference
Regular Plural	23.72*(13.89)*	93.21	43.70*(14.10)*	95.00	19.97
Zero regular plural	1.73*(2.15)*	13.87	1.50*(2.22)*	3.26	.227
Irregular plural	.00	0.00	.30*(0.95)*	0.65	.300
Zero irregular plural	.00	0.00	.50*(1.58)*	1.09	.500

Note. Op. = Opportunities.

Table 14
Select Past Tense Features and Examples

Feature	Example
Regular past	He **walked** the dog.
Zero regular past	He **walk_** the dog.
Irregular past	She **ate** the cake.
Zero irregular past	She **eat** the cake.
Did + Verb	He **did eat** the cake.

Table 15
Mann-Whitney U Test for Past Tense During Language Sample (N=21)

Morpheme	4 y.o (Mdn)	6 y.o (Mdn)	*U*	*z*	*p*
Regular past	2.00	8.00	27.50	-1.95	.051
Zero regular past	1.00	2.50	44.50	-.751	.468
Irregular past	3.00	6.50	22.50	-1.044	.020*
Zero irregular past	3.00	1.50	40.50	-2.310	.314
Did + verb	.00	.00	49.50	-1.049	.705

Table 16
Descriptive Information for Past Tense During Language Sample (N=21)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	%Op. 6TD	Mean Difference
Regular past	3.64*(4.41)*	29.20%	8.10*(5.99)*	40.30%	4.464
Zero regular past	2.36*(2.94)*	18.98%	3.10*(3.21)*	15.42%	.736
Irregular past	3.27*(2.65)*	26.28%	6.4*(3.06)*	31.84%	3.13
Zero irregular past	3.18*(3.12)*	25.55%	2.20*(2.90)*	10.95%	.98
Did + verb	.00	0%	.30 *(.95)*	1.49%	.30

Note. Op = Opportunities.

Table 17
Select Possession Features and Examples

Feature	Example
Possessive	The plate is **hers**. The **girl's** food.
Zero possessive	The **boy_** oatmeal **He** oatmeal.
Noun/Pronoun + Own Possessive + Own	That's the **boy_own** That's he **own**. That's the **boy's own**.

Table 18
Mann-Whitney U Test for Possession During Language Sample (N=21)

Morpheme	4TD (*Mdn*)	6TD (*Mdn*)	*U*	*z*	*p*
Possessive	2.00	7.50	34.00	-.1.49	.151
Zero Possessive	1.00	1.50	46.50	-.622	.557
Possessive+Own	0.00	1.50	38.50	-1.908	.251

Table 19
Descriptive Information for Possession During Language Sample (N=21)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	% Op. 6TD	Mean Difference
Possessive	4.18(*4.64*)	70.77%	6.90(*3.54*)	72.63%	2.718
Zero Possessive	1.73(*2.53*)	29.23%	1.50(*1.08*)	15.79%	.227
Possessive+Own	.00	0.00%	1.10(*2.28*)	11.58%	.722

Note. Op. = Opportunities.

Table 20
Select Third Person Singular and Examples

Feature	Example
Marked third person singular	It **looks** yummy
Zero third person singular	Then she **mix_** it.
Does + verb	She **does check** your teeth.

Table 21
Mann-Whitney U Test for Third Person Singular During Language Sample (N=21)

Morpheme	4TD (*Mdn*)	6TD (*Mdn*)	*U*	*z*	*p*
Third person	2.0	9.50	20.50	-2.438	.013*
Zero third person	2.0	1.0	49.50	-.395	.705

Note. Asterisks note statistical significance.

Table 22
Descriptive Information for Third Person Singular During Language Sample (N=21)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	% Op. 6TD	Mean Difference
Third person	4.27*(5.31)*	58.02	8.80*(3.46)*	72.73	4.527
Zero third person	3.09*(3.78)*	41.98	3.3*(3.65)*	27.27	.20909

Note. Op. = Opportunities.

Table 23
Examples of Selected Copula Features

Feature	Example
CU: Copula: Am	I **am** done.
CU: Contractible Copula: Am	I**'m** done.
CS: Copula: Ø Am	I _ done.
CU: Copula: Is	That **is** beautiful.
CU: Contractible Copula: Is	That**'s** beautiful.
CS: Copula: Ø Is	That _ beautiful.
CS: Copula: Leveled Is	They **is** beautiful.
CS: Copula: Contractible Leveled Is	They**'s** beautiful.
CU: Copula: Are	They **are** happy.
CU: Contractible Copula: Are	They**'re** happy.
CS: Copula: Ø Are	They _ happy.
CU: Copula: Was	The dog **was** too dirty.
CS: Copula: Ø Was	The dog _ too dirty.
CS: Copula: Leveled Was	The dogs **was** too dirty.
CU: Copula: Were	They **were** very sad.
CS: Copula: Ø Were	They _ very sad.

Table 24
Mann-Whitney U Test for Copula: be (N=21)

Morpheme	4TD (*Mdn*)	6TD (*Mdn*)	*U*	*z*	*p*
CU: Copula: Am	.00	.00	54.5	-.069	.973
CU: Contractible Copula: Am	.00	1.0	41.0	-1.08	.349
CS: Copula: Ø Am	.00	.00	51.5	-.405	.809
CU: Copula: Is	4.0	9.5	11.0	-3.113	.001*
CU: Contractible Copula: Is	13.00	24.00	23.50	-2.22	.024*
CS: Copula: Ø Is	4.00	1.0	25.50	-2.113	.036*
CS: Copula: Leveled Is	.00	.00	38.00	-1.621	.251
CS: Copula: Contractible Leveled Is	.00	.00	50.00	-.953	.756
CU: Copula: Are	.00	1.0	36.50	-1.439	.197
CU: Contractible Copula: Are	.00	1.0	32.50	-1.719	.114
CS: Copula: Ø Are	.00	.00	39.50	-1.461	.282
CU: Copula: Was	1.00	3.0	29.50	-1.830	.072
CS: Copula: Ø Was	--	--	--	--	--
CS: Copula: Leveled Was	.00	.00	33.00	-2.266	.132
CU: Copula: Were	.00	.00	50.00	-.963	.756
CS: Copula: Ø Were	--	--	--	--	--

Note. Asterisks note statistical significance.

Table 25
Descriptive Information for Copula: be (N=21)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	% Op.6TD	Mean Difference
CU: Copula: Am	.09*(.3)*	7.69%	.10*(.32)*	4.76%	0.001
CU: Contractible Copula: Am	.82*(1.78)*	69.23%	1.70*(3.34)*	80.95%	0.88
CS: Copula: Ø Am	0.27*(.65)*	23.08%	0.30*(.95)*	14.29%	0.027
CU: Copula: Is	4.56*(4.8)*	20.08%	13.80*(8.85)*	35.94%	9.256
CU: Contractible Copula: Is	13.82*(8.28)*	61.04%	23.0*(7.97)*	59.90%	9.18
CS: Copula: Ø Is	4.09*(3.24)*	18.07%	1.20*(1.34)*	3.13%	2.89
CS: Copula: Leveled Is	0.09*(.3)*	0.40%	.40(0.52)	1.04%	.31
CS: Copula: Contractible Leveled Is	0.09*(.3)*	0.40%	0.0	0%	0.091
CU: Copula: Are	0.55*(1.04)*	17.14%	.90(.88)	28.13%	0.355
CU: Contractible Copula: Are	1.00*(2.41)*	31.43%	2.10(2.33)	65.63%	1.100
CS: Copula: Ø Are	1.636*(2.66)*	51.43%	0.20(0.63)	6.25%	1.436
CU: Copula: Was	1.27(1.49)	100.00 %	3.80(3.29)	88.37%	2.527
CS: Copula: Ø Was	0.00	--	0.00	--	--
CS: Copula: Leveled Was	0.00	--	0.50(0.71)	11.63%	0.500
CU: Copula: Were	0.09*(.3)*	100%	0.00	--	0.091
CS: Copula: Ø Were	0.00	--	0.00	--	--

Note. Op. = Opportunities.

Table 26
Examples of Selected Auxiliary Features

Feature	Example
CU: Auxiliary: Am	I **am** doing it.
CU: Contractible Auxiliary: Am	I**'m** doing it.
CS: Auxiliary: Ø Am	I _ doing it.
CU: Auxiliary: Is	Sam **is** walking his dog.
CU: Contractible Auxiliary: Is	Sam**'s** walking his dog.
CS: Auxiliary: Ø Is	Sam _ walking his dog
CS: Auxiliary: Leveled Is	They **is** walking the dog.
CS: Be+verb	They**'s** beautiful.
CS: Is+Be+Verb	They **are** happy.
CS: Is+Verb	They**'re** happy.
CU: Auxiliary: Are	They **are** coming.
CU: Contractible Auxiliary: Are	They**'re** coming.
CS: Auxiliary: Ø Are	They _ coming.
CU: Auxiliary: Was	One cat **was** looking at the bowl.
CS: Auxiliary: Ø Was	One cat _ looking at the bowl.
CS: Auxiliary: Leveled Was	They **was** looking at the dog.
CU: Auxiliary: Were	One cat and one dog **were** looking at the bowl.
CS: Auxiliary: Ø Were	One cat and one dog _ looking at the bowl.
CU: Auxiliary: Will	I **will** do it.
CU: Contractible Auxiliary: Will	I**'ll** do it.
CS: Auxiliary: Ø Will	I _ do it.
CS: Gin/Gon	I **gin** make it for you.
CS: Ga	I **ga** do it.

Table 27
Mann-Whitney U Test for Auxiliary (N=21)

Morpheme	4TD (*Mdn*)	6TD (*Mdn*)	*U*	*z*	*p*
CU: Auxiliary: Am	.00	.50	36.50	-1.578	.197
CU: Contractible Auxiliary: Am	1.00	4.50	20.50	-2.464	.013*
CS: Auxiliary: Ø Am	1.00	1.0	47.00	.586	.605
CU: Auxiliary: Is	2.00	7.50	15.00	-2.855	.004*
CU: Contractible Auxiliary: Is	2.0	8.50	28.00	-1.907	.061
CS: Auxiliary: Ø Is	2.00	.00	41.00	-1.028	.349
CS: Auxiliary: Leveled Is	.00	.00	49.00	-.696	.705
CS: Be+verb	.00	.00	50.00	-.953	.756
CS: Is+Be+Verb	.00	.00	38.50	-1.910	.251
CS: Is+Verb	.00	.00	43.50	-1.182	.426
CU: Auxiliary: Are	1.00	2.50	34.00	-1.518	.152
CU: Contractible Auxiliary: Are	2.00	1.0	41.00	-1.015	.349
CS: Auxiliary: Ø Are	1.00	2.0	49.50	-.394	.705
CU: Auxiliary: Was	.00	3.0	36.50	-1.328	.197
CS: Auxiliary: Ø Was	.00	.00	54.50	-.069	.973
CS: Auxiliary: Leveled Was	.00	.00	44.00	-1.520	.468
CU: Auxiliary: Were	.00	.00	54.00	-.138	.973
CS: Auxiliary: Ø Were	.00	.00	45.00	-1.382	.512
CU: Auxiliary: Will	.00	.00	50.00	-.953	.756
CU: Contractible Auxiliary: Will	.00	.00	54.50	-.039	.973
CS: Auxiliary: Ø Will	.00	.00	55.00	.00	1.0
CS: Gin/Gon	.00	.00	45.00	-1.382	.512
CS: Ga	.00	.00	50.00	-.953	.756

Note. Asterisks note statistical significance.

Table 28
Descriptive Information for Auxiliary (N=21)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	% Op.6TD	Mean Difference
CU: Auxiliary: Am	0.18*(.41)*	4.65%	2.70(7.15)	25.71%	2.518
CU: Contractible Auxiliary: Am*	2.00*(2.9)*	51.16%	6.70(6.53)	63.81%	4.700
CS: Auxiliary: Ø Am	1.73*(1.85)*	44.19%	1.10(1.10)	10.48%	.627
CU: Auxiliary: Is*	1.91*(2.12)*	18.92%	11.80(10.69)	48.36%	9.891
CU: Contractible Auxiliary: Is	4.27*(5.69)*	42.34%	8.40(4.81)	34.43%	4.127
CS: Auxiliary: Ø Is	3.27*(4.22)*	32.43%	2.30(3.95)	9.43%	.97273
CS: Auxiliary: Leveled Is	0.09*(.3)*	0.90%	.20(.42)	0.82%	.10909
CS: Be+verb	0.09*(.3)*	0.90%	0.00	0.00%	.09091
CS: Is+Be+Verb	0.00	0.00%	0.50(.97)	2.05%	.50000
CS: Is+Verb	0.45*(1.51)*	4.50%	1.20(2.3)	4.92%	.74545
CU: Auxiliary: Are	1.45*(2.21)*	23.19%	3.00(2.83)	46.88%	1.54545
CU: Contractible Auxiliary: Are	2.73*(3.38)*	43.48%	1.30(1.64)	20.31%	1.42727
CS: Auxiliary: Ø Are	2.09*(2.39)*	33.33%	2.10(1.73)	32.81%	.00909
CU: Auxiliary: Was	3.00*(4.15)*	97.06%	3.70(2.98)	80.43%	.70000
CS: Auxiliary: Ø Was	0.09*(.3)*	2.94%	0.10*(0.32)*	2.17%	.00909
CS: Auxiliary: Leveled Was	0.00	0.00%	0.80*(2.20)*	17.39%	.80000
CU: Auxiliary: Were	0.09(.3)	20.00%	0.30(.95)	100.00%	.20909
CS: Auxiliary: Ø Were	0.36(.92)	80.00%	0.00	0%	.36364
CU: Auxiliary: Will	0.09*(.3)*	5.56%	0.00	0%	.09091
CU: Contractible Auxiliary: Will	0.82*(1.08)*	50.00%	1.4*(2.55)*	93.33%	.58182
CS: Auxiliary: Ø Will	0.27*(.9)*	16.67%	0.1*(.32)*	6.67%	.17273
CS: Gin/Gon	0.36*(.92)*	22.22%	0.00	0.00%	.36364
CS: Ga	0.09*(.3)*	5.56%	0.00	0.00%	.09091

Table 29

Time Sequence of Child Assessments (Face-to-Face)

Day 1	
Hearing screening	10 minutes
Articulation screening and oral motor screener	10 minutes
PTONI	10 minutes
Sentence repetition (TOLD-5)	10 minutes
Syntactic understanding (TOLD-5)	10 minutes
Retell & generation (MAIN)- BCE	15 minutes
10-minute conversation sample- BCE	10 minutes
15-minute play-based language sample- BCE	15 minutes
Total:	90 minutes plus breaks as needed
Day 2	
TEGI	20 minutes
Retell & generation (MAIN)-SE	15 minutes
10-minute conversation sample-SE	10 minutes
15-minute play-based language sample-SE	15 minutes
Morphological completion (TOLD-5)	10 minutes
Relational vocabulary (TOLD-5)	10 minutes
Picture & Oral vocabulary (TOLD-5)	10 minutes
Total:	90 minutes plus breaks as needed

Table 30
Time Sequence of Child Assessments (Remote)

Day 1	
Oral motor screening, Articulation Screening, TEGI-ST	20 minutes
PTONI	10 minutes
Sentence repetition (TOLD-5)	10 minutes
Retell & generation (MAIN)- BCE	15 minutes
10-minute conversation sample- BCE	10 minutes
Total:	65 minutes plus breaks as needed
Day 2	
Syntactic understanding (TOLD-5)	10 minutes
Retell & generation (MAIN)- SE	15 minutes
10-minute conversation sample-SE	10 minutes
Morphological completion (TOLD-5)	10 minutes
Picture & Oral vocabulary (TOLD-5)	10 minutes
Relational vocabulary (TOLD-5)	10 minutes
Total:	65 minutes plus breaks as needed

Table 31
Mean and Standard Deviation for Participants (N=20)

Group	*N* (F/M)	Avg. age in mo.	Maternal Education	PTONI	CCC-2	SI (TOLDP-5)
4TD	7 (5/2)	51 (*2.0*)	16.00 *(2.0)*	116.14*(19.84)*	109.00(*12.90*)	10.71(*2.21*)
6TD	13(6/7)	77 (*4.0*)	15.23 *(2.52)*	105.23 *(17.73)*	102.84 (*10.83*)	12.54(*2.40*)

Note. Mo = Months; PTONI = Primary Test of Nonverbal Intelligence; CCC-2= Children's Communication Checklist-2; SI= Sentence Imitation subtest, Test of Language Development, Primary-5.

Table 32
Classification Measures Performance of All Participants (N=20)

Participant ID	Gender	Age	Artic. Screening	PTONI	CCC-2	SI (TOLDP-5)
Participant02	F	4.10	Passed	86	134.00	9.00
Participant03	F	6.30	Passed	87	91.00	17.00
Participant04	F	4.40	Passed	115	105.00	9.00
Participant06	M	6.11	Passed	129	86.00	14.00
Participant09	F	6.10	Passed	124	110.00	11.00
Participant10	M	6.50	Passed	87	97.00	10.00
Participant11	M	6.40	Passed	100	112.00	11.00
Participant12	F	4.60	Passed	147	107.00	13.00
Participant13	M	6.00	Passed	100	107.00	13.00
Participant14	F	6.90	Passed	132	111.00	16.00
Participant15	F	4.30	Passed	131	106.00	9.00
Participant16	F	6.40	Passed	104	126.00	13.00
Participant17	M	6.80	Passed	88	95.00	9.00
Participant18	M	4.40	Passed	114	113.00	14.00
Participant20	F	6.30	Passed	87	92.00	11.00
Participant21	M	4.20	Passed	120	107.00	12.00
Participant22	F	6.11	Passed	94	104.00	11.00
Participant25	M	4.00	Passed	105	99.00	15.00
Participant26	F	4.00	Passed	100	91.00	9.00
Participant27	M	6.00	Passed	131	103.00	12.00

Note. Artic = Articulation; PTONI = Primary Test of Nonverbal Intelligence; CCC-2 = Children's Communication Checklist-2; SI, TOLDP-5 = Sentence Imitation subtest, Test of Language Development, Primary-5.

Table 33
Mean and Standard Deviation for TEGI-ST (N=20)

Group	*N*	TEGI-ST-SE	TEGI-ST-BCE
4TD	7	28.10(*20.48*)	100.00(*0.00*)
6TD	13	61.63(*27.70*)	100.00(*0.00*)

Note. TEGI= Test of Early Grammatical Impairment Screening Test.

Table 34
Performance on Test of Early Grammatical Impairment Screening Test of All Participants (N=20)

Participant ID	Gender	Age Group	TEGI-SE	TEGI-BCE
Participant02	F	4.10	0	100.00
Participant03	F	6.30	60.71	100.00
Participant04	F	4.40	26.67	100.00
Participant06	M	6.11	81.25	100.00
Participant09	F	6.10	25	100.00
Participant10	M	6.50	23.33	100.00
Participant11	M	6.40	100	100.00
Participant12	F	4.60	49.17	100.00
Participant13	M	6.00	75	100.00
Participant14	F	6.90	100	100.00
Participant15	F	4.30	37.5	100.00
Participant16	F	6.40	25.16	100.00
Participant17	M	6.80	41.58	100.00
Participant18	M	4.40	45.83	100.00
Participant20	F	6.30	61.43	100.00
Participant21	M	4.20	0	100.00
Participant22	F	6.11	76.11	100.00
Participant25	M	4.00	44.44	100.00
Participant26	F	4.00	37.5	100.00
Participant27	M	6.00	87.22	100.00

Note. TEGI-ST = Test of Early Grammatical Impairment Screening Test.

Table 35
Examples and Reliability for Morpho-Syntactic Codes (Dissertation Study)

Morpho-syntactic feature	CU Morpheme	CU Example	Reliability	CS Morpheme	CS Example	Reliability
			Past Tense			
Regular Past Tense	Marked	I got that for my birthday when I **turned** six.	100%	Zero marked	You **bake** before?	100%
Irregular Past Tense	Marked	Because they never **told** her.	100%	Zero marked	My grammy used candles when she **make** a cake for my birthday.	97%
				Did + verb	I already did eat.	90.90%
			Third Person Singular			
Third Person Singular	Marked	It **looks** yummy.	100%	Zero marked	And then she **mix** it.	100%
				Does + verb	She **does check** your teeth.	100%
			Copula- To Be			
Copula: Am	Marked	I **am** done.	100%	Zero Uncontracted/Contracted marked	I _ going to Orlando.	100%
Copula: Am	Contracted	**I'm** finished.	100%	Copula: Am		
Copula: Is	Marked	Latoya **is** mad.	93.33%			

Copula: Is	Contracted	Wow **that's** beautiful.	94.12%	Zero Uncontracted/Contracted Copula: Is	Latoya _ mad.	100%
Copula: Is				Leveled Copula: Is	They **is** beautiful.	100%
				Leveled Copula: Contracted Is	They**'s** beautiful	100%
Copula: Are	Marked	They **are** happy.	100%	Zero Uncontracted/Contracted Copula: Are	They _ happy.	100%
Copula: Are	Contracted	**They're** over there.	100%			
Copula: Was	Marked	And plus, it **was** too dirty.	100%	Zero Copula: Was	The dog _ too dirty	--
				Leveled Copula: Was	The dogs **was** too dirty	100%
Copula: Were	Marked	They **were** very sad	100%	Zero Copula: Were	They _ very sad.	--
			Auxiliary To Be			
Auxiliary: Am	Marked	I **am** doing it.	100%	Zero Uncontracted/Contracted marked Auxiliary: Am	I _ doing it.	100%
Auxiliary: Am	Contracted	**I'm** finished.	100%			
Auxiliary: Is	Marked	He **is** walking his dog.	95%	Zero Uncontracted/Contracted marked Auxiliary: Is	He _ walking his dog.	90%
Auxiliary: Is	Contracted	**He's** walking his dog.	100%			

				Leveled Auxiliary: Is	They **is** eating a lot.	100%
				Be + Verb	She **be** rude sometimes.	100%
				Is + Be + Verb	She **is be playing** all day.	100%
				Is + Verb	She **is play** all day.	100%
Auxiliary: Are	Marked	Tamika and Travis **are** coming.	100%	Zero Uncontracted/Contracted marked Auxiliary: Are	Tamika and Travis _ coming.	100%
Auxiliary: Are	Contracted	They**'re** coming.	100%			
Auxiliary: Was	Marked	One cat **was** looking at the bowl.	100%	Zero Auxiliary: Was	One cat _ looking at the bowl.	100%
				Leveled Auxiliary: Was	A dog and cat **was** looking at the bowl.	91%
Auxiliary: Were	Marked	One cat and one dog **were** looking at the bowl.	100%	Zero Auxiliary: Were	A cat and one dog _ at the bowl.	100%

Note. CU = creole-universal; CS = creole-specific

Table 36
Creole Density of All Participants (N=20)

Participant ID	BCE Conversation	SE Conversation	Average	Description
Participant02	10.17	9.33	9.75	Low user
Participant03	23.88	7.46	15.67	Medium user
Participant04	9.15	11.36	10.26	Low user
Participant06	29.29	21.67	25.48	High user
Participant09	24.49	18.52	21.50	High user
Participant10	11.70	12.33	12.02	Medium user
Participant11	13.64	12.40	13.02	Medium user
Participant12	0.00	0.00	0.00	No use
Participant13	1.05	5.21	3.13	Low user
Participant14	1.35	2.30	1.83	Low user
Participant15	16.23	8.00	12.12	Medium user
Participant16	46.94	33.66	40.30	High user
Participant17	17.11	16.33	16.72	Medium user
Participant18	6.06	6.96	6.51	Low user
Participant20	21.95	10.58	16.26	Medium user
Participant21	4.44	12.50	8.47	Low user
Participant22	7.69	11.59	9.64	Low user
Participant25	3.01	0.78	1.90	Low user
Participant26	8.11	1.33	4.72	Low user
Participant27	8.18	4.49	6.34	Low user

Note. No use = less than 1%; Low user = density values range from 1% to 11%; Medium user = density value ranged from 11% to 20%; High user = density value greater than 20%.

Table 37
Wilcoxon Signed-Rank Test for CSFU Given Language Modeling in 4TD (N = 7)

Task (Mdn)	Task (Mdn)	*T*	*z*	*p*
Language Sample-BCE (13.64)	Language Sample-SE (15.46)	11.00	.105	.917
Story Retell-BCE (33.33)	Story Retell-SE (38.89)	10.00	-.676	.499
Story Generation-BCE (31.82)	Story Generation-SE (33.33)	5.00	-1.521	.128

Table 38
Wilcoxon Signed-Rank Test for CSFU Given Language Modeling in 6TD (N = 13)

Task (Mdn)	Task (Mdn)	*T*	*z*	*p*
Language Sample-BCE (35.86)	Language Sample-SE (20.00)	70.00	1.712	.087
Story Retell-BCE (15.38)	Story Retell-SE (6.25)	42.00	1.478	.139
Story Generation-BCE (25.00)	Story Generation-SE (14.29)	65.00	1.363	.173

Table 39
Wilcoxon Signed-Rank Test for CSFU Given Language Modeling in First Graders (N = 5)

Task (Mdn)	Task (Mdn)	*T*	*z*	*p*
Language Sample-BCE (35.87)	Language Sample-SE (20.00)	2.00	3.708	.138
Story Retell-BCE (14.81)	Story Retell-SE (8.69)	3.00	-.730	.465
Story Generation-BCE (25.00)	Story Generation-SE (14.28)	8.00	.135	.893

Table 40
Wilcoxon Signed-Rank Test for CSFU Given Language Modeling in Second Graders (N = 7)

Task (Mdn)	Task (Mdn)	*T*	*z*	*p*
Language Sample-BCE (37.50)	Language Sample-SE (31.37)	11.00	-.507	.612
Story Retell-BCE (15.38)	Story Retell-SE (6.25)	5.00	-1.153	.249
Story Generation- BCE (40.90)	Story Generation-SE (11.11)	.00	-2.371	.018*

Note. Asterisks note statistical significance of $p < .05$.

Table 41
Pairwise Comparisons for CSFU in 4TD Across Tasks (N =7)

Task (Mdn)	Task (Mdn)	X^2	*z*	*p*
Language Sample (15.46)	Story Retell (38.89)	-1.286	-1.863	.374
Language Sample (15.46)	Story Generation (33.33)	-1.143	-1.656	.586
Language Sample (15.46)	Sentence Completion (62.50)	-2.143	-3.105	.011*
Story Retell (38.89)	Story Generation (33.33)	.143	.207	1.00
Story Retell (38.89)	Sentence Completion (62.50)	-.857	-1.242	1.00
Story Generation (33.33)	Sentence Completion (62.50)	-1.00	-1.449	.884

Note. Asterisks note statistical significance of $p < .05$. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 42
Pairwise Comparisons for CSFU in 6TD Across Tasks (N =13)

Task (Mdn)	Task (Mdn)	X^2	*z*	*p*
Language Sample (20.00)	Story Retell (6.25)	1.192	2.355	.111
Language Sample (20.00)	Story Generation (14.29)	.462	.911	1.00
Language Sample (20.00)	Sentence Completion (25.50)	-.577	-1.139	1.00
Story Retell (6.25)	Story Generation (14.29)	-.731	-1.443	.894
Story Retell (6.25)	Sentence Completion (25.50)	-1.769	-3.494	.003**
Story Generation (14.29)	Sentence Completion (25.50)	-1.038	-2.051	.242

Note. One asterisk * note statistical significance of $p < .05$ and two asterisks ** note statistical significance of $p < .01$. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 43
Median Values for CSFU in First Graders (N = 5) and Second Graders (N = 7)

Task	First Graders (Mdn)	Second Graders (Mdn)
Language Sample	20.00	31.37
Story Retell	8.70	6.25
Story Generation	14.29	11.11
Sentence Completion	38.57	23.89

Table 44
Mann-Whitney U Test for Past tense During Language Sample (BCE Modeling) (N=20)

Morpheme	4TD (Mdn)	6TD (Mdn)	U	*z*	*p*
Regular past	.00	1.00	25.00	-1.697	.115
Zero regular past	.00	2.00	17.50	-2.270	.024*
Did + verb	.00	.00	35.00	-1.338	.438
Irregular past	1.00	6.00	23.500	-1.760	.081
Zero irregular past	1.00	3.00	40.00	-.448	.699

Note. Asterisks note statistical significance of $p < .05$.

Table 45
Descriptive Information for Past Tense During Language Sample (BCE Modeling) (N=20)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	% Op.6TD	Mean Difference
Regular past	.43*(.787)*	33.33%	4.69*(6.223)*	58.65%	4.264
Zero regular past	.86 *(1.46)*	66.67%	3.31*(3.43)*	41.35%	2.451
Did + verb	.00	0.00%	1.38 *(.95)*	6.87%	1.38
Irregular past	2.57*(4.32)*	51.42%	7.54*(6.728)*	70.00%	4.97
Zero irregular past	2.43*(3.10)*	48.57%	3.23*(3.72)*	30.00%	.80

Table 46
Mann-Whitney U Test for Past Tense During Language Sample (SE Modeling) (N=20)

Morpheme	4TD (Mdn)	6TD (Mdn)	*U*	*z*	*p*
Regular past	.00	3.00	19.00	-2.207	.037*
Zero regular past	1.00	1.00	45.00	-.041	1.00
Did + verb	.00	.00	31.500	-1.588	.275
Irregular past	3.00	5.00	25.500	-1.593	.115
Zero irregular past	1.00	1.00	41.00	-.371	.757

Note. Asterisks note statistical significance of $p < .05$.

Table 47
Descriptive Information for Past Tense During Language Sample (SE Modeling) (N=20)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	% Op.6TD	Mean Difference
Regular past	.29 *(.49)*	16.67%	4.12*(4.56)*	68.23%	3.87
Zero regular past	1.43 *(1.40)*	83.33%	1.85*(2.34)*	30.77%	.42
Did + verb	.00	0.00%	.70 *(.169)*	4.72%	7.69
Irregular past	2.86*(2.04)*	60.60%	7.61*(6.99)*	79.84%	4.76
Zero irregular past	1.86*(3.23)*	39.40%	1.92*(2.50)*	31.31%	.07

Table 48
Mann-Whitney U Test For Third Person Singular During Language Sample (BCE Modeling) (N=20)

Morpheme	4TD (Mdn)	6TD (Mdn)	*U*	*z*	*p*
Third person	2.00	2.00	48.500	.240	.817
Zero third person	2.00	.00	33.00	-1.102	.351
Does + verb	.00	.00	52.50	1.065	.588

Table 49

Descriptive Information for Third Person Singular During Language Sample (BCE Modeling) (N=20)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	% Op.6TD	Mean Difference
Third person	4.14*(5.928)*	76.32%	4.62*(5.12)*	70.60%	.473
Zero third person	1.29 *(.95)*	23.68%	.85*(1.41)*	12.94%	.44
Does + verb	.00	0.00%	1.08 *(3.09)*	16.47%	1.08

Table 50
Mann-Whitney U Test for Third Person Singular During Language Sample (SE Modeling) (N=20)

Morpheme	4TD (Mdn)	6TD (Mdn)	U	*z*	*p*
Third person	2.00	2.00	48.500	.240	.817
Zero third person	2.00	.00	33.00	-1.102	.351
Does + verb	.00	.00	52.50	1.065	.588

Table 51
Descriptive Information for Third Person Singular During Language Sample (SE Modeling) (N=20)

Morpheme	4TD (M/SD)	%Op. 4TD	6TD (M/SD)	% Op.6TD	Mean Difference
Third person	4.00*(7.30)*	87.50%	3.15*(3.67)*	59.42%	.85
Zero third person	.57 *(.1.13)*	12.50%	1.61*(2.79)*	30.43%	1.04
Does + verb	.00	0.00%	.54 *(1.33)*	10.14%	.54

Table 52

Total Frequency of Each Creole-universal and Creole-specific Features Per Group (N=20) for Copula be (BCE Modeling LS)

Feature	4TD (*N*=7)	6TD (*N*=13)	% of Opportunities (4TD)	% of Opportunities (6TD)
CU: Copula: Am	0	2.00	0%	40%
CU: Contractible Copula: Am	0	0	0%	0%
CS: Copula: Ø Am	1	3	100%	60%
CU: Copula: Is	10	66	76.92%	80.49%
CU: Contractible Copula: Is	0	0	0.00%	0.00%
CS: Copula: Ø Is	3	16	23.08%	19.51%
CS: Copula: Leveled Is	0	1	0.00%	7.69%
CS: Copula: Contractible Leveled Is	0	0	0.00%	0.00%
CU: Copula: Are	7	6	87.50%	46.15%
CU: Contractible Copula: Are	0	0	0.00%	0.00%
CS: Copula: Ø Are	1	6	12.50%	46.15%
CU: Copula: Was	12	55	100.00%	98.21%
CS: Copula: Ø Was	0	1	0.00%	1.79%
CS: Copula: Leveled Was	0	3	0.00%	42.86%
CU: Copula: Were	0	4	0.00%	57.14%
CS: Copula: Ø Were	0	0	0.00%	0.00%

Table 53

Total Frequency of Each Creole-universal and Creole-specific Features Per Group (N=20) for Copula be (English Modeling LS)

Feature	4TD (*N*=7)	6TD (*N*=13)	% of Opportunities (4TD)	% of Opportunities (6TD)
CU: Copula: Am	1	2	50.00%	66.67%
CU: Contractible Copula: Am	0	0	0.00%	0.00%
CS: Copula: Ø Am	1	1	50.00%	33.33%
CU: Copula: Is	22	55	88.00%	84.62%
CU: Contractible Copula: Is	0	0	0.00%	0.00%
CS: Copula: Ø Is	3	10	12.00%	18.46%
CS: Copula: Leveled Is	1	1	16.67%	16.67%
CS: Copula: Contractible Leveled Is	0	0	0.00%	0.00%
CU: Copula: Are	3	2	50.00%	33.33%
CU: Contractible Copula: Are	0	0	0.00%	0.00%
CS: Copula: Ø Are	2	3	33.33%	50.00%
CU: Copula: Was	8	59	100%	100%
CS: Copula: Ø Was	0	0	0.00%	0.00%
CS: Copula: Leveled Was	1	2	100%	40.00%
CU: Copula: Were	0	3	0.00%	60.00%
CS: Copula: Ø Were	0	0	0.00%	0.00%

Table 54

Total Frequency of Each Creole-universal and Creole-specific Features Per Group (N=20) for Auxiliary be (BCE Modeling LS)

Morpheme	4TD (*N*=7)	6TD (*N*=13)	% of Opportunities (4TD)	% of Opportunities (6TD)
CU: Auxiliary: Am	1	1	25.00%	33.33%
CU: Contractible Auxiliary: Am	0	0	0.00%	0.00%
CS: Auxiliary: Ø Am	3	2	75.00%	66.67%
CU: Auxiliary: Is	0	7	0.00%	9.86%
CU: Contractible Auxiliary: Is	0	0	0.00%	0.00%
CS: Auxiliary: Ø Is	3	5.0	60.00%	7.04%
CS: Be+verb	1.0	1.0	20.00%	1.41%
CS: Is+Be+Verb	0	1.0	0.00%	1.41%
CS: Is+Verb	1.0	57.00	20.00%	80.28%
CS: Auxiliary: Leveled Is	0	0.0	0.00%	0.00%
CU: Auxiliary: Are	0	0.00	0.00%	0.00%
CU: Contractible Auxiliary: Are	0	1.00	0.00%	20.00%
CS: Auxiliary: Ø Are	2.0	4.00	100.00%	80.00%
CU: Auxiliary: Was	4.0	21.00	66.67%	91.30%
CS: Auxiliary: Ø Was	2.0	2.00	33.33%	8.70%
CS: Auxiliary: Leveled Was	2.00	1.00	100.00%	20.00%
CU: Auxiliary: Were	0	4.00	0.00%	80.00%
CS: Auxiliary: Ø Were	.00	.00	0.00%	0.00%

Table 55

Total Frequency of Each Creole-universal and Creole-specific Features Per Group (N=20) for Auxiliary be (English Modeling LS)

Morpheme	4TD (*N*=7)	6TD (*N*=13)	% of Opportunities (4TD)	% of Opportunities (6TD)
CU: Auxiliary: Am	1	.00	100.00	0.00
CU: Contractible Auxiliary: Am	.00	0.00	0.00	0.00
CS: Auxiliary: Ø Am	.00	5.00	0.00	100.00
CU: Auxiliary: Is	.00	4.00	0.00	10.26
CU: Contractible Auxiliary: Is	.00	0.00	0.00	0.00
CS: Auxiliary: Ø Is	1.0	5.00	11.11	12.82
CS: Be+verb	.00	.00	0.00	0.00
CS: Is+Be+Verb	.00	2.00	0.00	5.13
CS: Is+Verb	8.0	28.00	88.89	71.79
CS: Auxiliary: Leveled Is	.00	.00	0.00	0.00
CU: Auxiliary: Are	.00	.00	0.00	0.00
CU: Contractible Auxiliary: Are	.00	.00	0.00	0.00
CS: Auxiliary: Ø Are	.00	4.00	0.00	100.00
CU: Auxiliary: Was	9.0	33.00	100.00	94.29
CS: Auxiliary: Ø Was	.00	2.00	0.00	5.71
CS: Auxiliary: Leveled Was	1.0	.00	100.00	0.00
CU: Auxiliary: Were	.00	6.00	0.00	100.00
CS: Auxiliary: Ø Were	.00	.00	0.00	0.00

Appendix 2: Figures

Figure 1
Distribution of Creole Density for 4TD and 6TD (N=21)

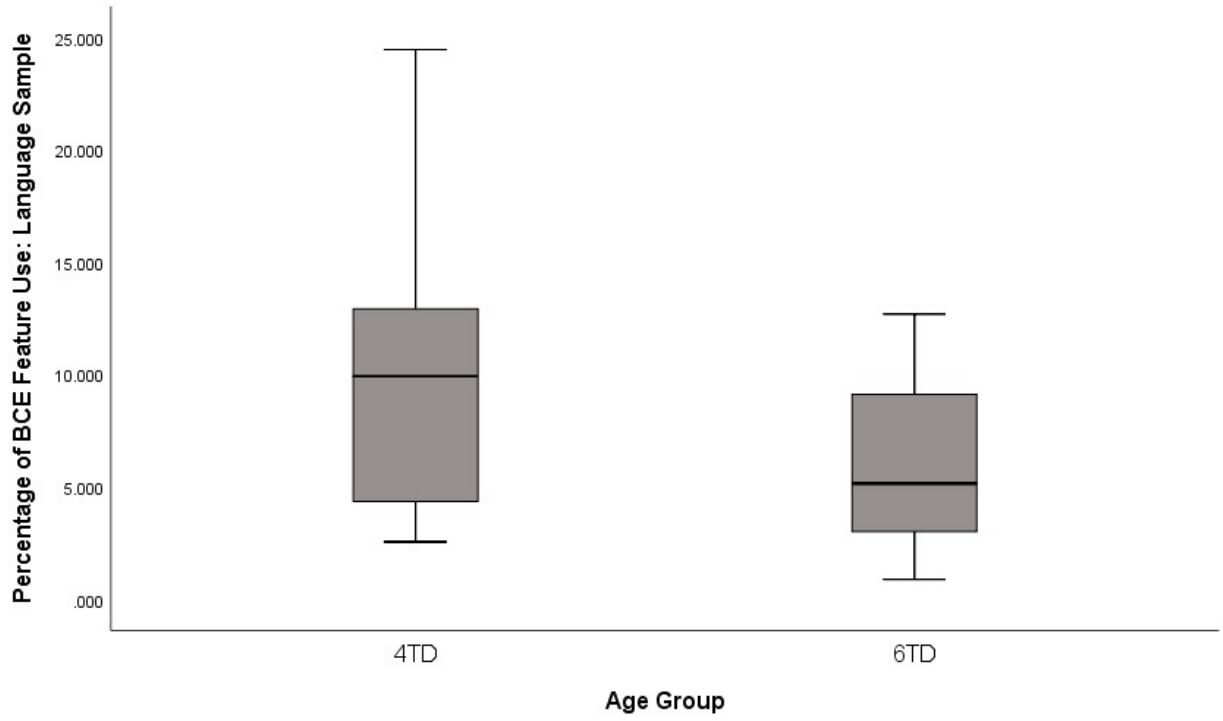
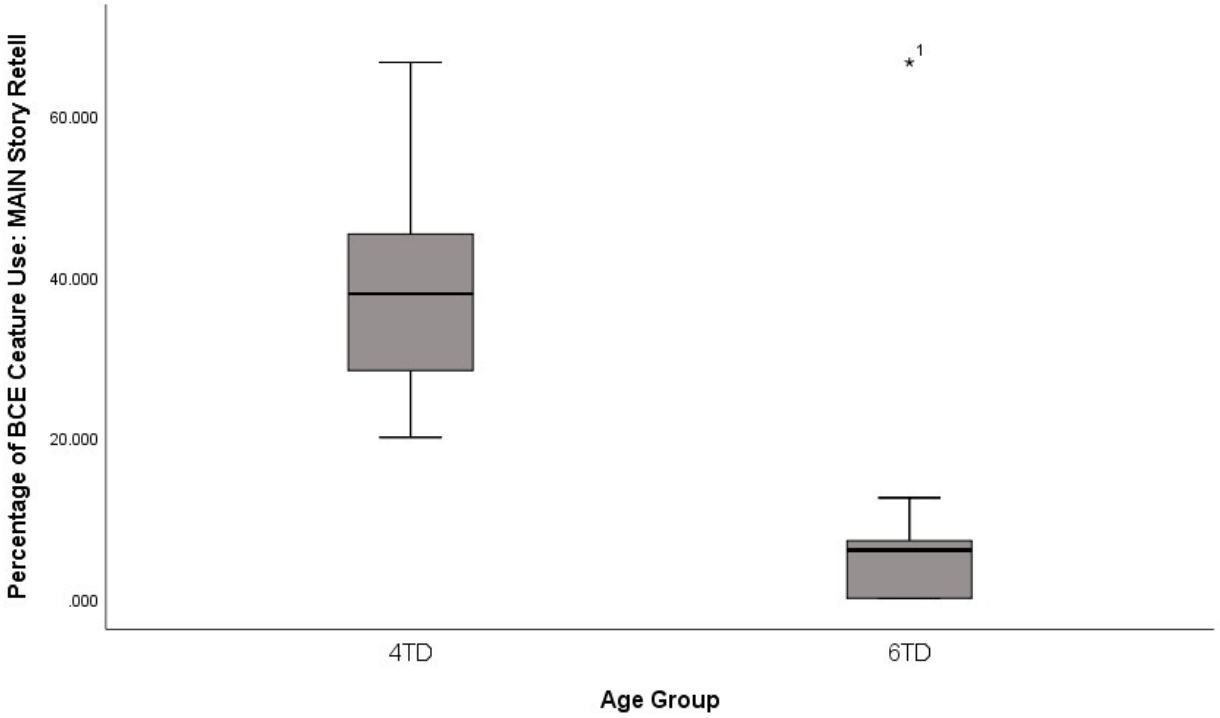
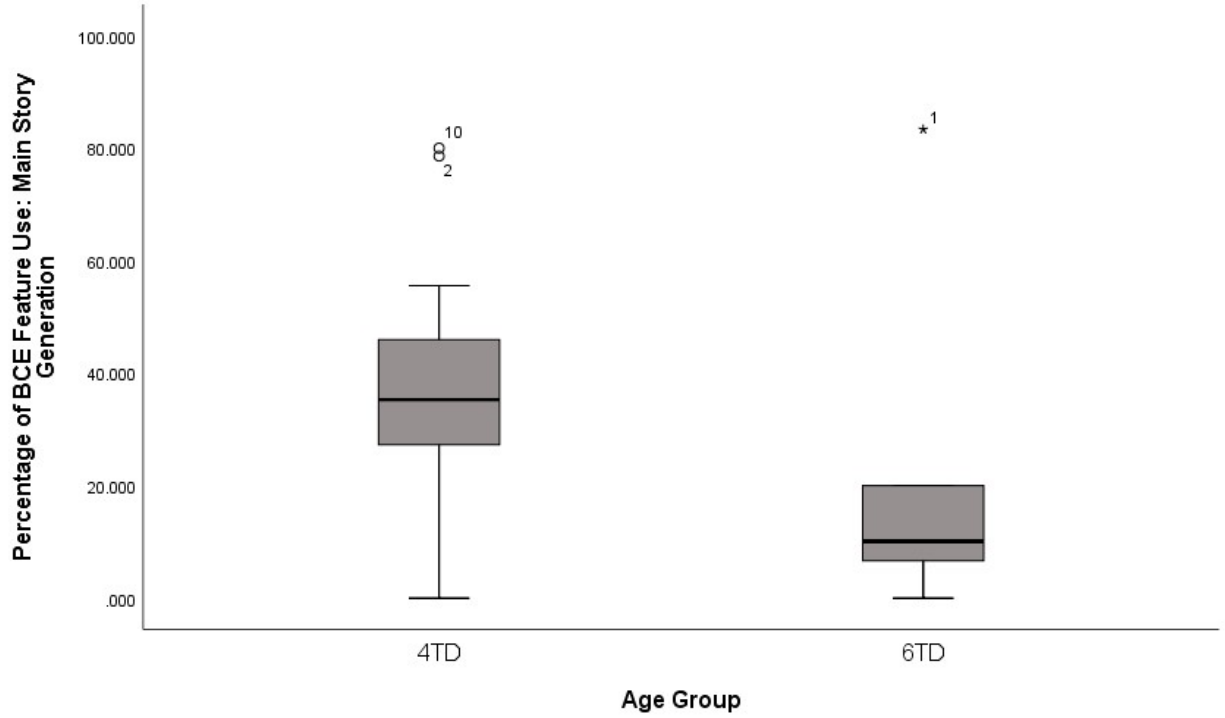


Figure 2
Distribution of Creole-Specific Feature Use During Story Retell (N=21)



Note. Symbols and numbers note outliers.

Figure 3
Distribution of Creole-Specific Feature Use During Story Generation (N=21)



Note. Symbols and numbers note outliers.

Figure 4
Distribution of Creole-Specific Feature Use During Sentence Completion Task (N=21)

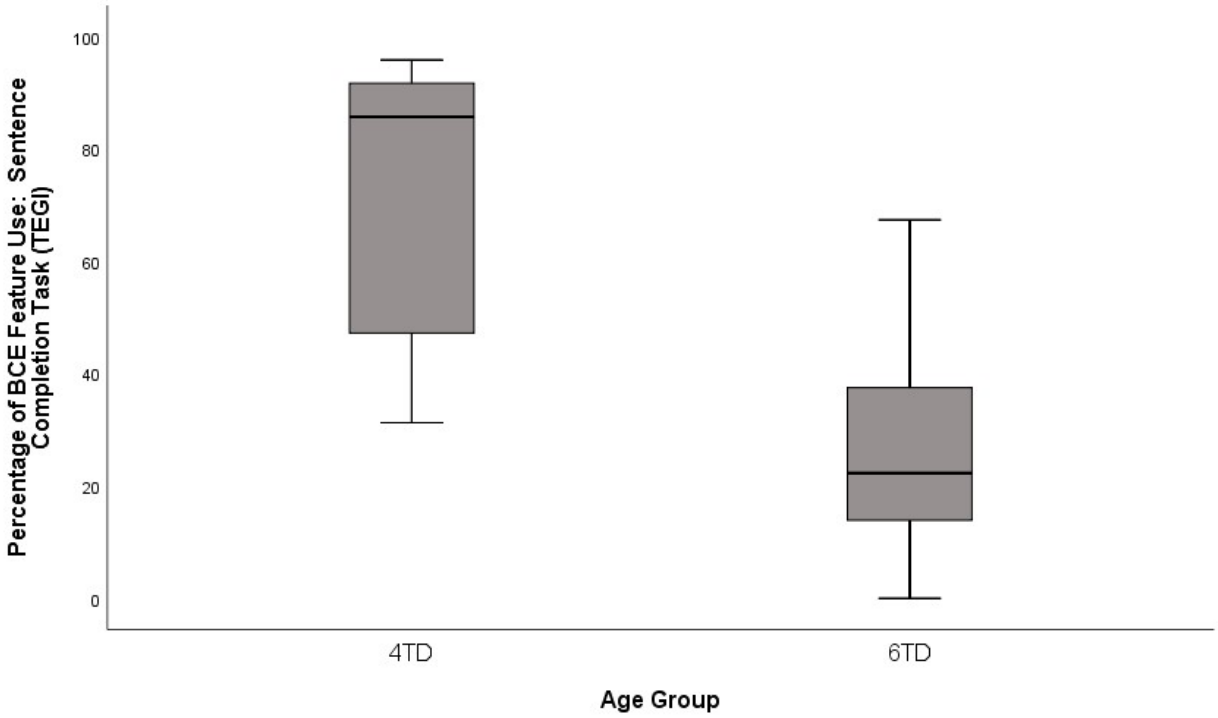
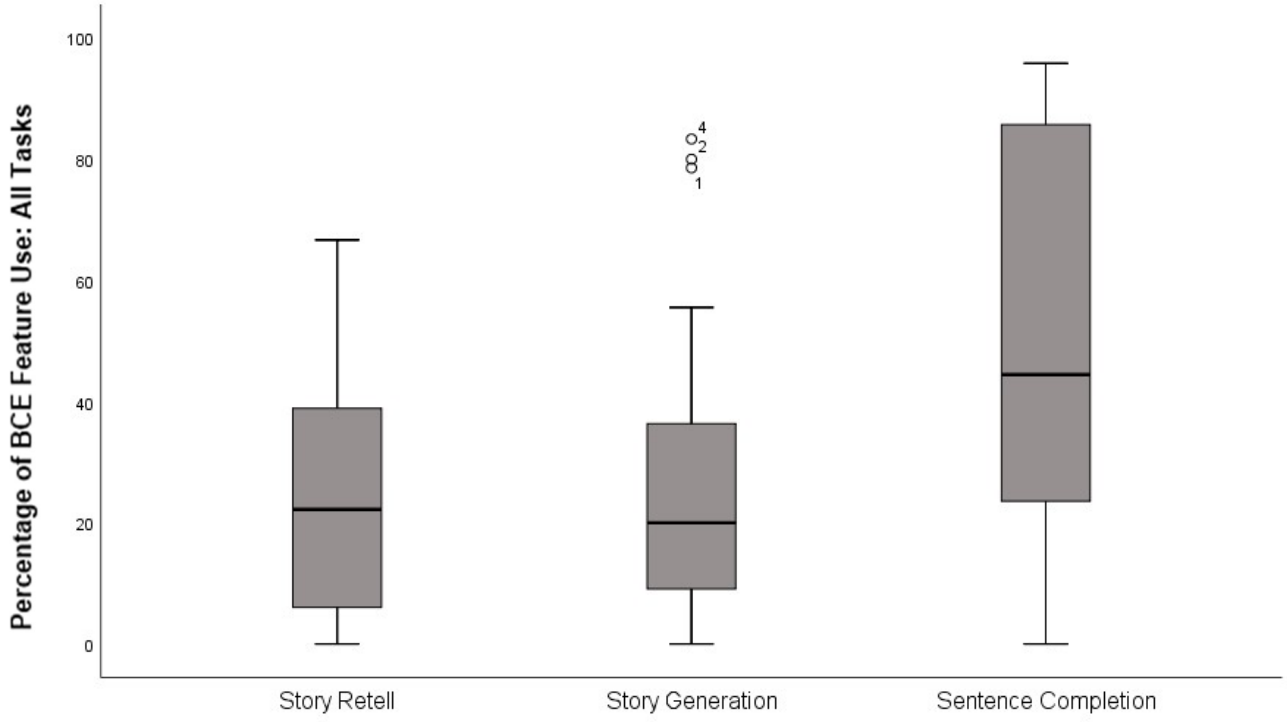


Figure 5
Distribution of Creole-Specific Feature Across All Tasks (Groups Combined) (N=21)



Note. Symbols and numbers note outliers.

Figure 6
Distribution of Language Sample Length

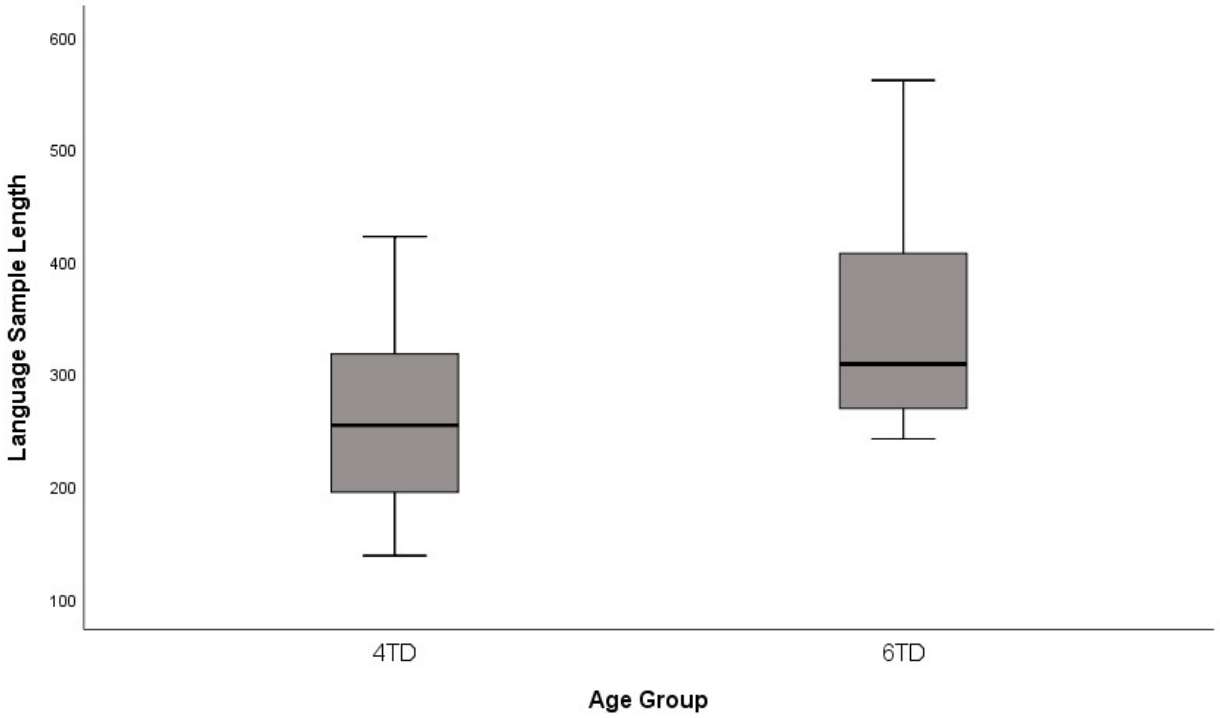


Figure 7
Marked Regular Plural- Statistically Significant Results

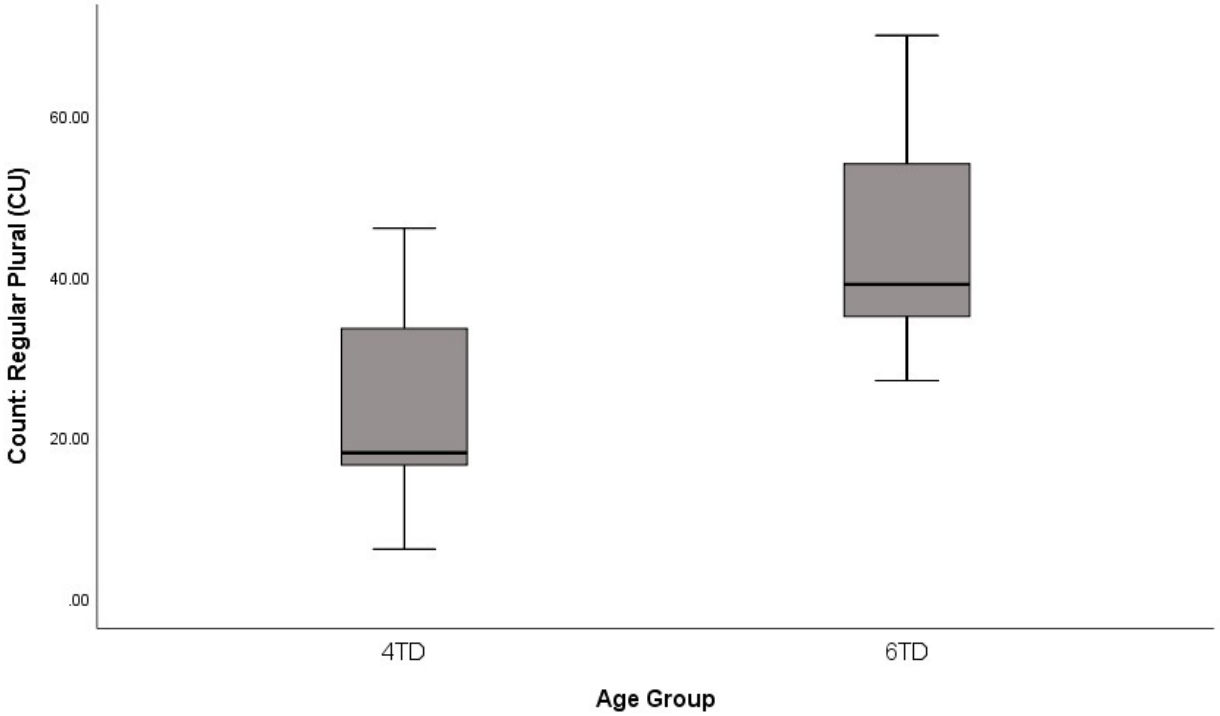
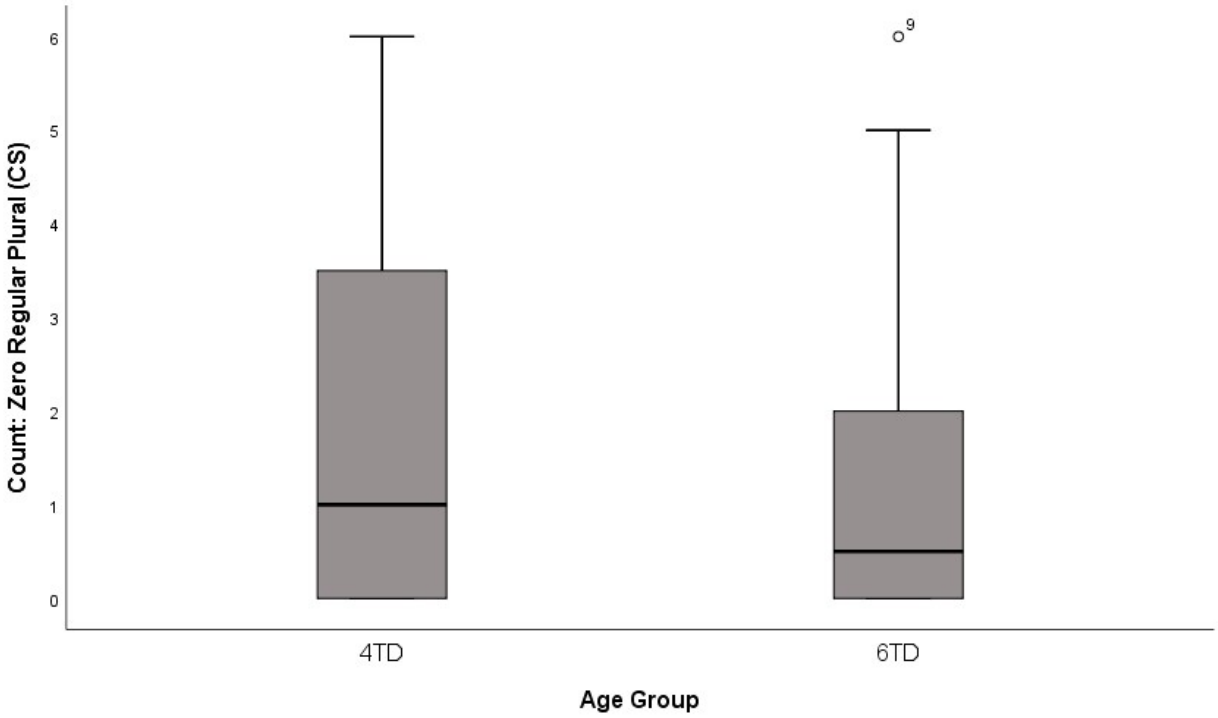
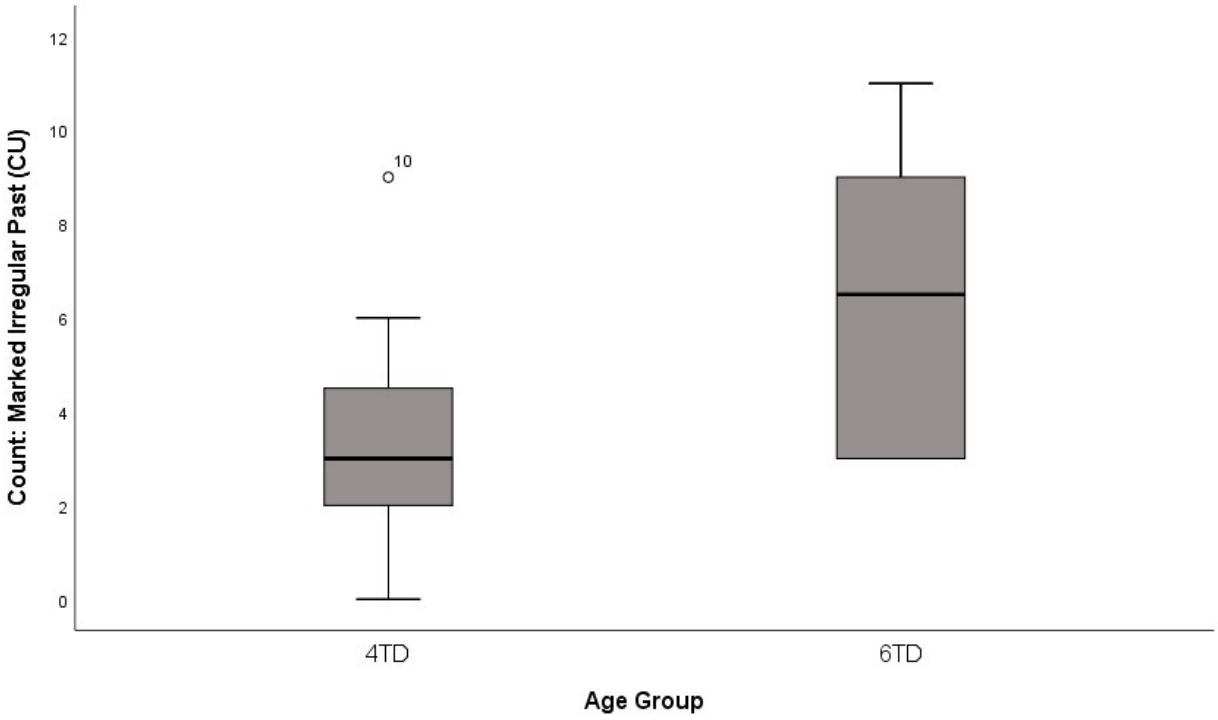


Figure 8
Zero Marked Regular Plural- Not Statistically Significant Results



Note. Symbols and numbers note outliers.

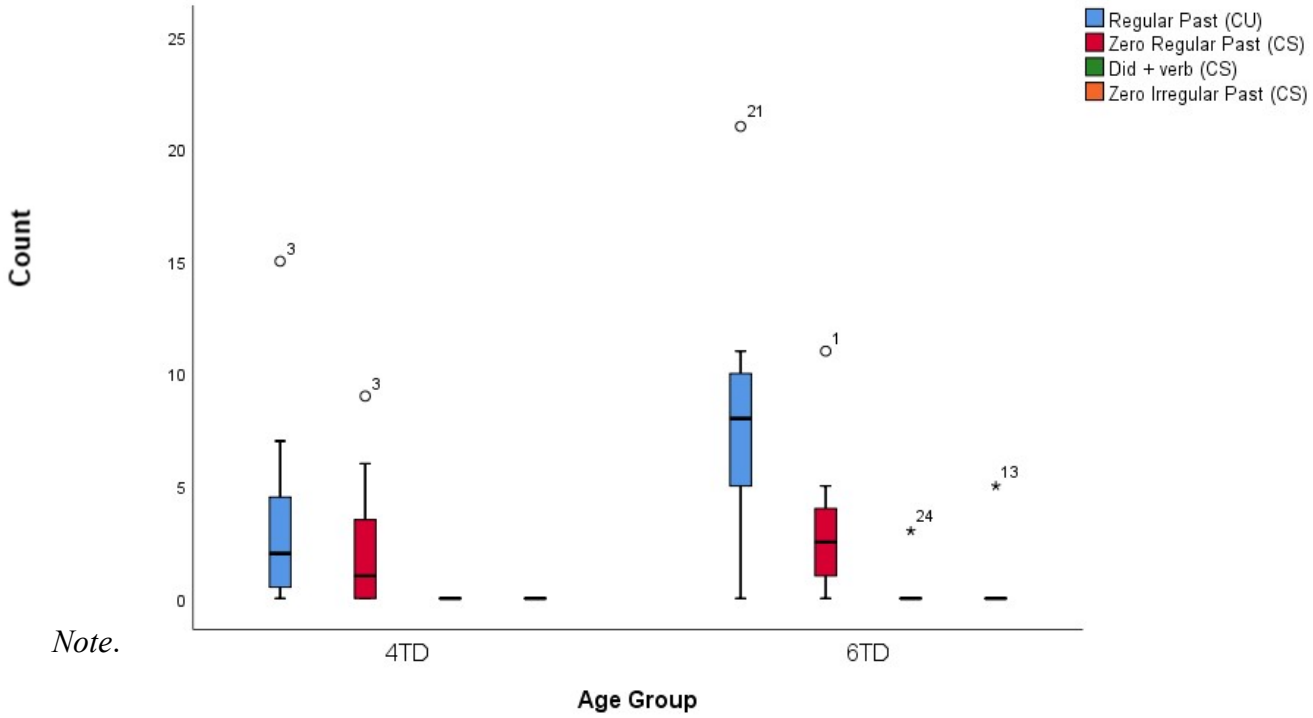
Figure 9
Marked Irregular Past Tense- Statistically Significant Results



Note. Symbols and numbers note outliers.

Figure 10

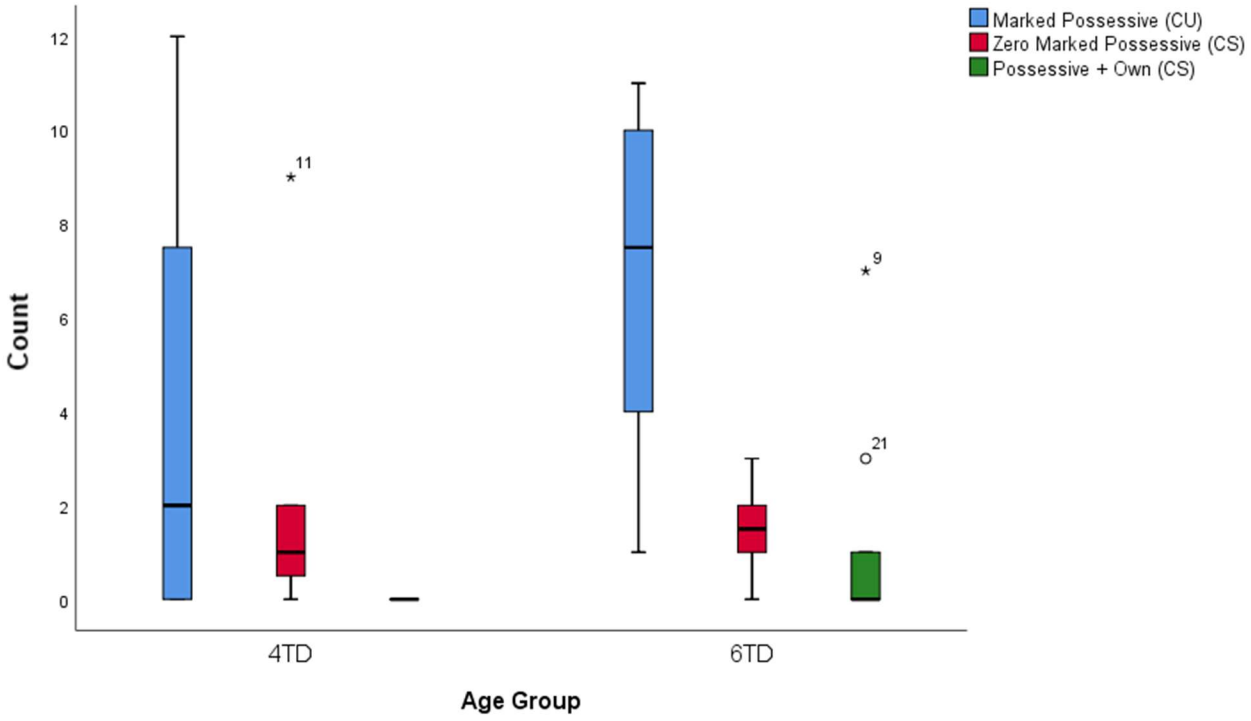
Past tense- Not Statistically Significant Results



Note.

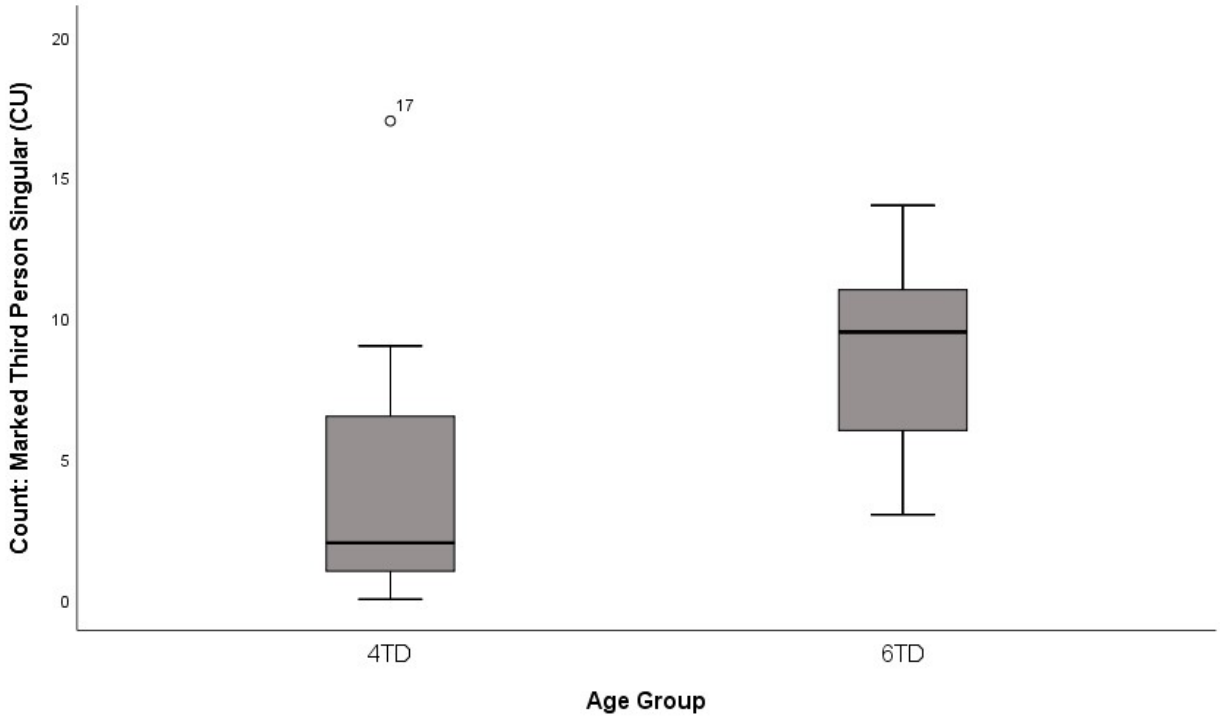
Symbols and numbers note outliers.

Figure 11
Possession- Not Statistically Significant Results



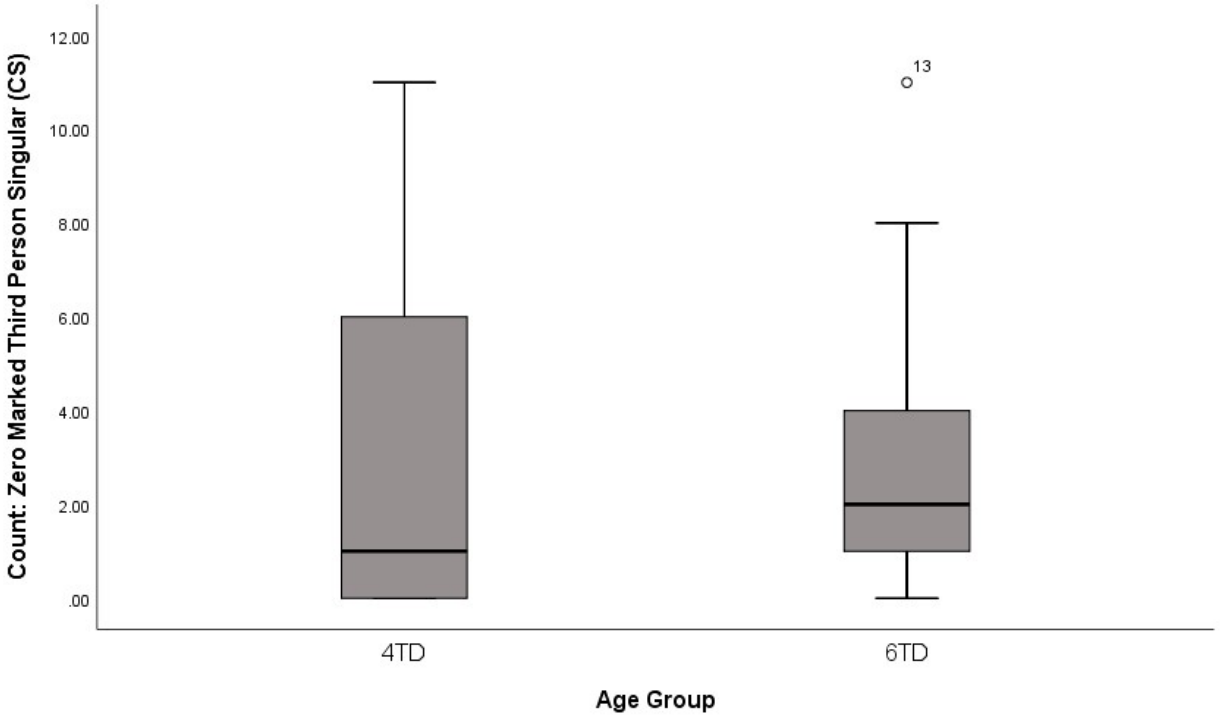
Note. Symbols and numbers note outliers.

Figure 12
Marked Third Person Singular: Statistically Significant Results



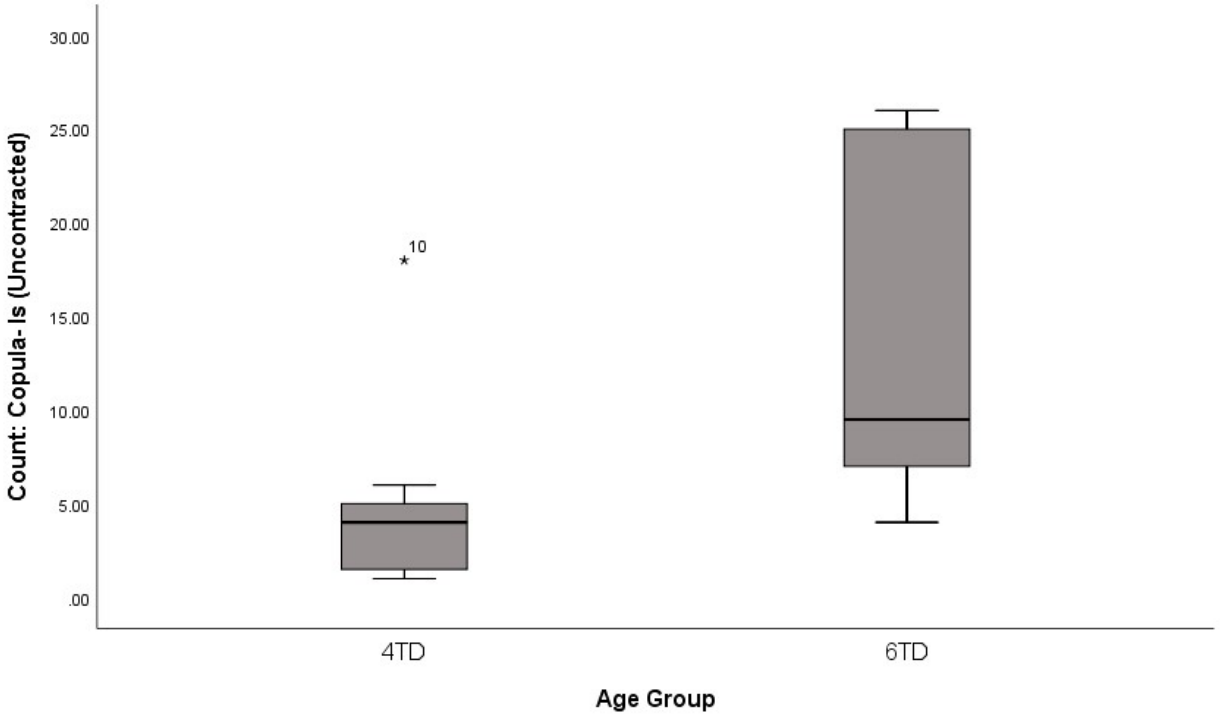
Note. Symbols and numbers note outliers.

Figure 13
Zero Marked Third Person Singular: Not Statistically Significant Results



Note. Symbols and numbers note outliers.

Figure 14
Marked Copula Is (Uncontracted): Statistically Significant Results



Note. Symbols and numbers note outliers.

Figure 15
Marked Copula Is (Contracted): Statistically Significant Results

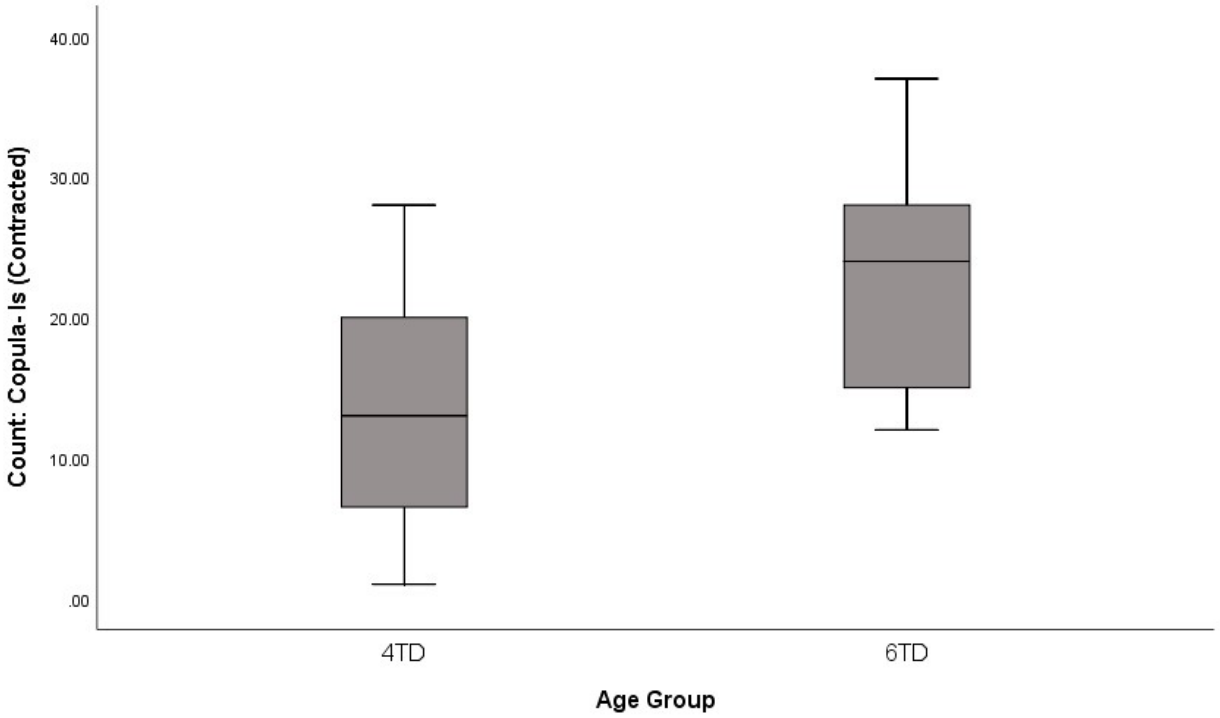


Figure 16
Zero Marked Copula Is: Statistically Significant Results

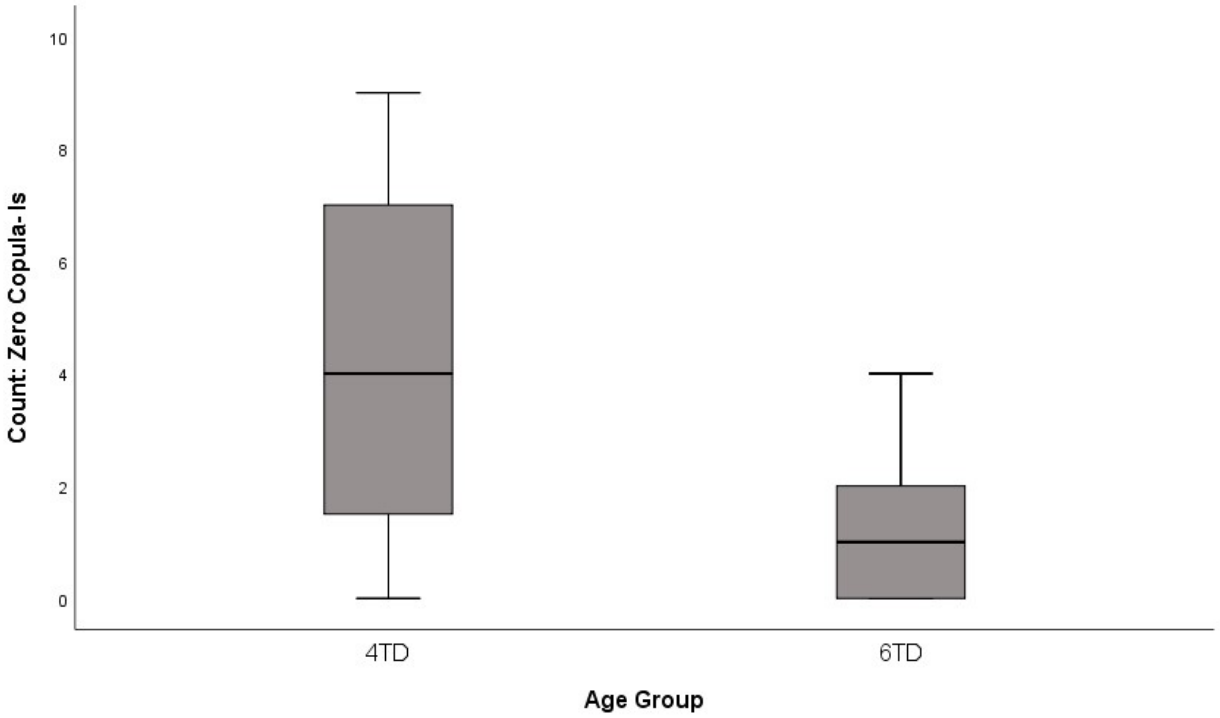
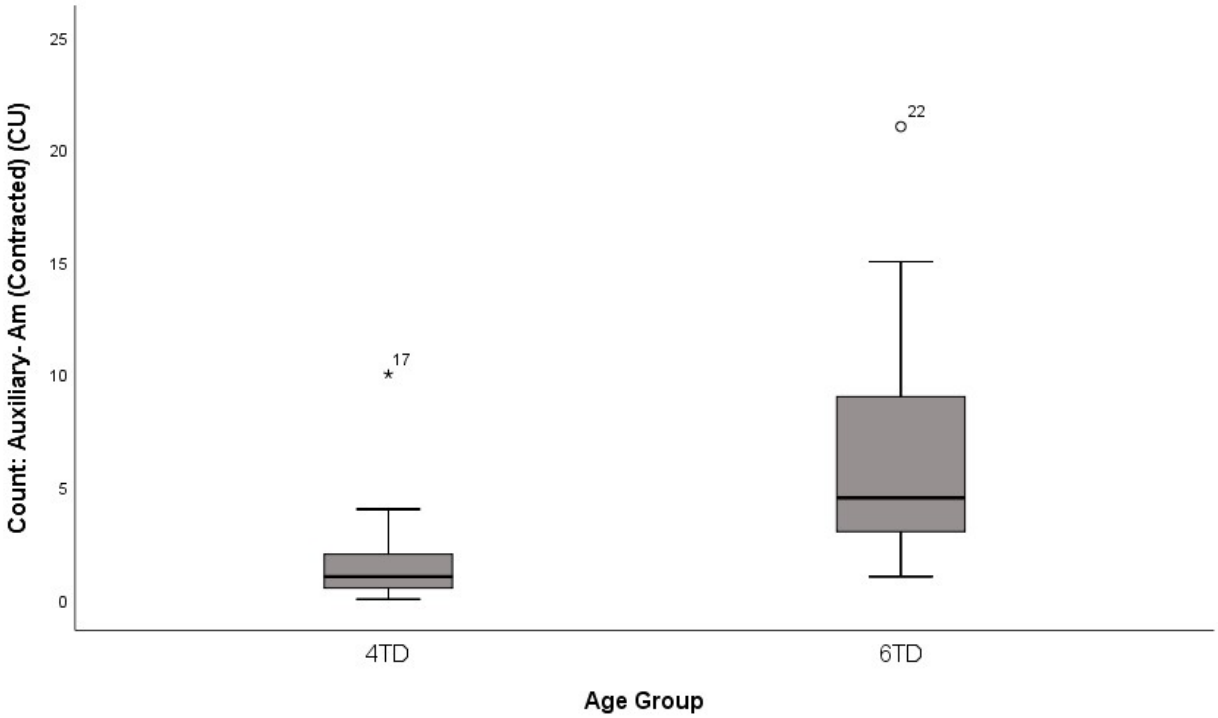


Figure 17
Marked Auxiliary Am (Contracted): Statistically Significant Results



Note. Symbols and numbers note outliers.

Figure 18
Marked Auxiliary Is (Uncontracted): Statistically Significant Results

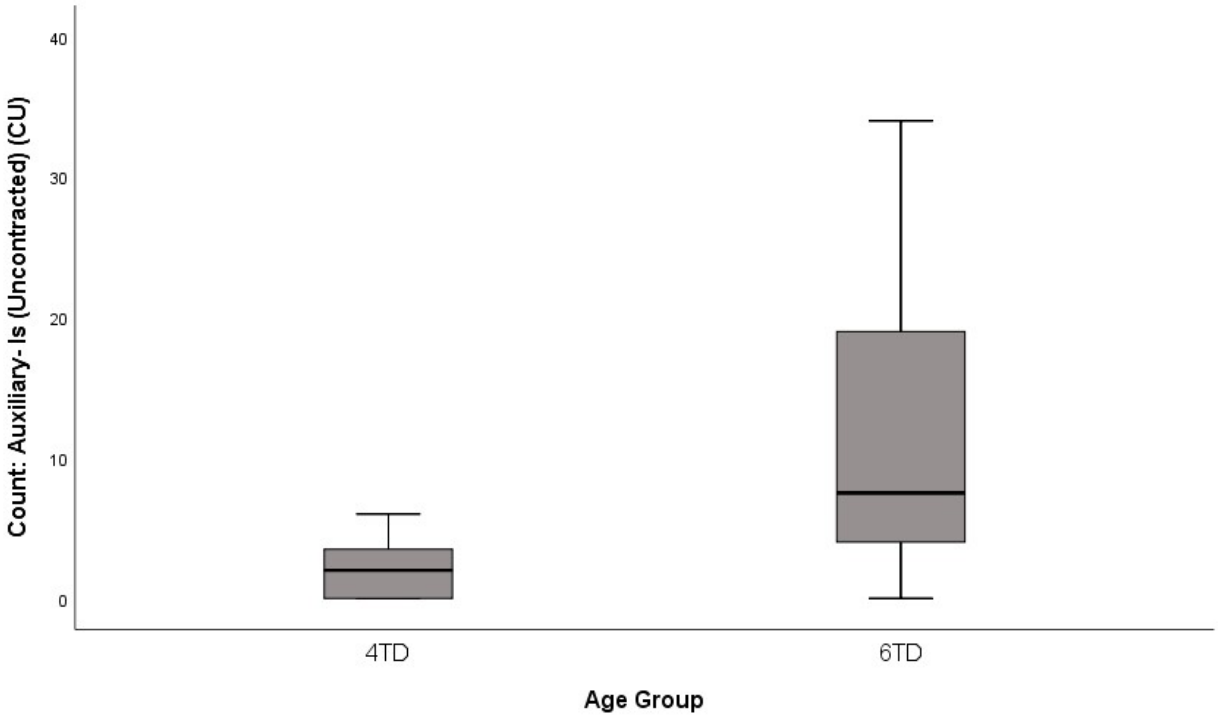
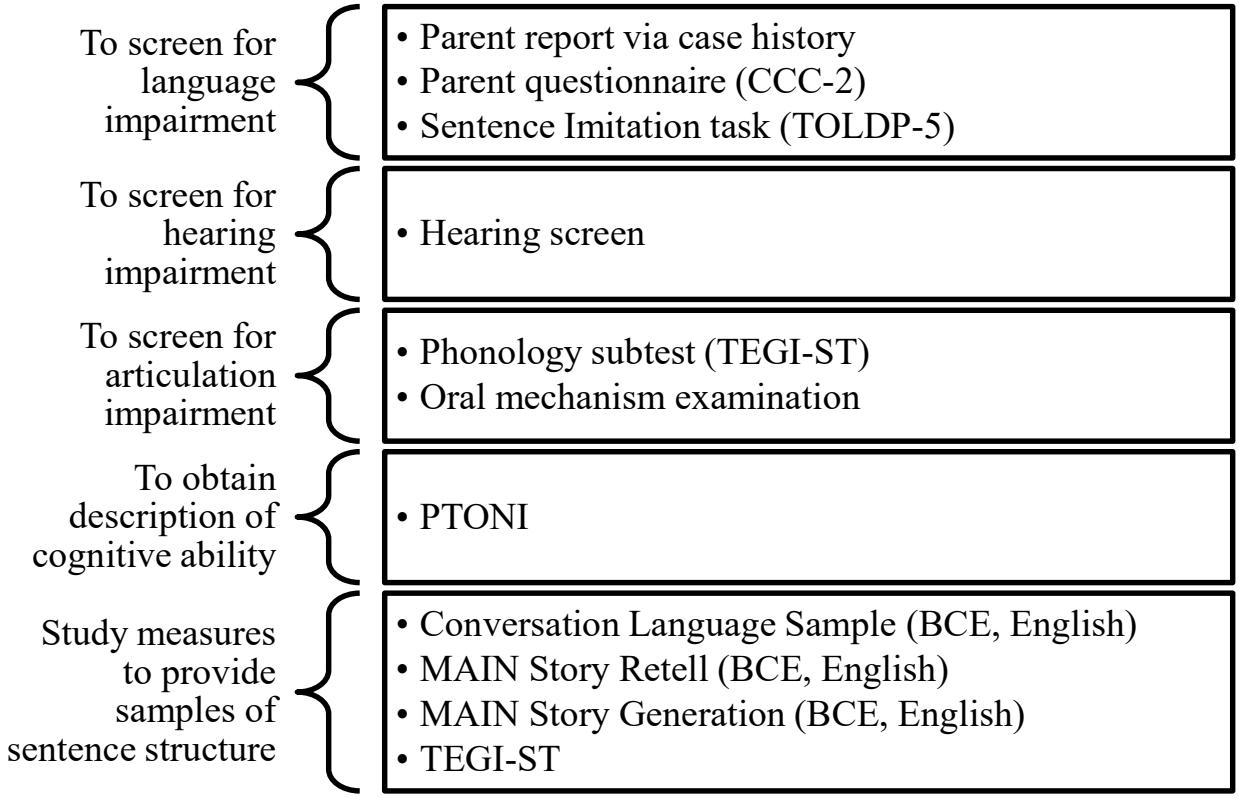


Figure 19
Study Design

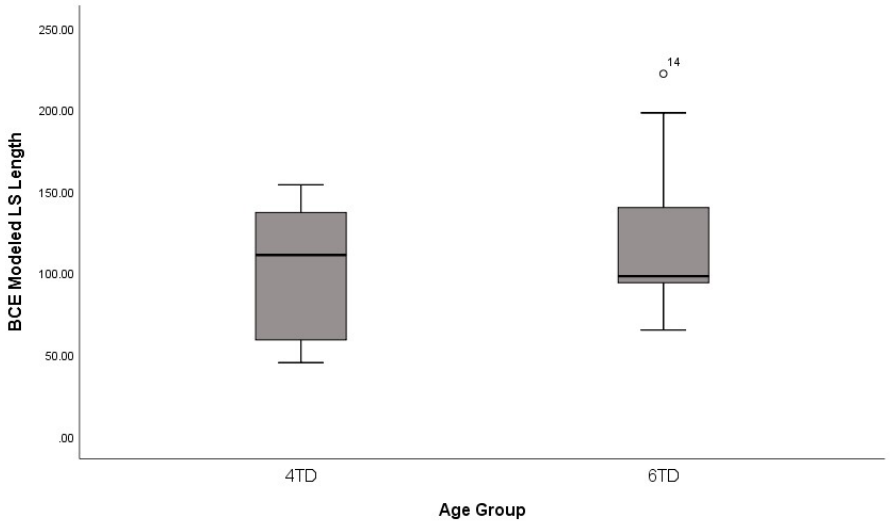


Note. CCC-2 = Children's Communication Checklist; TOLDP-5 = Test of Language Development, Primary, 5th Edition; TEGI-ST = Test of Early Grammatical Impairment, Screening Test; PTONI = Primary Test of Nonverbal Intelligence; MAIN = Multilingual Assessment Instrument for Narratives.

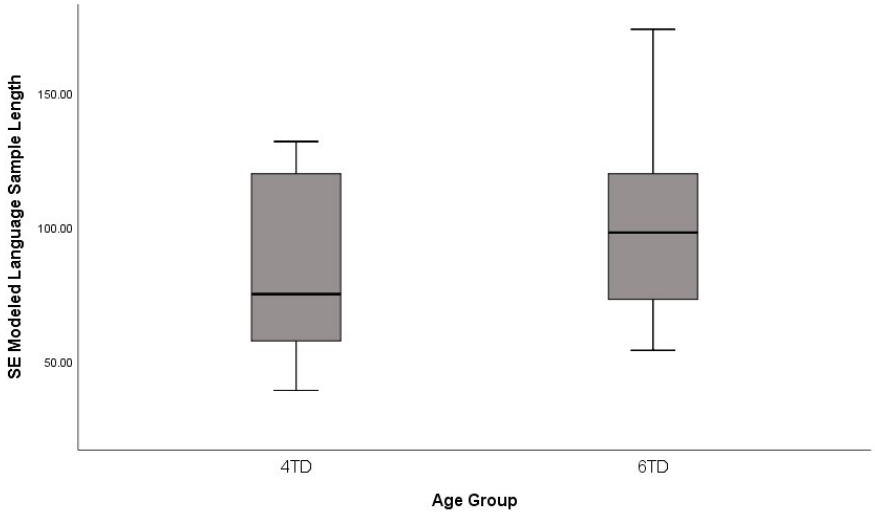
Figure 20

Distribution of Language Sample Length for a) BCE-Modeled Language Sample; b) SE-Modeled Language Sample; and c) Both Groups

a)



b)



c)

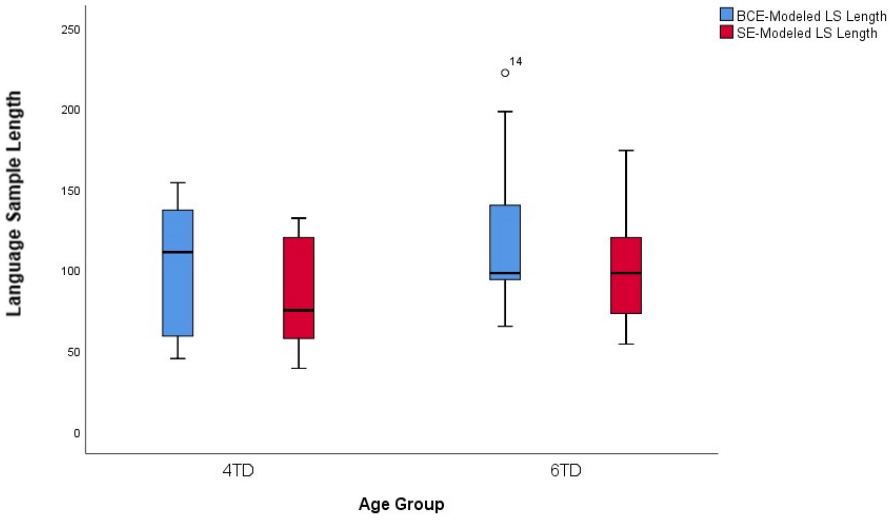
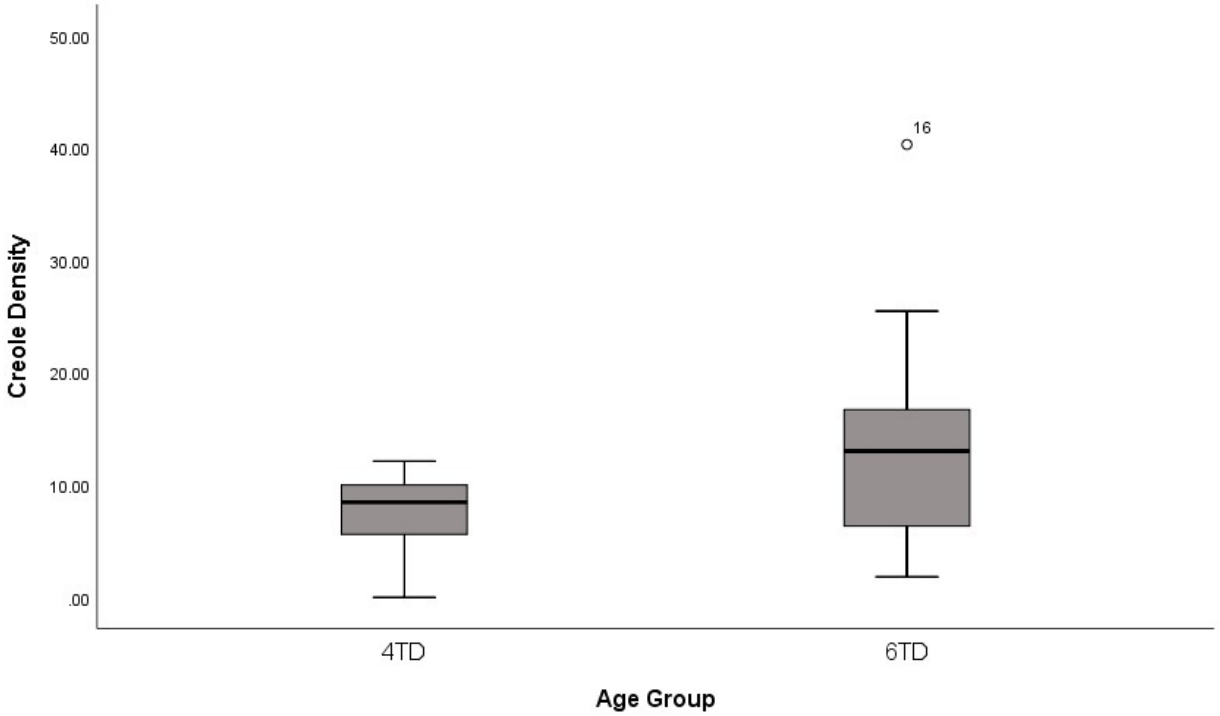
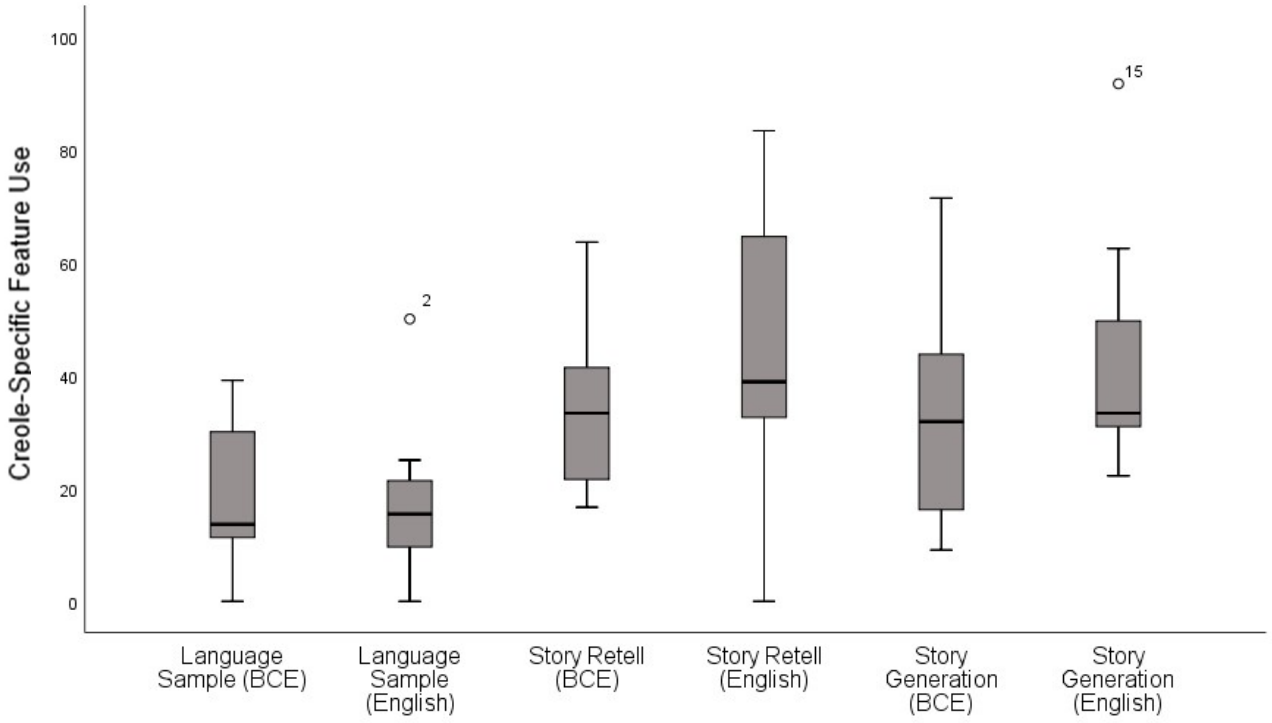


Figure 21
Distribution for Creole Density (N=20)



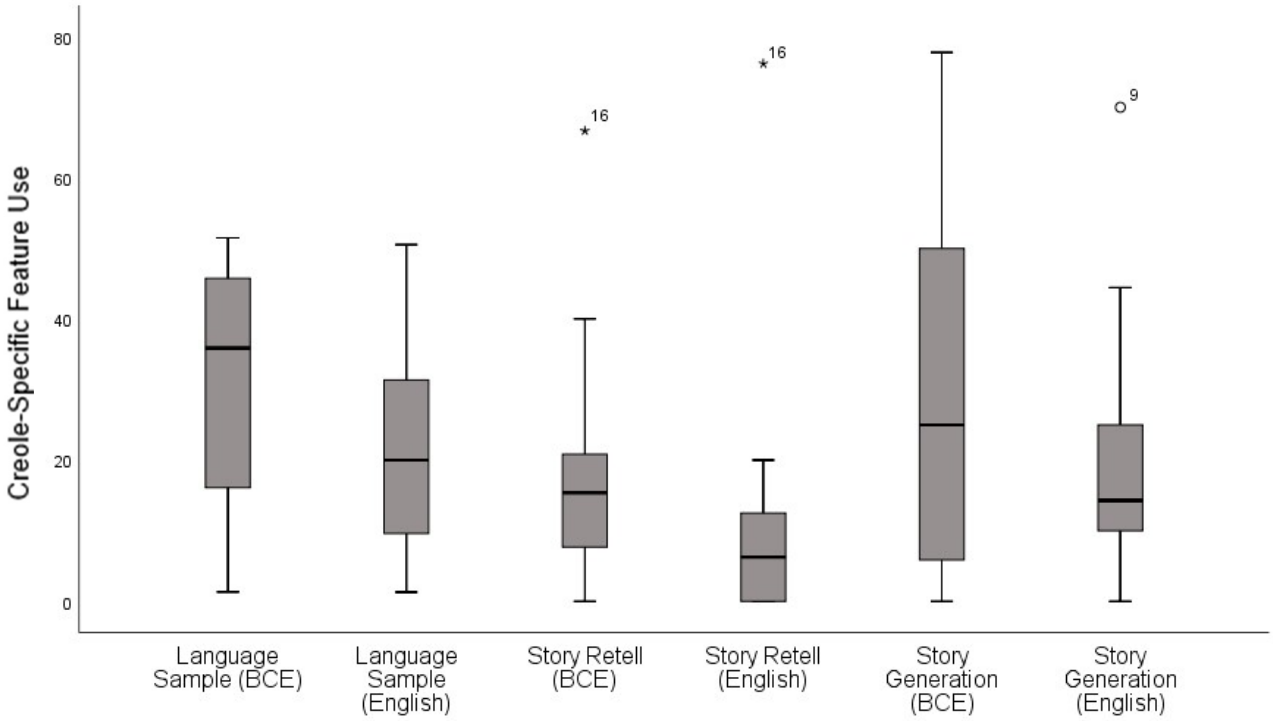
Note. Symbols and numbers note outliers.

Figure 22
Distribution for Creole-Specific Feature Use in 4TD Between Tasks (N=7)



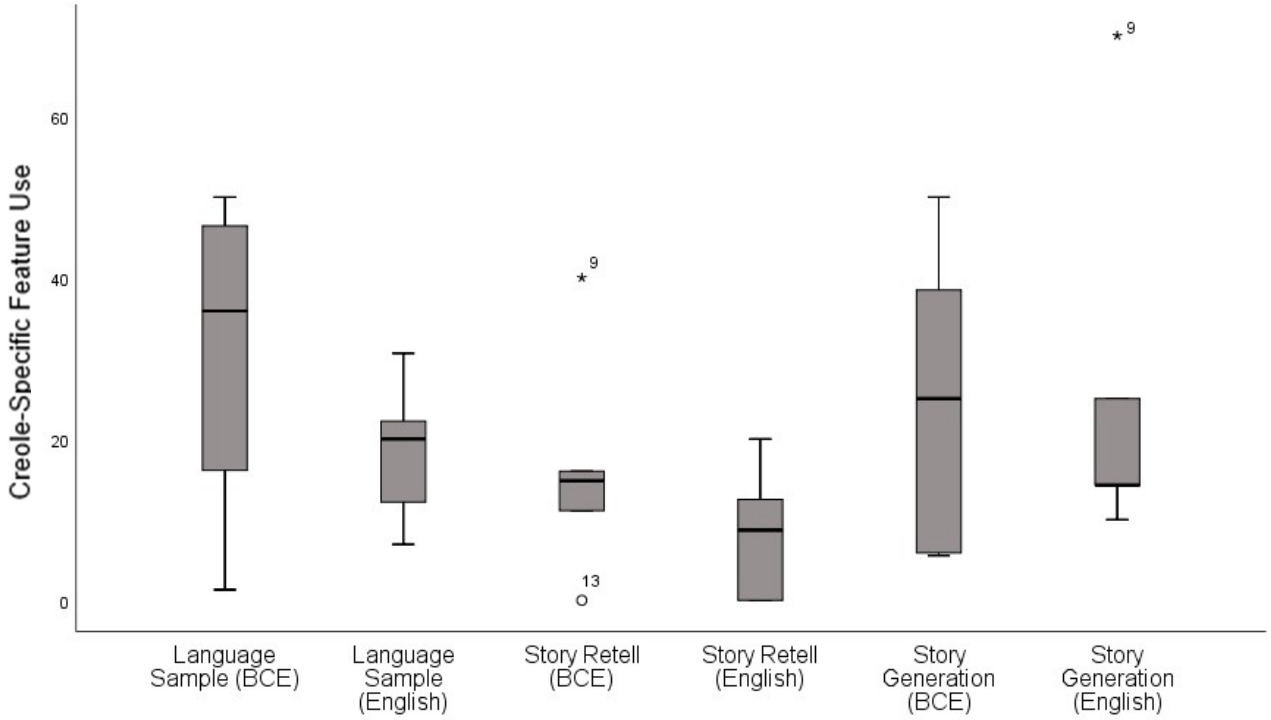
Note. Symbols and numbers note outliers.

Figure 23
Distribution for Creole-Specific Feature Use in 6TD Between Tasks (N=13)



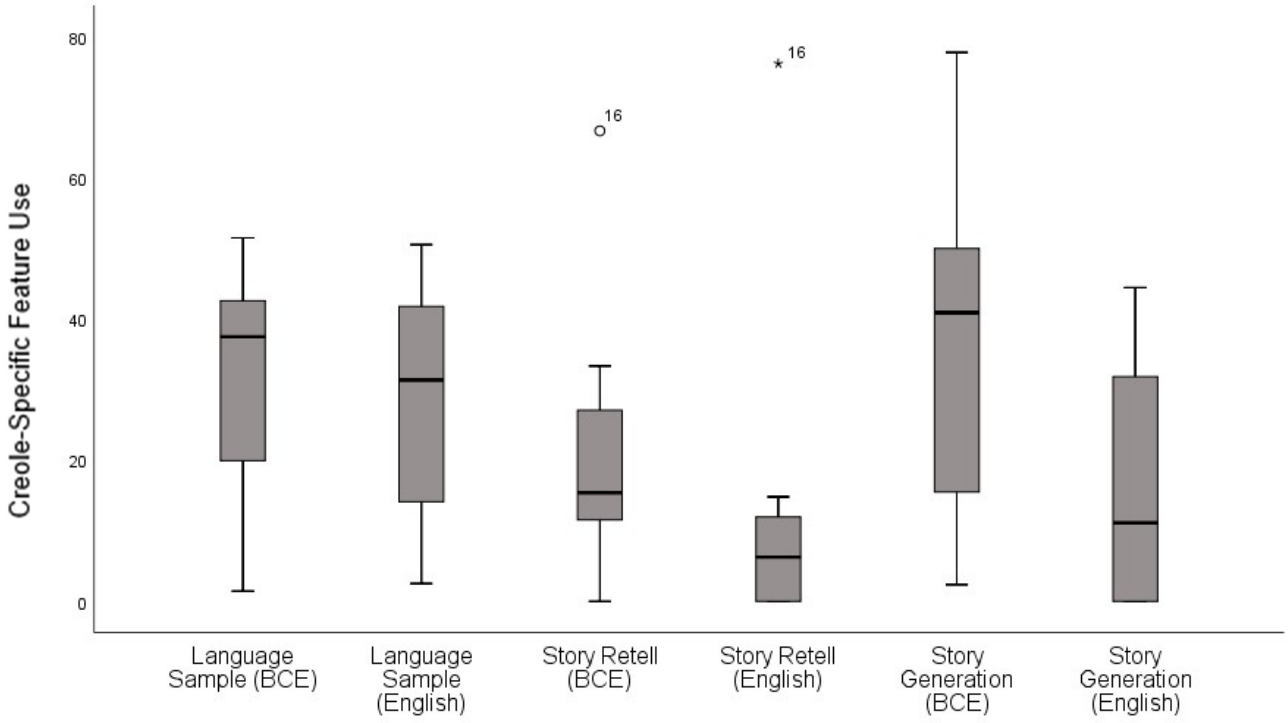
Note. Symbols and numbers note outliers.

Figure 24
Distribution for Creole-Specific Feature Use in First Graders Between Tasks (N=5)



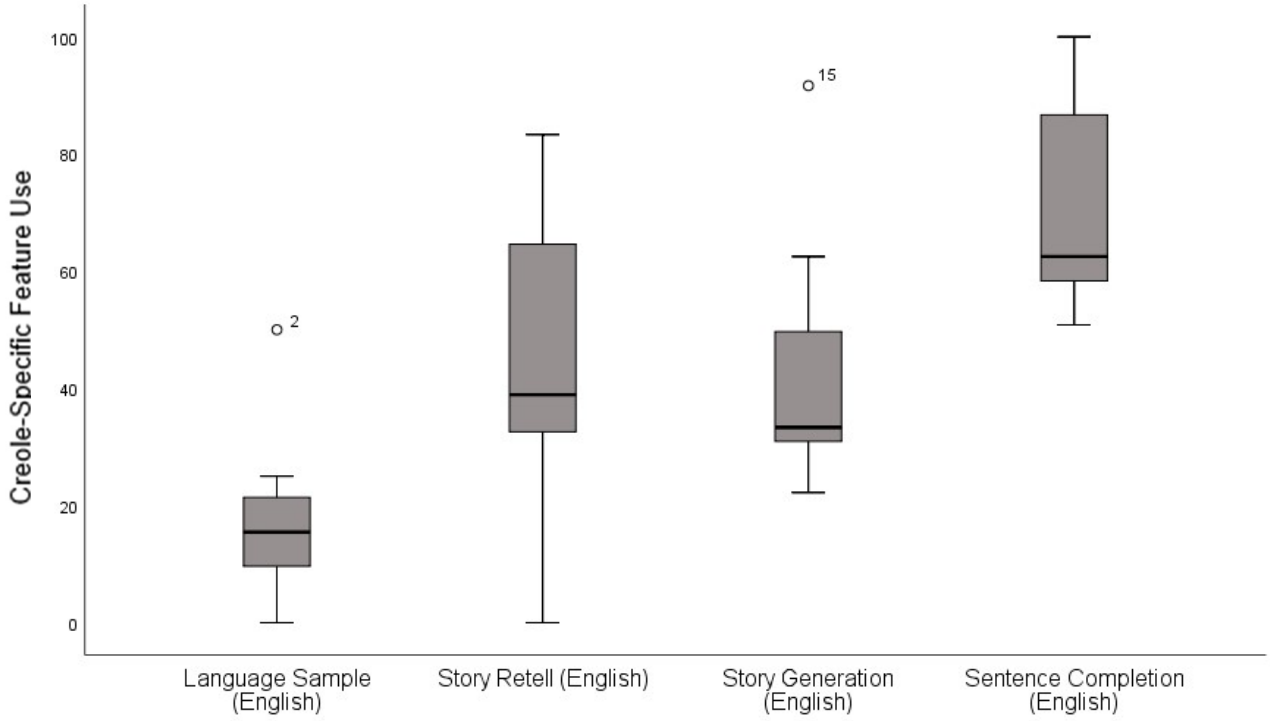
Note. Symbols and numbers note outliers.

Figure 25
Distribution for Creole-Specific Feature Use in Second Graders Between Tasks (N=7)



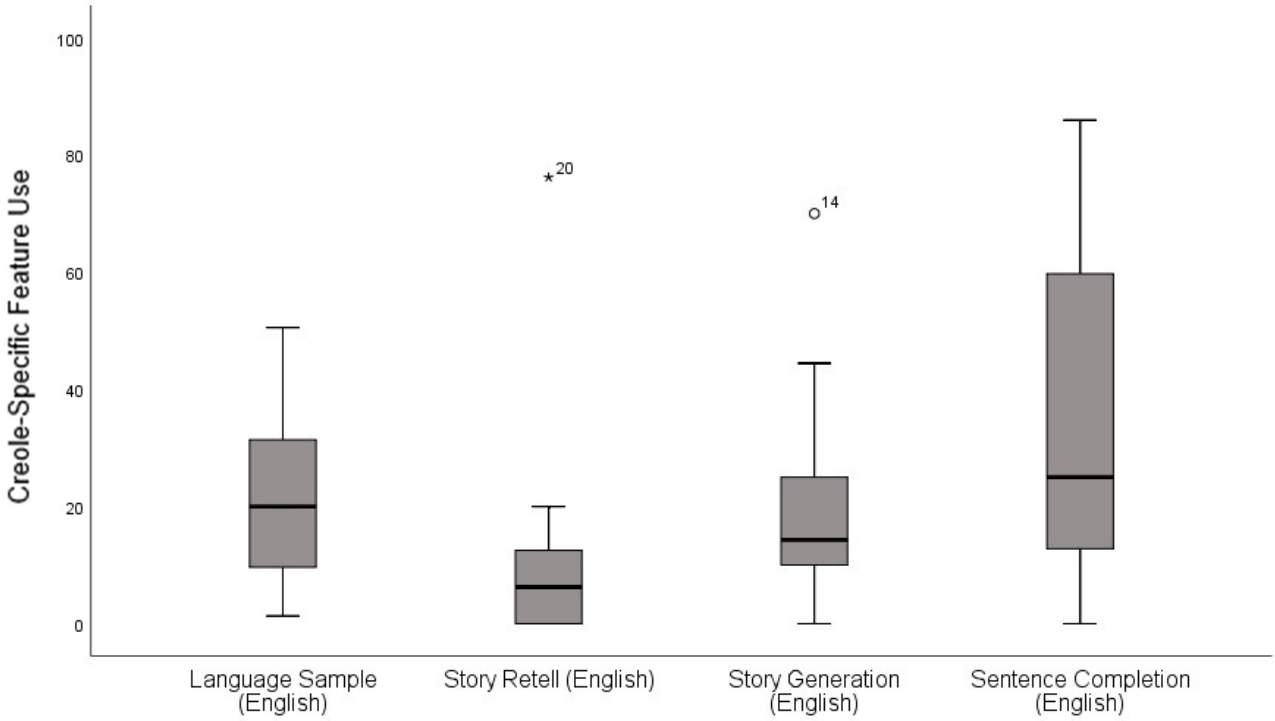
Note. Symbols and numbers note outliers.

Figure 26
Distribution for Creole-Specific Feature Use in 4TD Across Tasks (N=7)



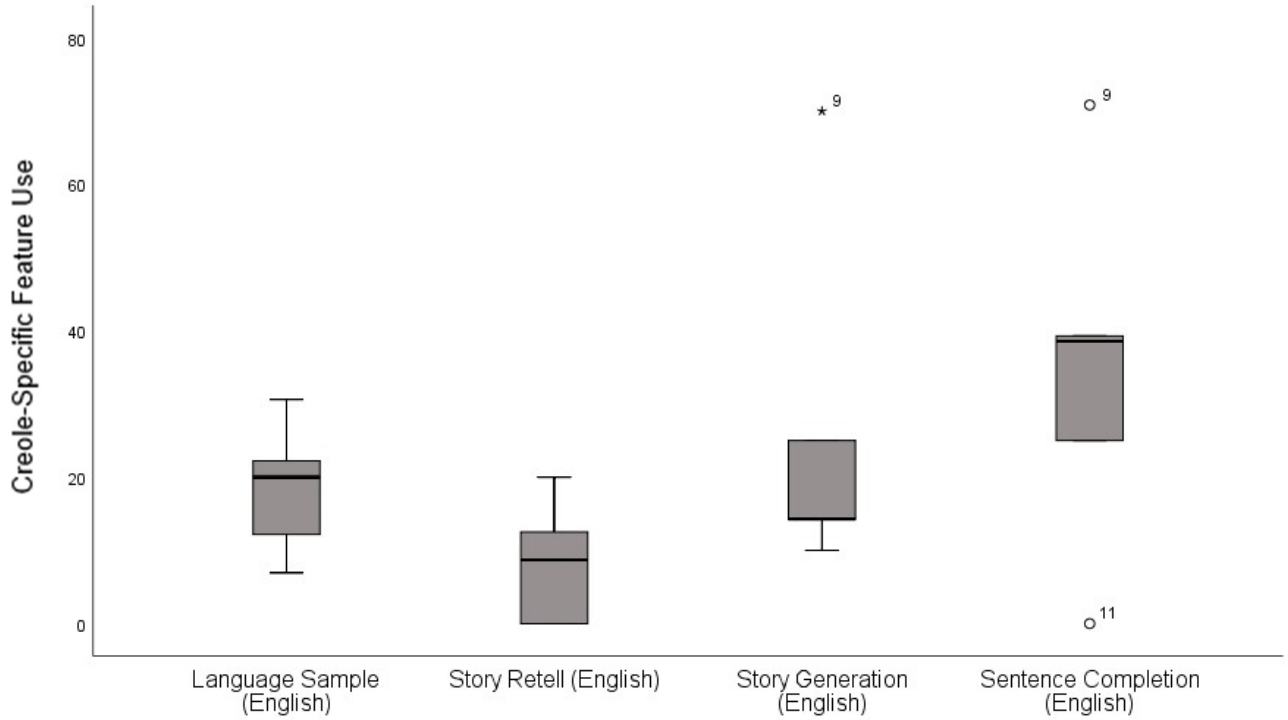
Note. Symbols and numbers note outliers.

Figure 27
Distribution for Creole-Specific Feature Use in 6TD Across Tasks (N=13)



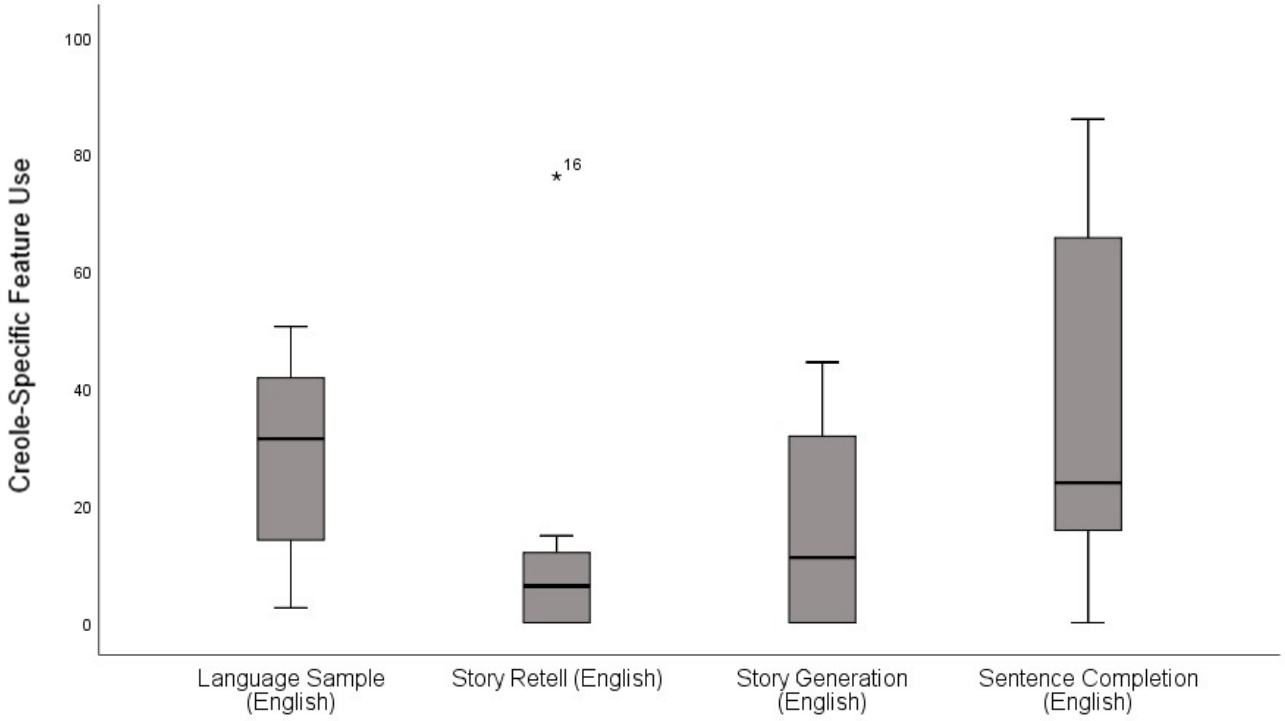
Note. Symbols and numbers note outliers.

Figure 28
Distribution for Creole-Specific Feature Use in First Graders Across Tasks (N=5)



Note. Symbols and numbers note outliers.

Figure 29
Distribution for Creole-Specific Feature Use in Second Graders Across Tasks (N=7)



Note. Symbols and numbers note outliers.

Figure 30
Distribution Marked Regular & Regular Past Tense Marking on Sentence Completion Task *(N=20)*

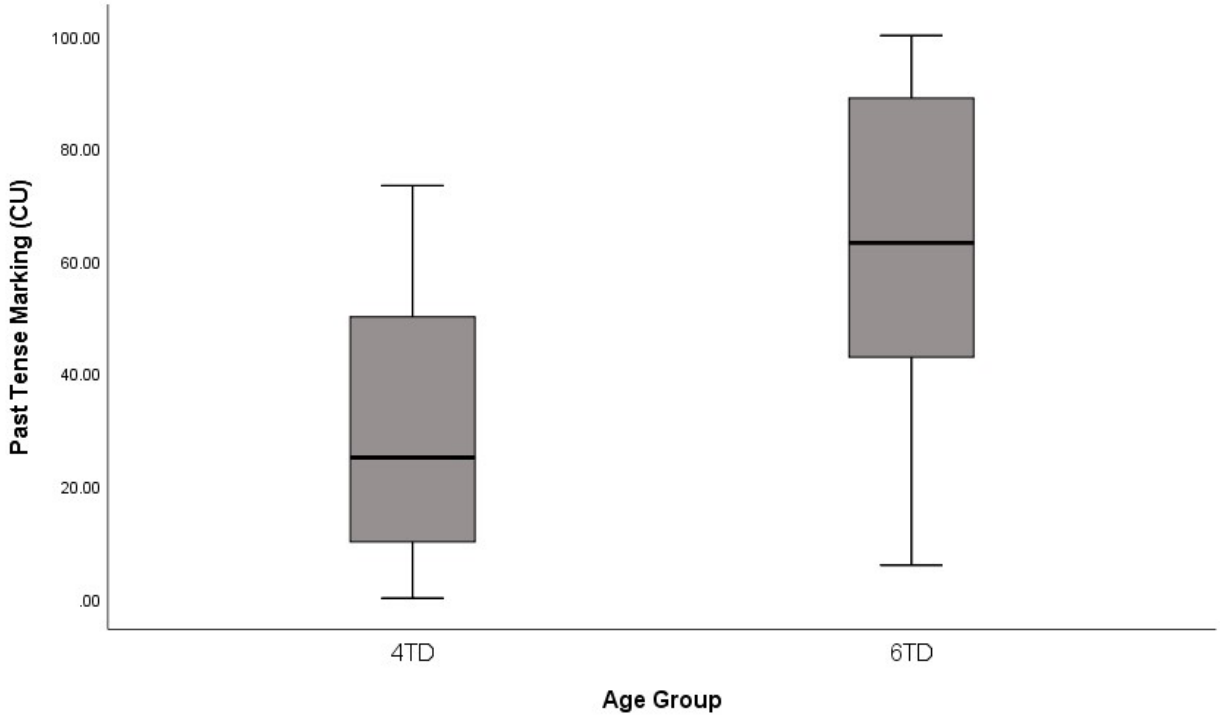
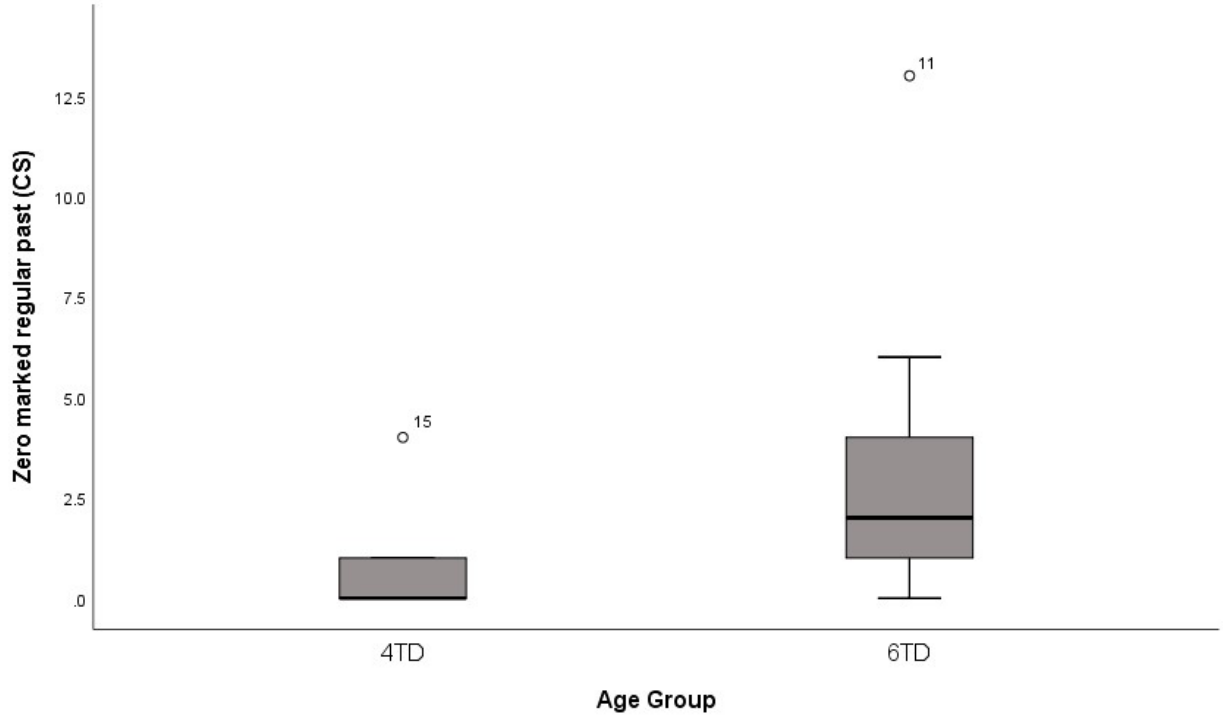


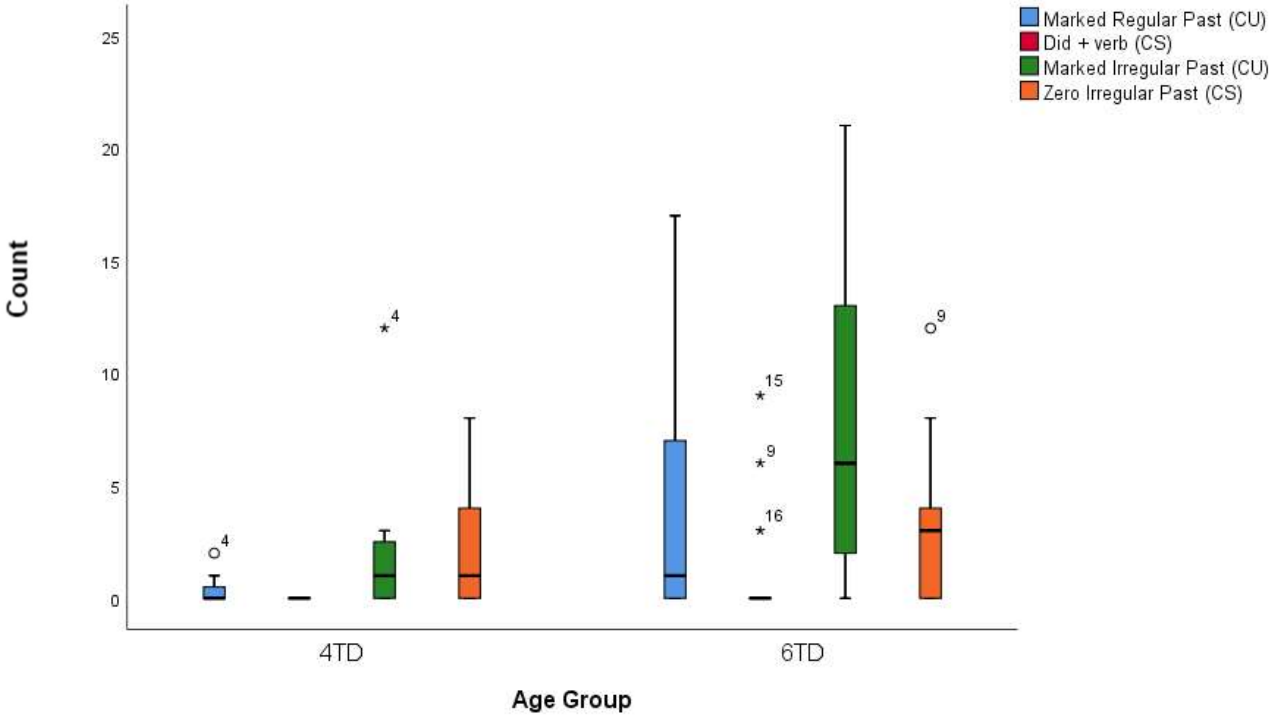
Figure 31
Zero Marked Regular Past Tense- Statistically Significant Results (Language Sample, BCE Modeling)



Note. Symbols and numbers note outliers.

Figure 32

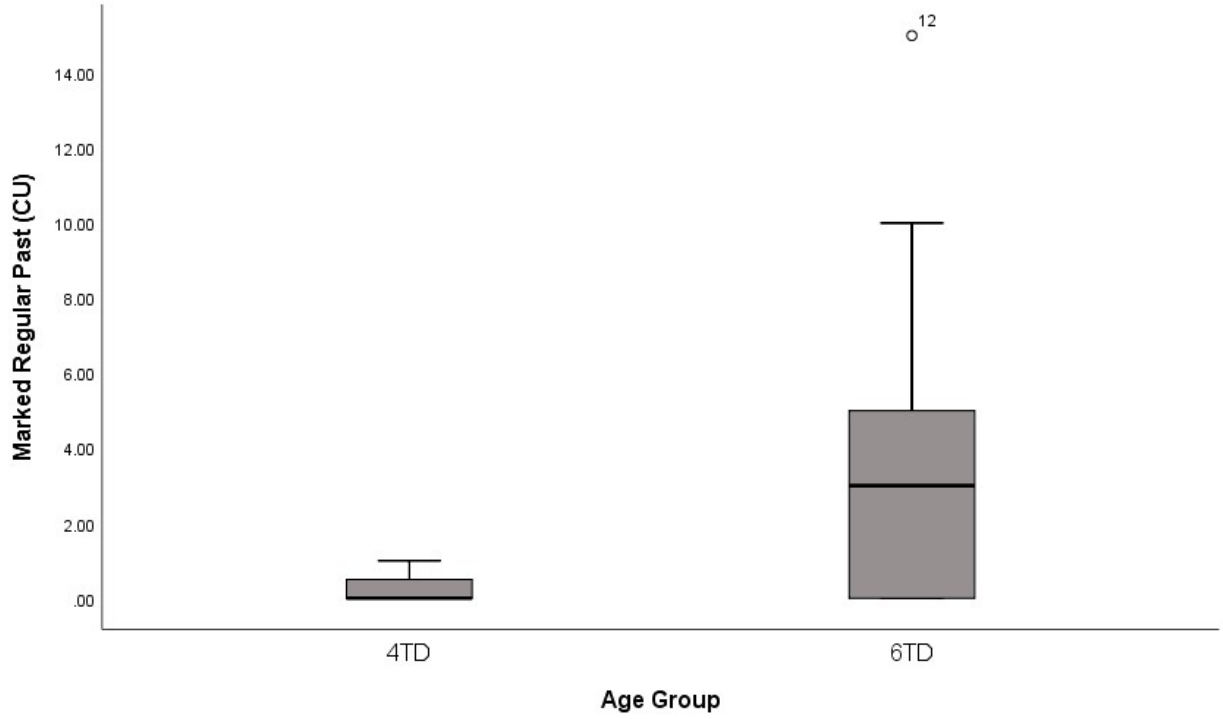
Past tense- Not Statistically Significant Results During Language Sample (BCE Modeling)



Note. Symbols and numbers note outliers.

Figure 33

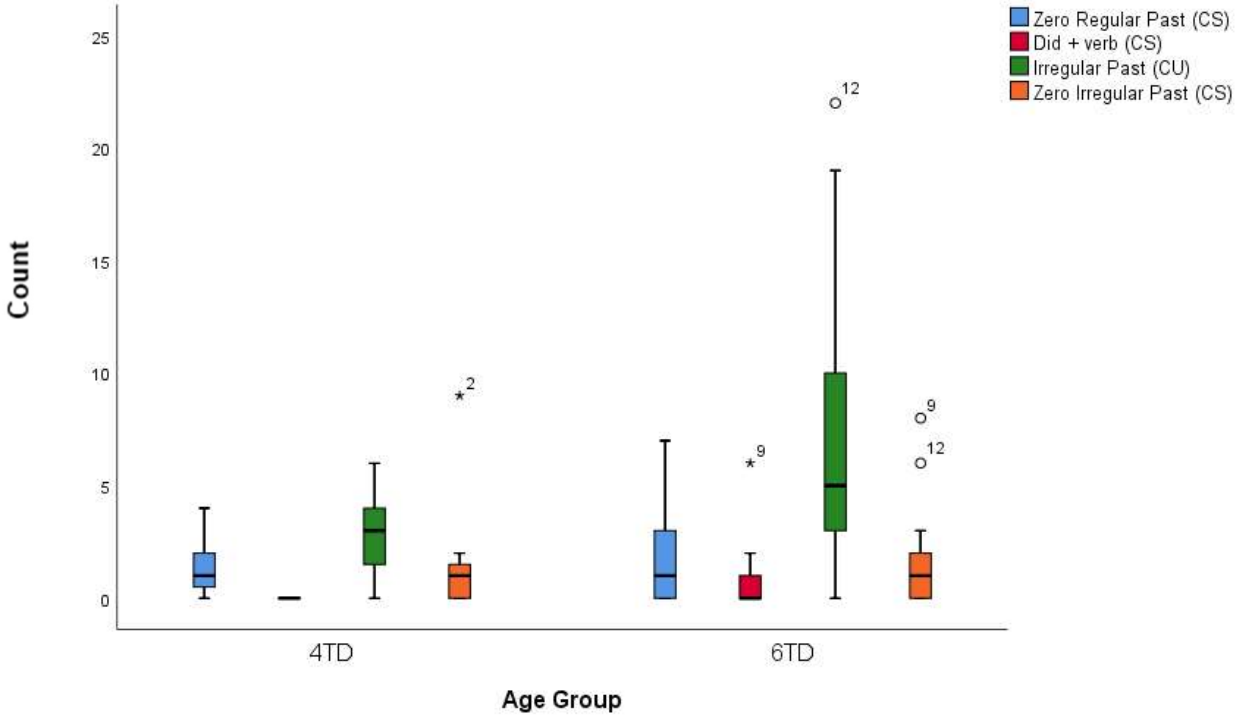
Marked Regular Past Tense- Statistically Significant Results (Language Sample, SE Modeling)



Note. Symbols and numbers note outliers.

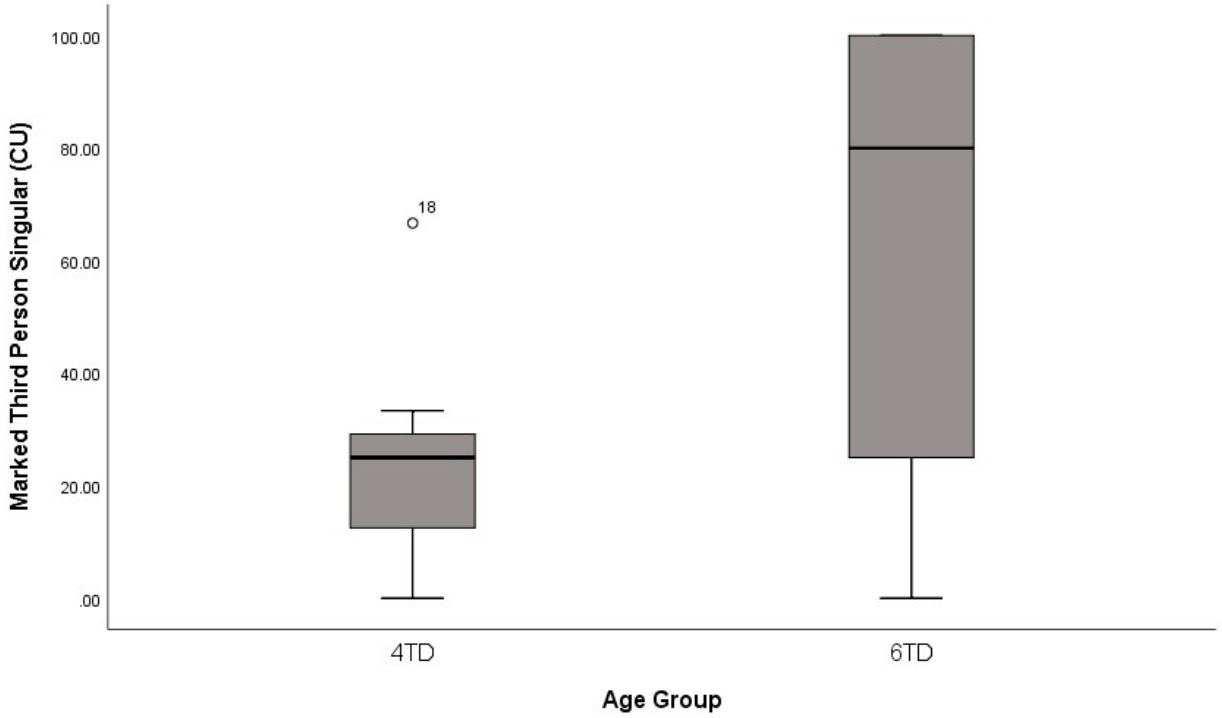
Figure 34

Past tense- Not Statistically Significant Results, Language Sample (SE Modeling)



Note. Symbols and numbers note outliers.

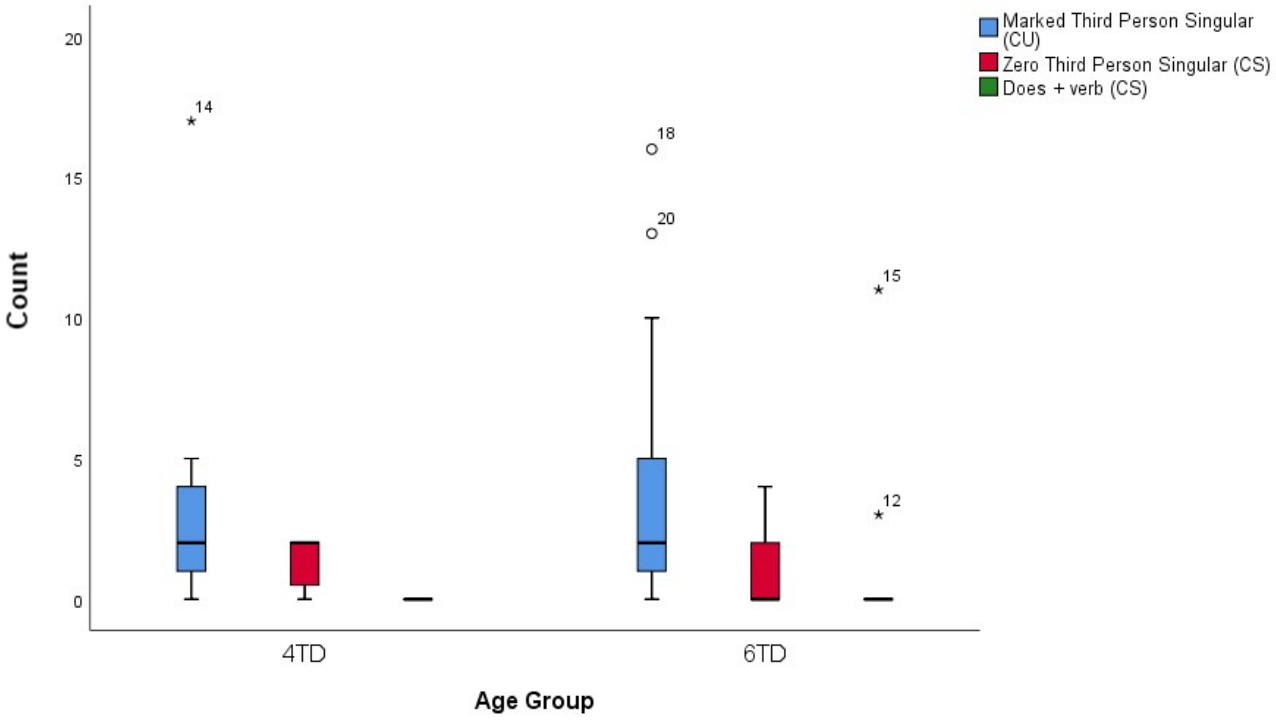
Figure 35
Distribution of Marked Third Person Singular on Sentence Completion Task (N=20)



Note. Symbols and numbers note outliers.

Figure 36

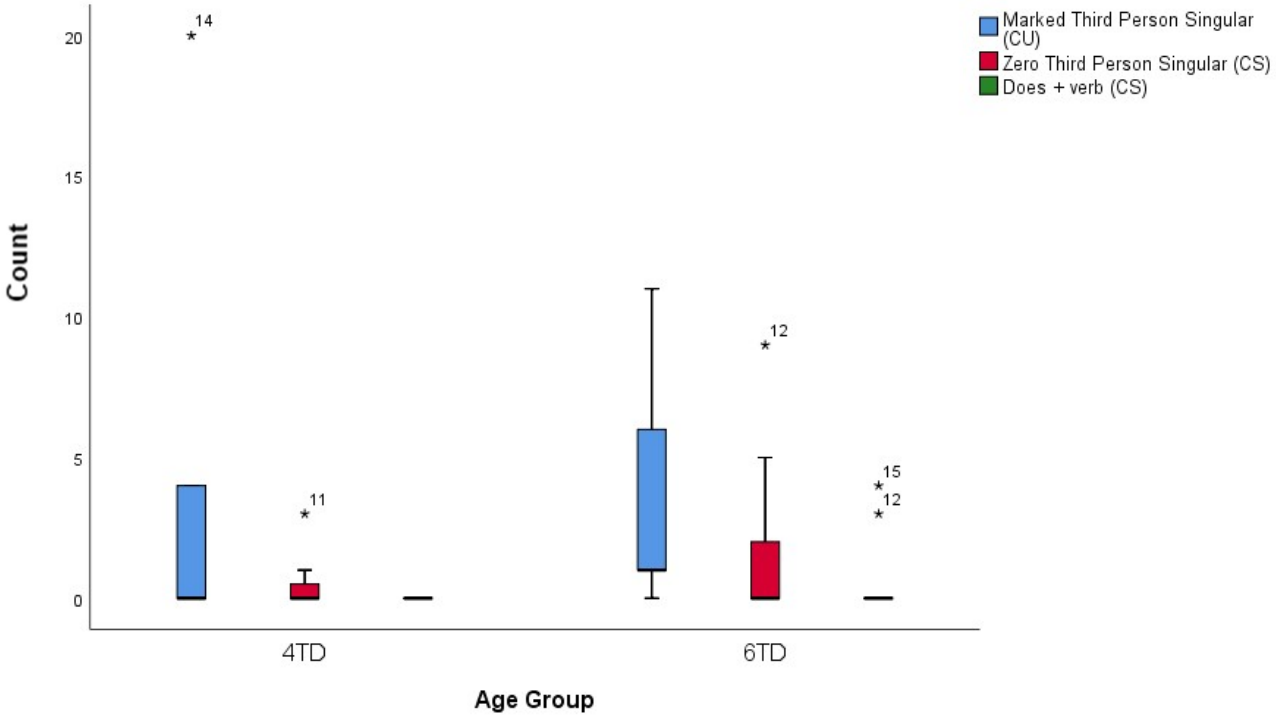
Third Person- Not statistically Significant Results, Language Sample (BCE Modeling)



Note. Symbols and numbers note outliers.

Figure 37

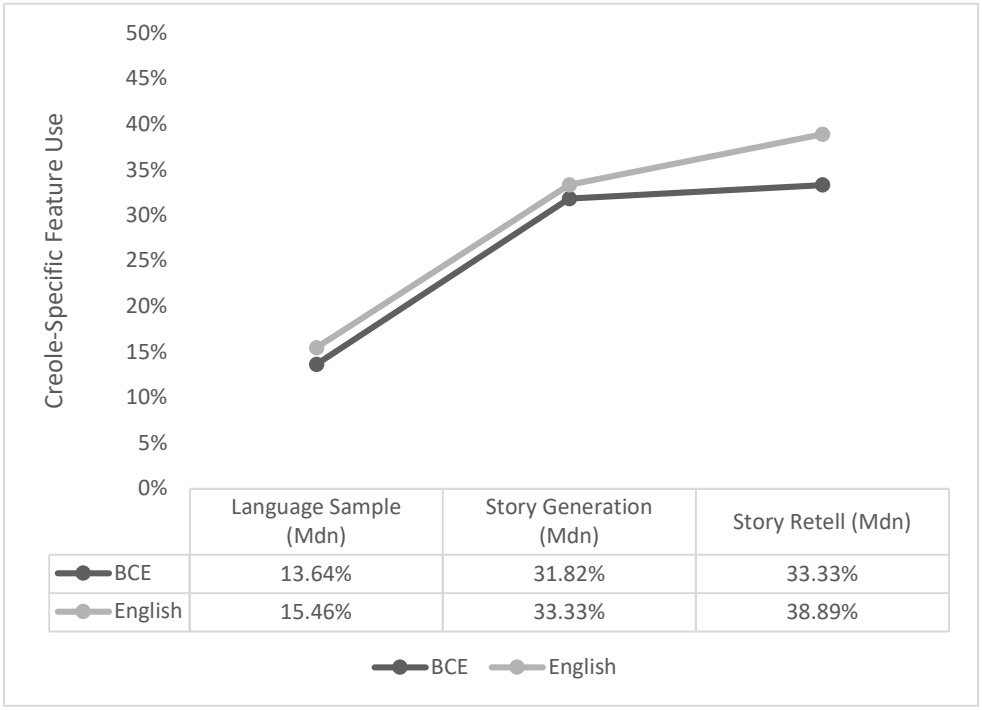
Third Person- Not Statistically Significant Results, Language Sample (SE Modeling)



Note. Symbols and numbers note outliers.

Figure 38
Creole-Specific Feature Use Given Language Modeling for a) 4TD (N=7) and b) 6TD (N = 13)

a)



b)

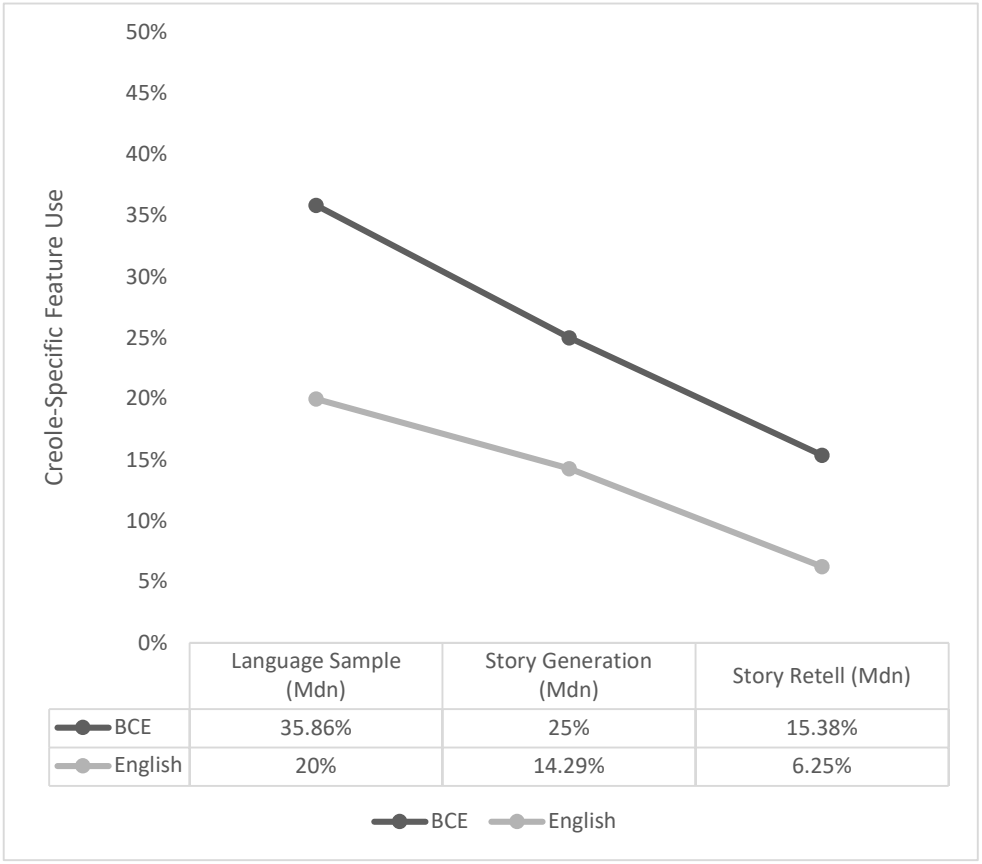
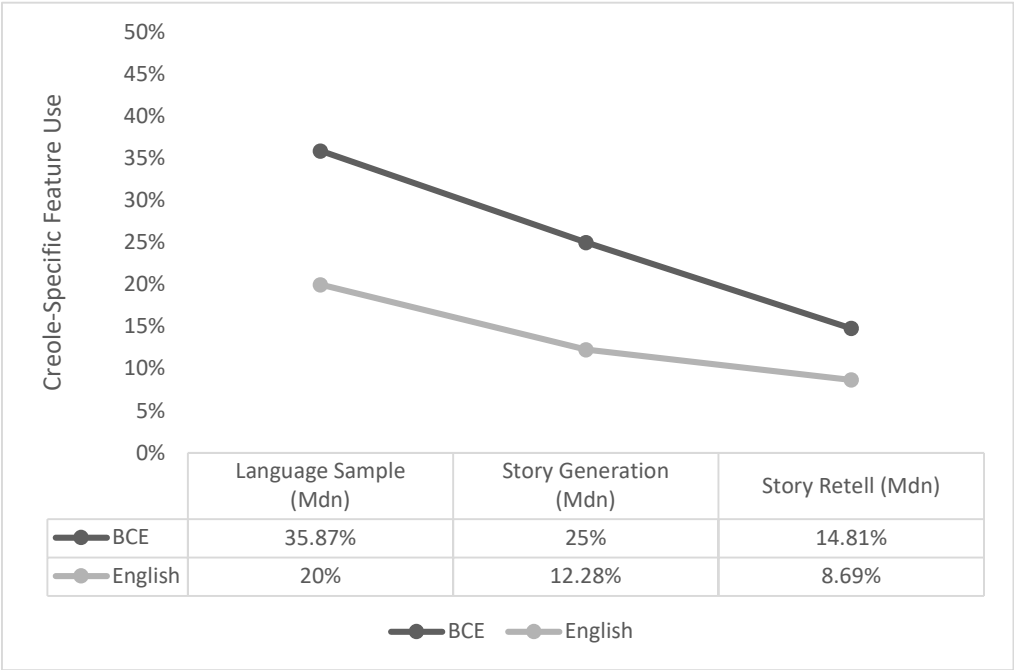


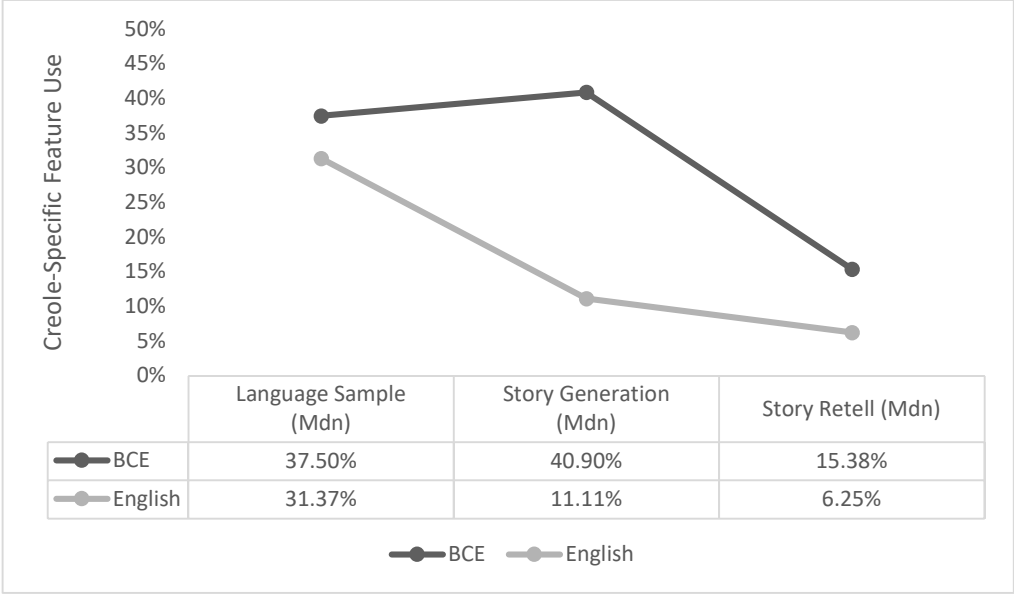
Figure 39
Creole-Specific Feature Use Given Language Modeling for a) First Graders (N = 5) and b) Second Graders (N = 7)

a)



	Language Sample (Mdn)	Story Generation (Mdn)	Story Retell (Mdn)
BCE	35.87%	25%	14.81%
English	20%	12.28%	8.69%

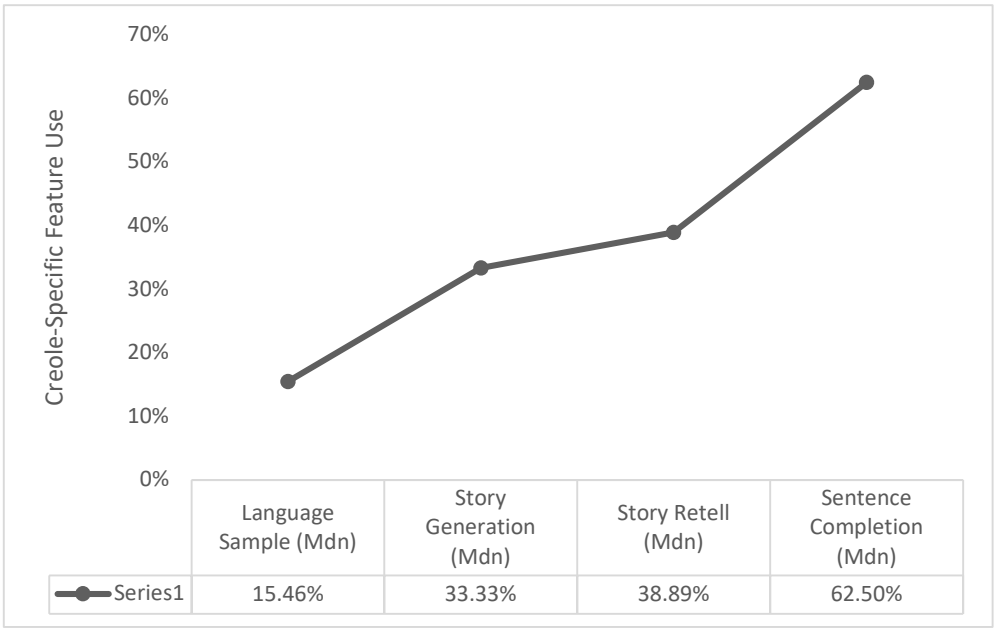
b)



	Language Sample (Mdn)	Story Generation (Mdn)	Story Retell (Mdn)
BCE	37.50%	40.90%	15.38%
English	31.37%	11.11%	6.25%

Figure 40
Creole-Specific Feature Use Across Tasks (SE Modeling) for a) 4TD (N = 7) and b) 6TD (N = 13)

a)



b)

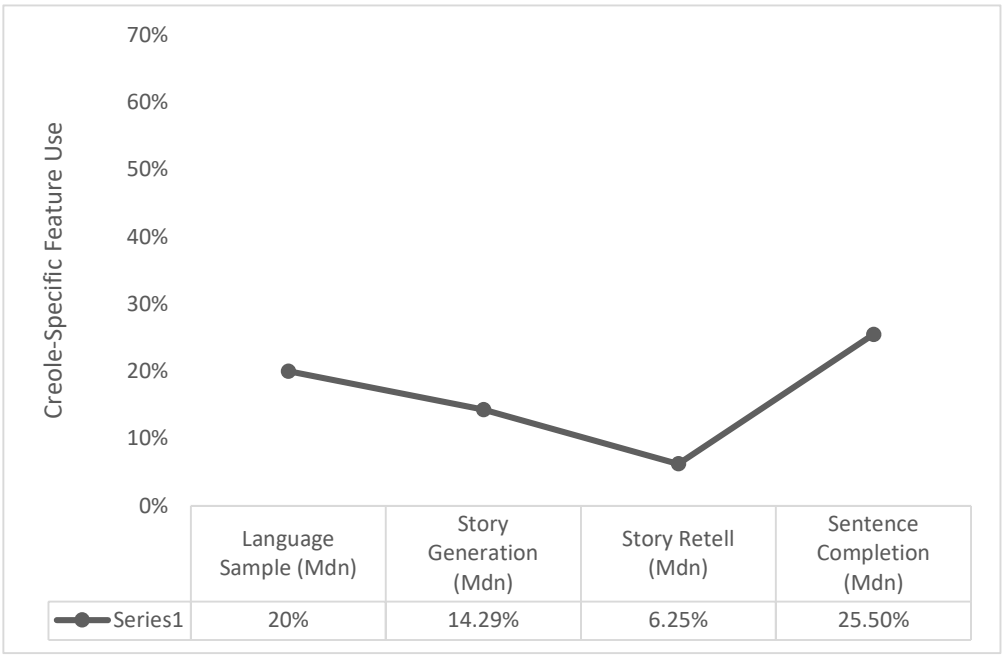
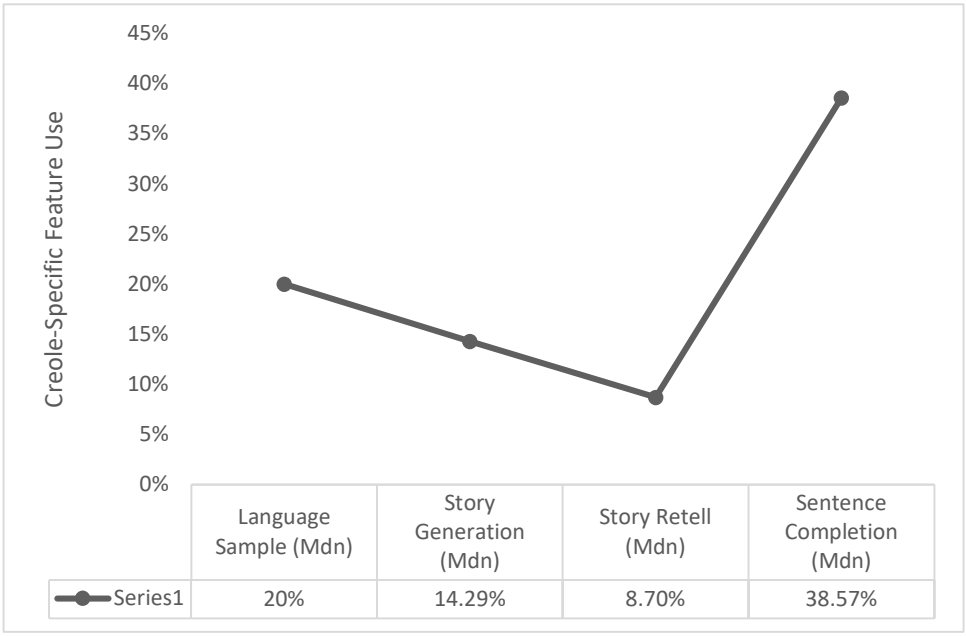
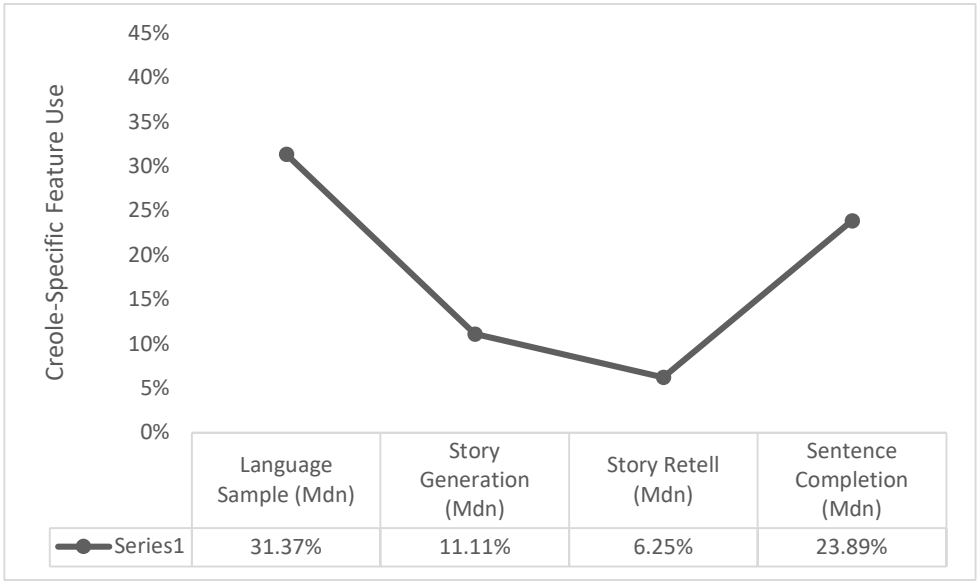


Figure 41
Creole-Specific Feature Use Across Tasks (SE Modeling) for a) First Graders (N = 5) and b) Second graders (N = 7)

a)



b)



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