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The Growth of Complex Syntax in School-Age African American Children Who Speak African American English

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ABSTRACT

Purpose: Syntax provides critical support for both academic success and linguistic growth, yet it has not been a focus of language research in school-age African American children. This study examines complex syntax performance of African American children in second through fifth grades.
Method: The current study explores the syntactic performances of African American children (N = 513) in Grades 2–5 on the Test of Language Development–Intermediate who speak African American English. Multilevel modeling was used to evaluate the growth and associated changes between dialect density and syntax. Analyzed data were compared both to the normative sample and within the recruited sample.
Results: The results suggest that dialect density exerted its impact early but did not continue to influence syntactic growth over time. Additionally, it was not until dialect density was accounted for in growth models that African American children's syntactic growth resembled normative expectations of a standardized language instrument.
Conclusion: The current study suggests that failure to consider cultural language differences obscures our understanding of African American students' linguistic competence on standardized language assessments.

A significant number of students in the United States are African American children who speak African American English (AAE; Rickford, 1991, 1992; Washington et al., 2018). Whereas AAE impacts all five domains of American English (i.e., morphology, syntax, pragmatics, phonology, and semantics), AAE is largely considered a morphosyntactic dialect, as the morphological and syntactic structures of American English are most significantly impacted by dialect use (see Craig & Washington, 1994, 2004; Van Hofwegen & Wolfram, 2010 for features of AAE). Prior research on the syntax use of African American children has focused largely on simple sentences and the early complex constructions of very young children at approximately 4–6 years of age (Craig & Washington, 1994, 1995; Jackson & Roberts, 2001; Oetting & Newkirk, 2008). These studies of very young children have shown that syntax may be a strong linguistic skill area for African American children who speak AAE (Craig & Washington, 1994, 1995; Oetting & Newkirk, 2008). More specifically, Craig and Washington (1994) found that African American children whose dialects were the densest and resided in low-income, urban neighborhoods exhibited the highest level of complex syntactic skills upon starting school, when compared to their peers who used less AAE.

These early studies have been important for understanding AAE-speaking children's foundational complex skills. More recent studies focused on complex grammatical structures in AAE speakers are also focused on young children in preschool and kindergarten (Oetting et al., 2013). It is notable that these studies have a clinical focus on distinguishing language disorders within dialect use in AAE-speaking children and have been important for understanding developmental differences in the use of

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selected features that overlap in typical and clinical populations who speak AAE.

Whereas all of these studies have been important for understanding early syntax development, sentence-level skills continue to grow and develop beyond these early years and become increasingly more important both clinically and educationally as children encounter more complex language orally and in text (Montag & MacDonald, 2015). Indeed, the relative absence of studies focusing on complex linguistic structures after African American children enter primary school is a glaring omission in the normative literature. Developmentally, it is important to examine the impact of AAE on complex syntax abilities beyond these very early years, as language acquisition research has demonstrated that complex syntax has a documented impact on school-age language and literacy growth (Bowerman, 1979, 1981; Montag & MacDonald, 2015; Nippold, 1993).

The increased complexity of children's language continues to be important, both linguistically and cognitively as they age (Nippold, 2014). Montag and MacDonald (2015), for example, hypothesized that the onset of literacy in school-age children is a source of linguistic exposure that contributes significantly to the development and growth of complex syntactic structures, affecting not only reading but also children's spoken language choices. These complex linguistic changes make it important therefore to examine oral language used after children have entered school.

These and other studies of complex syntax development in school-age children focus primarily on sentence productions in General American English (GAE). Understanding how the growth of complex syntactic structures is impacted by dialect variation is important for the development of normative profiles that include children whose language development and use may vary from GAE, a major dialect of American English that predominates in both educational and clinical contexts.

The aim of this investigation is to contribute to existing literature by enhancing our knowledge of how syntax evolves among AAE-speaking children in Grades 2–5. Specifically, we explore whether the use of AAE to varying degrees influences the continued growth of complex syntax in school-age African American children in second through fifth grades.

Syntactic Development and General Academic Language

The contextual and meaning-making functions of syntax allow children to infer meaning, bootstrap vocabulary, and build cohesion and coherence between narratives and complex ideas (Gardner-Neblett et al., 2012; Grohmann, 2014; Levy, 1979; Sénéchal et al., 2008; Sénéchal & Lever, 2014). For example, a simple syntax becomes complex when children are able to add subordinate clauses through the use of prepositions and conjunctions to an independent clause. The new adjoined clauses create sentences that support the identification of a common reference, allowing learners to express multiple ideas in a single sentence using cohesive devices that support listener clarity in the oral language and improve comprehension in reading.

As children move from preschool to elementary school, language learning has become increasingly focused on developing language skills to support success in school. These skills are distinguished from foundational and early language skills based on their complexity. To manage school-level reading, writing, and oral language interactions, children must be able to demonstrate the use and understanding of complex language structures (Arndt & Schuele, 2013; Hoff, 2013; Juel, 1988; Marinellie, 2004; Montag & MacDonald, 2015). Reciprocally, the language of print also supports the development of complex language by providing an important source of linguistic experience for children (Montag & MacDonald, 2015). The development of strong academic skills relies largely on the growth of complex oral language skills, and syntax is used to express complex language (Brimo et al., 2018).

Increasing our understanding of syntax in older children seems particularly important for African American children who speak AAE, as AAE has been determined to be a highly influential source of variation in their language and literacy development (Craig et al., 2005; Washington et al., 2018). More specifically, the density of use of AAE has been found to influence African American children's language developmental trajectories (Gatlin & Wanzek, 2015; Washington et al., 2018). Despite the potential importance of these more advanced structures for African American children, we know relatively little about the use of complex syntax beyond the early acquisition phases at approximately 5 years of age or how its continued development may or may not be influenced by a child's use of AAE.

Capturing Complex Syntax in AAE Dialect

AAE dialect has well-established and predictable effects on the organization of American English (Craig et al., 2005; Craig & Washington, 1986, 2004; Horton-Ikard, 2010; Stockman & Vaughn-Cooke, 1992; Washington et al., 2018). AAE speakers use their dialects to communicate with linguistic clarity, brevity, and fluency (Sadiq, 2008). Studies focusing on the impact of AAE on young children have stressed the importance of examining the degree of dialect use. AAE occurs in the oral language of

African American children on a continuum from low to high usage, referred to as dialect density. Low-density users produce significantly fewer AAE features in their oral language than do children who are high-density speakers, for whom AAE may predominate (Lee-James & Washington, 2018; Washington & Craig, 1998; Washington et al., 2018).

In an early study of the relationship of complex syntax to dialect density, Craig and Washington (1994) found that African American preschoolers produce a wide variety of complex syntaxes during spontaneous discourse. Moreover, children who produced more AAE features also produced more complex syntax, and those who were dense dialect users had the strongest syntactic abilities. On the other hand, Jackson and Roberts (2001) found that, among African American preschool-age participants between 3 and 4 years old, dialect was not related to the amount of complex syntax used. Importantly, dialect density was not considered. The findings of Jackson and Roberts (2001) appear to contradict those of Craig and Washington (1994), suggesting that the relationship between complex language skills and dialect may not be clearly understood. In a subsequent study, Craig and Washington (2004) stated that these important relationships between language-related skills, particularly, complex syntax, and dialect density warrant further investigation during elementary school-age years because the syntactic performances of the densest users of AAE are the least well understood. What is known is that children who use dense dialects later struggle with development of key literacy skills such as reading and writing upon entry into schooling (Gatlin & Wanzek, 2015; N. P. Terry & Connor, 2012; Washington et al., 2018), making it critically important that we examine the relationships between complex language development and dialect density at school age. The dearth of research focused specifically on complex syntax in school-age African American children does not allow us to draw any conclusions about the relationship between complex syntactic abilities and AAE or how the intersection of dialect density and complex syntax might be related in older children. Clarifying this interaction could provide important new information to support our understanding of the developmental trajectory of this population, contributing to an improved understanding of normative expectations for AAE-speaking children. The current investigation seeks to clarify the relationship between complex syntax and dialect density in a sample of children enrolled in the second through fifth grades.

The Current Study

Syntactic competence is essential for mastering both written and oral language expressions (N. A. Taylor et al., 2012; Weissberg, 2000). Examination of syntax within the context of dialect use provides an opportunity to clarify the impact of cultural linguistic variation on the critical language acquisition skill identified by Bowerman (1979) as an "important step forward" in language development (p. 285). The current study examined the impact of AAE dialect density on the development of syntax in the elementary school years for African American children. The following research questions were posed:

1. What is the age-related growth of syntactic skills for second- through fifth-grade African American children who speak AAE?
2. How does dialect density impact the growth of syntactic skills?

Method

Participants

Participants were drawn from a larger, 3-year study focused on examining the relations between dialect variation, language, and literacy, and identifying reading disabilities in school-age African American children. Participants were recruited from six schools within a large urban, public school district in the Southeastern region of the United States. Participating schools were located in very low-income communities where 87%–100% of students qualified for the National School Lunch program, a federally assisted meal program for children and families based on household income and family size (see Washington et al., 2018). Consent was obtained from participants during orientation sessions at the beginning of each school year

In the larger study, a cohort sequential design was used to follow 895 African American children from first through fifth grades. Cohort sequential designs attempt to capture trends in development over a broad age range by utilizing multiple cohorts of participants, each contributing shorter intervals of data (see, e.g., Miyazaki & Raudenbush, 2000; Prinzie & Onghena, 2005). In the parent study, participants were measured for two consecutive years across the 3 years of the parent study (i.e., from first to second grades, from second to third grades, from third to fourth grades, or from fourth to fifth grades).

Children who were a minimum of 8 years of age (M = 114 months of age, SD = 11.5 months) and who had not experienced grade retention were included in this investigation for a total of 513 participants (50% female). Specifically, 374 children who were below the age of 8 years were eliminated and who did not meet the age criteria set by the Sentence Combining subtest of the

Test of Language Development–Intermediate (TOLD-I: Fourth Edition; Hammill & Newcomer, 2008), our outcome measure. Eight students who were held back a grade also were excluded from the analysis. Overall, this resulted in 513 participants who met the inclusion criteria for this investigation.

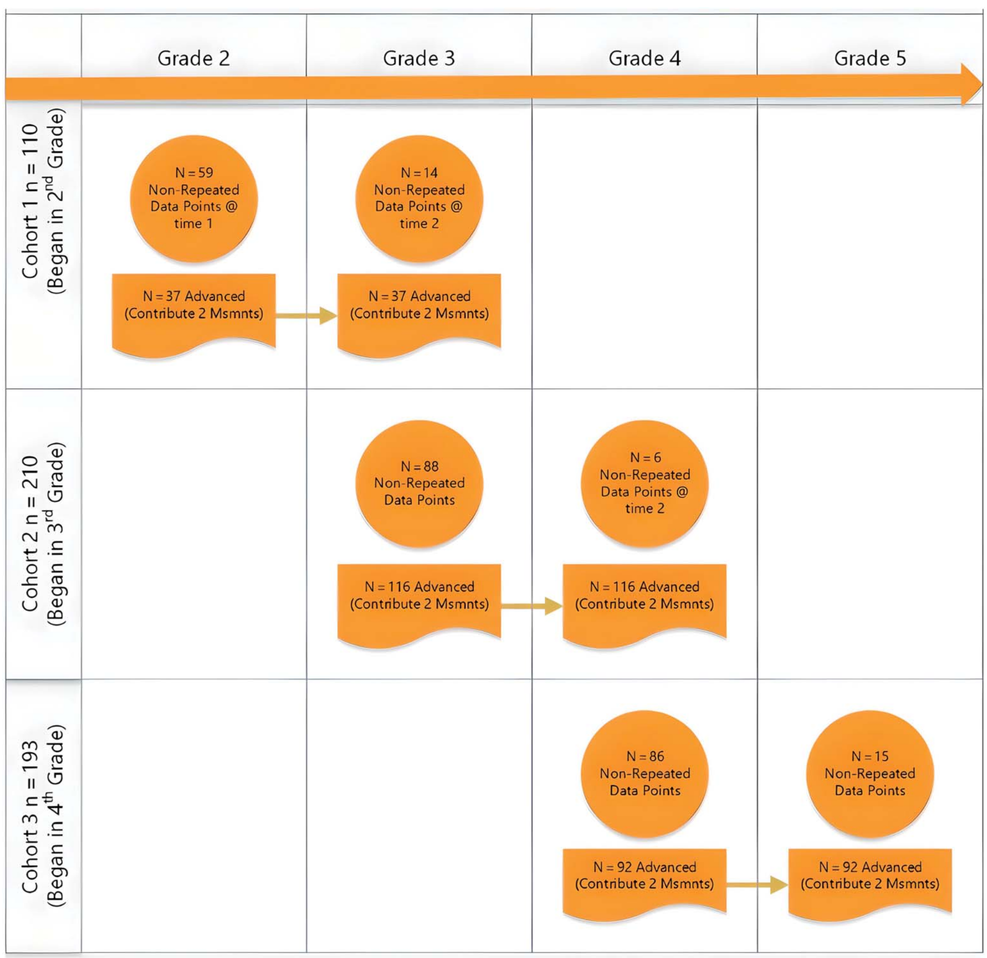
Dialect density among these participants was approximately 50% overall, and cohorts of participants were similar in their distributions of dialect use (Cohort 1 who began the study in second grade, M = 52.51, SD = 30.78; Cohort 2 who began the study in third grade, M = 48.18, SD = 26.48; and Cohort 3 who began the study in fourth grade, M = 46.38, SD = 27.44). Additional information about dialect density and its calculation can be found in the Measures and Procedures section. Figure 1 provides a schematic of outcome data coverage across cohorts participating in the current study.

Measures and Procedures

Syntax

Syntax was measured using the Sentence Combining subtest of the TOLD-I: Fourth Edition (Hammill & Newcomer, 2008). The Sentence Combining subtest assesses an individual's ability to reorganize short sentences into complex sentences. Hammill and Newcomer (2008) designed the subtest to examine children's (ages 8–0 to 17–11 years) understanding of how to use phrases, embedded clauses, transformations, and adjectives to construct sentences compared to a norming sample. Examiners verbally prompted examinees with sentences of varying lengths and complexity, and examinees were instructed to combine them to form a single complex sentence (e.g., "The bird perched on the statue. It was an eagle. It had a broken leg. It flew away; The eagle sat on the perch of the statue with a broken leg and then flew

Figure 1. Outcome data coverage by Cohorts 1, 2, and 3.



away"). With 36 possible assessment items, scaled scores between 8 and 12 were considered to be within the average range (13–20 = *Above average*, 1–7 = *Below average* or *impaired*). Hammill and Newcomer (2008) reported that this subscale demonstrated good reliability (Cronbach's α = .94) with African American participants and demonstrated moderate construct validity with several tests of language (r = .23 for the Peabody Picture Vocabulary Test–Third Edition to r = .55 for the Pragmatic Language Observation Scale; Hammill & Newcomer, 2008).

Dialect Density

Children's dialect utterances were elicited using the Language Variation subtest of the Diagnostic Evaluation of Language Variation–Screening Test (DELV-ST; Seymour et al., 2003). The DELV-ST is a norm-referenced screener of dialects, and the Language Variation subtest uses 15 items to assess phonological and morphosyntactic dialect features. Children's responses are characterized along a continuum/degree of use (i.e., mainstream, some variation from mainstream, or strong variation from mainstream). The Degree of Language Variation (DELV-ST) assessment contains 15 test items from which density was calculated from children's responses by counting the number of AAE productions and then dividing by the sum of AAE and GAE productions, which was multiplied by 100, resulting in a percentage of dialect use or dialect density. This method of capturing dialect density includes consideration for variations in phonology, morphology, and, importantly, syntax (based on inclusion of *wh*-questions items provided by Craig et al., 2005). For this study, dialect density refers to the quantification of distinct contrasting features used (AAE–GAE) rather than the specific kind or quality of features employed.

Study Design

This study utilized a cohort sequential design to examine the relationship between dialects and syntactic development. Of the 513 participants included in the current investigation, 245 contributed two complete time points of measurement, and 268 contributed only one time point of measurement. The 268 students with only one time point of measurement thus had incomplete data on the outcome variable of interest in the current study due to random missingness in administration (i.e., school absences or scheduling conflicts), as well as patterns of attrition and/or refreshment sampling (i.e., their missing time points were missing at random [MAR] and not due to their likely scores on outcome measures). Notably, the average retention rate for the parent study was more than half of the sample (approximately 56%), and thus, a refreshment sample of 360 children was collected as part of the planned data collection in parent study Year 2. This pattern of retention/attrition is commonly observed in children and families living in high-poverty urban environments and is often due to changes in housing and migration within school districts (Fitzgerald et al., 1998). For analyses, students who were missing a time point of observation were included, and their missing time points of measurement were considered to be MAR (i.e., assuming that data were not missing as a function of the value of children's scores on the outcome variable; Little et al., 2014). The outcome data for this study are shown in Figure 1.

Results

Measurement Model

Descriptive analyses examined growth trends via visual inspection of raw data and mean syntactic growth trends across cohorts. These analyses were used to inform subsequent modeling decisions for the specification of growth trends and to support models examining age–cohort interaction effects. Given the nested nature of the data, multilevel modeling was used to evaluate the growth and associative change between dialect and syntax with time (child age) at Level 1 and children at Level 2. Child age was mode centered at 96 months (the mode age of children in Cohort 1 at Time 1 of measurement and the lowest appropriate age of administration for the TOLD-I–Fourth Edition; Hammill & Newcomer, 2008). Dialect density was median centered at 50%. Syntax was approximately normally distributed with a slight, positive skew (skew = .66; Kolmogorov–Smirnov D = .18, $p < .01$ for raw score units; skew = .49, Kolmogorov–Smirnov D = .13, $p < .01$ for scaled score units). However, given that the skew was only slight, we opted not to perform data transformations in favor of ease of interpretation.

Following descriptive analyses, a series of multilevel models were examined using a "build-up" approach, such that models became increasingly complex in specifications as analyses progressed. Using the PROC MIXED procedure in SAS (Version 9.4; SAS Institute Inc., 2013), model analyses began with an "empty" random intercepts model (Model 1) in which the intraclass correlation coefficient (ICC) was calculated and within- and between-subject variances were examined. Next, Model 2 examined an unconditional growth model with only time (child age) as a predictor of syntactic growth. Next, a cohort-specific growth model (Model 3) was compared to the unconditional growth model to examine potential age–cohort interaction effects (i.e., examining the assumption that data from this cohort sequential design could be treated as a single distribution and that cohort effects were negligible; Miyazaki & Raudenbush, 2000). Finally, dialect density was added as a predictor of syntactic growth (Model 4). By default, missing data were treated as MAR and estimated using the maximum likelihood estimation. For the sake of brevity, model findings are reported in terms of their relevance to the research questions in the current study; however, the full model results are included in Appendices A and B.

Model analyses were conducted for both raw scores (i.e., among only AAE speakers in the current sample) and scaled score metrics. Scaled scores provide a comparative, age-standardized, population-based performance metric. However, when comparing scaled scores across time, growth can appear negative or nonexistent because scaled scores inherently control for age (i.e., a scaled score is performance relative to similarly age peers; Norman et al., 2011). Among this population of AAE-speaking children, problems with the use of scaled scores for examinations of growth are compounded because African American, urban, and low-income children are also inherently compared to a norming sample that is quite different from them. As is often the case with standardized language instruments, the norming sample for the TOLD-I is representative of the national population (Hammill & Newcomer, 2008), which is predominantly composed of White individuals (~78%), who do not reside in low-income households and are not situated in locations with higher urban population density.

Research Question 1: Age-Related Growth of Syntax

Descriptive Analyses With Syntactic Raw Scores

Visual inspection of raw data trends supported small linear growth trends that appeared to be similarly sloped (parallel) across the cohorts. Figure 2 displays the raw data trends in syntax growth across cohorts.

Cohort means (displayed in Table 1) were plotted across ages at each measurement time point (see Figure 3). The standard deviations in the mean outcome estimates are denoted by vertical error bars. Similar to the trends in the raw data displayed in Figure 2, this aggregate picture of adjacent cohort means demonstrates that cohorts appear to have similar (parallel to overlapping error bars) linear growth trajectories across time.

Multilevel Analyses With Syntactic Raw Scores

Model 1. The "empty" random intercepts model demonstrated significant within- and between-person variance in complex syntax as well as a large ICC (ICC = .50), indicating that multilevel model analyses were needed. Appendix A presents the details of the full model.

Model 2. In Model 2, the unconditional growth model added an average fixed effect for linear growth over time, as well as a random effect allowing people to vary in their growth trajectories. The unconditional growth model (with a random effect allowing people to vary in their growth trajectories) evidenced a nonpositive definite variance–covariance matrix due to problems with the random growth parameter. This indicates that the estimation of random effects for growth is not supported by these data. When Model 2 was estimated with a random intercept and fixed effect for linear growth, the model converged and was estimated without any issue. This model indicated that the within- and between-person variances were significant (σ^2 = 16.46, *SE* = 1.43, *Z* = 11.48, $p <$ .001; τ_{00} = 19.86, *SE* = 2.17, *Z* = 9.16, $p < .001$). On average, when children were at the initial age of 96 months, their estimated raw syntax score was about six correct items, β_{00} = 6.27, *SE* = 0.41, $t(741)$ = 15.17, $p <$ .001, but children significantly varied in their initial statuses. For each month in which children were aged, they gained positively but slowly, with an average of .15 raw points per month, β_{10} = .15, *SE* = 0.02, $t(754)$ = 7.74, $p <$ .001. This model significantly improved the fit compared to baseline Model 1, χ^2_{Diff} (1) = 56.50, $p < .001$.

Taken together, raw score descriptive and multilevel model analyses for Models 1 and 2 indicated positive, linear growth across the second to fifth years, with significant individual differences in starting levels of syntax. Perhaps, unsurprisingly, given raw score descriptive analyses, Model 3 analyses (detailed results available in Appendix A) indicated that cohorts did not appear to differ significantly in their raw score linear growth trends across the second to fifth grades. All cohorts followed a similar linear growth trajectory in this cohort sequential study. Next, model analyses for Research Question 1 continued with an examination of syntactic growth using scaled scores as an outcome metric.

Descriptive Analyses With Syntactic-Scaled Scores

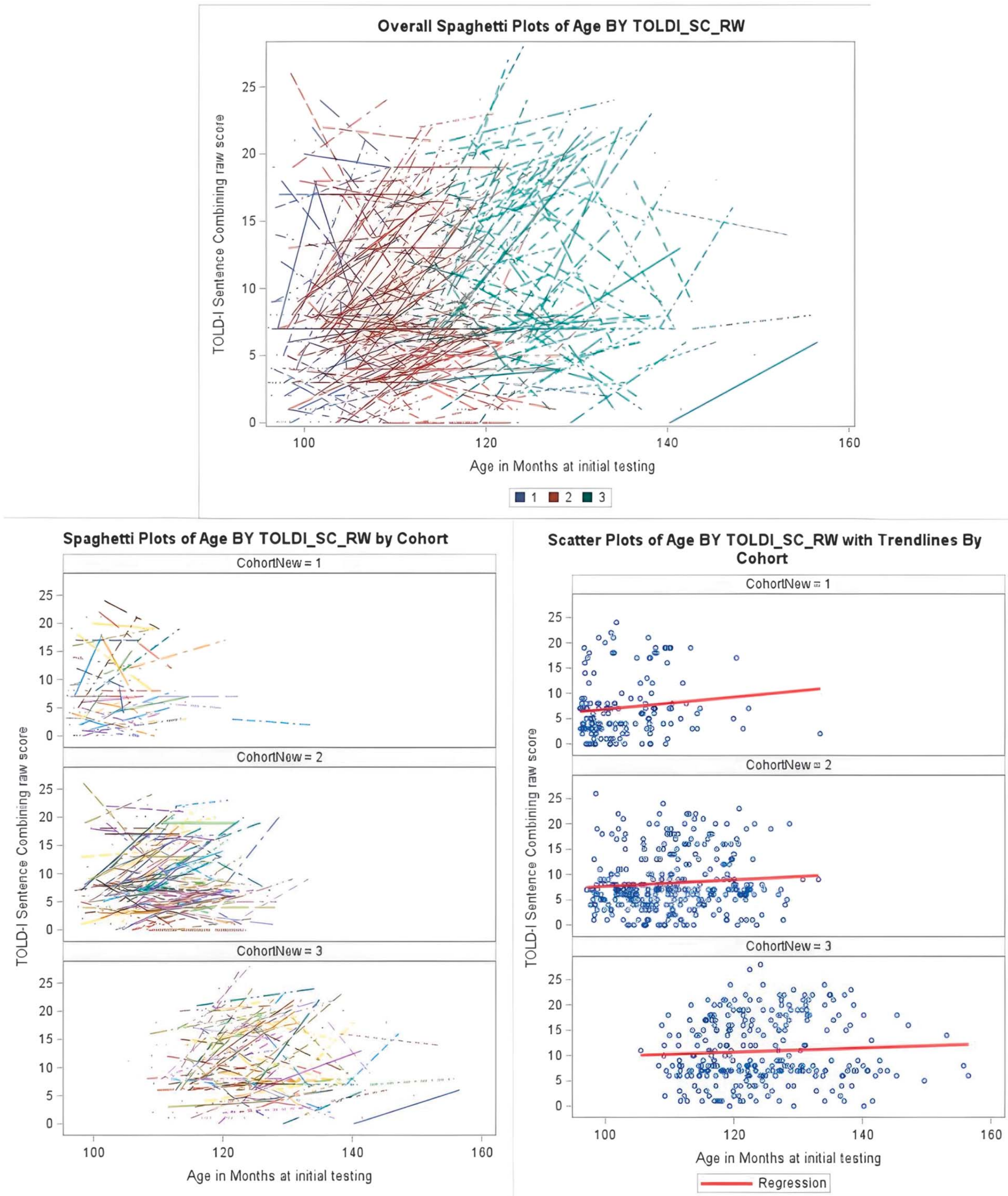
In contrast to the raw data trends, the scaled score trends appeared to be slightly negatively sloped. Figure 4 displays the scaled score data trends in syntax growth across cohorts.

Cohort means (displayed in Table 2) were plotted across age groups at each time point of measurement (see Figure 5). The standard deviations in the mean outcome estimates are denoted with vertical error bars. Similar to the trends in the scaled score data displayed in Figure 4, this aggregate picture of adjacent cohort means demonstrates that cohorts appear to have similar (parallel with overlapping error bars) linear growth trajectories across time. However, in contrast to the mean trajectory plots examined for raw syntax scores, the mean trajectories in scaled scores appear to have very small slopes, suggesting very little change in scaled syntax scores over time.

Multilevel Analyses With Syntactic Scaled Scores

Model 1s. The "empty" random intercepts model demonstrated significant within- and between-person

Figure 2. Raw scores data trends in syntax growth across cohorts. TOLD-I = Test of Language Development–Intermediate.



variance in complex syntax as well as a large ICC (ICC = .57), indicating that multilevel model analyses were needed. The full model details are presented in Appendices A and B.

Model 2s. As was the case with raw score models, the unconditional growth model (with a random effect allowing people to vary in their growth trajectories) evidenced a nonpositive definite variance–covariance matrix

Table 1. Raw scores syntax cohort means across time.

Cohort	Grade 2	Grade 3	Grade 4	Grade 5
Cohort 1				
Age in months *M* (*SD*)	100.22 (4.20)	108.69 (5.98)		
Syntax *M* (*SD*)	6.25 (5.75)	9.10 (6.34)		
Cohort 2				
Age in months *M* (*SD*)		106.06 (5.31)	117.52 (5.27)	
Syntax *M* (*SD*)		7.28 (5.33)	10.04 (5.96)	
Cohort 3				
Age in months *M* (*SD*)			119.42 (6.65)	131.94 (7.62)
Syntax *M* (*SD*)			9.52 (5.74)	13.07 (6.80)

due to problems with the random growth parameter. Model 2s, when estimated with a random intercept and fixed effect for linear growth, indicated that within- and between-person variances were significant (σ^2 = 3.75, *SE* = 0.33, *Z* = 11.27, $p < .001$; τ_{00} = 4.93, *SE* = 0.53, *Z* = 9.36, $p < .001$). On average, when children were at the initial age of 96 months, their estimated syntax scale score was approximately 7, β_{00} = 7.30, *SE* = 0.20, *t*(741) = 36.22, $p < .001$, but children significantly varied in their initial status. For each month of age, their scaled scores did not significantly improve on average, β_{10} = −0.01, *SE* = 0.01, *t*(749) = −1.11, *p* = .27. Not surprisingly, given that there was no significant growth in scaled scores over time, this model did not significantly improve fit compared to the baseline Model 1 s, χ^2_{Diff} (1) = 1.20, *p* = .29.

Scaled score descriptive and multilevel model analyses for Models 1 and 2 indicated no growth across the second to fifth years, with significant individual differences in starting levels of syntax. Model 3 analyses (detailed results available in Appendix A) indicated that cohorts did not appear to differ significantly in their scaled score linear growth trends across the second and fifth grades. Next, model analyses addressed Research Question 2, with the addition of dialect density as a person-level predictor in Models 4 and 4 s.

Research Question 2: Density and Syntactic Growth

Multilevel Analyses With Syntactic Raw Scores

Model 4. The final model introduces dialect density as a predictor of syntax growth at the child level. This model significantly improved the fit over Model 2b, χ^2_{Diff} (2) = 166.10, $p < .001$. Dialect was significantly and negatively related to children's initial status, β_{01} = −0.09, *SE* = 0.01, *t*(746) = −6.56, $p < .001$. On average, for every one unit increase in dialect density beyond 50%, children's initial syntax raw scores decreased by −0.09 points (e.g., increasing dialect density to 60% would coincide with an

Figure 3. Raw scores syntax cohort means across time.

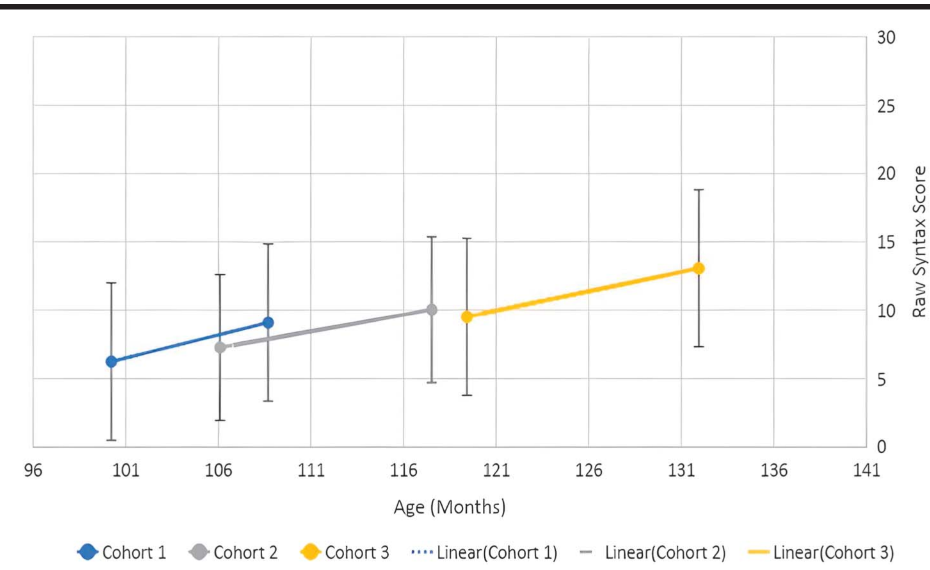
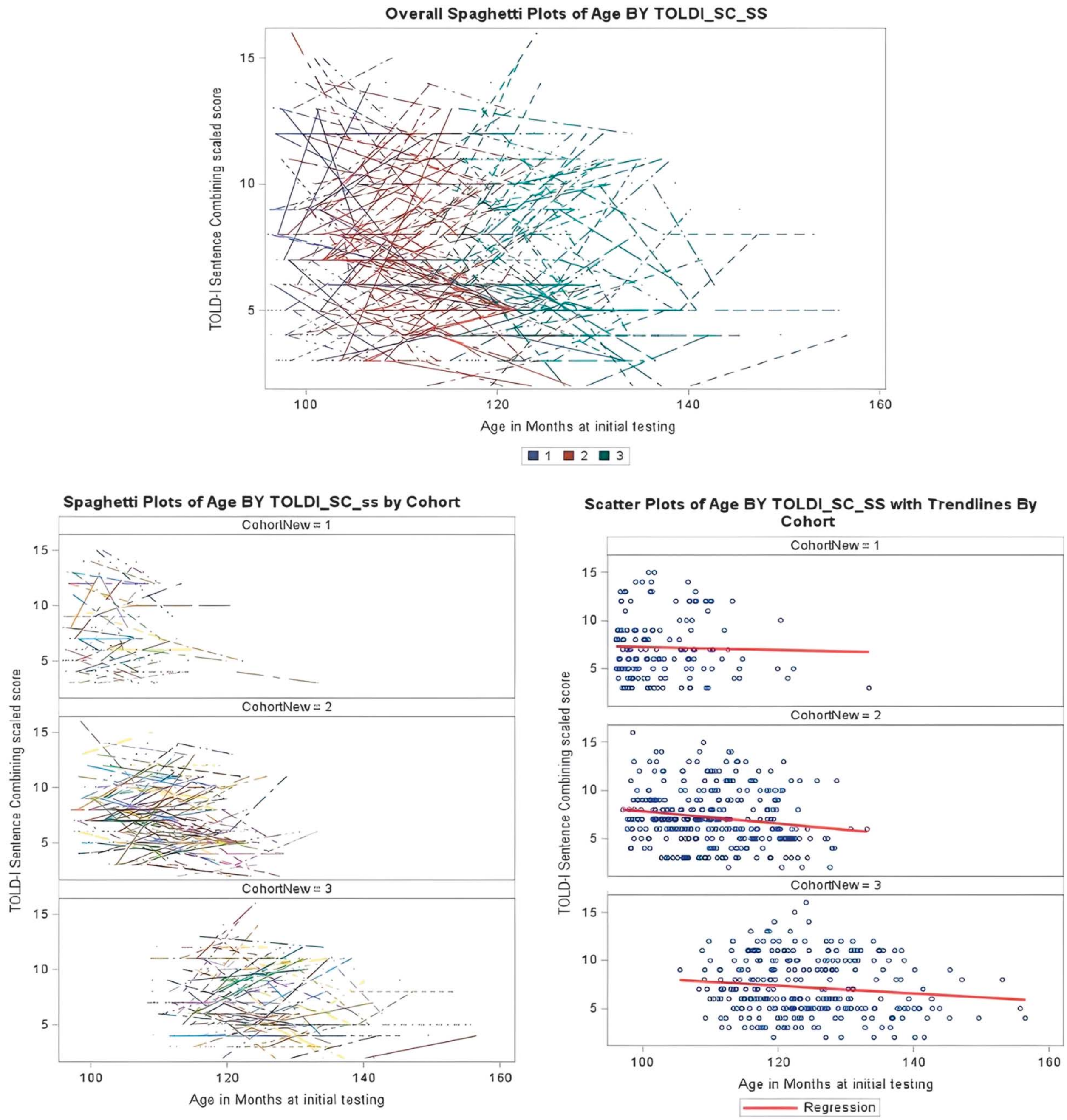


Figure 4. Scaled scores for syntax growth across cohorts. TOLD-I = Test of Language Development–Intermediate.



initial 1 raw score point lower, 70% would coincide with 2 raw score points lower). However, dialect did not significantly impact children's growth rates in syntax, $\beta_{11} = -2.40 \times 10^{-4}$, $SE = 6.07 \times 10^{-4}$, $t(746) = -0.40$, $p = .69$. Given that syntax scores were low at the first appropriate time of testing, initial status $\beta_{00} = 10.92$, $SE = 0.77$, $t(743) = 14.21$, $p < .001$, and grew at a slow but positive rate thereafter, $\beta_{10} = 0.13$, $SE = 0.03$, $t(736) = 3.85$, $p < .001$, the initial impact of the dialect is not trivial. Dialect density accounted for approximately 38.2% of the variance in initial syntax status.

Multilevel Analyses With Syntactic Scaled Scores

Model 4s. Model 4s introduced dialect density as a predictor of growth in scaled syntax scores. This was the only model that significantly improved fit over the

Table 2. Scaled syntax cohort means by across time.

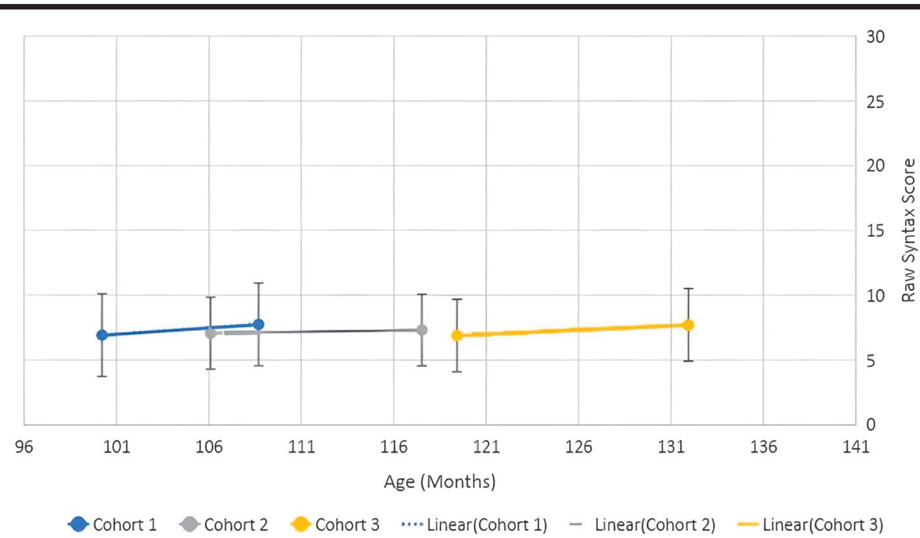
Cohort	Grade 2	Grade 3	Grade 4	Grade 5
Cohort 1				
Age in months *M* (*SD*)	100.22 (4.20)	108.69 (5.98)		
Syntax *M* (*SD*)	6.92 (3.19)	7.75 (3.21)		
Cohort 2				
Age in months *M* (*SD*)		106.06 (5.31)	117.52 (5.27)	
Syntax *M* (*SD*)		7.08 (2.77)	7.32 (3.04)	
Cohort 3				
Age in months *M* (*SD*)			119.42 (6.65)	131.94 (7.62)
Syntax *M* (*SD*)			6.89 (2.80)	7.71 (3.12)

baseline Model 1s, χ^2_{Diff} (2) = 157.70, $p < .001$. Similar to the results for raw syntax scores, dialect density was significantly and negatively related to children's initial status, $\beta_{01} = -0.05$, $SE = 0.01$, $t(746) = -7.53$, $p < .001$. On average, for every 1 unit increase in dialect density beyond 50%, children's initial syntax scaled scores decreased by −0.05 points (e.g., an 8-year-old child with dialect density of 70% would be predicted to score a full scaled score point lower than a child at 50% dialect density). Even after accounting for the effect of dialect, children did not demonstrate growth in syntax scaled scores over time, $\beta_{10} = -0.03$, $SE = 0.02$, $t(726) = -1.90$, $p = .06$, and dialect had no significant impact on rates of growth, $\beta_{11} = 2.16 \times 10^{-4}$, $SE = 2.95 \times 10^{-4}$, $t(739) = 0.73$, $p = .46$. In other words, although children differed in their starting scaled scores, on average, dialect appeared to exert a negative impact on syntax-scaled scores when children were at the lowest age bound for this assessment (96 months). As they aged, they remained at approximately the same scale score, approximately 10 on average, $\beta_{00} = 9.88$, $SE = 0.37$, $t(743) = 26.40$, $p < .001$. Dialect density accounted for approximately 37.3% of the variance in children's initial syntax-scaled scores, and it was not until dialect was included as a predictor in the model that children's average and initial scaled scores resembled the mean scaled score expected using this instrument.

Summary

In terms of growth, an analysis of raw scores revealed that dialect did not impact the growth trajectory of syntax, which was positive, linear, and not steep. In an analysis of both raw and scaled scores, where dialect was not included as a predictor, dialect exerted a negative impact at the outset of the first age-appropriate time point for the use of this assessment. Importantly, it was not until dialect was included as a predictor that syntax scores resembled average and normed performance. This trend was most evident in the scaled score analyses. Without dialect as a predictor of complex syntactic growth, AAE-

Figure 5. Scaled syntax cohort means across time.



speaking children appeared to start about 1 *SD* below their mostly White GAE-speaking group in the norming sample and then to remain at this low-average performance level as they aged. However, when dialect was included as a predictor of within group variance among AAE-speaking children, they tended to perform at national population average levels of complex syntax (when at only 50% dialect density) and remained at average levels as they aged.

Discussion

The current study explored the syntax production of African American children in Grades 2–5 who used AAE using a cohort sequential design. Participants were enrolled in public schools in the Southeastern United States and lived in neighborhoods that included high levels of poverty. Specifically, we asked what is the age-related growth of complex syntax skills in children who speak AAE, and how is this growth impacted by the density of their spoken dialect? Syntax is a foundational language skill that supports both the development of literacy and more advanced language-based skills such as inferencing, narrative building, semantic referencing, coherence, and cohesion (Gardner-Neblett et al., 2012; Levy, 1979; Sénéchal et al., 2008; Sénéchal & Lever, 2014). The current study seeks to contribute to our understanding of complex syntax in AAE speakers, in order to begin the work of providing evidence to support development of normative syntactic expectations for AAE speakers. Furthermore, in this investigation, we examined variation within AAE speakers, rather than across two or more dialects (e.g., AAE → GAE). Importantly, as soon as dialect was entered into our models, accounting for speakers' use of AAE, the models revealed average, rather than below average, syntactic growth.

Our findings suggest that, across the second through fifth grades, African American children who used varying densities of AAE demonstrated a slow but steady trajectory of syntactic growth. This pattern of syntactic gain is evident in the raw scores and was confirmed using scaled scores as a population-referenced measure of performance. However, despite these gains over time, AAE-speaking children consistently scored slightly below GAE-normed expectations in the second, third, fourth, and fifth grades (approximately 1 *SD* below average in scaled scores). However, when dialect density was included as a predictor of syntactic performance over time, additional nuances in this syntactic growth pattern became evident.

At second grade, dialect exerted a negative impact on syntactic performance, but it did not continue to influence syntactic growth trajectories beyond the second grade. Children who spoke AAE with higher dialect densities performed lower than their peers who used less dialect. Furthermore, once dialect density was accounted for in the prediction of syntactic growth, children who used dialect at moderate levels (50% or lower) had similar scaled score performances to GAE norms. These outcomes confirm the importance of considering children's degree of dialect use for interpreting language outcomes. That is, children who evidenced strong dialect variation on the DELV performed less well than their peers with lower amounts of variation at second grade.

With respect to our second question regarding the impact of dialect density over time, the results suggested that AAE exerted its impact early, at around 8 years of age, for the participants in this investigation; data with younger children might have revealed its impact even earlier. When dialect was not accounted for as a factor in African American children's syntactic growth, their scaled score performance was low to average at approximately 7–8 scaled points. On average, an increase in dialect density beyond 50% density was associated with decreased raw and scaled scores at 8 years of age (e.g., moving to 70% dialect density would be associated with −2 raw points and −1 scaled point). Although these outcomes make it appear that dialect has a negative influence on syntax production, it should be noted that the negative impact of dialect was dependent on the density level (increases beyond 50% were associated with lower syntax scores). Furthermore, once dialect was included in the model, the average scaled scores were approximately 10 points at 50% dialect density, indicating the average performance on the instrument. These results indicated that dialect density was a significant predictor of initial levels of syntax production. Dialect density did not, however, continue to influence subsequent growth.

One of the major findings of this study is that the assessment approach used to measure language is important for detecting syntactic growth in dense speakers of AAE. Specifically, when standardized, norm-referenced scaled scores were used to measure syntactic growth within children over time, none was evident. Second graders had a standard deviation below GAE-norms, and they remained in this low-to-average range across elementary school years. However, when raw scores were plotted to measure growth, slow, positive linear growth was evident, even in dense speakers, whose language is arguably furthest away from the GAE standard being measured on the TOLD.

The use of raw scores permitted comparison of our AAE-speaking participants to each other rather than to a national standard whose language use likely did not approximate their own. This within-group comparison revealed that complex syntax scores were low and only grew at an average rate of 0.13 raw score units per month, which equates to getting only one more correct item after an entire school year. Whereas, technically, scaled scores are not designed to reveal growth rates, they do allow comparison of a group or individual to a normative standard. Thus, they have the potential to illuminate patterns of acceleration and deceleration in growth relative to the norming sample. In the current study, we examined scaled scores to highlight growth rate as an enduring cause of standardized assessment performance gaps in complex syntax among children who use AAE. The examination of scaled scores revealed that when dialect is not considered as a factor, African American children tend to perform about 1 *SD* below their White peers across the early elementary school years, with no acceleration in growth to close this gap.

Regardless of the type of score used (raw or standardized), children who used dense dialect tended to begin second grade with lower syntactic scores than their peers as a function of their dialect density. Perhaps these outcomes for high dialect users are less reflective of their abilities and are more reflective of the lack of regard for dialect use in the classroom and in standardized assessments. That is, the focus on "switching" away from AAE dialect use to the use of the GAE language of the test places the high-density speaker at a disadvantage, providing limited opportunity to demonstrate linguistic skills within the language system where they arguably have the highest competence and opportunity for social use. This interpretation is supported by the absence of AAE's impact on the overall growth of complex syntax and Washington and Craig's (1994) earlier finding that young African American children who are the best language users are also the highest density dialect users. The current investigation suggests that this AAE advantage, as measured by standardized testing, has disappeared by second grade.

It is not surprising that standardized test scores underestimated the language performance of African American children from urban, low-income areas. This is an issue that has been documented in the extant literature for dialect speakers for more than 30 years (see, e.g., Cole & Taylor, 1990; Hilliard, 1980, 1983; Oetting et al., 2013; Oetting & McDonald, 2002; O. L. Taylor & Payne, 1983; Washington & Craig, 2004). Our findings demonstrate that, when the language variety used by African American speakers is not considered during assessment, the linguistic distance from GAE can mask the underlying linguistic competence of the test taker, resulting in outcomes that support a deficit model. That is, when we use assessment instruments that are not culturally and linguistically sensitive, we learn more about children's ability to manage unfamiliar code than what they truly know about language. Furthermore, the impact of high-density dialect use reported here has been described by others for print-based skills, including writing (Puranik et al., 2020). High dialect density reportedly slows the growth of both reading and writing, and this is particularly true for African American children growing up in poverty (Puranik et al., 2020; Washington et al., 2018, 2019).

The current study extends these findings to include important oral language skills and complex syntax and challenges the notion that complex syntax is somehow exempt from the influence of AAE. Arguably, the more dialect a child uses, the less their language approximates that used for assessment. For these high-density speakers, failure to consider dialect can significantly obscure what they know about language, as they use their cognitive resources instead of responding to an unfamiliar language variety (Brown et al., 2015; J. M. Terry et al., 2022; Washington & Seidenberg, 2022).

Limitations and Future Directions

The current study observed complex syntax development beginning at the age of 8 years. There is a need to examine more retrospectively the relationship between dialect density and syntax at earlier ages using growth models. Studies focusing on younger African American children have been cross-sectional and have not considered the impact or growth of dialect density. Future work should include younger children, perhaps beginning at age 3 years when dialect use is first described (Horton-Ikard & Weismer, 2007; Newkirk-Turner et al., 2014). This would allow us to understand how dialect and dialect density develop and whether density's influence on syntax occurs before age 8 years, but perhaps after age 5 years, when Craig and Washington (1994) saw positive relationships between density and early complex syntax.

Whereas the calculation of dialect density relies primarily on word-level considerations of phonological and morphological features, syntax operates at the phrase, clause, and sentence levels. The key, organizational, and semantic contributions of syntax are generally not considered in the estimation of dialect density. Thus, knowledge of how AAE speakers use their dialect knowledge to build and evaluate sentences in connected, oral language, and text is not well understood. Even in its current form, dialect density has proven to be informative for providing a more nuanced understanding of how dialect influences general language abilities, such as complex syntax. Specifically, there is converging evidence across studies demonstrating that the degree, or density, of dialect used is important to consider, not the use of dialect in and of itself. However, as AAE is a morphosyntactic system, expanding dialect density measures to include sentences and beyond is an important direction for future research (see Green, 2010). Furthermore, as noted by Johnson and Koonce (2018), continuing to discuss AAE at the feature level obscures understanding of the linguistic system.

There exist noncontrastive alternatives to the investigation of syntax, which focus on the utilization of dialect patterns inside a dialect system rather than relying solely on dialect density (Green, 2010; Johnson & Koonce, 2018). These approaches, combined with a dialect density measure that considers a larger unit of analysis such as the sentence, should enable scholars to investigate AAE in the context of linguistic development, distinct from GAE, offering a more comprehensive analysis beyond the mere presence or absence of certain linguistic features.

In addition to examining the developmental impact of dialect, future research should explore the possibility that children may differ in their growth as a function of individual differences in factors such as dialect density, socioeconomic status, gender, neighborhoods, and so forth. In the current study, our multilevel growth model was unable to estimate the "random" effects on children's growth rates. This may represent a "real" effect, that is, children are so similar to one another that no random differences exist between them. However, given the wide variance we observed in their raw syntactic trajectories, this is more likely due to a combination of wide child-level variance and sample size. Additionally, the children's shared socioeconomic backgrounds and regional dialect similarities could also contribute to underestimation of random effects. Future research should incorporate this landmark study's estimated growth rate in power analysis simulation studies to determine adequate sample size for more complex random effects models.

Future research would benefit from using additional language sampling approaches that capture the full system of dialect (Johnson & Koonce, 2018). It is important to focus on capturing the complex syntax production of dialect speakers using measures that account for both the standardized and nonstandardized use of syntax and dialect. Standardized language exams frequently demonstrate less sensitivity in evaluating the language proficiency of dialect speakers who do not speak GAE, such as AAE speakers. As a result, these assessments often underestimate the linguistic abilities of these individuals (see, e.g., Cole & Taylor, 1990; O. L. Taylor & Payne, 1983; Washington & Craig, 2004). Nonstandardized measures, such as spontaneous language sampling, may reflect the language abilities of dialect speakers more accurately. The use of standardized measures in this investigation, undoubtedly, is limiting. However, nonstandardized language measures require time and skills that practitioners, such as teachers and clinicians, often do not have. Future research might benefit from the development of culturally and linguistically sensitive assessment measures that not only allow dialect responding but also provide normative data that can be used by practitioners to characterize the language used by AAE speakers more fairly and accurately.

Conclusions

Prior research has suggested that complex syntax abilities are found to be strong for African American children who speak AAE at the time of school entry. This study extended the study of complex syntax to include older, elementary school-age AAE-speaking children. African American children bring their linguistic knowledge and dialect competence to clinics and classrooms. The current study suggests that the failure to consider cultural language differences obscures our understanding of the linguistic competence of these students. In 1980, nearly 50 years ago, Hilliard emphasized the need for a thorough examination of testing and assessment tools used with African American children in order to accurately and comprehensively describe African American language use in the United States. The current study, which specifically examines syntax, a language domain, aligns with Hilliard's explicit call for action. Moreover, it would be advantageous for future studies to include samples consisting of AAE speakers who represent a wide range of socioeconomic, geographic, and regional origins (for further insights on geographical variations, refer to the work of Charity et al., 2004). Conducting such studies would contribute to enhancing the precision of instruments such as the TOLD-I for use with AAE speakers.

Language varieties such as AAE allow children to express sentences and ideas in ways that reflect their cultural backgrounds. An important challenge for researchers and educators is to embrace this expression on assessments and learn to capitalize on it in the classroom. Unfortunately, current approaches have resulted in a focus on poor performances of children on assessments rather than the need to adapt assessments to allow children to exhibit what they know, rather than highlighting what they do not know.

Author Contributions

Bryan K. Murray: Conceptualization (Equal), Formal analysis (Equal), Writing – original draft (Equal), Writing – review & editing (Equal). **Katherine T. Rhodes:** Conceptualization (Equal), Formal analysis (Equal), Writing – original draft (Equal), Writing – review & editing (Equal). **Julie A. Washington:** Conceptualization (Equal), Formal analysis (Equal), Writing – original draft (Equal), Writing – review & editing (Equal).

Data Availability Statement

The data sets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

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Appendix A

Baseline and Cohort Model Results

Baseline Model

The “empty” random intercepts model (also called an unconditional means model) examined syntax as predicted by an average, fixed intercept with the allowance that people could vary from this average (random effect). Model 1 indicated that within- and between-person variance were significant (σ^2 = 19.08, *SE* = 1.66, *Z* = 11.49, $p < .001$; τ_{00} = 19.24, *SE* = 2.30, *Z* = 8.35, $p < .001$), providing support for the need of multilevel modeling analysis. The intraclass correlation (ICC) indicated that approximately 50% of variance in raw syntax scores could be accounted for by random differences between children (ρ = .50). Similarly, Model 1 s indicated that within- and between-person variance in scaled syntax scores were significant (σ^2 = 3.72, *SE* = .33, *Z* = 11.34, $p < .001$; τ_{00} = 5.00, *SE* = .52, *Z* = 9.52, $p < .001$), providing support for the need of multilevel modeling analysis. The ICC indicated that approximately 57% of variance in scaled syntax scores could be accounted for by random differences between children (ρ = .57).

Cohort Effect Testing

In order to examine the assumption of no cohort relations to estimated growth trajectories, the grade levels at which students were measured in the current study were used to define three cohorts of interest in this cohort sequential design (Cohort 1, including students who contributed measurements beginning at Grade 2; Cohort 2, including students who contributed measurements beginning at Grade 3; and Cohort 3, including students who contributed measurements beginning at Grade 4). Model 3 explicitly tested this assumption by allowing for cohort differences in growth trajectories (Miyazaki & Raudenbush, 2000). Model 3 did not significantly improve fit as compared to Model 2, χ^2_{Diff} (4) = 2.80, p = .41. Cohorts did not appear to differ significantly in their raw score linear growth trends, and cohort specific effects were ignorable meaning that all cohorts appeared to follow a similar linear growth trajectory in this cohort sequential study.

For scaled syntax scores, Model 3 s did not significantly improve fit as compared to Model 2 s, χ^2_{Diff} (4) = 1.60, p = .19. Given that the overall unconditional growth model does not significantly degrade fit, model effects are generally not presented or interpreted for the cohort-specific model. Again, this suggests that any small differences in cohort-specific growth trajectories are negligible.

Appendix B

Full Model Results Tables

Table B.1. Model results for raw complex syntax scores.

	Model 1: Random intercept (unconditional means model)	Model 2: Fixed unconditional growth model	Model 4: Dialect conditioned growth
	Coefficient (*SE*)	**Coefficient (*SE*)**	**Coefficient (*SE*)**
Fixed effects			
Mean initial status β_{00}	8.84 (0.25)***	6.27 (0.41)***	10.92 (0.77)***
Dialect β_{01}			–.09 (0.01)***
Mean growth rate β_{10}		0.15 (0.02)***	.13 (0.03)***
Growth conditional on dialect β_{11}			-2.40×10^{-4} (6.07×10^{-4})^{NS}
	Variance component (*SE*)	**Variance component (*SE*)**	**Variance component (*SE*)**
Random effects			
Initial status r_{0i}	19.24 (2.30)***	19.86 (2.17)***	12.27 (1.75)***
Level-1 error ε_{ti}	19.08 (1.66)***	16.46 (1.43)***	16.80 (1.45)***
Model fit statistics			
–2 log-likelihood	4,843.60	4,787.10	4,621.00
AIC (smaller is better)	4,849.60	4,795.10	4,633.00
BIC (smaller is better)	4,862.30	4,812.00	4,658.40
Model notes		χ^2_{Diff} (*1*) = 56.50*** Significantly improved fit over Baseline Model 1	χ^2_{Diff} (*2*) = 166.10*** Significantly improved fit over Model 2b

***Correlation higher than .001.

Table B.2. Model results for scaled complex syntax scores.

	Model 1: Random intercept (unconditional means model)	Model 2: Fixed unconditional growth model	Model 4: Dialect conditioned growth
	Coefficient (*SE*)	**Coefficient (*SE*)**	**Coefficient (*SE*)**
Fixed effects			
Mean initial status β_{00}	7.12 (0.12)***	7.30 (0.20)***	9.88 (0.37)***
Dialect β_{01}			–0.05 (0.01)***
Mean growth rate β_{10}		–0.01 (0.01)^{NS}	–0.03 (0.02)^{NS}
Growth conditional on dialect β_{11}			2.16×10^{-4} (2.95×10^{-4})^{NS}
	Variance component (*SE*)	**Variance component (*SE*)**	**Variance component (*SE*)**
Random effects			
Initial status r_{0i}	5.00 (0.52)***	4.93 (0.53)***	3.09 (0.43)***
Level-1 error ε_{ti}	3.72 (0.33)***	3.75 (0.33)***	3.83 (0.34)***
Model fit statistics			
–2 log-likelihood	3,685.10	3,683.90	3,526.20
AIC (smaller is better)	3,691.10	3,691.90	3,538.20
BIC (smaller is better)	3,703.90	3,708.90	3,563.60
Model notes		χ^2_{Diff} (1) = 1.20^{NS} Does not significantly improve fit over Baseline Model 1	χ^2_{Diff} (2) = 157.70*** Significantly improved fit over Model 2b; χ^2_{Diff} (3) = 158.90*** Significantly improved fit over Model 1

Note. *SE* = standard error; AIC = Akaike information criterion; Bayesian information criterion.

***Correlation higher than .001.