Examining Relationships Among Dialect Variation, Literacy Skills, and School Context in First Grade

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Purpose: This study examined relationships between the use of nonmainstream American English dialects, literacy skills, and school environment among typically developing first graders (n = 617), of whom 48% were African American and 52% were White, in order to describe and better understand the difficulties many children from linguistically diverse backgrounds experience while learning to read.
Method: Using hierarchical linear modeling, the authors examined the linear and quadratic relationships between students' dialect variation (DVAR) and their vocabulary, phonological awareness, and word reading skills, taking into account school environment, specifically schoolwide socioeconomic status (SES).
Results: The relationships between DVAR and literacy outcomes depended on the outcome of interest and school SES. However, children's race did not generally affect the trajectory or strength of the relationships between outcomes and dialect variation. For vocabulary and word reading, the association was nonlinear, that is, U-shaped, but this depended on school SES. For phonological awareness, a negative linear relationship was observed that did not depend on school SES.
Conclusions: The results inform theories on the relationship between DVAR and literacy achievement and suggest a more complex explanation of how nonmainstream American English dialect use might influence how young children learn to read.

KEY WORDS: dialects, dialect variation, literacy, school environment

Findings across multiple studies are converging to show that multiple factors are associated with the widely varying achievement observed among children in American schools. Salient sources of influence include race, ethnicity, gender, socioeconomic status (SES), cultural differences, and language differences (Jencks & Phillips, 1998; McLoyd, 1998; National Reading Panel, 2000; Shonkoff & Phillips, 2000; Snow, Burns, & Griffin, 1998). Of these, SES and race appear to be among the most salient child characteristics that predict whether students will be more or less likely to achieve academic success. These so-called achievement gaps between race and SES groups are observable at school entry, before children participate in formal literacy instruction (Morrison, Bachman, & Connor, 2005), and may widen as children continue their schooling (Entwisle & Alexander, 1993; Entwisle, Alexander, & Olson, 1997). With the goal of explaining and then alleviating the achievement gap, researchers continue efforts to clarify relationships between known variables and to search for other variables that may inform educational practices and policies.

Recently, research on Child × Environment interactions (Connor, Morrison, Fishman, Schatschneider, & Underwood, 2007; Connor et al.,

2009) and transactional theories (Sameroff & MacKenzie, 2003) has demonstrated that the association between sources of influence, such as school context and poverty, and student achievement may be more complex and dynamic than previously postulated. There is no reason to assume that more complex associations might not exist between students' use of a dialect that varies from mainstream American English (MAE), school environment, and their language and literacy skills. The purpose of this study is to contribute to the discussion on achievement gaps by examining the potentially complex relationships among schoolwide poverty levels, students' use of dialects that vary from MAE, and their language and literacy skills at the beginning of first grade.

School Context and Academic Achievement

Ecological and transactional theories of development (Bronfenbrenner, 1979, 1989; Coll et al., 1996; Jencks & Mayer, 1990; Leventhal & Brooks-Gunn, 2000; Morrison & Connor, 2009; Sameroff & MacKenzie, 2003) emphasize the importance of the contexts in which children develop and how interactions between factors intrinsic (e.g., cognition, attention) and extrinsic (e.g., family and school characteristics), as well as the cumulative effects of these factors to the child, influence behavior and long-term outcomes. From this viewpoint, measures of literacy skill assess the child as well as the ecological context that informs the child's performance on such a measure. As such, investigations of literacy performance should consider child, family, and school variables simultaneously in order to explicate the substantial differences observed among children and their varying success learning to read.

Researchers have observed school characteristics, such as percentage of children from low-income homes or from racially diverse backgrounds, to be significantly related to student achievement. For instance, Kainz and Vernon-Feagans (2007) found child characteristics (e.g., age, gender) and family characteristics (e.g., parent's education, household income) to be good predictors of initial reading skills at school entry, while classroom-level characteristics (e.g., quality of instruction) and school-level characteristics (e.g., percentage of children from low-income homes, from racially diverse backgrounds, or underperforming in schools) were better predictors of reading skill over time. Other researchers have found that children of color and children from low-income homes are more likely to attend racially segregated, high-poverty, and academically underperforming schools than are White children and children from middle- to high-income homes (Balfanz & Legters, 2004; Fryer & Levitt, 2004; Lee & Burkam, 2002; National Reading Panel, 2000; Orfield & Lee, 2005).

These school characteristics and outcomes are parallel to the data on neighborhood characteristics. A review of this literature found that high-SES neighborhoods were positively associated with students' educational outcomes, while low SES neighborhoods were negatively associated with student educational outcomes (Leventhal & Brooks-Gunn, 2000). Additionally, neighborhood resources directly affect school and community resources, such as experience and quality of teachers and the number and quality of libraries and after-school programs (Connor, Son, Hindman, & Morrison, 2005; Jencks & Mayer, 1990). Low SES neighborhoods generally provide fewer and lower quality educational resources than more affluent neighborhoods. Given this close link between schools and neighborhoods, an examination of school characteristics includes a larger discussion about neighborhoods (Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998).

Dialect Variation and Literacy Achievement

As American schools become more ethnically, culturally, and economically diverse, they also become more linguistically diverse. Arguably, it is this linguistic diversity that may have important implications for literacy learning, as accumulating evidence from various studies has revealed important associations between children's oral and written language development (Morrison et al., 2005; Scarborough, 2001; Storch & Whitehurst, 2002; Watson, 2001). Here, we make the distinction between *bilingual* and *bidialectal* children. Our research concerns the large number of children whose primary language is English but whose nonmainstream language use and practices are significantly different from those they encounter in formal mainstream environments such as schools. Whereas the literature on bilingualism might inform the discussion of bidialectalism, dialects are not languages (Charity, 2008; Wolfram, Adger, & Christian, 1999). Therefore, the relationship between dialect density and literacy performance may be quite different from the relationship between language differences and literacy performance and thus involves independent inquiry.

Investigations of the relationship between dialect density and literacy skills date back more than 30 years and have included MAE and nonmainstream American English (NMAE) dialects as well as dialects of other languages (Siegel, 1999). Recently, a number of language-related research studies have focused on various NMAE dialects, including Southern American English (SoAE; Oetting, Cantrell, & Horohov, 1999; Oetting & Garrity,

2006; Oetting & McDonald, 2001), Creole English (Oetting & Garrity, 2006), Appalachian English (Garn-Nunn & Perkins, 1999), Latino English (Gutiérrez-Clellen & Simon-Cereijido, 2007), and African American English (AAE; Charity, Scarborough, & Griffin, 2004; Craig & Washington, 2004b; Craig & Washington, 2006; Horton-Ikard & Miller, 2004; Oetting & Garrity, 2006; Oetting & Pruitt, 2005; Pearson, Velleman, Bryant, & Charko, 2009).

Although not individual languages, these NMAE dialects are quite systematic and rule-governed. In fact, many NMAE dialects are distinguished from MAE dialects by the frequency and contexts in which distinct phonological, morphosyntactic, and prosodic features occur rather than the absence or presence of specific features. For instance, both NMAE and MAE speakers reduce final consonant clusters; however, some NMAE dialects do so more frequently and within specific linguistic constraints. Moreover, not all NMAE dialects are socially stigmatized in the United States. For instance, negative perceptions of AAE can be found across the United States. However, in some regions of the county and in some popular culture instances, SoAE is viewed with endearment and nostalgia. For most dialects of a single language, those factors that are shared tend to be less stigmatized, whereas nonoverlapping features tend to be more marked and thus more socially stigmatizing.

Specifically, this study includes children who likely speak MAE, AAE, and SoAE. Both AAE and SoAE share some features with MAE and many more features with each other due to the strong historical ties between African Americans and Whites in the South (Bailey & Thomas, 1998; Charity, 2008). Overlapping phonological and morphosyntactic features between AAE and SoAE are clustered mostly around vowel changes and *r*-lessness and include changes to diphthong vowels (e.g., *oil* pronounced as *oal*), fricative stopping before nasals (e.g., *isn't* pronounced as *idn*), metathesis of final /s/ stops (e.g., *asked* pronounced as *aksed*), using *done* to mark past tense (e.g., *I told you yesterday* produced as *I done told you*), and use of double modals (e.g., *I could do it* produced as *I might could do it*). Many of these features, especially those that are phonological, carry little social stigmatism in the South, though they may be viewed negatively in other regions of the United States.

In contrast, nonoverlapping phonological features include deletion of final nasals (e.g., pronouncing *join* as *joy*), substitution of /k/ for /t/ in /str/ clusters (e.g., pronouncing *street* as *skreet*), and loss of /y/ after specific consonants (e.g., pronouncing *computer* as *compooter*). In addition, many of the morphosyntactic features of AAE are unique to the dialect and include copula deletion (e.g., *he is happy* produced as *he happy*) and using the copula to indicate habitual action (e.g., *he always runs fast* produced as *he be running fast*). Features that are unique to AAE tend to carry greater social stigmatism than those that are shared with SoAE. Moreover, there appears to be a growing divergence between these two dialects, as many old-fashioned features of SoAE phonology are rapidly disappearing in White speech and are becoming more prominent in the speech of African Americans (Bailey & Thomas, 1998). A more complete list of features can be found in other sources (Bailey & Thomas, 1998; Charity, 2008; Green, 2002; Mufwene, Rickford, Bailey, & Baugh, 1998).

While recent language-based research has considered multiple NMAE dialects, recent empirical investigations exploring specifically the relationship between NMAE use and early literacy skills have focused almost exclusively on AAE use among African American children. Nonetheless, findings from these studies can inform studies of dialect density in more racially and linguistically diverse samples, especially if the relationship between the NMAE and MAE under investigation is similar to that between AAE and MAE. These studies of AAE use, characterized by relatively large samples of preschool and primary grade-level children and sensitive measures of NMAE dialect use, have revealed important aspects about the nature and significance of dialect density among children who are learning how to read and write.

For instance, researchers have observed the frequency of AAE use to vary by gender, age, grade, SES, and discourse context (Charity et al., 2004; Craig & Washington, 2004a; Horton-Ikard & Miller, 2004; Thompson, Craig, & Washington, 2004; J. A. Washington & Craig, 1998; J. A. Washington, Craig, & Connor, 1998; J. A. Washington, Craig, & Kushmaul, 1998). Researchers have also reported greater production of AAE forms (or lesser production of mainstream phonological and morphosyntactic forms) during various discourse contexts (e.g., sentence repetition, text reading, elicited narrative production, and spontaneous language production) to be correlated with measures of letter-word recognition, decoding, and reading comprehension skills among children in kindergarten through second grade (Charity et al., 2004); accuracy and rate scores during passage reading among children in second through fifth grade (Craig, Thompson, Washington, & Potter, 2004); performance on national and state standardized reading achievement tests among children in first through fifth grade (Craig & Washington, 2004a); measures of rhyming, letter-word recognition, and sentence imitation skills among preschoolers (Connor & Craig, 2006); accuracy in oral usage and spelling of inflections among children in first through third grade (Terry, 2006); and accuracy in spelling dialect-sensitive phonological features among third graders (Kohler et al., 2007). Overall, the results of these studies provide support for an important and perhaps educationally significant

relationship between AAE use and early literacy achievement, and it is likely that these results could be extended to other NMAE dialects.

However, the nature of this relationship remains unclear. Briefly, three theories have been proposed to explain it. Again, these hypotheses were formulated based on research with AAE. However, they should extend to other NMAE dialects whose relationship to MAE is similar to that of AAE and MAE. The first, the teacher bias hypothesis, suggests that teachers' negative perceptions of children who use NMAE affects how teachers relate to students, ultimately resulting in less optimal instruction, lower expectations for achievement, and negative interactions (Shields, 1979; V. Washington & Miller-Jones, 1989). The second hypothesis suggests that linguistic mismatches between NMAE and written Standard English orthography may create confusion as children learn phoneme–grapheme correspondences, grammatical forms, and vocabulary (Labov, 1995). Finally, alternatively termed dialect awareness (Charity et al., 2004), dialect shifting (Connor & Craig, 2006; Craig & Washington, 2004a), and linguistic awareness/flexibility (Scarborough, Terry, & Griffin, 2007; Terry & Scarborough, 2009), a relatively new third hypothesis suggests that greater metalinguistic knowledge of both mainstream and nonmainstream forms and the relationship between them may be as important, if not more so, as the speech–print mismatches between NMAE and written Standard English forms for literacy acquisition. Presently, there is insufficient evidence to determine which theory best accounts for the observed relationship between dialect density and literacy achievement. Indeed, each may be operating independently and cumulatively. Additional research on the literacy skills of NMAE-speaking children who are learning how to read and write may help to clarify these theories and is an aim of this study.

Sociocultural Context and Dialect Variation

To date, investigations of the relationship between dialect density and literacy skills have not considered the sociocultural environment in which children who use NMAE dialects are educated. Examining the sociocultural environment, specifically the school context, is important because dialect use is a sociocultural phenomenon that depends on multiple factors, including age, gender, race, SES, discourse context, and speech partners (Wolfram et al., 1999). For example, Myhill (1988) found that when a racially diverse sample of adults were grouped by sociocultural factors, such as frequent contact with White people at work, school, and home, the individuals who had more interaction in the White community used less AAE in speech. Moreover, recent investigations of child AAE use have shown frequency of AAE use to vary by gender, age/grade, SES, and discourse context, with the frequency of AAE feature use decreasing as school experience increases (Charity et al., 2004; Craig & Washington, 2004a; Horton-Ikard & Miller, 2004; Thompson et al., 2004; J. A. Washington & Craig, 1998; J. A. Washington, Craig, & Connor, 1998; J. A. Washington, Craig, & Kushmaul, 1998). As the aforementioned literature suggests, sociocultural characteristics of the school context may have important implications for student achievement.

Examining dialect density and literacy skills within the context of sociocultural environment might also help clarify theories posited to explain this relationship. For instance, the linguistic awareness/flexibility hypothesis suggests that children's use of MAE and NMAE in appropriate social contexts is indicative of greater metalinguistic awareness. However, children's acquisition of and proficiency with this shifting ability may be dependent on their sociocultural environment. Children in more diverse linguistic communities may be presented with more opportunities not only to notice differences between spoken dialects but also to practice shifting between them for specific contexts. This kind of flexibility, according to the linguistic awareness/flexibility hypothesis, would be beneficial to all children because it is analogous to the kind of metacognitive awareness of language structures that is necessary for reading. There is some evidence of less frequent NMAE use among African American adults in more racially integrated or higher SES environments, which researchers have attributed to greater shifting ability due to their interactions in more socioculturally diverse environments (Labov, 1972; Myhill, 1988; Wolfram et al., 1999). In this study, we examine not just the sociolinguistic environment (i.e., school context) or the child's dialect use (i.e., dialect density) but also their performance on various literacy measures. Examining all three variables simultaneously may help to elucidate hypotheses on the relationship between dialect use and literacy skills.

Purpose

The purpose of this study was twofold. First, we wanted to investigate whether a relationship between children's NMAE dialect use and performance on measures of receptive vocabulary, phonological awareness, and word recognition would be observed in first graders. Second, if this relationship was observed, we wanted to investigate whether it was linear (i.e., a straight line sloping either up or down to define the relationship) or nonlinear (i.e., a U- or J-shaped curving line to define the

relationship) and whether the relationships differed by a sociocultural variable: school context. School context can be described by multiple characteristics, including racial, cultural, and economic diversity. For the purposes of this investigation, schools were examined by differences in schoolwide SES, specifically, the percentage of children enrolled in the school who qualified for free and reduced price lunch programs (FARL). Notably, in this study's school district, schools with a higher proportion of African American students and White students using NMAE also tended to have a higher proportion of children living in lower SES homes.

We chose to explore this relationship among young, typically developing first graders because they are learning how to read and write, and it remains unclear how dialect density influences their literacy learning. The targeted reading skills are critical components of reading acquisition and are known to be related to later reading achievement (Connor, 2008). Whereas a nonlinear or U-shaped relationship has been observed among preschoolers (Connor & Craig, 2006), negative, linear relationships have been observed among children in preschool through fifth grade (Charity et al., 2004; Craig & Washington, 2004a; Craig, Connor, & Washington, 2004; Terry, 2006). This variability in research findings warrants further investigation.

We chose to explore indicators of SES both because more or less NMAE dialect use (i.e., dialect density) has been shown to be related to this sociocultural variable and because SES is related to academic achievement (National Reading Panel, 2000; Snow et al., 1998). Moreover, as indicated previously, children who attend schools with a large percentage of children from low-income households tend to perform more poorly on various achievement measures than do children who attend schools with a smaller percentage of children from low-income households. The additional role that the sociocultural environment in schools plays in the relationship between dialect density and literacy achievement is also important to consider because dialect use is a sociocultural phenomenon that should be sensitive to the social and cultural environment in schools. Finally, we chose to explore this relationship among a racially diverse group of children because differences in nonmainstream feature production, as well as other sociolinguistic factors that govern NMAE use, may influence the relationship between dialect density and reading skills differently for White and African American children.

To summarize, the following research questions were posed:

1. What is the nature and variability of children's use of NMAE or MAE in an economically and racially diverse sample of first graders attending schools that vary socioeconomically?
2. What is the relationship between dialect use and students' vocabulary, phonological awareness, and word reading skills at the beginning of first grade?
3. Does the relationship between dialect use and students' vocabulary, phonological awareness, and word reading skills differ by school context, specifically schoolwide levels of poverty or affluence, and by race, specifically African American and White?

Method

Participants

This study included children who were participating in a larger randomized control field study on literacy instruction. Children (M = 6.7 years of age, SD = 0.46 years) in 70 first grade classrooms in 18 schools were recruited for the study. No children, including those identified with special needs, were excluded from the larger study. Over 85% of parents provided informed consent (n = 1,085). In accordance with the research design applied in the larger study, a subset of these children (n = 780) were selected at random to participate in an extended battery of language and literacy assessments, including a measure of dialect variation.

Of these children, approximately 10% were identified as having specific special or exceptional needs (e.g., specific language impairment, learning disability, deafness or hearing loss), and these children were not included in the current investigation. The rationale was that language delays may, in many respects, simulate a dialect variation, and our questions pertained to children who were typically developing. Information on race/ethnicity was not available for 5 children, and they were not included in this investigation either. Additionally, small percentages of children were described as having English as a second language (2%), Asian (2%), Hispanic (1%), and Middle Eastern (0.2%), and so these children were not included in the study. Thus, the current study focuses on this subset of 617 child participants, in 70 classrooms across 18 schools. Of these children, 48% were African American, and 52% were White. The sample was split evenly between boys and girls, at 50 percent each. Forty-five percent qualified for FARL.

Descriptive information for the children is provided in Table 1. Participants attended public schools in a single district in the southeastern United States, with schools in urban (n = 10), urban-fringe (n = 5), and rural (n = 3) communities. Published district statistics indicated that schools varied by the percentage of children who participated in the U.S. FARL program (range = 4%–96%). Descriptive information on the schools is provided in Table 2.

Table 1. Mean DVAR and performance on WJ–III tasks by DELV–S dialect group classifications for total sample, for children who are African American (AA) and children who are White (WH).

Variable and DELV–S dialect group	Total mean	*SD*	AA mean	WH mean
Percentage DVAR				
Significant variation from MAE	78.7143	13.29096	79.03	68.04
Moderate variation from MAE	50.2649	12.61871	51.96	48.34
MAE	12.3762	11.88641	18.75	10.39
HLM computed for sample	34.71	32.18	62.44	23.84
Vocabulary SS				
Significant variation	96.99	7.612	96.84	98.62
Moderate variation	101.41	10.095	99.46	103.12
MAE	108.45	10.320	104.95	109.39
HLM computed for sample	104.55	10.893	100.91	108.37
Phonological awareness SS				
Significant variation	102.86	12.837	101.42	91.24
Moderate variation	104.50	14.108	99.61	102.74
MAE	113.54	12.402	114.56	109.39
HLM computed for sample	109.77	13.610	104.4	110.48
Word-reading SS				
Significant variation	99.30	12.731	98.94	93.62
Moderate variation	105.93	15.117	104.39	98.68
MAE	112.71	14.592	113.54	110.48
HLM computed for sample	108.31	15.330	102.56	108.77
Vocabulary W score				
Significant variation	473.88	7.727	474.04	476.40
Moderate variation	477.39	10.380	477.58	478.65
MAE	484.63	9.645	482.00	485.72
HLM computed for sample	480.90	10.417	476.93	485.12
Phonological awareness W score				
Significant variation	477.37	13.319	477.44	473.33
Moderate variation	478.62	12.184	478.93	474.24
MAE	488.19	10.987	490.38	487.25
HLM computed for sample	484.30	12.801	481.81	486.14
Letter-word recognition W score				
Significant variation	399.47	24.617	399.89	385.60
Moderate variation	408.02	27.162	410.56	400.25
MAE	426.65	31.481	432.80	242.02
HLM computed for sample	417.20	31.759	411.36	421.92

Note. For standard scores (SS), standardized mean = 100 and *SD* = 15. DVAR = percentage of dialect variation; WJ–III = Woodcock-Johnson Tests of Achievement—Third Edition; DELV–S = Diagnostic Evaluation of Language Variation—Screening Test; MAE = mainstream American English; HLM = hierarchical linear modeling.

Measures

Dialect variation. Dialect variation was assessed using the Diagnostic Evaluation of Language Variation—Screening Test (DELV–S; Seymour, Roeper, & de Villiers, 2003). This study used the scores from Part 1 of this measure. Children were asked to describe actions in pictures or to respond to questions about pictures. For example, they were asked to identify a picture of teeth, and their pronunciation of the word was recorded. Children's responses were scored for the frequency of MAE and NMAE features produced, allowing them to be classified as speaking with strong, some, or no variation from MAE, according to test norms.

Language and literacy achievement. Receptive vocabulary, phonological awareness, and word reading skills

Table 2. School descriptives, including school socioeconomic status (SES), percentage of children who are African American, and the study school mean DVAR (standard deviation in parentheses).

School	School SES (% FARL)	School % of African American students	School mean DVAR
1	96.0	93.0	82.41 (10.9)
2	93.0	94.0	64.45 (24.3)
3	87.0	90.0	65.40 (25.3)
4	86.0	79.0	66.40 (31.0)
5	82.0	85.0	90.60 (2.4)
6	69.0	79.0	42.79 (24.2)
7	67.0	80.0	58.99 (32.14)
8	60.0	71.0	44.89 (32.8)
9	57.0	33.0	28.70 (30.23)
10	38.0	43.0	30.97 (28.2)
11	37.0	44.0	31.81 (30.9)
12	33.0	37.0	20.21 (23.4)
13	29.0	22.0	14.64 (16.3)
14	24.0	21.0	11.92 (18.47)
15	24.0	12.0	15.81 (18.8)
16	12.0	9.0	12.19 (12.7)
17	9.0	12.0	14.39 (14.4)
18	4.0	6.0	13.56 (15.7)

Note. Percentages of students eligible for the Free and Reduced Lunch (FARL) program and who are African American are reported by the school district and are schoolwide. School mean DVAR is the school aggregated mean for this first-grade sample.

were measured using subtests of the Woodcock-Johnson Tests of Achievement—Third Edition (WJ–III; Woodcock, McGrew, & Mather, 2001). This battery of assessments was selected because it is psychometrically strong (the median reliabilities range from .77 to .88, respectively, for children between the ages of 5 and 19 years) and because it is administered individually.

Vocabulary was assessed using the Picture Vocabulary subtest, for which children were asked to name pictures of increasingly less familiar objects. Phonological awareness was assessed using the Sound Awareness subtest, for which children were asked to rhyme words and delete, add, and reverse sounds in words. Word reading was assessed using the Letter-Word Identification subtest, for which children were asked to identify and name individual letters and words.

Procedures

All measures were administered and scored in standardized format by trained research staff. Children were assessed individually during the fall of the school year in a quiet area of the school. Because approximately 85% of the participants (in 60 out of 70 classrooms) attended classrooms where their teacher was participating in the treatment condition of the randomized control field trial and the rest of the children attended classes in the control group, fall scores were used in the analyses to control for any intervention effects.

Computing percentage of dialect variation. In addition to the criterion scores (i.e., MAE, some variation from MAE, and strong variation from MAE) provided by the DELV–S, a continuous variable was computed using children's responses on individual items. This continuous variable, percentage of dialect variation (DVAR), was used for analyses of the relationship between rate of dialect variation, language and literacy performance, and school context. Each item can receive a score of 1 in either Part A (response varies from MAE), Part B (response is MAE), or Part C (response could not be scored). Thus, to create DVAR, we divided the total score for Part A by the sum of Parts A and B (i.e., the total number of items that could be scored). We then multiplied by 100 to compute a percentage. In this way, DVAR represents the percentage of scored items that were observed to vary from MAE. Thus, a child who obtained a score of 9 in Part A and a score of 1 in Part B, with five items that could not be scored (Part C), would receive a DVAR score of 90%. In the same way, a child who obtained a score of 3 in Part A and a score of 11 in Part B, with one item that could not be scored, would receive a DVAR score of 21.4%. In this way, we created an interval variable that reflected dialect variation across a continuum while controlling for the number of items that could be scored. This procedure is similar to that applied in previous research on dialect variation (Charity et al., 2004).

This distinction was important because applying the DELV–S scoring might misidentify students' dialect use. For example, a student who used MAE under the DELV–S score would be identified as speaking with some variation from MAE if he or she could not respond to the probes appropriately (i.e., high score in Part C). Such a child might have provided MAE targets for all of the probes he or she understood (i.e., Part A = 0). In the same way, simply using the Part A score as a continuous variable would fail to provide a meaningful MAE score because children who obtained a score of 0 on Part A could include students who produced MAE on Part B (i.e., classifying them as using MAE), or they could be students who did not understand or appropriately respond to the item probes (i.e., producing larger scores for Part C and classifying them as using some variation from MAE).

Computing language and literacy scores. For the analyses, raw scores from subtests on the WJ–III were transformed into W scores. The W score is a variation of the Rasch Ability Scale, where a score of 500 represents the achievement of a typical 10-year-old child (SD = 15). Standard scores, where typical performance for a given age is 100 (SD = 15), are provided in Table 1 for interpretation purposes.

Missing data. All participants ($N = 617$) received the DELV–S, Picture Vocabulary, and Letter-Word Identification subtests of the WJ–III. Only a subset of children selected at random received the Sound Awareness ($n = 458$) subtest. Missing data analyses revealed no systematic differences, with regard to gender or race, among children who received all the assessments and those who received a subset. Therefore, all participants were included in the analyses.

Results

The data were analyzed in the following ways: First, analyses of variance (ANOVA) were used to answer Question 1, regarding the nature and variation of dialect use in this racially and economically diverse sample. Then, hierarchical linear models (HLM; Raudenbush & Bryk, 2002), with three levels—child, classroom, and school—were used to examine the variability in the degree to which children's dialect varied from MAE (i.e., DVAR) and the effect of this variation on their language and literacy skills in relationship to their schools' poverty levels (i.e., FARL). HLM models were built systematically beginning with an unconditional model from which intraclass correlations (ICC; i.e., proportions of variance falling between schools) were computed. Child-level variables were added at Level 1, and then school-level SES was added at Level 3. Chi-square model comparisons were used to assess model fit. Table 1 provides the descriptive statistics for HLM.

Children's Dialect Use

Children varied in their dialect use (see Table 1). In the sample, 28% were classified on the DELV–S as speaking with strong variation, 9% with some variation, and 62% with no variation from MAE. In addition, DVAR was distributed normally across the sample, with a mean of 37% ($SD = 32$), a minimum of 0%, and a maximum of 100%. DVAR agreed generally with the DELV–S criterion-based groups. Students in the MAE group achieved significantly lower DVAR scores ($M = 12.4$) compared with students whose dialect varied somewhat ($M = 50.3$) or strongly ($M = 78.7$) from MAE, $F(2, 641) = 1{,}854.2$, $p < .001$. On average, African American children achieved a mean DVAR score of 57%, and White children achieved a mean DVAR score of 14%. Mean DVAR scores for African American and White children are provided in Table 1.

Overall Achievement

Children varied widely in their language and literacy performance at the beginning of first grade (see Table 1). Whereas group means were solidly average (see Table 1), standard scores ranged from 74 to 140 on the Picture Vocabulary subtest, 48 to 161 on the Letter-Word Identification subtest, and 50 to 151 on the Sound Awareness subtest. Not surprisingly, children at schools with a larger percentage of students qualifying for FARL (i.e., low SES schools) tended to earn lower scores, on average, than did children at more affluent schools. ICCs, or the proportion of variance that fell between schools for each outcome, were fairly typical and were as follows: Vocabulary ICC = .155, Phonological Awareness ICC = .093, and Word Reading ICC = .094.

Typical relationships among performance on the language and literacy measures were observed (see Table 3). Generally, children with stronger vocabulary scores also had stronger phonological awareness and letter-word identification. Correlations ranged from .41 to .64.

Relationship Between Variation From MAE, Language and Literacy Skills, and School-Level Poverty

We used HLM to examine the relationship between DVAR and performance on language and literacy measures while considering school context. HLM is preferred because of the nested nature of these data; children were nested in classrooms, and classrooms were nested in schools. Failure to take into account the shared classroom- and school-level variance may lead to misestimation of standard errors. Children's performance (W scores) on the language and literacy measures was entered at Level 1 (i.e., the child level). School percentage FARL was entered at Level 3, the school level. No variables were added at the classroom level. Linear and quadratic terms were included for children's DVAR. The quadratic term, which allowed for examination of more complex nonlinear relationships between DVAR and student outcomes, was computed by squaring each child's DVAR score after centering scores at the sample mean (i.e., 37). All models were run with continuous variables grand mean centered, with the exception of the code for African American (AA) children (AA = 1, White = 0). Additionally, DVAR linear and quadratic terms for AA children were created (DVAR × AA and DVAR-squared × AA) to detect

Table 3. Correlations between language and literacy measures.

Score	DVAR	Vocabulary	Phonological awareness
Vocabulary W score	−.508*		
Phonological awareness W score	−.451*	.416*	
Word recognition W score	−.421*	.412*	.637*

*$p < .001$.

any differences in the relationship between DVAR and the outcomes for AA children compared with White children. Thus, the intercept represents the mean-fitted outcome for children who are White and have a mean DVAR score. Visual inspection of the data using scatter plots revealed that the full range of DVAR scores (1–100) was observed for both groups. Significant differences in coefficients for the variables AA, DVARAA, and DVAR-sq would suggest that the relationship between outcomes and DVAR varied by ethnic group. For the models built for Vocabulary and Word Reading, adding school SES improved the fit of the models. We have provided figures in addition to the tables to streamline interpretation. The figures were created using the HLM software (Version 6). It is important to note that the figures represent fitted or modeled results and therefore highlight information that may not be evident from data presented in the tables.

The analyses revealed complex and varied relationships between children's performance on measures of language and literacy skills and their DVAR score. Results varied by outcome measure, and the relationships were moderated, in some cases, by school-level SES. We describe the results for each outcome below.

Vocabulary. Overall, the relationship of DVAR to children's vocabulary scores was negative and nonlinear, but this varied by school SES (see Table 4 and Figure 1) inasmuch as the linear and the quadratic terms were significantly different from zero, although the significance of the quadratic term was borderline ($p = .063$). There was an effect of school-level SES (see Figure 1). Modeling school SES as high SES (school FARL = 20%), average SES (FARL = 50%), and low SES (FARL = 50%) for each ethnic group, results show that school SES had little effect on the relationship between students' DVAR and vocabulary scores at high-SES schools but an increasingly negative relationship at average and low SES schools. Although effect sizes for continuous variables are open to interpretation, using our model results comparing the relationship of DVAR with vocabulary for high SES and low SES schools, the effect size difference for MAE (DVAR = 0) and high dialect use (DVAR = 100) was 2.52 (which is large) at low SES schools. The effect size was 0.8 at typical SES schools and 0 at high SES schools. There was no significant difference in this relationship between African American and White children except that, overall, African American children tended to achieve higher vocabulary scores than did their White peers who achieved the same DVAR scores, and this tended to be greater at the higher SES schools.

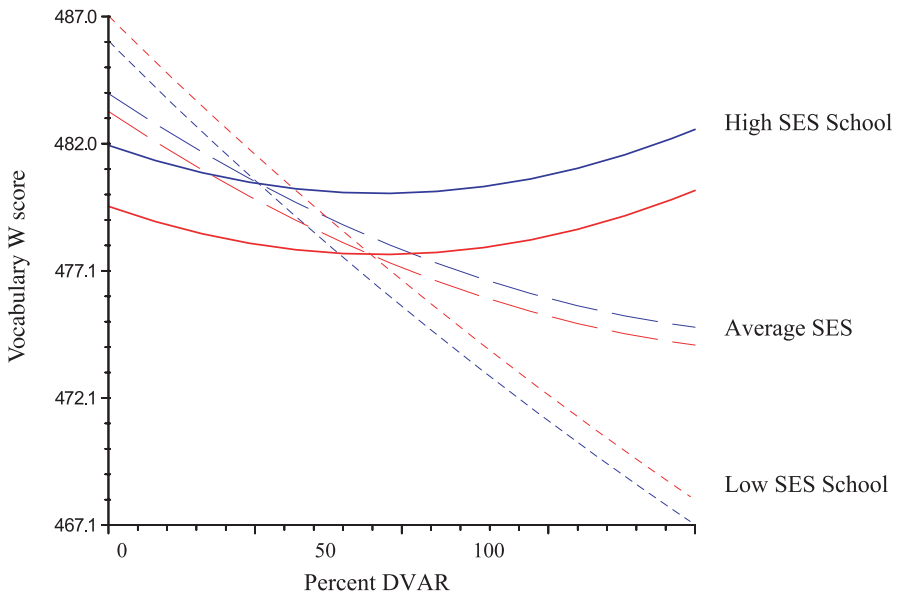
Phonological awareness. The association between children's DVAR and phonological awareness score was

Table 4. Hierarchical linear modeling for relationships between vocabulary, DVAR, and school-level SES.

Fixed effects	Coefficient	*SE*	Approx. *df*	*p*
Intercept	479.46	1.19	16	>.001
Child variables				
AA	−.70	1.48	605	.636
DVAR linear	−.11	.048	606	.026
DVAR quad	.002	.001	606	.063
AA × DVAR linear	−.03	.055	605	.532
AA × DVAR quad	−.002	.001	605	.232
School variables				
School SES	−.07	.04	16	.066
School SES × Child interactions				
AA × SES	.056	.050	605	.264
DVAR linear × SES linear	−.003	.001	605	.069
DVAR quad × SES	−.00007	.00001	605	.206
AA × DVAR linear × SES	.004	.002	605	.041
AA × DVAR quad × SES	.0001	.0001	605	.322
Random effects	**Variance**	***df′***	χ^2	***p***
Level 1	76.27			
Level 2	.02	52	32.51	>.500
Level 3	.34	16	25.44	.062

Note. Deviance = 4,427.86. African American children are coded as 1, and White children are coded as 0. All continuous variables are grand mean centered. AA × DVAR linear and quad show the extent to which the relationship between outcome and DVAR use differs for African American children compared with White children.

Figure 1. The relationship of children's dialect variation (DVAR) and vocabulary performance as a function of school-level poverty (FARL %). The red line represents children who are African American; and the blue line, children who are White. Solid lines represent high SES schools, and dotted lines represent low SES schools. Dashed lines represent average SES schools.



negative and linear (i.e., the quadratic trend was not significantly different than zero; see Table 5 and Figure 2). Again, African American children tended to achieve higher scores than did their White peers with similar DVAR scores. Moreover, this relationship was not moderated by school SES. Adding school SES variables did not improve the fit of the model and so were trimmed from the model. Thus, the more children used features of dialect that varied from MAE, the lower were their phonological awareness scores. The effect size contrasting students who used MAE (DVAR = 0%) and students whose dialect varied substantially from MAE (DVAR = 100%) was 2.1, which is large.

Table 5. Hierarchical linear modeling for relationships between phonological awareness, DVAR, and school-level poverty (SES).

Fixed effects	Coefficient	*SE*	Approx. *df*	*p*
Intercept	477.86	1.41	17	<.001
Child variables				
AA	8.15	1.81	452	<.001
DVAR linear	−.289	.054	452	<.001
DVAR quad	.002	.002	452	.301
AA × DVAR linear	.092	.066	452	.163
AA × DVAR quad	−.002	.002	452	.289
Random effects	**Variance**	***df′***	**χ^2**	***p***
Level 1	115.73			
Level 2	7.344	50	7.34	.022
Level 3	0.010	17	39.18	.001

Note. Deviance = 3,499.55.

Word reading. HLM results revealed that the association between children's word recognition scores and DVAR was U-shaped (i.e., nonlinear) and was mediated by school SES (see Table 6 and Figure 3). At all schools, there was a U-shaped relationship between DVAR and word reading score, indicating that, generally, children who used MAE or very high levels of dialect (high DVAR) achieved stronger word reading scores than did students whose dialect varied somewhat from MAE (about 50% DVAR). This relationship also differed for African American children when compared with their White peers who achieved the same DVAR score. Generally, African American children achieved higher word reading scores than did White children; this was especially true for African American children who demonstrated lower DVAR (less than about 60%). School SES had little effect on the relationship between DVAR and word reading. In contrast, White children who attended low SES schools exhibited significantly weaker word reading skills overall than did White children who attended average and high SES schools. Additionally, overall, the U-shaped relationship was in greater evidence at high SES schools than at lower SES schools. Informative overall effect sizes could not be computed, and the reader is referred to Figure 3 to make relevant comparisons among schools and

Figure 2. The relationship of children's DVAR and phonological awareness performance. The red line represents African American children's scores, and the blue line represents White children's scores. School SES had no significant relationship with students' scores.

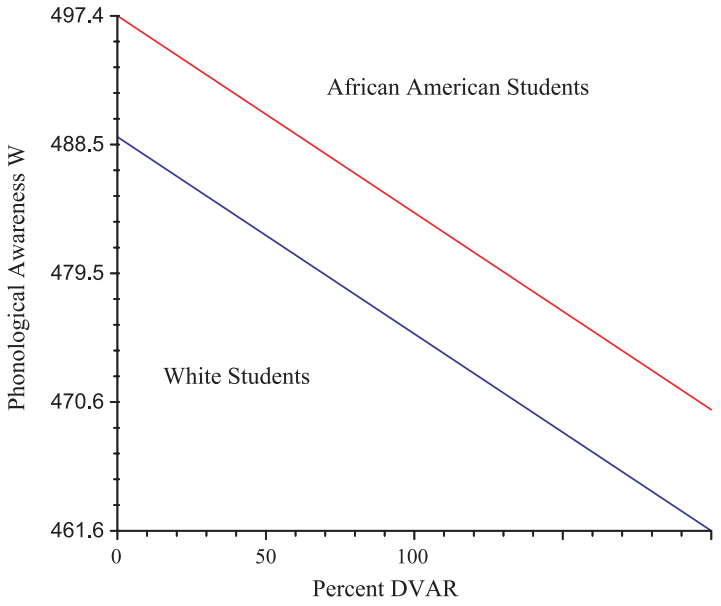
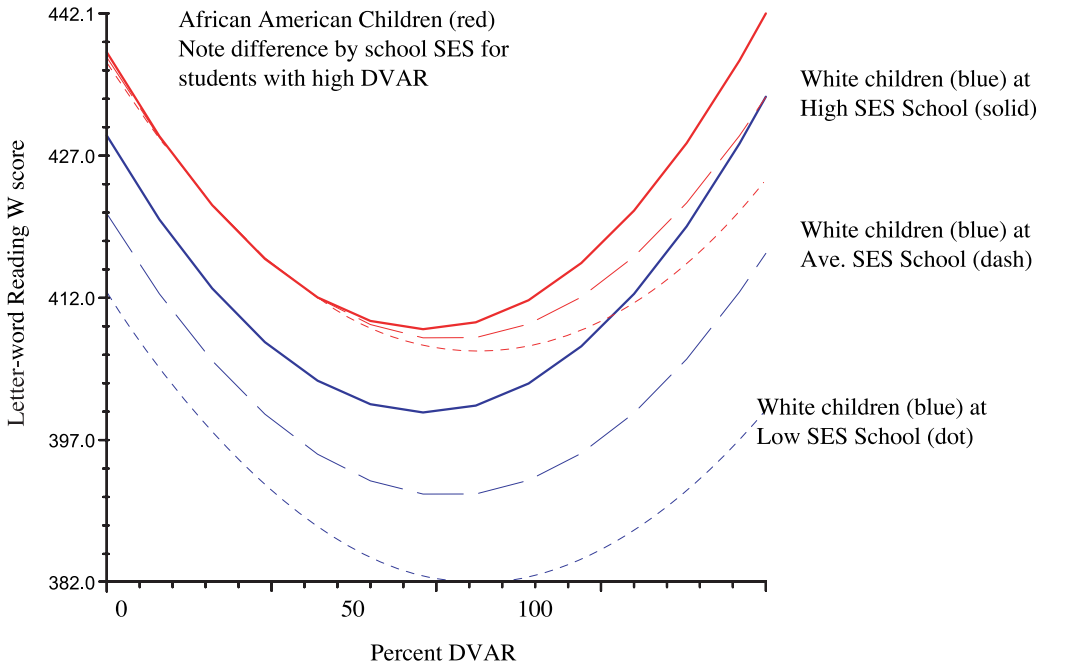


Table 6. Hierarchical linear modeling for relationships between word reading, DVAR, and school-level poverty (SES).

Fixed effects	Coefficient	*SE*	Approx. *df*	*p*
Intercept	399.78	3.76	16	<.001
Child variables				
AA	16.05	4.66	605	.001
DVAR linear	−.32	.15	605	.036
DVAR quad	.011	.004	606	.008
AA × DVAR linear	−.26	.173	605	.136
AA × DVAR quad	−.005	.005	605	.227
School variables				
School SES	−.25	.12	16	.045
School × Child interactions				
AA × SES	.26	.16	606	.105
DVAR linear × SES linear	−.002	.005	605	.766
DVAR quad × SES	−.0005	.0002	605	.782
AA × DVAR linear × SES	.011	.006	605	.065
AA × DVAR quad × SES	−.0002	.0002	605	.342
Random effects	**Variance**	***df′***	χ^2	***p***
Level 1	760.39			
Level 2	4.39	52	53.30	.424
Level 3	.095	16	17.34	.364

Note. Deviance = 5,847.51.

Figure 3. The relationship of children's DVAR and word-reading performance as a function of school-level poverty (FARL %). Red lines represent African American children's scores, and blue lines represent White children's scores. Solid lines are high SES, dashed lines are average (Ave.) SES, and dotted lines are low SES schools.



NMAE use with regard to whether children were African American or White.

Discussion

This study had two primary goals: to examine the relationship between DVAR and reading skills among children in first grade and to explore how this relationship, if observed, might vary by school context (i.e., the percentage of children in the school who lived in poverty, that is, who qualified for FARL programs) and student race (i.e., African American or White). We investigated this relationship in a racially, linguistically, and socioeconomically diverse group of children for three reading skills: phonological awareness, vocabulary, and word recognition. Both dialect use and reading skill varied widely among this group of first graders. Overall, the results of this study suggest a complex relationship between NMAE dialect use, school context, race, and early reading achievement.

DVAR and Literacy Skills

A significant nonlinear relationship (i.e., U-shaped) was observed between DVAR and word reading, whereas generally significant negative linear relationships were observed for phonological awareness and vocabulary skills. Overall, children who used NMAE forms more frequently had weaker phonological awareness and receptive vocabulary skills, but for vocabulary, this varied by school SES, with the negative linear relationship strengthening as school SES decreased. At the same time, children who used NMAE forms with moderate frequency achieved lower word reading scores than did children who used NMAE forms infrequently or frequently (a U-shaped relationship).

Some of these results are similar to those of other recent studies on AAE and early reading skills. For instance, whereas Connor and Craig (2006) found a similar nonlinear relationship for letter-word recognition skills among preschoolers who used AAE, Charity et al. (2004) and Craig and Washington (2004a) both observed negative linear relationships between AAE use and word reading among first graders. Also similar to this study, Connor and Craig (2006) observed a negative linear relationship for AAE use and receptive vocabulary skills; however, unlike this study, Connor and Craig also found a nonlinear relationship between AAE use and phonological awareness among preschoolers.

Differences in the findings might be explained by the measures used in the respective studies. For example, Craig and Washington (2004a) used subtests of state-mandated reading achievement tests, while Connor and Craig (2006), Charity et al. (2004), and this study used standardized measures of word reading skills. Connor and Craig (2006) used a state-provided test of rhyming

skills to measure phonological awareness skills, whereas this study used a standardized measure of various phonological awareness skills, including rhyming, blending, deletion, and substitution. These tasks likely tapped reading skills in different ways. Still, the current study used the same word recognition and vocabulary measures that Connor and Craig (2006) and Charity et al. (2004) used in their investigations, suggesting that differences in measures alone cannot account for the inconsistency in findings.

Differences in the children who participated in these studies might also explain differences in the findings. This study included a racially and linguistically diverse group of children in first grade, while the other studies included only African American children who used AAE and children in prekindergarten and kindergarten through second grade. As discussed below, this racial and linguistic diversity may have implications for the relationship between DVAR and early reading skills.

In addition, researchers have found not only that children acquire literacy skills rapidly in the preschool and early elementary years but also that many children begin to use NMAE forms significantly less frequently in speech during these years (Connor & Craig, 2006; Craig & Washington, 2004a). Thus, the relationships between DVAR and specific literacy skills may be particularly sensitive to age and grade changes in literacy skills and in language use, which could account for differences in the findings from these studies. For instance, whereas Connor and Craig (2006) found that more or less frequent AAE use was associated with stronger reading skills among preschoolers, Craig and Washington (2004a) found that frequent AAE use was associated with weaker reading skills among older children in the primary grades.

Finally, these findings may also be an artifact of the instruction children received in these reading skills. Although considering instructional differences were beyond the scope of this study, there is ample evidence that the instruction children receive is related to their reading achievement (National Reading Panel, 2000). Children participating in this study attended 18 different schools. It is plausible that the reading instruction they received differed in both quality and quantity. Furthermore, in general, the schools in this study that had a greater percentage of children living in poverty also had lower overall reading achievement scores on state tests. At the same time, many of the lower SES schools were participating in Reading First, and so children in this study would have experienced enhanced reading instruction in kindergarten. Newly released reports of Reading First reveal that, generally, this instruction led to significantly greater gains in decoding skills (i.e., similar to the phonological and word recognition skills assessed here) in Reading First schools when compared with schools in the same district that did not receive Reading First funds (Gamse, Jacob, Horst, Boulay, & Unlu, 2008). Taken together, our results indicate that children were achieving differently at the various schools, and instruction likely played a role in their achievement.

The Effect of School Context and Student Race

Both the number of students who lived in poverty at the school and the students' race were found to be important factors in the relationship between DVAR and reading skills. A school context effect was observed for word reading and vocabulary skills but not for phonological awareness. Also, in general, the relationship between DVAR and these reading skills did not differ for African American and White children. This finding suggests that, for those NMAE dialects represented in this sample, NMAE use in speech has similar consequences for reading skill irrespective of children's race. It is the context in which these children were educated, not their race, that seemed to have greater implications for how DVAR was related to their reading achievement.

For instance, a U-shaped relationship was observed between word reading and DVAR among White and African American children in this sample. However, among African American children, school FARL had little effect on this relationship, especially among children who used very few NMAE forms in speech. School FARL effects were more noticeable among African American children who had high DVAR scores, such that children who used many NMAE forms in speech at higher SES schools outperformed those at lower SES schools. Conversely, among White children, school FARL had a much stronger effect on the relationship between word reading and DVAR. Irrespective of DVAR scores, White children at high SES schools outperformed their peers at low and average SES schools.

Meanwhile, a similar pattern of relationships between DVAR, receptive vocabulary, and phonological awareness was observed among African American and White children. For vocabulary, school context played a much greater role than did students' race. Children who attended schools with many children living in poverty and who used NMAE dialect forms more frequently exhibited weaker vocabulary skills than did children who used these forms infrequently or moderately. In general, at high and average SES schools, NMAE use was not associated with weaker vocabulary scores. A closer examination of Figure 1 reveals that a school SES effect was noticeable only for children with DVAR scores above 50%. For these children, stronger receptive vocabulary knowledge was associated with greater school SES levels.

These findings suggest that the relationship between NMAE use and vocabulary may be driven, at least in part, by SES, a school-level source of influence. Researchers have observed weaker vocabulary skills (Hart & Risley, 1995) and more frequent NMAE use (Horton-Ikard & Miller, 2004; J. A. Washington & Craig, 1998) among children living in poverty. Perhaps poverty and the proximal sources of influence associated with it (e.g., the home learning environment), not NMAE use itself, is the more critical influence on children's vocabulary acquisition.

In notable contrast to word reading and vocabulary, the relationship between DVAR and phonological awareness skills did not vary by school context. Irrespective of school poverty levels, both African American and White first graders who used more NMAE dialect forms in speech tended to perform more poorly on tasks that tapped phonological awareness skills. It is important to note that this was the only measure of metalinguistic knowledge in this study. Defining *metalinguistic awareness*, Scarborough and Brady (2004) state that "most adolescents and adults not only can use language effectively for communication and other purposes, but also can treat language as something that can be intentionally thought about, judged, played with, and manipulated in various ways" (p. 17). Specifically, phonological awareness involves conscious attention to and manipulation of the phonological structure of spoken words. This measure, then, provides some indication of how children in this study understood the properties of spoken language and, more important for this discussion, how speech forms can be changed in specific contexts. Findings from this study suggest that frequent NMAE use somehow compromises this skill in first graders, even when they received explicit instruction, which was characteristic of the kindergarten instruction observed at some of these schools (Stephanie Al Otaiba, personal communication, September 2008).

Finally, it is interesting to note that African American children in this sample tended to perform better than their White peers who had the same DVAR scores on word reading and phonological awareness measures. For vocabulary, White children tended to outperform African American children with the same DVAR scores at high and average SES schools but not at low SES schools. This reversal of the achievement gap was an unexpected finding. Although frequent production of nonmainstream forms by White children has been associated with speech language difficulties (Ciolli & Seymour, 2004; Seymour et al., 2003), the children in this study had no such diagnoses. The sampling criteria also excluded children diagnosed with learning disabilities. Therefore, their weaker reading skills cannot be attributed to speech language disorders or reading disabilities. This finding may be related to the amount of instructional intervention occurring at the schools children in this study attended. The majority of African American children who were high NMAE speakers were at low SES schools, while White children who were high NMAE speakers were at more economically diverse schools. There was a lot of targeted early literacy instruction at these low SES schools, including direct instruction in phonological awareness, decoding, word recognition, and vocabulary. This reversal of the achievement gap may be explained, at least in part, by the instructional interventions that the African American children likely benefited from in these schools. However, as discussed below, dialect use may have some impact on this finding as well. Clearly, more research is needed to examine whether this intriguing finding can be replicated.

These findings support and extend recent findings of a significant relationship between school-level factors, race, and early literacy skills (Kainz & Vernon-Feagans, 2007). Although school context was defined by a socioeconomic factor, the percentage of children in schools who qualified for FARL programs was highly correlated with the percentage of African American children who attended the school (r = .95), suggesting that similar findings might be observed at schools with varying amounts of racial diversity. Charity et al. (2004) also noted school-level effects in their research, finding that children who attended urban schools with a large number of African American children and a higher proportion of students living in poverty produced more AAE forms in speech. The researchers also noted that preliminary data from ongoing studies suggested that African American first graders attending suburban schools with a large number of African American children and fewer children participating in federal lunch programs produced fewer AAE forms in speech. Although these results do not speak specifically to the relationship between school context, DVAR, and reading achievement, they do indicate that NMAE dialect use is related to both child- and school-level socioeconomic factors.

In sum, the results of this study support recent findings of a significant relationship between NMAE dialect use and early literacy skills (Charity et al., 2004; Connor & Craig, 2006; Craig & Washington, 2004a; Terry & Scarborough, 2009). They also extend the discussion to include the roles that race and school-level factors play in this relationship. The complexity revealed by examining all of these variables simultaneously may also help to clarify the mechanisms underlying this relationship.

Theoretical Implications for a Relationship Between DVAR and Early Literacy Skills

As mentioned earlier, three theories have been posited to explain relationships observed between DVAR and literacy skills among young children: teacher bias,

linguistic mismatch, and linguistic awareness/flexibility. Each theory would predict different relationships between school context, race, DVAR, and reading skills. The first theory, teacher bias, suggests that the relationships between DVAR and reading skills are due to negative interactions with teachers who hold inappropriate assumptions about children who use NMAE dialects frequently. Teachers may view NMAE dialect use as "bad English" or presume that children who produce NMAE forms in school are disadvantaged, uneducated, or disabled. As a result, they interact with these students differently, perhaps by overcorrecting their dialect use, placing them in less academically challenging reading groups, or simply providing instruction that does not meet the students' needs. For example, there is accumulating evidence that children at high-poverty schools with stronger skills at the beginning of first grade tend to demonstrate weaker achievement gains than do children who begin first grade with typical or weaker skills (Connor et al., 2009; Neal & Schanzenbach, 2007). Therefore, according to the teacher bias hypothesis, frequent NMAE use would be associated with lower expectations for achievement and, hence, poor reading achievement. In other words, a negative linear relationship would be observed between NMAE use and reading skills.

Though negative linear relationships were found in this study, it is not clear that these findings can be accounted for by the teacher bias theory. This study did not include measures of student–teacher interactions or teachers' views on linguistic diversity, both critical variables to consider for this theory. In addition, the teacher bias theory does not take into account reading processes or important characteristics about the relationship between oral and written language. Therefore, it cannot explain why different relationships were found for each reading skill in this study or why this study's findings differ from others that included older and younger children at different stages in reading development and NMAE use. Therefore, it is likely that findings from this study cannot be accounted for by the teacher bias theory.

Arguably the most accepted theory on the relationship between DVAR and reading skills is linguistic mismatch. First posited in early research on AAE, this theory suggests that mismatches between speech and print are critical to NMAE speakers' word reading skills. Specifically, because NMAE forms are not represented in Standard English orthography, children who produce many of these forms in speech will have difficulty reconciling standard letter-sound correspondences, grammatical forms, and other written forms that differ between their spoken and written language. For example, in many NMAE dialects, the regular past tense form is often not produced, and final consonant clusters are reduced, such that *Yesterday, he walked to the playground* may be produced as *Yesterday, he walk to the playgroun*. Children who often produce these forms in speech may be confused when they encounter them while reading words, and this confusion may lead to poor word recognition skills. Moreover, although all children encounter speech–print mismatches as they learn to read, children who use NMAE dialects encounter many more discrepancies than do children who use MAE dialects because many more MAE forms are represented in Standard English orthography. Therefore, according to the linguistic mismatch hypothesis, frequent NMAE use would be associated with poor reading achievement irrespective of school context. In other words, a negative linear relationship would be observed between NMAE use and reading skills, and this would not vary by schools.

As mentioned earlier, researchers have reported moderate, negative linear associations between greater production of AAE forms in speech and lesser performance on measures of language and literacy skills (Charity et al., 2004; Craig et al., 2004; Craig & Washington, 2004a; Terry, 2006). A similar relationship was found for vocabulary and phonological awareness in this study, though SES differences may explain the relationship found between DVAR and vocabulary. Whereas the negative linear relationship observed between DVAR and phonological awareness might be expected from the linguistic mismatch hypothesis, it is important to remember that this theory considers only speech–print mismatches, not metalinguistic awareness, in the reading process. Therefore, it is unclear how findings associated with metalingustic skills can be explained by this theory. Moreover, the school context effects observed in this study cannot be accounted for by this theory, which does not consider factors outside of speech–print mismatches. Most important, a U-shaped relationship was found for word reading. Children who produced NMAE forms frequently in speech achieved higher word recognition scores than did children who produced these forms with moderate frequency. In fact, children with very high DVAR scores (i.e., NMAE speakers) and very low DVAR scores (i.e., MAE speakers) performed similarly on the word recognition measure, suggesting that the great number of speech–print mismatches encountered by these NMAE speakers did not interfere with their ability to read words. These findings, therefore, cannot be accounted for, at least entirely, by the linguistic mismatch hypothesis.

The third theory, linguistic awareness/flexibility, attempts to consider not only the processes involved in reading acquisition but also the sociolinguistic contexts in which language is used to explain the relationship between DVAR and literacy skills. With respect to reading processes, this hypothesis prefaces the critical role that metalinguistic awareness plays in the development of reading skills. There is ample evidence that metalinguistic awareness, specifically phonological awareness, is not only essential for the acquisition of reading skills but also predictive of later reading achievement (Carlisle,

2003; Connor, 2008; National Reading Panel, 2000). In general, children with strong metalinguistic awareness skills become good readers. Moreover, children and adults develop metalinguistic knowledge for all parts of language, including morphology, semantics, syntax, and pragmatics. It is important to note that these parts of language do not operate independently of each other (Bloom & Lahey, 1978). For instance, phonological, morphological, and semantic knowledge are all necessary to understand that the regular past tense marker /*-ed*/ has three sounds (e.g., as in *rubbed, risked, rested*) that all convey the same meaning. It is also important to note that dialects are characterized by systematic differences in these parts of language.

Metalinguistic knowledge, specifically pragmatic awareness, has a lot to do with sociolinguistic contexts of language use—the second fundamental component of the linguistic awareness/flexibility hypothesis. Pragmatics governs the social uses of language, both as a listener and as a speaker, and involves communicative intent and presupposition (Roth & Spekman, 1984). For NMAE dialect speakers, NMAE dialect use can be intentional, especially among older children and adults (Wolfram et al., 1999). This may explain, in part, decreased production of NMAE forms by children as they progress in school (Craig & Washington, 2004a). Increased MAE use may also be accounted for by children's immersion in more racially and/or linguistically diverse social contexts, like school. As mentioned earlier, dialect use is socioculturally based, and variation in NMAE use has to be related to gender, age/grade, SES, discourse context, and social context (Charity et al., 2004; Craig & Washington, 2004a; Horton-Ikard & Miller, 2004; Myhill, 1988; Thompson et al., 2004; J. A. Washington & Craig, 1998; J. A. Washington, Craig, & Connor, 1998; J. A. Washington, Craig, & Kushmaul, 1998).

Taken together, the components of the linguistic awareness/flexibility hypothesis suggest that the amount of dialect variation one uses may be indicative of one's metalinguistic awareness. Specifically, children and adults who produce many nonmainstream forms in speech during sociolinguistic contexts that presuppose MAE use (e.g., formal assessments, oral reading tasks) may be exhibiting poor metalinguistic awareness skills, which in turn may be interfering with reading achievement. It is important to note that, according to this theory, frequent NMAE use does not cause poor metalinguistic awareness or poor reading achievement. Rather, it is a lack of awareness for when NMAE or MAE use is more appropriate that may be a sign of a general lack of metalinguistic insight, and that weakness in metalinguistic awareness could be related to poor reading skills. Therefore, according to this hypothesis, both linear and U-shaped relationships could be observed between DVAR and reading skills, but the relationship itself would depend not only on the reading skill examined but also on the age of the speaker, the speaker's level of language and reading development, and the social contexts in which language is used. Therefore, any relationship observed between DVAR and reading skills could be sensitive to school context.

Take, for instance, the negative linear relationship found between DVAR and phonological awareness that was not sensitive to school context. This finding might be viewed as evidence for the mismatch hypothesis because higher NMAE speakers had weaker phonological awareness skills than did lower NMAE speakers. However, when considered with previous findings of a U-shaped relationship among preschoolers who use AAE (Connor & Craig, 2006) and of significant decreases in spoken AAE use between kindergarten and first grade (Craig & Washington, 2004a), the linear relationship observed here might be explained by a lack of dialect shifting among children with high DVAR. If dialect shifting is an emerging skill for young children, perhaps as children get older they become more linguistically aware of subtle differences between their speech and MAE or Standard English forms in print. However, older school children who do not shift, like the children with high DVAR scores in this study, may be exhibiting less proficient linguistic awareness skills, producing the negative linear relationship observed here with the phonological awareness measure and in other studies with older children (Charity et al., 2004; Craig & Washington, 2004a). This rationale would be supported by the linguistic awareness/flexibility hypothesis.

This hypothesis might also explain why African American children in this study had stronger reading skills than White children with the same DVAR scores, while the relationship between DVAR and reading skills was largely the same for children in both race groups. Consider, first, that in this study a regional NMAE dialect may have been the mainstream dialect for this area: SoAE. Therefore, SoAE use may not be stigmatized and thus not corrected or even noticed by listeners or speakers. However, AAE, a social dialect, is stigmatized throughout the nation, perhaps even more so due to recent media coverage of the Ebonics educational programs proposed in California during the late 1990s. It is likely that many African American children in this study used AAE, which may have been noticed by their parents, teachers, peers, and themselves. Siegel (1999) notes that psycholinguists hypothesize that three processes are involved in the acquisition of a second dialect: noticing differences between dialects, comparing the dialects, and integrating the use of both dialects in communication activities. Furthermore, these processes are not likely to occur naturally when the dialects are similar because communication

does not break down; therefore, a lack of awareness of dialect differences is quite possible.

Given this line of reasoning, it is possible that the African American children in this study were more aware of differences between NMAE and MAE in their sociolinguistic environment, an indication that their metalinguistic insight was strong, in general, resulting in higher phonological awareness scores, which in turn contributed to higher word-reading scores. Their White peers may have been less aware of these differences, which may be reflected in their weaker phonological awareness and word recognition scores. Moreover, both African American and White children who used NMAE forms frequently were probably more likely to be attuned to differences between NMAE and MAE, which may explain why their word-reading skills were stronger than for children who produced these forms with moderate frequency.

Finally, school context effects might also be explained by this hypothesis. Because school FARL correlated highly with the percentage of children in the school who were African American, it is likely that many of the higher SES schools were less racially and linguistically diverse than the lower SES schools. Children who attended schools with less linguistic diversity may not have had as many opportunities to notice dialect differences as did children in more diverse schools. Again, a lack of awareness of these differences might be reflected in poorer word-reading skills for children in lower SES schools. Note, however, that this school context effect was not significant for African American children with DVAR scores below 50%. Perhaps for African American children who attend high SES schools, the relationship between NMAE use and DVAR is minimized by good instruction (if one can presume that better instruction is occurring at higher SES schools than at lower SES schools), whereas for White children this effect is noticeable for all levels of NMAE use. Each of these rationales would be supported by the linguistic awareness/flexibility hypothesis.

Taken together, these results seem to favor the linguistic awareness/flexibility hypothesis. It may be, however, that for children with weaker linguistic awareness/flexibility, the mismatch between the dialect they speak and the Standard English text they read provides an additional obstacle to their literacy development. For children with strong linguistic awareness/flexibility, this mismatch may not pose as much of a challenge. Other sociolinguistic variables involved in language use may also be accounted for by the teacher bias hypothesis and may explain the relationship between DVAR and reading skills. At the risk of providing more conjecture than science, the results of this study at the very least suggest that more research is needed to fully understand how and why researchers continue to observe significant relationships between DVAR and literacy skills that are sensitive to sociocultural influences.

Conclusion

In summary, the results of this study contribute to the literature on the relationship between dialect variation and literacy achievement and reveal a very complex relationship that may be sensitive to school environment but not to race. The relationships between DVAR and word recognition, phonological awareness, and receptive vocabulary skills were significant but very different, especially when school context was considered. At the same time, these relationships did not differ for African American and White children overall. When considering these findings with other investigations of young children, it appears that the relationship between DVAR and literacy skills is dependent not only on the literacy skill itself but also on the age/grade level of the students and the environments in which they are educated.

The results of this study do not imply a causal relationship between DVAR and literacy achievement. More rigorous studies, both experimental and applied, with large numbers of children are needed to fully understand the mechanisms underlying the strong correlations that have been observed between measures of NMAE dialect use and literacy skills. Given the range of DVAR observed among this racially and socioeconomically diverse group of children, it is possible that it will be difficult to make any broad assumptions about the nature of this relationship and the implications for instruction. Rather, the complex nature of these findings, considered along with other similar investigations, may be indicative of a need for more fine-tuned recommendations for the educational implications of NMAE dialect use (Charity, 2008; Connor, 2008; Terry, 2008).

In a continued effort to find ways of closing or limiting the achievement gap, future research should consider NMAE use in studies of literacy. This should include a critical examination of disaggregated student data based on race, language (dialect), SES, and school factors. There is a complex relationship among these variables, and simple explanations about school performances based on race and SES are no longer sufficient. Researchers must examine more closely the impact of school and community factors on student performance as well as dialect use across race and social contexts. This will further our understanding of the relationships between DVAR and literacy and further test theories about NMAE use in schools. Future investigations considering multiple, interacting variables may help to better elucidate the mechanisms underlying these complex relationships as

well as the educational significance of dialect variation in assessment and instruction of linguistically diverse children.

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