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Teacher Outreach Efforts and Reading Achievement in Kindergarten

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To estimate the overall relationship between teachers' outreach efforts and the reading achievement of diverse kindergartners over the school year, multilevel modeling techniques were applied using a large sample of kindergarten students. The results showed that in schools with greater outreach efforts by teachers, there were sharper gains in the reading scores of students with low initial reading ability and students who frequently read outside of school. Minority students with low initial reading ability did not show much gain in schools where teachers engaged more in outreach. These findings demonstrate that teacher outreach efforts, student minority status, and reading outside of school were related to kindergartners' gains in reading skills, and distinguished the reading skills students carry with them to elementary school. Implications and methodological issues for future study are also addressed.

Keywords: diversity, achievement, teachers' roles, early childhood teachers

Students are substantially influenced by their parents and families during the transition into kindergarten and throughout their first year of formal schooling. Teacher outreach efforts to help young children transition to kindergarten, along with the involvement of parents and families, should be an important element of kindergarten classrooms. Indeed, kindergarten teachers put a significant amount of time and effort into such outreach (McIntyre, Eckert, Fiese, DiGennaro, & Wildenger, 2007; Pianta, Cox, Taylor, & Early, 1999; Rimm-Kaufman & Pianta, 1999). For example, teachers commonly distribute newsletters, send information about parenting or schooling, send orientation materials, offer workshops, invite parents to volunteer in the classroom, make phone calls to parents, encourage parents and children to visit the classroom prior to the beginning of school, and invite parents to attend preenrollment orientation (Epstein, 2001; Hindman, Skibbe, & Morrison, 2010).

Nonetheless, questions arise as to whether it is worthwhile for kindergarten teachers to put such time and effort into reaching out when they are already occupied with numerous tasks

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in the classroom. Do young children have better achievement if they are in schools where the teachers invest their efforts in supporting students' transition into kindergarten? If so, do some children benefit more than others? Alternatively, does it matter whether schools and teachers focus on such efforts in preparation for and during students' earliest year of formal schooling? Investigating the role of teachers' outreach efforts in kindergartners' achievement by answering this array of questions is pivotal for administrators and policymakers, as well as for kindergarten teachers themselves. Unfortunately, there is not much research exploring the relationship between such outreach efforts and students' academic achievement, especially in reading, across a racially and ethnically diverse student body. Answering these questions will provide the field of education with significant implications on some of the pressing policy questions concerning teachers' outreach efforts and students' early academic achievement.

In the following sections, we first introduce the transactional model as the conceptual framework guiding this study. We then review studies on teachers' outreach efforts and the relationship of teachers' outreach efforts with kindergartners' characteristics, including reading achievement, minority status, and reading experiences outside of school. Next, we investigate the relationship between teachers' outreach efforts and the reading achievement of a diverse group of kindergartners through multilevel modeling. Finally, based upon the findings, we discuss implications, limitations, and suggestions for future research.

CONCEPTUAL FRAMEWORK: TRANSACTIONAL MODEL

The transactional model served as the conceptual framework for this study. The transactional model posits that development occurs through bidirectional interactions between an individual and the environment (Sameroff & Fiese, 2000). Teachers have an important influence on a student's development, and, in turn, a student also influences teachers through his or her needs for care, learning dispositions, and responsiveness (Jung, 2010; Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998). That is, students' outcomes result not just from their individual characteristics (e.g., cognitive ability, attention span), nor only from the environmental characteristics (e.g., teachers' sensitivity, poverty), but also from the transactions between the two groups of characteristics (Sameroff & Fiese, 2000). In other words, the success of instruction is dependent not only on the characteristics of the student, but also on the environment in which the instruction occurs (Sameroff, 1983; Sameroff & MacKenzie, 2003). As such, successful development occurs when the environment is responsive to a student's individual needs (Mahoney & Perales, 2003).

Through positive interactions with adults, children experience improvements in academic and socioemotional domains (Birch & Ladd, 1997; Hamre & Pianta, 2001; Pianta, 1999). Positive adult-child interactions are those in which the adult is responsive to the child's needs and provides the child with a secure base from which to venture toward new challenges. Indeed, the extant literature indicates that caregivers' responsive interactions with children were important factors influencing the cognitive development of children with learning or developmental disabilities (Mahoney et al., 1998). Positive (i.e., responsive) interactions between adults and children also foster children's self-concept. In conjunction with evidence supporting a bidirectional link between children's academic achievement and their self-concept, such that academic achievement contributes to self-concept and self-concept contributes to academic achievement (Pajaras

& Schunk, 2001; Strein, 1993; Valentine, DuBois, & Cooper, 2004), the transactional model suggests that positive interactions with an adult can improve children's academic skills by providing support as children face academic challenges, such as reading.

The transactional model thus assumes that there are reciprocal influences between child and caregiver, and evidence indicates this reciprocity extends to teachers and other adults (Pianta, 1999). In this study, the environment consists primarily of teachers, so the critical transactions are those between the teachers and students with diverse family and contextual backgrounds.

LITERATURE REVIEW

Teachers' Outreach Efforts in Kindergarten

Early childhood researchers, educators, and policymakers have emphasized the importance of teachers' outreach efforts and practices for ensuring successful transition to kindergarten (Hindman et al., 2010; Pianta et al., 1999; Rathbun & Hausken, 2001; Schulting, Malone, & Dodge, 2005). Although there is no universally agreed-upon definition of teachers' outreach efforts, certain practices are frequently adopted in schools. Kindergarten teachers commonly telephone parents and send information home about the kindergarten program, invite parents and children to visit the classroom prior to the beginning of school, and invite parents to attend preenrollment orientation (Hindman et al., 2010; Schulting et al., 2005). Among these, the most frequently endorsed practices are those occurring before or after the beginning of the school year and/or involving low intensity contact, such as flyers, group open houses, and phone calls (Pianta et al., 1999; Rathbun & Hausken, 2001). Incorporating these earlier studies, teachers' outreach efforts in this study were operationalized to include home-oriented practices and school-oriented practices. Home-oriented practices include sending parents information like newsletters, activity ideas/resources, or parenting ideas or making home visits. School-oriented practices include arranging for preschoolers to spend time in kindergarten classrooms and inviting parents to an orientation prior to the start of school. Other practices also include gathering family/child information (employing shortened school days at the beginning of the school year), as well as communicating with families through phone calls, written notes, or e-mails. Through such multiple outreaching efforts, teachers are establishing positive connections with the children and their families, and enhancing the parent-teacher relationship.

Studies suggest, however, that a family's experiences regarding such outreach efforts in kindergarten transitions are not always satisfactory. Many families want more involvement and more information about transitioning plans and kindergarten expectations (McIntyre et al., 2007). The experiences of these families may be consistent with the barriers and challenges that teachers face in relation to the outreach efforts. The greatest barriers identified by kindergarten teachers include class lists are generated too late to make contact before school starts, summer work is not financially supported, and transition plans are not available in the school district (Pianta et al., 1999). Pianta et al. noted that good transition-related outreach practices are proactive, personalized, and intense. Teachers' outreach efforts in the transitional phase may be more effective if the teachers use a variety of methods in addition to more commonly used practices (e.g., phone calls, journals), including less direct and less involved methods (e.g., note exchanges) to communicate with parents (Patrikakou & Weissberg, 2000; Rimm-Kaufman & Pianta, 1999).

Researchers also have shown that some significant discontinuities exist between preschool and kindergarten systems in relation to teachers' outreach efforts. For instance, Rimm-Kaufman and Pianta (1999) compared the outreach efforts of kindergarten teachers with those of preschool teachers. They found that at the kindergarten level, as compared with the preschool level, overall family contact rate was significantly lower and the school initiated more contacts to address negative topics, such as lack of family support, academic problems, and behavioral problems. Rimm-Kaufman and Pianta (1999) further found that a greater percentage of kindergarten teachers' outreach efforts included note exchanges, which is regarded to be a less direct and less involved approach. Furthermore, they found that low-income families, in particular, were more likely to receive negative feedback from kindergarten teachers, which in turn impeded successful family-school relationships (Rimm-Kaufman & Pianta, 1999).

Although the importance of teachers' outreach efforts is relatively well documented, there is not much research exploring the relationship between teachers' outreach efforts and kindergarten students' reading achievement in particular. In the following section, we review the related studies.

Student Reading Achievement

Reading achievement is a primary focus of most kindergarten curricula and teachers. The home environment is where students first experience basic reading concepts and skills. Teachers are responsible in many ways for determining the needs of each child and family, developing the most relevant and meaningful activities, choosing the most effective methods of communication, and following up appropriately (Battle-Bailey, 2004). However, parents and families or teachers alone are not enough to achieve such important academic goals. Therefore, providing well-planned reading instructions at school, arranging opportunities to practice reading in and out of school, and connecting with families to support this entire experience should be part of the teachers' role in improving kindergartners' reading achievement (Xu & Gulosino, 2006).

However, as McCarthey (2000) noted, there are several barriers to successful home-school connections in relation to early literacy, especially for students from diverse socioeconomic backgrounds, such as the mismatch between the home and school environments, different values about the roles of teachers and parents, and different patterns of discourse. In this context, the teacher (school)-parent (family) relationship is a critical factor in students' reading achievement during their early school years (McCarthey).

Numerous studies suggest that teachers' outreach efforts are related to students' academic outcomes (Fantuzzo, McWayne, Perry, & Childs, 2004; Hughes & Kwok, 2007). The role of kindergarten teachers in students' reading achievement can vary widely depending on the program and the type of practices utilized. One study (Hughes & Kwok, 2007) focused on lower-achieving 1st-grade students to examine the association between the quality of relationships (i.e., student-teacher and parent-teacher) and students' academic abilities. The results supported the existence of an effect of relationship quality on students' academic motivation and performance such that 1st-graders had greater reading achievements when they and their parents experienced supportive relationships with their teachers (Hughes & Kwok, 2007). The study confirmed that teachers' outreach efforts and practices are significant elements of a family's supportive relationship with teachers and schools.

Similarly, Xu and Gulosino (2006) reported that teacher-parent interaction is a positive determinant of student performance at the kindergarten level based on their study using Early Childhood Longitudinal Study-Kindergarten Class (ECLS-K) data to explore how teachers matter in kindergarten students' reading performance. They found that it was not the teachers' credentials (i.e., degree level, certification status) that mattered, but rather behavioral aspects—specifically, teachers' outreach efforts to establish and maintain strong teacher-parent relationships. Fantuzzo et al. (2004) also reported a positive relationship between teachers' interactions with the family and student outcome in a sample of predominantly African American, urban, low-income Head Start children. Good teacher-parent relationships led to an overall improvement in students' reading test scores. However, few studies have documented the relationship between teachers' outreach efforts and students' academic outcomes in kindergarten.

Student Minority Status

Pianta et al. (1999) found that, as schools become more urban and have a higher percentage of minority and/or low-income children, teachers' outreach efforts and personal contacts became less frequent as compared with teachers in rural, low poverty, or low minority schools. Furthermore, in schools with higher proportions of at-risk students (e.g., low-income, minority, English language learners), less parental attendance was reported. Teachers reported using more transition activities than their counterparts in schools with lower proportions of students considered at higher risk for academic problems (Rathburn & Hausken, 2001).

This phenomenon also has been observed in other studies. Fantuzzo et al. (2004) examined the relationship between family involvement and student outcome, and the results revealed an important relationship between the multidimensional construct of parent involvement and students' competencies with ethnic minority, urban, low-income students. The authors pointed out the critical need for effective teachers' outreach efforts, particularly for African American and low-income families (Fantuzzo et al.). They further suggested that helping teachers connect with minority children and their parents could be a major means of preventing at-risk children from academic failure during their early school experiences. These studies underscore the growing evidence that improving the quality of family involvement is especially critical for low-income, minority students' early academic engagement and success. Given that teachers in schools with higher proportions of students at higher risk for academic problems report less use of outreach practices and are more likely to use practices that can be characterized as low-intensity, group-oriented activities, it is crucial to provide more organizational support for teachers' outreach activities, especially when working with at-risk populations (Rathbun & Hausken, 2001). As such, minority students, especially African Americans, and their parents are less likely to experience positive relationships that support students' achievement compared to their Hispanic and White counterparts (Hughes & Kwok, 2007).

Student Reading Outside of School

One type of classroom instructional practice commonly employed by kindergarten teachers is read-aloud. Although the effectiveness of read-aloud is potentially controversial among reading experts, studies suggest that teachers need to do more than just read aloud to students to promote

reading achievement. For example, a study by Meyer, Wardrop, Stahl, and Linn (1994) revealed a negative relationship between the amount of time kindergarten teachers spend reading and their students' reading achievement. They found that activities more directly related to the reading process, such as letter-sound corresponding practice and word reading, have a positive correlation with students' reading achievement. Although reading to students certainly has been, and still is, a highly promoted activity by many professionals, this suggests that kindergarten students might need to participate more actively in reading the texts themselves (Meyer et al., 1994). Particularly, active student involvement and extended practice opportunities with phonemically decodable texts were found to be beneficial to students with lower entering reading abilities at the 1st-grade level (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Juel & Minden-Cupp, 2000).

Providing students with active reading experiences in addition to the commonly employed read-aloud strategies and extended practice in and out of school appears to be an important element in students' reading (Torgesen, 2002). Patrikakou and Weissberg (2000) suggested that schools play an instrumental role, and teachers need to make increased efforts in sharing meaningful strategies with parents that they can apply in their child's education. When certain parent practices (e.g., reading with their child) documented to be important in children's cognitive and academic development are not as widely practiced, teachers might need to pay more attention to implementing relevant outreach practices. A language-rich environment at home that is encouraged by teachers' support is certainly an important determinant of kindergartners' reading success (Fantuzzo et al., 2004).

As such, a key component of the home-school connection in relation to reading is the sharing of information by teachers (McCarthy, 2000). Sending books and other materials home, making home visits, gathering information about students' home literacy activities, and providing parents with access to school practices are commonly recommended for teachers. Providing interactive reading homework to students also has been suggested as a way to improve home-school connection and parent involvement by providing supportive reading opportunities outside of school (Battle-Bailey, 2004).

In relation to the reading opportunities outside of school, Jordan, Snow, and Porche (2000) evaluated the effects of a family literacy project with kindergartners for over a year. As a result of this intervention, children whose families actively engaged in early literacy development activities had significant improvements in their language scores, and those who were initially low achieving gained the most (Jordan et al.). These findings extend the promising potential that supportive and conducive home environments can motivate young children to read, which eventually leads to higher reading achievement, especially for struggling readers (Baker, 2003). However, the relationship between teachers' outreach efforts and students who are (or are not) engaged in reading outside of school is yet to be documented.

Although the importance of teacher-parent interaction on student performance has been highlighted, and teachers' outreach efforts are often mentioned as a means of developing positive teacher-parent relationships (Xu & Gulosino, 2006), researchers have not taken a deeper look at students who could be "at risk," such as minority students or students entering kindergarten with lower reading abilities than their counterparts. More research on the relationships between teachers' outreach efforts and student-level reading achievement (especially for young children at risk for academic failure, many of whom are from minority and low socioeconomic status [SES] backgrounds) is sorely needed.

To fill the gap in the literature, we examined the relationships between indicators of teachers' outreach efforts and students' background characteristics with two types of outcomes: (1) kindergarten students' reading achievement over the year and (2) the relationship between initial reading ability and reading achievement at the end of the kindergarten year. Understanding the impact of teachers' outreach efforts and students' characteristics is crucial to teachers, parents, and administrators in conceptualizing how students' learning may be affected during the early school years. These characteristics may impact the gains made in reading skills while in kindergarten and also distinguish the reading skills students carry to elementary schools. The following two research questions guided the study:

1. What is the relationship between kindergarten teachers' outreach efforts and kindergarten children's reading achievement at the end of the kindergarten year?
2. How are teachers' outreach efforts related to initial reading ability at kindergarten entry, minority status, reading outside of school, and reading achievement at the end of the kindergarten year?

METHOD

Sample and Data

The research questions were addressed using a sample of more than 3,300 children in 158 U.S. schools (1,716 males and 1,593 females; 2,332 White and Asian students and 972 other minority students including Hispanic, African American, and American Indian students) from the ECLS-K sponsored by the National Center for Education Statistics (NCES). In this study, Asians were not categorized as minorities, and Whites and Asians were grouped together because their average reading achievement scores were more similar to each other than to those of other groups. ECLS-K is a longitudinal study conducted in the United States that includes a wide range of variables on the family, school, and classroom in relation to children's development and school achievement. Using ECLS-K data to explore early issues with reading achievement is appropriate, given that data were collected from a nationally representative sample of kindergartners across the United States in the base year. Although the ECLS-K data affords estimation of statistical effects, it is based on a large, nonexperimental field study and does not warrant the estimation of causal effects. Therefore, when causal language (i.e., influence, effect) is used in this article, it is for heuristic purposes (NCES, 2001).

For this study, we use data from the first two waves of the ECLS-K in the Fall and Spring of kindergarten, taken from the ECLS public use data set. ECLS-K oversampled certain types of schools, such as private schools and schools with a high proportion of children who speak English as a second language or are Asian/Pacific Islanders. To take the probabilities of sampling bias into consideration and adjust for stratified sampling design effects, two weights are used in the analyses of this study. ECLS-K data include school-level weights (variable S2SAQWOJ for weighting) and child-level weights (variable BYCPTWOJ for weighting) to generalize findings to the population from which they were drawn. The final sample for this includes public, Catholic, and elite private schools and is limited to students with full test score data.

Measures

Dependent variable. The dependent variable is children's reading achievement scores at the end of the kindergarten year. At the beginning and the end of kindergarten, children were individually administered cognitive reading assessments. The decision to use the reading achievement outcome scores at the end of the kindergarten year as the dependent variable was based on a theoretical consideration of school readiness and the transition to formal schooling (La Paro, Pianta, & Cox, 2000; Rimm-Kaufman, Pianta, & Cox, 2000). Kindergartners' early transitional period to school has been considered to be important in preparing them for elementary school (Rimm-Kaufman et al., 2000). It has been well established by researchers that failure in reading during the transition period is a major predictor of larger failures in school and throughout life (Maccini & Hughes, 1997; Montague, Enders, & Castro, 2005). This study therefore examined students' kindergarten outcomes in reading achievement. The ECLS-K used direct cognitive assessments to evaluate students' academic achievement during the Fall and Spring of kindergarten year. Students' competence in reading (language use and literacy) was measured using the cognitive assessment battery. Utilizing computer-assisted interviewing tools, this assessment was administered in a one-on-one setting. Standardized achievement scores for reading were averaged to create a composite reading achievement for each student (NCES, 2001). The reading assessment included questions designed to measure basic skills (letter recognition, beginning and ending sounds); vocabulary (receptive vocabulary, as in "point to the picture of the cat"); and comprehension (listening comprehension, words in context). Comprehension items were targeted to measure skills in initial understanding, developing interpretation, personal reflection, and demonstrating a critical stance (evaluative judgments about the text, such as recognizing implausible events). Here, our operational definition of *reading achievement* refers to the broad ability that would entail children's overall reading skills and achievement. The scale score version of this test, which is equated with item response theory (IRT), was used for this study. In the analysis, IRT scores were converted to z scores ($M = 0$, $SD = 1$), standardizing each around its mean. The alpha coefficients for the scale scores were high (above .80; Rock & Pollack, 2002).

Child characteristics. Several variables were used to describe child characteristics, including SES (z score, $M = 0$, $SD = 1$); frequency of reading outside of school (z score, $M = 0$, $SD = 1$); IRT test scores of reading at the beginning of the kindergarten year (z score, $M = 0$, $SD = 1$); and minority status. For the minority status, we employed a dummy-coded measure indicating whether the child was a member of a traditionally underperforming racial/ethnic group (Hispanic, African American, & American Indian = 1, White & Asian = 0). Past studies using the ECLS-K data suggested that Asians and Whites were grouped together because their average reading achievement scores were more similar to each other than to those of other racial/ethnic group (e.g., Ready & Lee, 2006). Except for the beginning IRT test scores, which we set to vary, we controlled for various student characteristics such as minority status, SES, and reading outside of school as these may serve as alternative explanations for the effects of teacher characteristics on reading achievement at the end of the kindergarten year.

School-based characteristics. The central independent variables of teachers' characteristics are indicators of teachers' outreach efforts (z score, $M = 0$, $SD = 1$, composite measure of sending information home to parents, preschoolers spending time in kindergarten classrooms,

shortened school days at the beginning of the school year, and parent orientation prior to the start of school) at the school level. Because the effects of the teachers' characteristics on the achievement of students may be confounded by such characteristics as school location and social context, we included indicators of urbanicity as controls at the school level in our models. Urbanicity of the schools was dummy coded as urban (1) and nonurban (0) to provide a robust explanation of the findings.

Data Analysis

We used a two-level hierarchical format, hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002), because the research questions guiding the study were multilevel and addressed the questions involved in estimating the difference in kindergarten students' reading performance in relation to teachers' characteristics. HLM allows one to model student-level outcomes within schools and then to examine and model between-school differences. The recommendation of Darling-Hammond's (2000) review of teacher quality and student achievement suggests that HLM techniques are adequate for exploring the relationships among teacher- and school-related variables.

RESULTS

The descriptive statistics of children in regard to the four areas of interest—minority status, SES, entering reading ability, and reading outside of school—are provided in Table 1.

This analysis was concerned with estimating the difference in kindergarten students' reading learning in association with teacher characteristics in schools where the teachers are involved in outreach efforts. The first step in conducting the HLM analysis was to estimate a fully unconditional model, without any student- or school-level variables. This model estimates variances in the outcome variable at the student and school levels and is also tested for significant differences between schools (Bryk & Raudenbush, 1992). The next step in the analysis was to estimate a within-school model, which involved adding student-level predictors in the model. Student variables included student's minority status, SES, frequency of reading outside of school, and prior reading achievement at the beginning of kindergarten. The final step and the remainder of the analysis involved estimating a between-school model. We tested a series of models that included

TABLE 1
Sample Description

<i>Child Characteristics</i>	<i>%</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
Race (% minority)	29.4			
Socioeconomic status		.11	.76	−4.75–2.64
Entering reading ability		22.77	8.63	10.08–69.06
Frequency of outside of school reading		3.02	.98	1–4

Note. $N = 3309$.

the teacher's outreach efforts, and the two research questions of this study were addressed at the school level (Level 2). Below, each step of the analysis is delineated.

Fully Unconditional Model

The fully unconditional model shows the estimates associated with the unconditional model with no predictors at the child or school level from the results of the two-level reading achievement models. The chi-square test demonstrated that children and schools differed significantly in achievement levels (τ_{00} is statistically significant, χ^2 : 1015.78). This indicates that the mean of reading achievement is not the same across the 158 schools. In other words, average reading achievement at the end of the kindergarten year varies significantly among the various schools.

Calculation of the proportion of variation attributable to school intraclass correlation coefficient (ICC) indicated that 25.8% of the variability in reading achievement outcome was due to school-to-school differences ($ICC = \frac{\tau_{00}}{\tau_{00} + \sigma^2} = \frac{0.26115}{0.26115 + .075286} = 0.2575$). These variance components at the child and school levels were significantly different from zero ($p < .001$). The random effects reported in the fully unconditional model served as a baseline for the within-school model analysis. The results of the fully unconditional model are provided in Table 2.

Within-School Model

A within-school model allows us to determine which individual-level predictors are significantly related to the reading achievement score at the end of the kindergarten year, as well as whether the effects of individual-level predictors vary significantly at the group level. The within-school model accounted for roughly 68% of the individual-level variance in an individual student's reading achievement.

In our model below, the intercept was group-mean centered, and all other Level 1 variables were grand-mean centered with the exception of initial reading ability, which was group-mean centered. Therefore, the Level 1 intercept was the average achievement of students with average student characteristics, except for the random effects of entering reading ability in the model.

When building the Level 1 model, we first allowed the intercept and slope for our main independent variable (entering reading ability) to vary to examine the random effects. There was a reduction in the degrees of freedom because there were schools without minority or White students. For the random effects part, the variance of u_{0j} , or τ_{00} , had a χ^2 ($df = 157$) value of 297.01,

TABLE 2
Results From the Fully Unconditional Model

	<i>End of Kindergarten Reading Achievement</i>	<i>df</i>	<i>χ</i>
Random effects: Between school variance	0.261***	157	1015.78
Reliability estimates: Students' reading achievement	0.84		

*** $p < .001$.

which is significant. Therefore, the mean of entering reading scores varied across the 158 schools. Because we were interested in determining whether Level 2 variance existed for the intercept and entering reading ability slope, the variances of the remaining variables in our Level 1 model were constrained. Therefore, the effects of child-level SES, minority status, and reading outside of school were fixed so those effects on reading achievement were the same for all schools.

The fixed effects in the model showed that, after controlling for other variables in the model, SES, minority status, and reading outside of school were all significant predictors of kindergarten reading achievement. On average, within a school, for every one standard deviation increase in entering reading ability within a kindergarten, the reading achievement at the end of kindergarten year increased by 0.785 standard deviations, controlling for all other variables in the model. As a student's SES increased by one standard deviation, that student's reading achievement increased by 0.08 standard deviations, controlling for all other variables in the model. For every one standard deviation increase in reading outside of school, reading achievement increased by 0.06 standard deviations, controlling for all other variables in the model. Reading achievement was 0.097 standard deviations lower for minority students than for nonminority students (White and Asian for this analysis), holding all else constant. The Level 1 intercept was the average achievement of children with average characteristics, except for the random effects of entering reading ability in the model. Individual-level variance explained by the within-school model was $\frac{0.753-0.25}{0.753} = 0.678$. This means that about 68% of the individual level variance was explained by the within-school model. In other words, the within-school model accounted for roughly 68% of the individual-level variance in an individual student's reading achievement. The reliability estimate for the outcome was 0.936, whereas the reliability estimate for the entering reading ability slope, which was allowed to vary, was 0.445. According to the recommendation by Raudenbush, Bryk, Cheong, and Congdon (2000), the reliability estimate of the slope was acceptable. The results are shown in Table 3.

Between-School Model

After determining that reading achievement (intercept) and the effect of initial reading ability on reading achievement (slope) vary significantly across schools, we wanted to use school-level predictors to explain whether such differences existed between schools and could be explained

TABLE 3
Within-School Model of Kindergarten Reading Achievement

<i>Random Effect</i>	<i>Variance Component</i>	<i>df</i>	χ^2
School mean achievement	0.2506	157	2291.49***
Mean entering reading ability	0.0224	157	297.01***
Level 1 error	0.2503		
Percentage of individual level variance explained within school model			
Proportion of σ^2 explained	$= \frac{\sigma^2_{\text{FUM}} - \sigma^2_{\text{WITHIN}}}{\sigma^2_{\text{FUM}}}$	$= \frac{0.753 - 0.25}{0.753}$	$= 0.678 = 68\%$

*** $p < .001$.

by those variables. Therefore, in the between-school model, we added teachers' school-level outreach efforts as a school-level predictor as well as a school context variable (urbanicity). Because we allowed the slope to be free at the school level, we aggregated the teacher-related variable, which was originally in the child file at the school. Therefore, we created an aggregate school-level variable for variables related to teachers' outreach efforts. Teachers' outreach efforts were grand-mean centered and urbanicity was uncentered. The reliability estimate for the between-school model for average one-year kindergarten reading scores was 0.937. The reliability for the slope was 0.412.

Table 4 presents the conditional between-school results. School-level predictors were used to answer the research questions regarding the effects of schools in terms of teachers' school-level outreach efforts on reading achievement, as well as the relationship between initial reading ability and reading achievement outcome after one year in school. Since the indicator of urbanicity was included as a control at Level 2 of the models and was not the focus of the research questions, the results of urbanicity are not reported in this study.

Teachers' outreach efforts and reading achievement. Results addressing the first research question are presented at the top of Table 4. In running the between-classroom models, school-level predictors (i.e., teachers' outreach efforts) were included when modeling the intercept for end-of-kindergarten reading achievement.

As shown in Table 4, on average, schools with more teachers' outreach efforts had a less steep entering reading ability slope in reading achievement ($SD = -0.058, p < .05$). In schools where teachers' outreach efforts were strong, students entering with lower reading abilities gained

TABLE 4
Between-School Models of Kindergarten Reading Achievement

<i>Model</i>		
<i>Variable</i>	<i>Within-school</i>	<i>Between-school</i>
Fixed effects		
School mean achievement	-0.093 (0.051)	-0.169 (0.058)**
Teachers' outreach efforts		0.034 (0.05)
Mean entering reading ability	0.785 (0.023)***	0.832 (0.028)***
Teachers' outreach efforts		-0.058 (0.024)*
Socioeconomic status	0.080 (0.18)***	
Teachers' outreach efforts		0.088 (0.015)
Minority	-0.097 (0.039)**	-0.070 (0.039)*
Teachers' outreach efforts		-0.104 (0.033)**
Reading outside of school	0.063 (0.01)***	0.056 (0.013)***
Teachers' outreach efforts		0.021 (0.009)*
Random effects		
School mean achievement	0.501***	0.504***
Mean entering reading ability	0.149***	0.140***
Level 1 error	0.50	0.498

Note. Results are based on data from 3,309 students distributed across 158 kindergarten schools. Standard errors are in parentheses.

* $p < .05$. ** $p < .01$. *** $p < .001$.

more over a year at the expense of their counterparts entering with higher reading abilities. This highlights the influence of teachers' outreach efforts on students with lower reading abilities and the effect of these efforts in decreasing the achievement gap between students entering with lower reading ability and those entering with higher reading abilities. Students entering kindergarten with higher reading ability, however, did not benefit much from being in the classroom with teachers with strong outreach efforts.

Teachers' outreach efforts and the relationship between entering reading ability, minority status, outside of school reading, and reading achievement. To answer the second research question, the analysis focused on the influence of teachers' outreach efforts on the relationship between students' entering reading ability, minority status, reading outside of school, and reading achievement at the end of the kindergarten year. Several results presented in Table 4 address the second research question. Teachers' outreach efforts have a significant influence on the relationship between minority status and reading achievement at the end of the kindergarten year. On average, minority students had lower average reading achievement scores at the end of the kindergarten year (0.104 standard deviation lower) when teachers' outreach efforts were strong. That indicates that, for minority students in schools with greater teacher outreach efforts, the achievement gap between students with lower initial reading scores and those with higher initial reading scores increased over the school year. In other words, minority students with higher initial reading scores benefited from being in schools with more outreach efforts, although teachers' outreach efforts did not decrease the achievement gap over the school year.

Teachers' outreach efforts had a significant influence on the relationship between students' frequency of reading outside of school and reading achievement at the end of the kindergarten year. On average, students who read more frequently outside of school had higher average reading achievement (0.021 standard deviation higher) when teachers' outreach efforts were strong. That indicates that when kindergarten students with lower reading abilities were taught in schools with greater teacher outreach efforts and read more frequently outside of school, they gained more than their counterparts who entered with higher reading abilities. In other words, the achievement gap between students with lower initial reading scores and those with higher initial reading scores decreased over the school year when teacher outreach efforts were combined with frequent outside of school reading.

DISCUSSION

This study was designed to investigate the degree to which school-level teachers' outreach efforts are related to students' reading achievement outcomes over the course of the kindergarten year. This study used two-level HLM models and a large database to estimate the reading achievement of kindergarten students. Investigation of the source of the school-level achievement differences indicated that teachers' outreach efforts were strongly associated with students' achievement levels and gains in reading skills over the kindergarten school year. The findings were drawn from analyses intended to reflect the influences of school-level teacher characteristics.

To answer the first research question, which explored the effect of teachers' outreach efforts on student reading achievement, it was found that students with lower initial reading abilities entering schools with greater teacher outreach efforts gained more over the school year than

their counterparts entering with higher reading abilities. Therefore, students entering kindergarten with stronger reading ability did not benefit much from being in the classroom with teachers exerting greater outreach efforts. As mentioned above, earlier studies investigating teachers' outreach efforts have generally focused on partial elements of this comprehensive phenomenon. For instance, a few researchers (e.g., Patrikakou & Weissberg, 2000; Rathbun & Hausken, 2001) reported that teachers' outreach efforts were associated with greater parental involvement—particularly during students' kindergarten years. Others (e.g., Fantuzzo et al., 2004; Hughes & Kwok, 2007) explored the implications of family involvement for students' outcomes and reported positive associations. However, there has not been much research investigating the influence of teachers' outreach efforts on students' learning outcomes; the results of this study provide this previously lacking insight into the relationships between teachers' outreach efforts and kindergarten students' reading achievement at the end of the kindergarten year. The results also support the views of several scholars (e.g., Rathbun & Hausken, 2001; Schulting et al., 2005; Xu & Gulosino, 2006) that there is a meaningful link between teachers' outreach efforts and student achievement by the shared community, including teachers and parents, especially during the kindergarten years.

To answer the second research question, which explored the influence of teachers' outreach efforts on the relationships between entering reading ability, minority status, outside of school reading, and reading achievement, notable results were found in a number of areas. In schools where teachers invested greater outreach efforts, reading scores across time reflected sharper gains among students with lower initial reading ability. The results of this study suggest that students entering with lower reading abilities gained more at the expense of their counterparts entering with higher reading abilities, and students entering with higher reading abilities did not benefit much from being in a classroom with teachers exerting outreach efforts.

The results also revealed that minority students with lower initial reading ability did not benefit much from being in schools where teachers strived to reach out to parents. Notably, the achievement gap between minority students with lower initial reading ability compared to those with higher initial reading ability widened over the school year. This result mirrors the findings of Hughes and Kwok (2007), in that minority parents and students are less likely to experience positive relationships with teachers, and current teachers' relationship-building efforts could be widening the already existing school readiness gap between African American and White students rather than leveling the playing field. As Fantuzzo et al. (2004) pointed out, it is critical to support teachers to collaborate with minority students and their parents to prevent at-risk students from experiencing academic difficulties during their early education. In contrast, the results showed that minority students entering kindergarten with higher reading abilities in schools where teachers invest greater efforts in outreach benefitted more. This highlights the importance of preparing minority students in preschool so they can enter kindergarten with advanced reading abilities and benefit from being in such an environment. This further implies that if minority students are better prepared for entry into kindergarten, there is a better chance of bridging the achievement gap by the end of the kindergarten year.

Not surprisingly, recent empirical studies suggest that intensive involvement efforts must begin prior to kindergarten entry, not in kindergarten or higher elementary grades, and that preschool education with early language and literacy experience is a potential solution to improve reading outcomes for African American students (Craig, Connor, & Washington, 2003; Washington, 2001). Therefore, if we aim to decrease the achievement gap between minority students and

their counterparts, we need to underscore the early school readiness upon kindergarten entry, and ensure that minority students are better prepared at the preschool level to take advantage of teachers' outreach efforts at the kindergarten level.

Additionally, in schools where teachers invested greater outreach efforts, reading scores across time reflected sharper gains among students reading frequently outside of school. This highlights the importance of students reading outside of school, especially for students with lower reading abilities. This result reflects and further supports many others' perspectives on components of successful reading instruction. For instance, Meyer and colleagues (1994) revealed a negative relationship between the amounts of time kindergarten teachers spent reading and their students' reading achievement, which corroborates many previous studies reporting low-to-moderate negative correlations between teachers' reading to children and children's reading achievement. Chatterji (2006) also reported that more at-home reading time was associated with greater reading achievement among African American students. Clearly, merely reading aloud to a child is not enough, and children in kindergarten need to actively participate in reading texts themselves. More explicit reading instruction in conjunction with extended practice opportunities for students at risk for reading difficulties might be in order (Torgesen, 2002). Taken altogether, the results of this study strengthen the importance of kindergarten children's reading outside of school experiences.

This study demonstrated the importance of teachers' outreach efforts for students with lower reading abilities and also emphasized the importance of children's reading experiences outside of school. Overall, in schools where teachers invested extra outreach efforts, reading scores across time reflected sharper gains among students with lower initial reading ability and among students reading frequently outside of school. Furthermore, these findings show that teachers' outreach efforts, student minority status, and reading outside of school were not only related to the gains made in reading skills while in kindergarten, but also distinguished the reading skills students carry into elementary school. We found that providing children with extra opportunities to practice reading (at school and at home) is a critical element to prevent reading difficulties. Activities requiring students' conscious participation to read are highly recommended for young students with lower reading abilities (Chatterji, 2006; Foorman et al., 1998; Juel & Minden-Cupp, 2000). Kindergarten teachers might need to include more direct reading instructions in school and provide opportunities for students to practice reading in and out of school to prevent their students from reading failure.

Although the literature indicates that the characteristics of individual children and families need to be considered to maximize the effectiveness of teachers' outreach efforts, we understand that the time and effort required by teachers to do so is enormous. In many cases, teachers' commitment may not be enough to make this a consistent reality and there may be myriad barriers in front of teachers. However, based upon the findings of this study, it is even clearer that kindergarten teachers' outreach efforts and activities should be continued, especially to help young children who are at high risk for academic failure. At the same time, administrative support such as developing systematic outreach plans for transitional periods and throughout the school year, as well as providing extra summer support for teachers to implement outreach efforts, may be necessary.

It also would be beneficial if kindergarten teachers' outreach efforts included more parent (home) involvement elements. As suggested by numerous researchers (e.g., Baker, 2003; Battle-Bailey, 2004; Fantuzzo et al., 2004; Hindman et al., 2010; Hughes & Kwok, 2007; Jordan

et al., 2000; McCarthey, 2000), family members and home environment considerably influence young children's school achievement—including reading abilities. As mentioned earlier, however, parental involvement alone is not sufficient without teachers' careful and deliberate efforts. As the transactional model posits, social relatedness and trust among teachers, children, and their families are critical to students' school engagement and academic success—especially during the early school years (Adams & Christenson, 2000; Hughes & Kwok, 2007; Sameroff & MacKenzie, 2003; Xu & Gulosino, 2006). This calls for educators to broaden the idea of a quality teacher to one who should be able to establish positive relationships not only with his or her students, but also with the parents; this is particularly true for minority and low-SES populations. Although reaching out to families is easier said than done, it is critical to persevere, knowing the powerful impact it has. As McCarthey (2000) pointed out, it is important to remember that building partnerships and connections is a shared responsibility, requiring teachers' careful planning, intentional effort, and patience.

This study is not without limitations. One of the limitations is associated with secondary analyses of large national ECLS-K data. Because variables are not experimentally controlled by the researchers, findings were primarily made through statistical procedures. In addition, the survey data do not adequately capture what type of activities represented concepts related to teachers' outreach efforts, or how reading outside of school occurs in the children's homes. Although it has been routinely accepted that teacher characteristics influence children's learning outcomes, most research has focused on how teacher characteristics influence aspects of the classroom environment. There has been little research specifically investigating which teacher characteristics influence the learning outcomes of kindergarten children. These issues need further exploration in relation to its statistical power with older children and the longitudinal effects through subsequent studies. More studies taking into account other potentially salient teacher variables, such as experience, race, and personal motivation, will require further investigation. Further investigations also should explore such mediating variables as teaching practice variables over a longer period of reading instruction.

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