



Development of student–teacher relationships in rural early elementary classrooms

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ABSTRACT

An increasing body of literature documents associations between student–teacher relationships, children's academic success, and children's social competence in school. Less is known about characteristics and processes involved in the quality of relationships between students and teachers, and little research has examined these issues with populations of young students and teachers living in rural communities. The current study examined the relationships between rural kindergarten and first-grade students and their teachers in spring of the school year, predicted by child demographic factors, child process factors, and teacher characteristics. Using a multi-level model to account for clustering of children in classrooms, children's behavior and literacy skills were examined as contributors to the teachers' perceptions of the developing teacher–student relationship, focusing on their potential to mediate associations between more distal characteristics and teacher–student relationships. Controlling for relationship conflict in fall, boys and African American students were more likely to have relationships with teachers that were higher in conflict in spring. When behavior and literacy skills measures were added to the model, children's behavior mediated the effect of gender, such that behavior problems accounted for much of the variance in student–teacher conflict associated with gender. However, neither behavior problems nor literacy skills mediated the effects of minority status on conflict; African American students had poorer relationships with teachers regardless of behavior or literacy skills.

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The quality of children's relationships with teachers is associated with academic achievement and social competence through the elementary years (Hamre & Pianta, 2001; Peisner-Feinberg et al., 2001; Pianta, Steinberg, & Rollins, 1995). Consistent with an ecological perspective (Bronfenbrenner & Morris, 1998) child-, family-, teacher-, classroom-, and school-level variables from micro to macro environments may contribute to the quality of the developing teacher–child relationship (Peisner-Feinberg et al., 2001). The purpose of this study was to examine factors contributing to teachers' perspectives of their relationships with children over the course of the school year. We examined how teacher–child relationships in the spring varied with distal (child demographic) and proximal (child behavior and literacy) and teacher characteristics in the fall of kindergarten and first-grade classrooms in a rural school district. Expanding on previous research, we were particularly interested in whether children's academic and behavioral

competence in the fall were associated with teachers' assessment of their relationships with children in the spring of the school year, beyond the effects of fall relationships.

Classic and contemporary theoretical perspectives support the importance of relationships for teaching and learning (Davis, 2001; Klem & Connell, 2004; Noddings, 2005; Pianta, Hamre, & Stuhlman, 2003; Sroufe, 2000). Children are designed by nature to develop relationships, and do so, albeit unintentionally, to increase their prospects of survival and well-being (Bowlby, 1984, 1988). As children develop relationships with caring adults, they construct ideas about self and relationships that guide them in interactions with other people and help them navigate challenges of new learning and development. Children's early experiences are formed in the context of the transactional influence of child and adult engaging in an interactive dance that develops into a relationship (Sameroff & Fiese, 2000). While Bowlby believed that children typically initiate these interactions, it is the more-skilled adult that recognizes and responds, leading the child into society's circle.

A high-quality, student–teacher relationship in early education is reflected in comfortable, constructive interactions between teacher and student. A frequently used metric distinguishes relationship qualities based on teachers' reports of conflict and

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closeness in interactions with the student (Pianta et al., 2003; Pianta & Steinberg, 1992). Closeness in the relationship refers to the extent of warm, reciprocal interactions, with the student turning to the teacher for comfort in times of stress. Conflict in the relationship describes the degree to which the teacher and student struggle, expressing anger and frustration in interactions.

The importance of teacher–student relationships for educational success has been substantively documented in early education (Pianta & Steinberg, 1992; Pianta et al., 1995). Children with close relationships with teachers perform better on social and academic indicators of school success (Birch & Ladd, 1997; Hughes & Kwok, 2007), and have more satisfying peer relations (Birch & Ladd, 1998; Howes, Matheson, & Hamilton, 1994a, 1994b). Children who struggle in early education may rely on relationships with teachers to take advantage of opportunities in the learning environment (Baker, 2006), such that teacher–student relationships may mediate associations between child, family, and classroom factors and child academic and social outcomes (Hughes, Gleason, & Zhang, 2005; Mashburn & Pianta, 2006). For example, in one study, teacher–student closeness was associated with decreasing externalizing problems during kindergarten (Silver, Measelle, Armstrong, & Essex, 2005). In another, high-quality relationships with teachers protected children from the long-term negative effects of internalizing problems, in addition to predicting fewer externalizing problems over the elementary school years (O'Connor, Dearing, & Collins, 2011). In light of the importance of teacher–student relationships in early education, and the need for research examining factors associated with developing relationships, the current study examined the development of closeness and conflict in student–teacher relationships with a sample of rural kindergarten and first-graders.

1. Child demographic factors and student–teacher relationships

Factors associated with teacher–student relationship quality during early education include child demographic factors, such as gender and ethnicity. Teachers generally report more conflict in their relationships with boys, and more closeness in their relationships with girls (Birch & Ladd, 1997; Hamre & Pianta, 2001; Kesner, 2000; Murray & Murray, 2004). This difference may be due in part to prevalence of female teachers reporting, reflecting a gender preference. Alternatively, boys' more aggressive, less-regulated behavior may make it more difficult for teachers to form and maintain positive relationships with them (Ladd, Birch, & Buhs, 1999). To date, research has not provided sufficient evidence explaining differential associations between boys and girls in their relationships with teachers. The current study considered contributions of gender to the developing teacher–student relationship, and process factors that may mediate the association between gender and relationship quality.

Students' ethnicity has also been associated with teachers' reports of relationship quality, though with some disparate findings. In some studies, teachers report higher-quality relationships with White and Hispanic students than with African American students (Hughes et al., 2005; Hughes & Kwok, 2007; Saft & Pianta, 2001), though in another study, African American teachers preferred the less dependent style of African American students in their sample (Murray & Murray, 2004). Researchers speculate that ethnic match between teachers and students may be more salient for the relationship than ethnicity of the student (Murray & Murray, 2004; Saft & Pianta, 2001), though few samples have included sufficient representation of minority teachers to examine this issue (Saft & Pianta, 2001). The current study included an ethnically diverse sample of students with which to examine teachers' perceptions

of their relationships with White students versus those with non-White students. We also examined process factors that may mediate the association between ethnicity and relationship quality.

2. Teacher characteristics and student–teacher relationships

It is clear from previous research that children's characteristics contribute to their observed and reported relationship qualities (Birch & Ladd, 1998; Howes, 2000; Howes et al., 1994a, 1994b), leading one to consider that students may "drive" their relationships with teachers. However, relationships are bidirectional, and while students may influence their relationships with teachers, research also suggests that characteristics of teachers contribute to their relationships with students. One such contributing factor is teachers' experience. One might expect that teachers with more years of experience in the classroom would be more adept at building relationships with students over the course of the year. Alternatively, some evidence suggests that veteran teachers may tire of the pressures of teaching and struggle to remain engaged with students. For example, one study reported that teachers with fewer years of teaching experience rated their relationships with students more positively than did more-experienced teachers (Mashburn, Hamre, Downer, & Pianta, 2006). In the current study, teachers' experience varied considerably, and we, therefore, examined associations of years of teaching experience with their assessment of relationships with students.

3. Child process factors and student–teacher relationships

While child and teacher characteristics are associated with the developing teacher–student relationship, it is unclear what processes might account for these associations. According to an ecological perspective, daily interpersonal interactions (proximal processes) drive the child's development and may mediate the influence of child and context on outcomes over time (Bronfenbrenner & Morris, 1998). Some studies document that students' disruptive behavior in the classroom is associated with their developing difficult relationships with teachers (Howes et al., 1994a, 1994b). When teachers identified young students as aggressive and/or less socially competent, observers described teachers' interactions with these students as less supportive (warm and encouraging) (Birch & Ladd, 1998; Blankmeyer, Flannery, & Vazsonyi, 2002). Second graders who demonstrated more disruptive behavior in their classroom had less close, more conflicted relationships with teachers (Howes, 2000). In a longitudinal study, children's behavior problems in first grade were associated with second and third grade relationships with the same teacher (Henricsson & Rydell, 2004), though the patterns of association were complex. Children prone to disruptive behavior in first grade, according to teachers, were observed in more conflicted interactions and more positive interactions with their teachers in second grade, and less positive relationships with their teachers in third grade. Teachers reported more conflict with disruptive children, but not less closeness than with other groups of children (anxious and non-problem). In a recent study with preschoolers, Hamre, Pianta, Downer, and Mashburn (2008) reported that teachers' assessments of children's behavior problems accounted for over half the variance in their reported relational conflict with children. In sum, children's behavior may impact the developing relationship with the teacher. The current study considered that behavior may mediate the association between children's demographic characteristics and the relationship with the teacher.

Disruptive behavior in the classroom is associated with poor academic performance. Children who struggle in kindergarten and

first grade, especially in reading, are more likely to have problems in elementary school and to be identified as having learning disabilities in later grades (Foorman & Torgesen, 2001). Children who have reading difficulties and/or learning disabilities often display behavior and skill deficits that challenge the teacher's instruction, and may result in a poorer student–teacher relationship and less academic progress and adjustment in school (Vaughn, Elbaum, & Boardman, 2001; Wanzek, Vaughn, Kim, & Cavanaugh, 2006). Foorman and Torgesen (2001) emphasized both the emotional and cognitive support from the teacher as critical for children who have reading difficulties. They stressed two kinds of cognitive scaffolding support, including the careful sequencing of reading tasks to build the child's skills and teacher–child dialog that fostered children's thinking skills during reading. In addition, children who struggle with reading and behavior in school are much more likely to come from families who are poor and less educated than children who do not struggle (Kainz & Vernon-Feagans, 2007; Lee & Burkham, 2002).

Studies have established links between students' academic ability and the teacher–student relationship. Children in higher-quality student–teacher relationships reported being more engaged in their work (Furrer & Skinner, 2003; Klem & Connell, 2004), tended to participate in classroom activities at higher rates (Ladd et al., 1999), and liked school more (Birch & Ladd, 1997). Children with conflicted student–teacher relationships reported liking school less (Birch & Ladd, 1997). Children with close relationships with teachers had better reading grades and better academic work habits than children who had more conflict in their relationship with the teacher; yet conflict in the student–teacher relationship bore a stronger association with children's grades and work habits than did closeness (Baker, 2006).

In the current study, we were interested in whether processes, such as academic performance and behavior in the classroom, might mediate the effects of child demographic factors on student–teacher relationships, beyond effects of fall student–teacher relationships, maternal education, and teacher experience, all of which have been shown to be important predictors of child outcomes and student–teacher relationships. This study is part of the ongoing Targeted Reading Intervention (TRI), a project of the National Research Center for Rural Education Support. TRI is a longitudinal study of children and teachers in rural settings, where it has been found that teachers tend to have more experience but less formal education than teachers in urban settings and children come to school with poorer skills than children in more urban settings (Lee & Burkham, 2002). Thus, understanding what predicts student–teacher relationships in this rural sample has implications not only for rural schools, but also for interventions that are implemented in these schools. To that end, we first examined how child demographic factors and teacher factors were associated with relationship closeness and conflict in the fall. We then investigated how child demographic and teacher factors were associated with closeness and conflict in the spring, controlling for fall. Finally, we examined how child process factors, specifically children's behavior and literacy skills, mediated closeness and conflict in the spring, controlling for the fall relationship.

4. Method

4.1. Participants

We examined student–teacher relationships in a sample of 199 kindergarten and first-grade students attending 20 classrooms in rural schools in the southeast. Family members completed the demographic survey, choosing from among five race/ethnicity categories: “American Indian”, “Black/African American”, “Asian”,

“White/European American”, or “Other.” The highly diverse participants were 30.9% White/non-Hispanic, 45.5% African American, and 17% Native American, and 8% other. None of the participants were identified as Asian. Mothers of 20% of the sample had less than a high school diploma. Forty-eight percent of the participants were male. The 20 kindergarten and first-grade teachers in this study were female. Thirteen teachers identified as White, 6 as African American, and one teacher selected “Other” to describe her ethnicity. All participating teachers had at least a college degree and all were licensed teachers. They ranged from early career to late career, but as a group, were relatively experienced, similar to reports from other studies of rural education (Monk, 2007; Vernon-Feagans, Gallagher, & Kainz, 2010). Ranging from .5 to 33 years teaching experience, the average number of years teaching was 16.

All participating children were participants at control schools in a longitudinal intervention study of early reading development. Teachers were asked to rate all children in their classrooms with respect to their reading achievement (above, at, or below grade level) at the beginning of the school year, based on previous school assessments and/or screenings. From these rated groups, five children were randomly selected as participants from those children who were rated as below grade level in emergent reading, and five children were randomly selected from those children who were rated as on or above grade level in emergent reading, for an average of 10 children per classroom.

4.1.1. Measures

Child- and teacher-level data were collected in the fall via family and teacher questionnaires and a child assessment battery; teacher–student relationship quality was assessed in the fall and spring via a teacher questionnaire. Students participated in formal assessments of their early literacy skills in the fall. Formally trained research assistants administered an hour-long battery of literacy and achievement tests in a quiet setting in the student's school, during the regular school day.

Maternal education. Mothers reported on their number of years of formal education via a family questionnaire completed in the fall.

Child demographics. Families reported on students' gender (with “boy” as the reference category) and ethnicity (with “White, non-Hispanic” as the reference category) via a family questionnaire completed in the fall.

Teacher ethnicity and experience. Via a teacher questionnaire completed in the fall, teachers reported their ethnicity (with “White/non-Hispanic” as the reference category) and number of years teaching experience as a lead teacher in a regular education classroom.

Child behavior. Teachers reported on child behavior in fall. *The Classroom Behavior Inventory* (Schaefer, Edgerton, & Arson, 1977) is a teacher questionnaire designed to assess six dimensions of children's competence and adjustment in early elementary school. Twenty-one items from the original questionnaire were used in the current analyses (Cronbach's $\alpha = .95$). Unipolar and bipolar scales include task orientation vs. distractibility, extroversion vs. introversion, considerateness vs. hostility, independence, curiosity, and intelligence. A mean of the scale items was used, with high scores reflecting more positive behavior. The CBI reportedly differentiates achievement scores for groups of children in school (Feagans & McKinney, 1981) and correlates well with school achievement measures (Schaefer, Hunter, & Edgerton, 1987).

Child literacy skills. Literacy competence was assessed for all participating children via a subtest of the *Woodcock Johnson Tests of Achievement, III* (WJTA, III; Woodcock, Mather & Shrank, 2004). The *Letter-Word Identification* subtest measures the student's word identification skills. The initial items require the student to identify letters and read words of increasing difficulty, with no connection to meaning or context. The items become increasingly difficult

as the selected words appear less and less frequently in written English. Letter-word Identification has a median reliability of .91 in the 5- to 19-year-old age range (Woodcock et al., 2004). Standardized scores from fall assessments were used for the current analyses.

Student–teacher relationship. Teachers completed the Student Teacher Relationship Scale – Short Form (Pianta, 2001) for each child in the fall (October–November) and spring (April–May) of the school year. A 15-item Likert-type scale designed to assess the quality of a teacher's relationship with a given child, the STRS-short form consists of two scales: closeness (warmth and open communication, 7 items) and conflict (friction and difficulty, 8 items). Sample items from the closeness scale include, "I have an affectionate, warm relationship with this child" and "This child spontaneously shares information about himself/herself with me." Sample items from the conflict scale include, "This child and I always seem to be struggling with each other" and "This child easily becomes angry at me." Sufficient internal reliability was found for the fall (closeness $\alpha = .87$, conflict $\alpha = .90$) and spring (closeness $\alpha = .88$, conflict $\alpha = .88$) scales. Means in the current analyses reflect positive scales, such that high conflict scores reflect better relationships (high score = less conflict). Closeness and conflict scales associations have been documented with children's academic performance and social development over the early elementary school years (Hamre & Pianta, 2001; Stuhlman & Pianta, 2004).

5. Results

5.1. Preliminary analyses

Data entry personnel followed documented scoring recommendations, including reverse coding, for the STRS and CBI, such that higher scores are always in the positive direction. An overall mean score for each instrument was created to reflect the mean response level for all items on the instrument. Fall and spring mean closeness, conflict, and CBI scores are reported in Table 1, as are average teacher and child variables. To control for issues related to socioeconomic status, we entered maternal education (years) in the analyses.

We examined potential associations between student race and gender and fall literacy skills (Letter-Word Identification) and behavior (child behavior inventory) using general linear models. In each level of the model, variables were entered simultaneously. The overall model predicting fall literacy skills by three racial categories (African American, White, and American Indian) and gender was non-significant. Using the same model predicting children's fall behavior, we found that teachers rated the behavior of American Indian students ($B = -.34$; $p = .03$) and boys ($B = -.29$; $p = .01$) lower than other children in the sample.

5.2. Bivariate associations among predictors and closeness and conflict

Correlations among variables are displayed in Table 2. Fall and spring ratings of student–teacher relationships (closeness and conflict) were highly inter-correlated, and were associated with teachers' ratings of child behavior. Teachers with more years experience reported more conflict in their relationships with children in the fall, and poorer behavior. Children whose mothers had more years of education scored higher on literacy skills assessments in fall and were rated as having less conflict with teachers in spring. Teachers reported higher relational closeness and lower conflict with children who scored higher on literacy skills (Letter-Word Identification task).

5.3. Baseline analyses: predicting fall closeness and conflict

To gauge the association of child and teacher characteristics with the development of the student–teacher relationship (closeness and conflict), we estimated a series of mixed models using SAS Proc Mixed (v 9.1) accounting for student clustering within teachers/classrooms. Continuous child-level predictors were centered for analyses (i.e., fall conflict, mothers' education, positive behavior, reading achievement). Child-level dummy variables (i.e., race, gender) were not centered for the purpose of interpretability. Our preliminary models investigated the associations among model predictors and fall relationship characteristics. Teachers reported less closeness in fall with African American students ($B = -.23$, $SE = .08$, $p = .007$) and closer relationships with students with more positive behavior ($B = .23$, $SE = .07$, $p = .001$). Mother's education, child gender and literacy skills, and teacher ethnicity and experience were not associated with fall closeness. Teachers reported less conflict in their relationships with students in fall when children had more positive behavior ($B = .72$, $SE = .08$, $p < .001$) and lower literacy skills scores ($B = -.02$, $SE = .01$, $p = .007$). Mother's education, child gender and ethnicity, and teacher ethnicity and experience were not associated with fall conflict.

5.4. Hierarchical analyses predicting spring closeness and conflict

To examine the effect of child and teacher characteristics on aspects of closeness and conflict in the spring, we estimated a series of mixed models (SAS PROC MIXED), again accounting for student clustering within teachers/classrooms for each aspect of the student–teacher relationship. Essentially ANCOVA models, HLM can be used to examine change over time due to other factors. In this case, we estimated the association between child and teacher characteristics on Time 2 (spring) student–teacher relationship factors, controlling for Time 1 (fall) student–teacher relationship factors. Model 1 estimated the quality of the student–teacher relationship at the end of the school year as a function of the quality at the beginning of the school year. Each subsequent model addressed specific research questions. Model 2 addressed whether student gender and minority status, and years of teacher experience accounted for change in the student–teacher relationships over the year, controlling for maternal education. Model 3 examined whether child behavioral and literacy competence: (1) accounted for student–teacher relationships, and (2) mediated the relation between student and teacher characteristics in the student–teacher relationship.

Following published work in this area, we interpret the unstandardized regression coefficients reported in Tables 3 and 4 as effect sizes (Hamre, Pianta, Downer, & Mashburn, 2008). Regression coefficients for centered predictors represent the magnitude of change in outcome scale expected for a 1-unit increase above the mean in the predictor variable. For non-centered predictors, each regression coefficient represents the change in outcome scale expected for a one-unit increase in the predictor variable. Because our non-centered child-level predictors are dummy variables indicating child race and gender, the non-centered regression coefficient is the mean difference in outcome between indicator and reference group coded in the dummy variable, adjusted for all other variables in the model. Our variable names are labeled to clarify this contrast.

Coefficients for models related to closeness are reported in Table 3. For the three models examining student–teacher closeness, teachers' reports of close relationships with their students in spring were predicted only by relationship closeness in fall. Neither teacher experience nor any of the child characteristics in Models

Table 1
Descriptive characteristics of children, total sample and ethnicity by gender.

	Total sample	Native American		African-American		White		Other	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Student–teacher relationship									
<i>Fall closeness</i>									
N	189	15	17	34	33	41	33	9	6
M	4.33	4.28	4.29	4.24	4.12	4.41	4.46	4.52	4.62
SD	0.65	0.68	0.70	0.78	0.65	0.69	0.46	0.46	0.28
<i>Spring closeness</i>									
N	182	14	19	32	30	40	28	9	7
M	4.48	4.34	4.58	4.46	4.29	4.55	4.46	4.68	4.73
SD	0.58	.63	0.54	0.63	0.64	0.62	0.54	0.25	0.37
<i>Fall conflict</i>									
N	189	15	17	34	33	41	33	9	6
M	4.25	4.10	3.94	4.21	4.03	4.48	4.33	4.57	4.43
SD	0.87	.99	0.76	0.97	0.95	0.79	0.78	0.81	0.67
<i>Spring conflict</i>									
N	182	14	19	32	30	40	28	9	7
M	4.26	4.22	4.13	4.15	3.62	4.63	4.46	4.57	4.61
SD	0.88	.84	0.87	0.98	1.06	0.48	0.70	0.65	1.03
Child behavior (positive)									
N	189	15	17	34	33	41	33	9	6
M	3.56	3.39	3.18	3.73	3.23	3.70	3.55	4.13	3.87
SD	0.75	.64	0.62	0.68	0.75	0.73	0.72	0.67	1.14
Literacy skills (LWI)									
N	195	14	18	34	35	42	33	9	7
M	112.24	112.36	111.28	113.59	110.89	113.67	109.39	119.11	110.86
SD	10.14	9.77	6.41	9.15	9.79	11.42	11.01	6.17	15.81
Mother's education (years)									
N	187	14	18	33	34	40	31	9	7
M	12.95	13.00	12.89	12.97	13.06	13.05	12.97	12.67	12.00
SD	1.98	2.57	1.97	1.59	2.21	2.07	1.54	2.00	3.06

Table 2
Correlations between relationship closeness and conflict and predictor variables.

	1	2	3	4	5	6	7	8
Fall closeness	1.00	.61 ⁺	.40 ⁺	.38 ⁺	-.14	.37 ⁺	.13	.10
Spring closeness		1.00	.23 ⁺	.37 ⁺	.01	.33 ⁺	.14 ⁺	.04
Fall conflict			1.00	.70 ⁺	-.16 ⁺	.59 ⁺	.15 ⁺	.08
Spring conflict				1.00	-.01	.60 ⁺	.14 ⁺	.40 ⁺
Teacher experience					1.00	-.18 ⁺	.03	.00
Child behavior						1.00	.44 ⁺	.04
Literacy skills (LWI)							1.00	.14 ⁺
Mother's education								1.00

* $p < .05$.

2 or 3 were associated with change in student–teacher closeness across the academic year, beyond initial reports of closeness.

Coefficients for models related to conflict are reported in Table 4. Teachers' reports of conflict in their relationships with students

in spring were predicted by their conflict in the fall, as shown in Model 1. However, as demonstrated in Model 2, teacher reports of conflict at the end of the year were associated with gender and ethnicity. More specifically, teachers reported more conflict with boys

Table 3
Hierarchical linear model: predicting spring student–teacher relationship closeness.

Effect	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Fall closeness	0.51 ⁺	0.06	0.52 ⁺	0.07	0.49 ⁺	0.07
Mother's education			0.01	0.02	0.01	0.02
Gender (boys vs. girls)			0.00	0.07	0.02	0.07
Native American (vs. White)			0.02	0.12	0.03	0.11
African American (vs. White)			0.02	0.08	0.03	0.08
Other ethnicity (vs. White)			0.13	0.13	0.11	0.13
Teacher ethnicity (African American vs. White)			-0.05	0.16	-0.05	0.16
Teacher experience (years)			0.00	0.01	0.00	0.01
Child behavior					0.05	0.06
Literacy skills (LWI)					0.00	0.00

* $p < .05$.

Table 4
Hierarchical linear model: predicting spring student–teacher relationship conflict.

Effect	Model 1		Model 2		Model 3	
	B	SE		SE	B	SE
Fall conflict	0.71*	0.06	0.65*	0.06	0.45*	0.07
Mother's education			0.02	0.02	0.02	0.02
Gender (boys vs. girls)			−0.22*	0.10	−0.13	0.09
African American (vs. White)			−0.45*	0.11	−0.40*	0.10
Native American (vs. White)			−0.18	0.15	−0.13	0.14
Other ethnicity (vs. White)			−0.07	0.17	−0.14	0.16
Teacher ethnicity (African American vs. White)			−0.02	0.18	−0.06	0.17
Teacher experience			0.01	0.01	0.01	0.01
Child behavior					0.43*	0.09
Literacy skills (LWI)					−0.01	0.01

* $p < .05$.

and African American students at the end of the year, even after controlling for initial conflict levels with these students. Girls and White students had less conflict with their teachers over the course of the school year. Subsequently, because grade and race could be proxies for academic processes that shape student–teacher relationships, we further scrutinized the model by adding children's literacy skills and behavior. The coefficient for contributions of children's behavior was statistically significant; however gender was no longer significant. The coefficient for literacy skills was not associated with teachers' conflict with students after accounting for other variables in the model. In combination, the diminished effect of gender with the addition of literacy skills and child behavior suggested that the gender effect on reported conflict might be mediated by teachers' perceptions of student behavior. Moreover, regardless of behavior and literacy skills, teachers reported higher conflict in their relationships with African American children as evidenced by a statistically significant coefficient for minority status in models 2 and 3. That is, teachers reported more conflict at the end of the year with African American students (but not American Indian, White or Other ethnic groups), even after controlling for initial reports of conflict, gender, maternal education, teacher experience and ethnicity, and student behavior.

To investigate more formally the role of teacher perceptions of student behavior as a mediator in the relation between gender and student–teacher relationships, we applied a technique for estimating indirect effects within data gathered under a cluster randomized design. The technique invokes a bias-corrected bootstrap to obtain a confidence interval for the indirect effect. Previous studies have indicated that the bias-corrected bootstrap provides superior power for detecting indirect effects in single-level (MacKinnon, Lockwood, & Williams, 2004) and multi-level analysis (Pituch, Stapleton, & Kang, 2006). Considering a basic mediation model, conditioned on the full set of covariates estimated in Model 3, the indirect effect of gender on conflict, as mediated by student behavior, is represented by the product term $a \times b$ (i.e., the effect of gender on behavior multiplied by the effect of behavior on conflict). Our analysis yielded a non-zero product term, indicating student behavior as a significant mediator ($B = -.16$; $C.I. = -.30, -.04$).

Finally, we estimated our final models for and conflict with the addition of three teacher race by student race interaction terms: American Indian Student X Teacher Black, Black Student X Teacher Black, and Other Race X Teacher Black. None of these terms was significant for closeness. Only the interaction term American Indian X Teacher Black significantly predicted child conflict ($B = 4.34$; $p = .04$). Adjusted means for four groups defined by the American Indian X Teacher Black interaction were: 4.29 (Not American Indian, Not Black Teacher), 4.11 (Not Black Teacher, American Indian), 4.38 (American Indian, Not Black Teacher), 3.58 (American Indian, Black Teacher). Pairwise tests of adjusted means indicated that African-American teachers reported greater

amounts of conflict with American Indian children over the school year, but not with other groups defined by the interaction.

6. Discussion

Increasing evidence suggests that relationship processes are important for children's academic and social success; therefore, understanding how relationships develop between teachers and students over the school year is crucial. The current study contributed in several unique ways to the literature on student–teacher relationships, and expanded on a growing knowledge base regarding behavior and relational conflict. This is the first known study to examine these processes with an exclusively rural population, and one of few studies to examine student–teacher relationships in early elementary school with an ethnically diverse sample of students and teachers. Furthermore, we examined the relationship at the beginning and end of the school year, controlling for fall when analyzing spring relationships. This allowed us to examine predictors associated with subtle changes in relationship quality over the course of the school year. Below, we consider findings and implications of these contributions.

Teachers' initial perspectives of their relationships with students were associated with child demographic and process factors, including academic ones. Not surprisingly, they reported experiencing less closeness and more conflict with children who they assigned lower ratings in behavior. However, teachers also reported less closeness with African American children in the fall, possibly reflecting an initial bias seen reflected in subsequent analyses showing increased conflict with African American children over the course of the school year. It is possible that this early feeling of less closeness is manifest in early uncomfortable transactions that emerge into growing conflict over the course of the school year. Somewhat counterintuitively, teachers reported less conflict in their initial relationships with children scoring lower on the literacy skills measure. This effect was quite small, but could reflect teachers' initial sensitivity toward supporting children who need more academic intervention early in the year.

The current study suggests that over the course of the school year, child demographic factors (gender and ethnicity), child process factors (behavior and literacy skills), are associated more with development of conflict in the student–teacher relationship than with relational closeness. This supports what other studies have suggested: relational conflict is more operant in the child's experiences and competence in school. Murray and Murray (2004) reported findings linking conflict, more so than closeness, to school adjustment for an ethnically diverse group of elementary students. Additionally, negative child characteristics were more associated with teacher–student relationships than were positive child characteristics. Child demographics, behavior, and academic orientations predicted conflict in their relationships with teachers, and as with our data, did not predict closeness. In another study

with diverse kindergarteners, student–teacher relational conflict was associated with children’s behavior, teacher stress, and classroom processes and climate (Mantzicopoulos, 2005), according to children’s perceptions.

The current study affirmed research findings supporting boys’ relationship disadvantage in early education, in that teachers perceived more conflict in their relationships with boys than with girls. However, we expanded on previous studies, and affirmed recent findings (Hamre et al., 2008), accounting for mediating processes implicated in boys’ disadvantage. When behavior problems were considered, gender of the child mattered less for the student–teacher relationship. Teachers struggle in their relationships with children who are less regulated, less attentive, and more hostile in their reactions, and recent evidence suggests that teachers these struggles emerge with boys and girls with behavior problems (Hamre et al., 2008).

However, other evidence suggests that boys may be particularly susceptible to the influence of their relationships with teachers, such that positive relationships may buffer against negative outcomes, and conflicted relationships may exacerbate disadvantages of negative behavior in boys. In one study, school failure was more strongly associated with poor student–teacher relationships for boys than for girls (Blankmeyer et al., 2002). In another study examining associations among students’ relatedness to teachers and academic engagement, girls demonstrated more relatedness to teachers than boys (Furrer & Skinner, 2003). However, the association between relatedness to teachers and engagement was stronger for boys, such that boys benefited more from good relationships with teachers. In combination with the findings from the current study, we understand more about the importance and mechanisms via which school settings may support or disadvantage boys academic and social success. From an applied perspective, these findings emphasize the importance of considering how teachers may be supported in their relationships with boys, and in particular with children prone to dysregulated behavior. Due to the growing high-stakes nature of achievement in early elementary school, continued research should focus on explicating mechanisms of gender-based advantage and disadvantage in the early elementary classroom.

In this investigation, children’s ethnicity predicted student–teacher relationship conflict, beyond the effects of initial relationship conflict, maternal education, and teacher experience. Possibly bearing more import than the mediation of gender effects, teachers reported increasing conflict with African American students over the school year. This begs the question of what processes explain teachers’ apparent relationship bias against African American students in this rural sample. Serious consideration of ethnic bias in relationships is warranted, further evidenced by recent findings that teacher–student relationship quality mediates the effects of ethnicity on teacher’s perceptions of child ability (Hughes et al., 2005) and classroom engagement (Hughes & Kwok, 2007). Further, since African American students may reap more academic benefits than White students from positive relationships with teachers (Burchinal, Peisner-Feinberg, Pianta & Howes, 2002), it is important to pursue further investigation of the mechanisms that account for teachers’ perceptions of relationship conflict with African American students.

It is no stretch to imagine that the sociocultural mismatch between White teachers and African American students could lead to relationship challenges that teachers are ill-prepared to address (Ladson-Billings, 1994), though one third of the teachers in the present study were African American. Contradicting an earlier finding that reported that non-White teachers were more likely to rate their relationships with non-White students positively (Mashburn et al., 2006), in this study, African American and White teachers did not differ generally in their reported relationship conflict with students, with one exception. African American teachers reported

greater conflict in their relationships only with American Indian students.

This finding cannot be separated from the fact that the Native American students in this sample all attended one school. Geographical context and culture may play a role in these findings, as the context of southeastern rural education may be one in which ethnic bias in relationships may be situated at the school or community level, and may filter down into classroom interactions. Because their relationships with teachers impact students’ achievement and adjustment in school, it is important for future research to examine the relational contexts of schooling for American Indian children and their teachers. For example, in a study with rural young adolescents, Native American children benefitted more than their White peers from an intervention aimed at enhancing positive school adjustment (Hamm et al., 2010). As the trend for cultural diversity in America’s student population increases, we are challenged to identify factors that enhance positive relationships and minimize conflict for all children. As a start, research needs to examine teachers’ beliefs about the cultures and families of the children they teach, and how teachers’ beliefs may impact their expectations for, perceptions of, and relationships with racial and ethnic minority children.

7. Limitations

Limitations in the current study include measurement issues of relationship perspective and process. Though consistently associated with school outcomes for children, teacher’s perspectives of relationships are limited. Students’ perspectives of their relationships with teachers could greatly enhance our understanding of the complexity of relational processes in school (Coplan & Prakash, 2003; Hughes, Cavell, & Willson, 2001; Picklo, 2005). Finally, we used teachers’ reports of student behavior and independently assessed literacy skills to examine mediating processes in the developing student–teacher relationship. Examination of developing relationships among teachers and students would benefit largely from observed processes, including classroom climate, teacher–student interactions, and peer interactions.

In addition to their perspectives on relationship quality with students, teachers in the current study also provided their perspective on children’s behavior in the classroom. Thus it is not surprising that teachers’ views of children’s behavior mediated the association for their perspective on the developing student–teacher relationship. On the other hand, children’s literacy skills did not mediate the association between child demographic factors and student–teacher relationship quality. Clearly, common source variance may have contributed to differences in these findings. However, in another study, parental and teacher reports of behavior problems mediated the association between children’s disability status and relationship with the teacher, suggesting that children’s behavior, teachers’ perspectives of their behavior, and their developing relationship require further detangling (Eisenhower, Baker, & Blacher, 2007).

The importance of further detangling of these factors is supported by findings of Liew, Chen, and Hughes (2010), whose data suggest that a positive student–teacher relationship (also reported by teachers) compensated for less regulated behavior, such that children with less effortful control did as well as their regulated classmates over early elementary grades when they had positive relationships with their teachers. Furthermore, other research suggests that literacy competence may be a partial result of quality student–relationships and child behavior, rather than a predictor (Hughes, Luo, Kwok, & Loyd, 2008). While it is likely that children’s behavior influences the developing student–teacher relationship, the teacher’s perspective on that behavior may be influenced by

the teacher's emotional states (Thijs & Koomen, 2008). Future studies in this realm would benefit from independent observations of children's behavior in the classroom, in addition to including the child's perspective. Multiple data sources on children's behavior would help to discriminate these factors.

In the current study, only years of teaching experience and teacher race/ethnicity were employed as predictive teacher factors in student–teacher relationships. Other factors, such as teachers' attitudes, sense of efficacy, teaching quality and classroom climate likely contribute in (possibly more meaningful) ways than the factors examined herein. Furthermore, the study included a relatively small number of teachers. Additional research, with a larger sample, that examines teachers' contributions to their relationships with students in more complex ways, is warranted.

8. Implications

This study contributes to understanding student–teacher relationships in early education by addressing the complex factors associated with teachers' perspectives of their relationships with students. As in other literature, child characteristics were more prevalent in manifestation of teachers' conflict with students than with their relational closeness (Murray & Murray, 2004; Buyse, Verschueren, Doumen, VanDamme, & Maes, 2008). Teachers' initial perceptions of their close relationships with students remained the strongest predictor through kindergarten or first-grade. On the other hand, several factors predicted changes in teachers' conflict with students over the course of the school year. While being male or African American was associated with teachers' reports of conflict in their relationships with students, aspects of students' behavior in the classroom subsequently accounted for conflict in teachers' relationships with boys. Teachers' difficulty with these relationships may be due to the tendency for boys and poor African American students to be less well prepared for school academically (according to standardized tests) and to be perceived by teachers as having more behavior problems. Teachers may need strategies to enhance the quality of their interactions and teaching of boys and African Americans, and may benefit from professional development that guides their interactions with boys and ethnic minorities – ideally strategies that address behavior guidance and building positive relationships.

For example, developmental knowledge, such as boys' (and some girls) tendency toward more active, intense play and interaction, can be employed to structure the early elementary classrooms more responsively. Furthermore, the increasing tendency toward structured, seated academic work in early elementary grades may increase teachers' expectations for regulated behavior among children who are still learning gaining the cognitive capacity to control themselves in academic contexts. By creating classroom environments that employ a variety of interest areas and accommodate physical activity throughout the day, teachers may reduce some children's tendency toward disrupting academic activities, and may decrease conflict teachers experience with children.

In light of the fact that relationships with African American children start with a bit less closeness, and grow greater in conflict over the school year, building closer, less-conflicted relationships with African American children may need to begin with thoughtfully building relationships with children's families – on families' terms (Ladson-Billings, 1994). For example, visiting families' homes and providing multiple, varied opportunities for communicating and connecting may be a starting point for facilitating relationships with families and students. This understanding can be built upon during the school year, and can serve as a buffer when conflict does arise. This suggestion is not an easy one to implement: while teachers in rural communities are more likely to personally know

the families in the community (Vernon-Feagans, Gallagher, & Kainz, 2010), families often live and are employed geographically far from the rural school building.

As a final consideration, this study did not assess features of the school, community, and culture on relationships between teachers and students, but future research would benefit from doing so, particularly as related to relationships in rural contexts. It is unlikely that the increasing conflict this sample of teachers experienced with African American students is a straightforward case of racial bias. After all, nearly one third of the teachers were African American, a factor that did not influence overall effects on reports of relational closeness. It is more likely that at least a portion of the increasing relational conflict is an artifact of school, community, and cultural-based struggles with ethnic bias and racial inequity. Other recent research (Kainz & Vernon-Feagans, 2007) points to the persistent and pervasive negative effects of racial inequality in systems of schooling. While further research explicating relational mechanisms is warranted, little additional evidence is needed to warrant beginning with the examination and frank discussion of these issues among the school and community systems educating and socializing children.

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