Early Education and Development

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/heed20

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To cite this article: Monica S. Lu, Jessica E. Whittaker, Erik Ruzek, Robert C. Pianta & Virginia E. Vitiello (2023) Fostering Early Motivation: The Influence of Teacher-Child Relationships and Interactions on Motivation in the Kindergarten Classroom, Early Education and Development, 34:3, 648-665, DOI: 10.1080/10409289.2022.2055992

To link to this article: https://doi.org/10.1080/10409289.2022.2055992

EARLY EDUCATION AND DEVELOPMENT
2023, VOL. 34, NO. 3, 648–665
https://doi.org/10.1080/10409289.2022.2055992

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Fostering Early Motivation: The Influence of Teacher-Child Relationships and Interactions on Motivation in the Kindergarten Classroom

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ABSTRACT

Research Findings: The present study examines the unique and joint effects of individual teacher-child relationships and overall quality of teacher-child interactions on the motivation of 2,745 kindergarten children (51% girls; ages 5–6) from an ethnically and linguistically diverse county. Teachers reported the closeness and conflict in their individual relationships with each child. The quality of teacher-child interactions was measured via classroom observations using the Classroom Assessment Scoring System (CLASS). Motivation was measured using children's self-reports of their school enjoyment, feelings toward the teacher, self-concept, and growth mindset. Multilevel models showed that teacher-child relationships characterized by high closeness were positively associated with children's motivation, whereas highly conflictual teacher-child relationships were associated with negative motivation outcomes, especially for boys. No significant associations were found between teacher-child interactions and children's motivation. *Practice or Policy:* The findings highlight the role of supportive relationships between teachers and children in the early development of motivation, and potential gender differences that may emerge. Professional development and training that help teachers form positive relationships with different children from diverse backgrounds may support teachers in fostering young children's motivation.

High-quality relationships and interactions during elementary school years create learning environments in which children feel supported to engage with their teachers, peers, and classroom tasks (e.g., Birch & Ladd, 1997; Hamre, 2014). Many studies have examined academic and socioemotional outcomes related to the quality of dyadic relationships between teachers and individual children (Roorda et al., 2011; Rucinski et al., 2018) and the quality of teachers' overall interactions with children through their setup of classroom climate and structure, and instructional practices (Burchinal et al., 2008; Mashburn et al., 2008). Less research has focused on how individual-level relationships and classroom-level interactions contribute to children's academic motivation. Motivation supports various aspects of children's academic success, including achievement, persistence, and academic choice (Wigfield et al., 2007). Unfortunately, studies show a decline in motivation starting as early as first grade (Bouffard et al., 2003; Harter, 1981). This points to the need to understand classroom processes that shape children's motivation during early school years. Thus, in the present study, we examine how the quality of individual teacher-child relationships and overall classroom teacher-child interactions

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uniquely and jointly contribute to kindergarten children's motivation. Moreover, although research suggests that positive relationships and interactions may be particularly salient for certain children (e.g., boys, English Language Learners; McGrath & Van Bergen, 2015), studies have not examined how children's individual characteristics strengthen or attenuate links between the quality of teacher-child relationships/interactions and motivation. Thus, we further investigate whether the quality of teacher-child relationships and interactions may be more strongly associated with some children's motivation than others.

Theoretical Frameworks

The self-determination theory (SDT) posits relatedness as a basic need in the development of motivation (Ryan & Deci, 2000). Teachers can foster relatedness through the relationships they form with individual children and through the general classroom climate they establish through their overall interactions with children (Nguyen et al., 2020). This sense of relatedness then promotes children's enjoyment of and engagement in their classroom activities and encourages them to seek out further learning opportunities (Niemiec & Ryan, 2009).

From the perspective of the bioecological model of human development (Bronfenbrenner & Morris, 2006), relatedness fostered through individual relationships and overall classroom interactions can be conceptualized on two levels, one that is proximal to the child and one that is more distal. Individual teacher-child relationships represent a proximal factor as they capture the positive or negative affects a teacher perceives with a child which may reflect in their individual interactions with that child. For example, teachers may display greater levels of sensitivity and responsiveness to children with whom they perceive a closer relationship (Hamre & Pianta, 2001). At a more distal level, the quality of teacher-child interactions reflects the general classroom climate the teacher provides for children on average as a class, such as the overall level of emotional support they cultivate in the classroom or their instructional and classroom management practices. Based on the dynamic nature of the bioecological model, these two levels can interact to shape children's motivation. Thus, by integrating the SDT and bioecological model, we examine sense of relatedness provided by teachers at two levels, the individual and classroom level, and how they contribute to and interact to shape young children's motivation.

Motivation during Elementary School Years

Motivation is linked to various positive academic outcomes (Wigfield et al., 2007). In the present study, we focus on four aspects of motivation: school enjoyment, academic self-concept, growth mindset, and feelings toward the teacher. We define *school enjoyment* as children's positive feelings toward learning in school (Ruzek et al., 2020). Children's enjoyment of reading (Guay et al., 2019) and science (Mantzicopoulos et al., 2018) have been associated with higher performance in those classes. In school, children also receive information about their performance from their teacher's feedback. These interactions become sources of information from which they form their academic self-concept (Shavelson et al., 1976). *Academic self-concept* is defined as children's perceptions of their academic abilities (Bong & Skaalvik, 2003). Moreover, children's interpretation of academic success and failure can influence their persistence in challenges (Dweck & Leggett, 1988). *Growth mindset* reflects children's beliefs that academic abilities are malleable (Dweck, 2006). The messages about ability and effort that a teacher conveys to a child can influence the child's mindsets toward learning (Rattan et al., 2012). Lastly, in line with the SDT, children who hold positive feelings toward their teacher may feel a stronger sense of relatedness and be more likely to enjoy and engage in their learning (Niemiec & Ryan, 2009). We define *feelings toward the teacher* as children's perceptions of their relationship with the teacher (Ruzek et al., 2020).

Individual Teacher-Child Relationships and Children's Motivation

Children's individual relationships with the teacher can play an important role in their academic and social development. The quality of teacher-child relationship reflects positive or negative affects in the dyadic relationships between teachers and children. These relationships can be shaped by both the child and the teacher's individual characteristics (Pianta et al., 2003). Teacher-child relationships can be conceptualized as two related dimensions: closeness (i.e., warmth, positive affect, and approachability) and conflict (i.e., negativity and lack of rapport; Hamre & Pianta, 2001). Relationships high in closeness are associated with higher achievement and positive social-emotional outcomes (O'Connor et al., 2011; Spilt et al., 2012). In contrast, relationships high in conflict are linked to lower achievement and more behavior problems (Hamre & Pianta, 2001; Spilt et al., 2012).

Fewer studies have examined motivational outcomes associated with the quality of teacher-child relationships. The extant literature suggests that teacher-child relationships may play an important role in children's motivation. For example, Cadima et al. (2015) found that first grade children with whom teachers perceived greater closeness showed higher behavioral engagement, a construct related to motivation, even though teachers' perceived conflict was not significantly related. Moreover, Guay et al. (2019) found that kindergarten children with whom teachers rated greater closeness showed higher intrinsic motivation and self-concept for reading.

Classroom Teacher-Child Interactions and Children's Motivation

At the classroom level, high-quality teacher-child interactions are a key component of early learning environments and promote academic outcomes from pre-K through 12th grade (Allen et al., 2011; Hamre et al., 2013). The quality of teacher-child interactions captures the overall level of opportunities the teacher provides in the classroom on average for children's learning and development (Hamre et al., 2007). The Classroom Assessment Scoring System (CLASS; Pianta, La Paro et al., 2008) emphasizes three domains of teacher-child interactions: emotional support, instructional support, and classroom organization. Emotional support captures the warmth and positive climate the teacher establishes in the classroom. Instructional support reflects the support and feedback the teacher provides to facilitate children's learning. Classroom organization involves teachers' practices to manage classroom behaviors and productivity. Using the CLASS framework, a number of studies have found positive associations between the three domains and children's vocabulary, math, and social development (e.g., Burchinal et al., 2008; Curby et al., 2009). On the other hand, some studies have found no significant associations between the quality of teacher-child interactions and children's academic outcomes (Burchinal et al., 2014; Ottmar et al., 2014).

With regards to motivation, there is some evidence to suggest that the quality of overall classroom interactions may contribute to children's motivation. For example, children show higher engagement in classrooms where teachers provide higher emotional support and classroom organization (Rimm-Kaufman et al., 2014). Another study found that kindergarten children had higher science intrinsic motivation and performance in classrooms where teachers showed higher emotional and instructional support during science instruction (Mantzicopoulos et al., 2018). In the present study, we extend and broaden this research to examine how the quality of teacher-child interactions throughout the school day relates to children's motivation.

Interactive Effects of Teacher-Child Relationships and Classroom Interactions

Although studies show the importance of establishing warm relationships at the individual level and high-quality interactions at the classroom level, there is less focus on how the two levels interact to shape children's motivation. Children's individual relationships with teachers can vary greatly within a classroom, based on the child and the teacher's characteristics (Pianta et al., 2003). The relationship is

also embedded in the classroom environment where features of the classroom and the relationship can reciprocally shape one another (Pianta et al., 2003). For example, classroom emotional support may buffer against the risk of developing aggressive behaviors for children with whom teachers report conflictual relationships (Rucinski et al., 2018). Another recent study that drew from the same dataset as the present found that preschool children benefited more from high quality teacher-child interactions when they also had closer, less conflictual relationships with their teacher (Nguyen et al., 2020), suggesting multiplicative effects of relationships and interactions at the two levels on children's outcomes.

Moderating Effects of Child Characteristics

The present study further investigates how associations between the quality of teacher-child relationships/interactions and children's motivation vary by gender and home language. Developmental theories suggest competing hypotheses. First, the gender socialization theory suggests that girls may be more sensitive to the quality of relationship with the teacher than boys (Burleson, 2003; Maccoby, 1998). Studies find support for this hypothesis such that teacher-child closeness is a stronger predictor of behavioral adjustment for girls than for boys (Baker, 2006; Ewing & Taylor, 2009). A second hypothesis stems from the academic risk perspective which argues that boys may be more sensitive to poor quality relationships with the teacher (Hamre & Pianta, 2001). In support of this hypothesis, studies found that conflictual teacher-child relationships are a stronger predictor of behavioral problems for boys than girls (Ewing & Taylor, 2009). Third, the SDT (Ryan & Deci, 2000) proposes relatedness as a basic need that must be satisfied for all individuals' development of motivation. Following this theory, the depth of connection a child perceives with the teacher is critical for motivation regardless of gender.

Children's home language may also shape their classroom experiences. Being immersed in an English learning environment can be stressful for children accustomed to speaking another language at home (Pappamihiel, 2001). Warmth and support from the teacher can help children feel more welcomed in an environment where the language is less familiar (Banse & Palacios, 2018). Differences in home language may also reflect cultural differences. One study suggests that teachers may have less close but also less conflictual relationships with English language learners (ELL) as language and cultural barriers may reduce the amount of interaction between them (Sullivan et al., 2015). Moreover, preschool ELL children show higher achievement when teachers not only provide high levels of emotional support, but also use their home language as part of the instruction, as the teachers may be more cognizant of children's cultural backgrounds (Burchinal et al., 2012). Thus, we consider gender and home language in capturing variability in how children's relationships and interactions with the teacher relate to their motivation.

Present Study

The present study adds to the literature by examining how the quality of individual teacher-child relationships and overall classroom interactions both individually, and in combination, are associated with kindergarten children's motivation in a large, ethnically and linguistically diverse sample. We explored three research questions:

1) To what extent are individual teacher-child relationships (closeness, conflict) and overall classroom interactions (emotional support, instructional support, classroom organization) associated with children's self-reported motivation? Based on previous studies, we hypothesized that teacher-child relationships and teacher-child interactions would be positively associated with children's motivation. We further hypothesized that, based on the SDT, high levels of emotional support, compared to instructional support or classroom organization, would be more strongly linked to motivation as it satisfies the relatedness essential to the development of motivation.

2) Do teacher-child relationships moderate the associations between classroom interactions and children's motivation? Based on the bioecological model, it is possible that the associations between overall classroom teacher-child interactions and motivation may vary based on the quality of relationship a child individually has with the teacher. However, given the limited research, it is unclear whether links between teacher-child interactions and motivation would be strengthened or attenuated by individual teacher-child relationships.

3) Do the associations between teacher-child relationships/teacher-child interactions and motivation differ based on gender and home language? We present this as an exploratory question given the competing theories (e.g., academic risk, SDT) and mixed findings (e.g., Sullivan et al., 2015) suggesting different possibilities for gender and home language differences.

Method

Participants

Participants were drawn from a large, ethnically and linguistically diverse county within a mid-Atlantic state in the United States. The county serves over 188,000 pre-K to 12th grade students, including a substantial immigrant population with 18% of families in which neither parents have US citizenship. The county serves students from highly diverse ethnic (39% White, 26% Hispanic, 20% Asian, 10% Black, 6% Multiracial or other ethnicity) and linguistic (>27% ELL students) backgrounds. Around a third of county students are from low-income families. Our sample draws from the full population of children who were income eligible for pre-K (described in more detail below) and who were enrolled in kindergarten in the county.

Participant Recruitment

Participants were recruited in two phases as part of a large longitudinal study (Pianta et al., 2018, 2020). In the first phase, children were recruited at the start of pre-K. All pre-K teachers in public schools were eligible. Teachers in community childcare centers with at least five publicly funded pre-K children were eligible. Public school teachers were recruited with the help of the district coordinator who distributed project information. Teachers who wished to participate completed a consent form. Consented teachers distributed consent forms to parents or guardians of their students. Children whose parents signed the consent form and who did not receive special education services (except speech) were eligible to participate. At community childcare centers, researchers communicated project information to center directors and provided consent forms to teachers at centers that expressed interest. Consented teachers followed the procedures outlined above for obtaining consent from eligible children. Roughly 80% of parents whose children were eligible consented, and around 90% were successfully followed into kindergarten.

The second phase of recruitment occurred at the start of kindergarten. Kindergarten children who were pre-K non-attenders were recruited. Non-attenders were eligible if they: (1) did not attend center-based pre-K at age 4; (2) had a total household income less than 250% of the federal poverty line; and (3) attended the same kindergarten classroom or elementary school as the pre-K attendee sample. The research team used parent-reported data from the school district to determine pre-K enrollment status. Procedures used during pre-K were followed for kindergarten recruitment. Teachers were informed of the study and asked for their interest to participate. Consented teachers distributed consent forms to eligible pre-K non-attenders' parents or guardians. Approximately 62% of parents consented to their child's participation.

Child, Teacher, and Classroom Characteristics

A total of 2,745 children participated in the study (51% girls; 11% White, 13% Black, 60% Hispanic, 12% Asian, 3% Multiracial or Other). Children in the sample came from a diverse linguistic background (18% English, 58% Spanish, 24% Other) and from families with an approximate income-to-needs ratio of 1.10 (*SD* = .72).

On average, kindergarten teachers (*n* = 448) had 17.40 years of education and 6.88 years of teaching experience. Classrooms had an average of 22 children (*SD* = 3.69) and 50% boys. Teachers reported a small percentage of children (9%) who had a disability or an individualized education plan, and that 42% of children had limited English proficiency. Most children were five years old at the start of kindergarten (83% 5-year-old, 17% 6-year-old). Of the participating teachers, 98 only consented to child-level data collection and not classroom observations. For analyses, these classroom-level data were estimated using missing data estimation methods.

Procedures

Data were collected using classroom observations, parent and teacher surveys, rating scales, child interviews, and direct assessments. Classroom observations were conducted two to three times during the kindergarten year. Observations occurred from the start of the day until dismissal or the end of instructional time. At each observation, two observers simultaneously captured the quality of teacher-child interactions using the Classroom Assessment Scoring System (CLASS; Pianta, La Paro et al., 2008), and the content and dosage of instruction using the behavioral coding system (BCS) adapted from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD) and the Classroom Observation System and Observational Record of the Caregiving Environment (McCartney et al., 2007; Pianta, La Paro et al., 2008; Ritchie et al., 2001).

In the fall, parents completed a demographic questionnaire regarding children's race, gender, age, household income, and parent education. Likewise, teachers completed a survey regarding their basic demographics. They also rated their beliefs about children using the Modernity Scale (Schaefer & Edgerton, 1985). In the fall and spring, teachers rated the quality of relationship with each child using the Student-Teacher Relationship Scale (STRS; Pianta, 2001).

Children's motivation was measured in the spring. Children participated in an interview led by a direct assessor. Keeping with school district procedures, interviews were conducted in English. Interviews started with two practice items to orient children to the rating scale. The scale consisted of three circles ordered in increasing size. Children were taught that the smallest circle meant *a little*, the medium circle meant *some*, and the largest circle meant *a lot*. They were asked to point to the corresponding circles to indicate their responses. If children did not respond by pointing to a circle, the assessor prompted them to point to a circle to indicate their answer. If the child did not respond, the assessor pointed to each circle and clarified what each circle meant. If the child still did not respond, the assessor left the item blank and proceeded with the next.

All participating children were administered direct child assessments in the fall and spring by trained data collectors. Data collectors completed a one-day training prior to delivering the assessments. When possible, children were assessed in a quiet space outside the classroom.

Measures

Individual Teacher-Child Relationships

Individual teacher-child relationships were measured using the *closeness* and *conflict* scales of the STRS (Pianta, 2001). The STRS contains 15 items that survey teachers' perceptions of their individual relationships with each child in the classroom. We adapted the scales to include nine of the 15 items. The closeness scale includes four items that ask teachers to rate the warmth and positive emotions in their relationships with each child on a 5-point Likert-scale (α = .83). The conflict scale includes five

items that ask teachers to rate the extent of their negative emotions, interactions, and conflict in their relationships with each child on a 5-point Likert-scale (α = .89). Composite scores of teachers' spring ratings were calculated for each scale.

Teacher-Child Interactions

The quality of classroom-level teacher-child interactions was measured using the CLASS (Pianta, La Paro et al., 2008). The CLASS assesses the quality of interactions the teacher establishes with children in their classroom as a whole. The quality of teacher-child interactions was rated on a 7-point scale across three domains: emotional support (α = .86), instructional support (α = .92), and classroom organization (α = .78). Each domain consists of three dimensions. Emotional support captures the warmth and sensitivity exhibited by the teacher. Instructional support consists of instructional practices the teacher provides to scaffold and expand children's learning. Classroom organization involves classroom management strategies the teacher uses to promote engagement and productivity. All data collectors received a two-day training session and had to be certified as reliable prior to data collection. Data collectors observed and rated classrooms in 15-minute cycles, 15 minutes to observe and 10 minutes to code, during each classroom visit across two separate occasions in the year. Composite scores were taken for each domain for analysis. Twenty percent of cycles were double coded to determine inter-rater reliability (ICC = 0.69).

Motivation

Children's motivation was measured across four constructs: self-concept, school enjoyment, feelings toward the teacher, and growth mindset. Each construct consists of four items. Self-concept asked children about their abilities in math, reading, writing, and school in general (e.g., *Are you good at reading letters and words?*). School enjoyment asked children about their feelings toward school (e.g., *Are you excited to go to school?*), and were drawn from the Academic Emotions Questionnaire – Elementary School (Lichtenfeld et al., 2012). Feelings toward the teacher surveyed how children perceived their relationship with their teacher (e.g., *Is your teacher nice to you?*). Growth mindset was measured with reference to a picture of a complicated castle built from wooden toy blocks. Children were asked to imagine that they were building the complicated castle and to indicate their mindset toward building it (e.g., *If you got stuck building the castle, how hard would you keep working on it?*). Children indicated their responses on a 3-point scale using three circles ordered in increasing size (1 = *a little*, 2 = *some*, 3 = *a lot*). All items (except school enjoyment) were from a measure developed for this project and evaluated during pre-K (Ruzek et al., 2020). Excluded from our analysis is a scale of children's perceptions of their peers. The fit of the full item set to their hypothesized latent variables in a confirmatory item factor analysis model fit to the kindergarten data was excellent (χ^2 = 328.497 (160), p < .001, RMSEA = .02, CFI = .98, TLI = .98, SRMR = .04). From a confirmatory factor analysis model, we estimated factor scores for the latent variables, exporting and using them as dependent variables in all subsequent analyses. Factor scores have a mean of 0 and variance of 1.

Covariates

Additional aspects of classroom instruction and teacher and child characteristics were measured to include as covariates for analyses. We used the BCS (adapted from NICHD SECCYD; McCartney et al., 2007; Pianta, La Paro et al., 2008; Ritchie et al., 2001) which was designed to capture activity setting (e.g., whole-group activities, free play), content of instruction, teacher behaviors, and child behaviors in the classroom. We used the activity setting that identified the proportion of time spent in teacher-directed whole-group activities as a covariate, as these were led by teachers and allowed for frequent interactions between teachers and children. Observers selected one activity setting for each 30-s interval, alternating between 30-s of observation and 30-s of coding, throughout a 16-min cycle. All observers attended a 1.5-day training session.

We also controlled for children's academic skills. We used children's standard scores on the Woodcock-Johnson III Psychoeducational Battery (WJ-III; Woodcock et al., 2001) Picture Vocabulary subtest which assesses children's language skills. Standard scores are nationally normed and compare children's performance to the average performance of their same-age peers.

Next, we controlled for teachers' beliefs about interactions with children, using the Modernity Scale (α = .78; Schaefer & Edgerton, 1985). They rated on a 5-point scale the extent to which they agreed with a series of statements regarding adult- and child-centered beliefs in teacher-child interactions (e.g., *Children learn best by doing things themselves rather than listening to others*). A higher score reflected more adult-centered than child-centered beliefs.

Data Analysis Plan

Using a regression-based framework, we examined associations between individual children's relationships with teachers and classroom-level teacher-child interactions with their motivation in kindergarten. Descriptive statistics are presented in Table 1 (descriptive statistics by gender are available in a supplemental table upon request). We used multi-level modeling to account for nesting of children within classrooms. The following covariates were included to control for potential selection factors and confounding variables and were coded accordingly: preschool attendance (0 = did not attend; 1 = attended), home language (0 = English; 1 = Spanish; 2 = Other), gender (0 = girl; 1 = boy), race/ethnicity (0 = White; 1 = Black; 2 = Hispanic; 3 = Asian; 4 = Other), household income, parent education (0 = no college education; 1 = college education), teacher's beliefs about children, kindergarten entry WJ-III Picture Vocabulary score, and proportion of teacher-directed activities. Intraclass correlation coefficients for self-concept, school enjoyment, feelings toward teacher, and growth mindset were 5%, 5%, 6%, and 4%, respectively. The final models were multivariate regression models in which all level 1 and level 2 associations between predictors and the four outcomes (self-concept, school enjoyment, feelings toward the teacher, and growth mindset) were simultaneously estimated. Main effects were modeled with the predictors of interest being the two teacher-child relationship variables (closeness, conflict) at level 1 and the three teacher-child interaction variables (emotional support, instructional support, classroom organization) at level 2. Next, level 1 slopes for the association between teacher-child relationship (closeness and conflict) and a given motivation outcome were allowed to vary across teachers; these slopes were in turn predicted by the teacher-child interaction predictor variables at level 2. Finally, we examined moderating effects of gender and home language. In all models, level 1 variables were centered within classrooms using latent mean centering which accounts for sampling error in the estimation of group means (Lüdtke et al.,

Table 1. Measure descriptive statistics.

Measure	Obs	Mean	SD	Min	Max	ICC
Child-Level						
Language skills: WJ-III	2168	87.31	12.12	50	135	
Self-concept	2321	0.00	0.79	−2.73	1.42	.045
School enjoyment	2321	0.00	0.83	−2.61	1.37	.050
Feelings toward teacher	2321	0.00	0.77	−2.64	1.33	.058
Growth mindset	2321	0.00	0.73	−2.39	1.17	.036
STRS: Closeness	1730	4.16	.81	1.25	5	
STRS: Conflict	1730	1.52	0.80	1	5	
BCS: Proportion of teacher-led activities	951	0.76	0.09	0.42	0.98	
Classroom-Level						
Ideas about children	350	2.21	.51	1.25	3.75	
CLASS: Emotional supp.	344	4.89	.71	2.54	6.73	
CLASS: Classroom org.	343	5.27	.63	2.98	6.75	
CLASS: Instructional supp.	344	2.05	.51	1.13	4.18	

Note. WJ-III = WJ-III Picture Vocabulary; STRS = Student-Teacher Relationship Scale; BCS = Behavioral Coding System; CLASS = Classroom Assessment Scoring System.

2008). Missing data was estimated using full information maximum likelihood, which uses all available data to estimate model parameters (Enders, 2010). Mplus version 8.4 was used for all analyses (Muthén & Muthen, 2017).

Results

Bivariate Correlations

Table 2 shows bivariate correlations for level 1 variables. In terms of the four motivation outcomes, correlations with these and teachers' closeness and conflict ratings were among the highest, followed by correlations with gender, and to a lesser degree, vocabulary skills. At the classroom level (Table 3), correlations were strongest between the classroom average motivation variables and CLASS emotional support (*r*s = .13-.27) and classroom organization (*r*s = .21-.32).

Main Effect of Teacher-Child Relationships and Interactions

Results from the multilevel multivariate regression model are presented in Table 4. In this model, all level 1 predictors were centered within classrooms. All coefficients reported are standardized betas. The model revealed that, relative to a classmate with an average closeness rating, when a teacher reported having higher closeness with a child, the child reported more positive feelings toward the teacher (B = .09, SE = .03, p = .004), greater school enjoyment (B = .08, SE = .03, p = .005), stronger growth mindset (B = .11, SE = .03, p = .001), and higher self-concept (B = .06, SE = .03, p = .041). On the other hand, when a teacher reported a higher conflict score with a child relative to the average conflict rating in the classroom, the child had less positive feelings toward the teacher (B = −.13, SE = .03, p = .001), lower school enjoyment (B = −.09, SE = .03, p = .001), and lower self-concept (B = −.07, SE = .03, p = .025). There were no significant associations between teacher-child interactions and children's motivation.

Interactive Effects of Teacher-Child Relationships and Interactions

Next we tested the possible moderating effect of teacher-reported closeness and conflict on the association between observed quality of classroom interactions and children's motivation. We added to the models reported in Table 4 cross-level interactions between CLASS domains and closeness and conflict.[1] None of the cross-level interactions were significant. Thus, evidence was inconclusive that the link between children's motivation and the quality of teacher-child interactions was enhanced or attenuated by teacher's perceived closeness and conflict with them.

Interactive Effects of Child Demographic Characteristics

Finally, we tested whether associations between teacher-reported closeness and conflict and the quality of teacher-child interactions and children's motivation were moderated by gender and home language. All but one of the interactions were *not* significant, providing inconclusive results about interactive effects. The one significant interaction was between gender and conflict for children's self-concept (p = .02; see, Table 5). Relative to girls, boys had lower self-concept when their teachers reported more conflict with them. For girls, a 1-unit increase in conflict was associated with a .05 decrease in self-concept, whereas for boys, a 1-unit increase in conflict was associated with a .09 decrease in self-concept (see, Figure 1). There were no other significant interactions between gender and conflict or gender and closeness for the other motivation constructs – although all were negative suggesting that boys' motivation was slightly (albeit not significantly) lower than girls' when teachers reported higher conflict *and* higher closeness.

Table 2. Bivariate correlations at the child level.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Feelings about teacher	1																
2. Enjoyment of school	0.76**	1															
3. Growth Mindset	0.58**	0.61**	1														
4. Self-concept	0.75**	0.80**	0.69**	1													
5. STRS: Closeness	0.10*	0.07	0.10*	0.06	1												
6. STRS: Conflict	−0.11**	−0.09*	−0.04	−0.06	−0.21**	1											
7. WJ-III PV	−0.02	−0.03	0.05	0.00	0.16**	0.06	1										
8. Attended pre-k	0.02	0.02	0.08*	0.05	−0.01	0.07	0.18**	1									
9. Lang: Spanish	0.03	0.02	−0.07	−0.02	0.01	−0.06	−0.34**	−0.08*	1								
10. Lang: Other	−0.04	0.00	0.03	0.00	−0.06	0.02	0.07	0.01	−0.66**	1							
11. Male	−0.09*	−0.05	0.02	0.00	−0.11**	0.09*	0.00	0.04	0.03	0.00	1						
12. Ethn: Black	0.02	0.01	0.06	0.05	0.03	0.11**	0.25**	0.17**	−0.47**	0.25**	0.00	1					
13. Ethn: Hispanic	0.02	0.01	−0.06	−0.02	0.04	−0.07	−0.31**	−0.07	0.90**	−0.69**	0.02	−0.51**	1				
14. Ethn: Asian	−0.09*	−0.06	−0.06	−0.09*	−0.12**	−0.02	0.04	0.03	−0.42**	0.52**	0.01	−0.15**	−0.45**	1			
15. Income to needs ratio	0.00	−0.01	0.03	−0.02	0.07	−0.02	0.25**	−0.08*	−0.23**	0.04	−0.07	−0.03	−0.19**	0.12**	1		
16. Parent Ed: Some college	−0.01	−0.01	0.11**	0.03	−0.07	0.10*	0.26**	0.06	−0.43**	0.28**	0.02	0.20**	−0.45**	0.20**	0.27**	1	
17. BCS-Prop Tch	0.06	0.04	0.00	0.03	−0.10*	0.02	−0.05	−0.02	−0.05	0.03	0.03	0.05	−0.06	0.01	0.04	−0.03	1

Note. $N = 951$. STRS = Student-Teacher Relationship Scale; WJ-III PV = WJ-III Picture Vocabulary; Lang = Home language; Ethn = Ethnicity; Parent Ed = Parent education; BCS-Prop Tch = Behavioral Coding System – Proportion teacher-led instruction.
*$p < .05$., **$p < .01$.

Table 3. Bivariate Correlations at the Classroom Level.

Variable	1	2	3	4	5	6	7	8
1. Feelings about teacher	1							
2. Enjoyment of school	0.81**	1						
3. Growth Mindset	0.60**	0.65**	1					
4. Academic self-concept	0.81**	0.80**	0.71**	1				
5. CLASS: Emotional Support	0.27**	0.21**	0.13	0.17*	1			
6. CLASS: Instructional Support	0.06	0.06	−0.04	0.04	0.50**	1		
7. CLASS: Classroom Organization	0.32**	0.28**	0.21**	0.25**	0.73**	0.37**	1	
8. Teacher ideas about children	0.11	0.15*	0.13	0.09	−0.07	0.00	−0.01	1

Note. $N = 343$. CLASS = Classroom Assessment Scoring System
*$p < .05$. **$p < .01$.

Table 4. Associations between teacher-child relationships/interactions and children's motivation.

Variable	Teacher		Enjoyment		Growth Mindset		Self-concept	
	B	se	*B*	se	*B*	se	*B*	se
Level 2 (between classrooms)								
CLASS Emotional Support	0.21	0.18	0.01	0.21	−0.01	0.20	−0.06	0.23
CLASS Instructional Support	0.02	0.12	0.02	0.13	0.07	0.14	0.01	0.14
CLASS Classroom Organization	0.24	0.14	0.32	0.18	0.13	0.19	0.33	0.18
Teacher: Ideas about children	0.08	0.10	0.18	0.10	0.10	0.13	0.04	0.12
R-square (between)	0.18		0.13		0.03		0.09	
Level 1 (within-classroom)								
Teacher: Closeness with child	0.09*	0.03*	0.08*	0.03*	0.11*	0.03*	0.06*	0.03*
Teacher: Conflict with child	−0.13*	0.03*	−0.09*	0.03*	−0.02	0.03	−0.07*	0.03*
Woodcock Johnson 14	0.02	0.02	0.03	0.03	0.07*	0.03*	0.04	0.03
Child attended pre-k	−0.01	0.02	−0.03	0.02	0.03	0.02	0.01	0.02
Child speaks Spanish language at home	0.06	0.05	0.10*	0.05*	0.04	0.05	0.04	0.05
Child speaks non-English/Spanish language at home	0.05	0.04	0.07	0.04	0.06	0.04	0.04	0.04
Male	−0.03	0.02	0.00	0.02	0.07*	0.02*	0.04	0.02
Ethnicity: Black	−0.02	0.03	0.03	0.03	−0.01	0.03	0.02	0.03
Ethnicity: Hispanic	0.01	0.05	0.02	0.05	0.00	0.05	0.03	0.05
Ethnicity: Asian	−0.05	0.03	0.01	0.03	−0.04	0.03	−0.02	0.03
Income to needs ratio	0.00	0.03	−0.02	0.03	−0.01	0.03	−0.03	0.03
Parent Ed: Some college	0.06*	0.03*	0.03	0.03	0.06	0.03	0.06	0.03
BCS-Prop Tch Structure	−0.04	0.04	0.03	0.04	0.05	0.04	0.03	0.04
R-square (within)	0.04		0.03		0.03		0.02	

Note. Standardized coefficients. Model fit – RMSEA = .00, CFI = 1, TLI = 1, SRMRw = .00, SRMRb = .04. CLASS = Classroom Assessment Scoring System; Parent Ed = Parent education; BCS-Prop Tch Structure = Behavioral Coding System – Proportion teacher-led instruction.
*$p < .05$.

Sensitivity Analysis

To test for possible confounding or mediating effects of children's feelings toward the teacher, we ran a sensitivity analysis that switched feelings toward the teacher from an outcome variable to a covariate (parameter estimates available in supplemental table upon request). Children's feelings toward the teacher positively predicted all three motivation outcomes (school enjoyment, growth mindset, self-concept; $p < .001$). Accounting for feelings toward the teacher, only growth mindset was significantly predicted by teacher closeness and conflict. Interestingly, both closeness ($B = .05$, $p = .017$) and conflict ($B = .06$, $p = .005$) were positively associated with children's growth mindset. It may be that children's feelings toward the teacher is a mediator between teacher-child relationship and children's motivation, as feelings toward the teacher predicted motivation whereas teachers-child relationships became less predictive. However, as children's motivation and feelings toward the teacher were measured concurrently at one timepoint, we are unable to test this possibility.

Table 5. Moderating Effects of Gender on Teacher-Child Relationship and Children's Motivation.

Variable	Teacher		Enjoyment		Growth Mindset		Self-concept	
	B	se	*B*	se	*B*	se	*B*	se
Level 2 (between classrooms)								
CLASS Emotional Support	0.21	0.19	0.01	0.21	−0.01	0.20	−0.06	0.23
CLASS Instructional Support	0.02	0.12	0.02	0.13	0.07	0.15	0.01	0.14
CLASS Classroom Organization	0.24	0.14	0.31	0.18	0.12	0.19	0.33	0.19
Teacher: Ideas about children	0.08	0.10	0.18	0.10	0.10	0.13	0.03	0.12
R-square (between)	0.18		0.13		0.03		0.09	
Level 1 (within-classroom)								
Teacher: Closeness with child	0.11*	0.03	0.10*	0.03	0.12*	0.03	0.09*	0.03
Teacher: Conflict with child	−0.11*	0.03	−0.08*	0.03	0.00	0.03	−0.05	0.04
Male x Closeness	−0.15	0.10	−0.12	0.10	−0.12	0.10	−0.16	0.11
Male x Conflict	−0.10	0.06	−0.0	0.05	−0.09	0.05	−0.11*	0.05
Woodcock Johnson 14	0.03	0.02	0.03	0.03	0.07*	0.03	0.04	0.03
Child attended pre-k	−0.01	0.02	−0.03	0.02	0.03	0.02	0.01	0.02
Child speaks Spanish language at home	0.06	0.05	0.10*	0.05	0.04	0.05	0.04	0.05
Child speaks non-English/Spanish language at home	0.05	0.04	0.07*	0.04	0.06	0.04	0.05	0.04
Male	0.20	0.12	0.16	0.11	0.25*	0.11	0.03*	0.12
Ethnicity: Black	−0.02	0.03	0.03	0.03	−0.01	0.03	0.02	0.03
Ethnicity: Hispanic	0.01	0.05	0.02	0.05	0.00	0.05	0.03	0.05
Ethnicity: Asian	−0.05	0.03	0.01	0.03	−0.04	0.03	−0.02	0.03
Income to needs ratio	−0.01	0.03	−0.02	0.03	−0.02	0.03	−0.03	0.03
Parent Ed: Some college	0.07*	0.03	0.03	0.03	0.06*	0.03	0.06*	0.03
BCS-Prop Tch Structure	−0.04	0.04	0.03	0.04	0.05	0.04	0.03	0.04
R-square (within)	0.04		0.03		0.03		0.03	

Note. Standardized coefficients. Model fit – RMSEA = .02, CFI = 1, TLI = 1, SRMRw = .00, SRMRb = .03. CLASS = Classroom Assessment Scoring System; Parent Ed = Parent education; BCS-Prop Tch Structure = Behavioral Coding System – Proportion teacher-led instruction.
*$p < .05$.

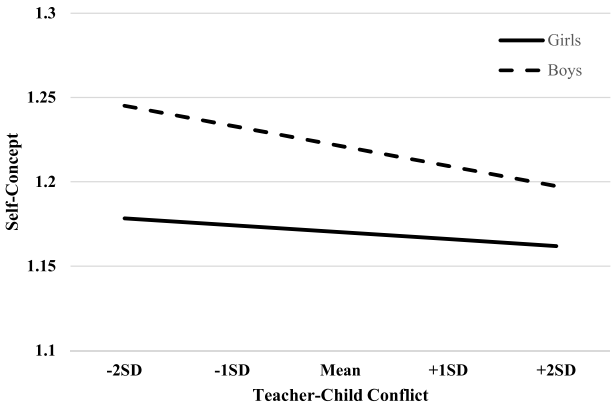

Figure 1. Gender x conflict interaction predicting children's self-concept.
Note. As conflict between teacher and children increased, boys' reported self-concept declined more greatly than girls'.

Discussion

The present study examined how the quality of teacher-child relationships at the individual level and teacher-child interactions at the classroom level independently and jointly relate to kindergarten children's motivation. We also examined whether the associations between teacher-child relationship quality and motivation differed based on children's individual characteristics. Our findings offer support for the critical role of individual teacher-child relationships in supporting kindergarten

children's motivation. However, little evidence was found to suggest links between classroom interactions and motivation. Nor were there interactive effects of teacher-child relationships and classroom interactions on motivation.

Our findings align with those from a study that found positive associations between teacher-child closeness in kindergarten and children's later intrinsic motivation and self-concept for reading in first grade (Guay et al., 2019). Specifically, we found that children with whom teachers perceived closer relationships reported more positive feelings toward the teacher and greater school enjoyment, growth mindset, and self-concept. Further, in line with literature that suggests conflict as a driver for suboptimal academic outcomes (e.g., Hamre & Pianta, 2001), we found that relationships characterized by high conflict may be detrimental for children's motivation. Specifically, children with whom teachers perceived higher conflict reported lower school enjoyment, lower self-concept, and less positive feelings toward their teachers.

The lack of association found between overall classroom interactions and children's motivation contrasts findings from a past study that found higher emotional support and instructional support to be associated with higher motivation (Mantzicopoulos et al., 2018). We hypothesized that teacher-child interactions especially emotional support would be positively associated with motivation as this domain would most reflect the sense of relatedness proposed in the SDT. The lack of significant associations may be due to the low variance in our motivation outcomes at the classroom level (ICC = .04-.06). Another possibility is that, similar to other studies using the CLASS (e.g., Curby et al., 2009; Nguyen et al., 2020), instructional support was relatively low compared to the other domains of teacher-child interactions. It is possible that the level of instructional support may be insufficient to promote children's motivation.

Further, our results showed that teacher-child relationships did not moderate associations between classroom interactions and motivation. Nguyen et al. (2020) suggest that individual relationships between teachers and children may set the foundation for their overall classroom experiences. Accordingly, kindergarten children's motivation may be more closely related to their individual interactions with the teacher rather than general classroom practices more distal to the child. For example, middle school teachers have been found to establish the motivation climate of the classroom in the first few days of school that remains stable over the year (Patrick et al., 2003). But unlike the overall teacher practices and messages that shape a classroom's motivation climate, teachers' evaluation of and feelings about a student can change across the school year (Wang et al., 2020). Hence, teacher-rated relationships may be more proximal and more salient as children form their own feelings about their teacher and their sense of motivation.

Finally, gender differences were found in the association between teacher-child relationships and children's motivation. Boys were more sensitive to conflictual relationships, such that boys with whom teachers reported highly conflictual relationships had lower self-concept than girls who had highly conflictual relationships with their teacher. This is congruent with the academic risk perspective which posits boys may be more sensitive to poor relationships with the teacher as they tend to be at higher risk of academic or behavioral problems (Hamre & Pianta, 2001). These gender differences may also be driven by teachers' own biases. Conflictual relationships with boys may confirm teachers' biases that boys tend to be more disruptive and hence direct more negative attention toward them (McGrath & Van Bergen, 2015). In contrast, we found inconclusive support for moderating effects of gender on the other motivation outcomes (feelings toward teacher, school enjoyment, growth mindset). From the academic risk perspective, this may be because self-concept may be more closely related to achievement than the other motivation constructs. Alternatively, based on the SDT, a child's sense of relatedness to their teacher is critical, regardless of gender, to their intrinsic motivation, which may be most reflected in their school enjoyment. Finally, evidence was inconclusive regarding moderating effects of home language on links between teacher-child relationships and children's motivation, emphasizing the importance of forming high-quality teacher-child relationships for all children.

Limitations

Some limitations should be considered in interpreting our study findings. First, we drew our findings from schools in a single linguistically and ethnically diverse county. Our sample had 82% of children who spoke a language other than English at home. Thus, the teachers' classroom practices and children's school experiences may be unique to this linguistic composition, which limits the generalizability of our findings. Future studies should investigate how children's classroom experiences and their relations to children's motivation might vary in schools of different demographic compositions.

Second, the results are limited based on the timepoints of data collection. Our conclusions are limited to spring reports of teacher-child relationships and children's motivation. Consequently, directional conclusions could not be made. Future studies that measure both fall and spring teacher-child relationships and motivation can better illuminate the development of motivation throughout the school year as a function of children's experiences in the classroom.

Furthermore, we relied on teacher reports of their relationship with each child which may be biased by their beliefs about the child or may differ from the child's perception of the relationship. We did find that children with whom teachers reported closer relationships also reported more positive feelings toward the teacher. However, we did not measure children's perceptions of conflict to confirm this alignment for teacher-child conflict. Future studies can use additional sources, such as observations or peer reports, to assess the quality of teacher-child relationships more objectively and comprehensively.

Finally, it is important to note the relatively small effect sizes of some of our findings (range = .06-.13). Past studies that examined teacher-child relationships and academic outcomes similarly report small effect sizes, around .02 to .10 (Baker, 2006; Nguyen et al., 2020). One possible explanation for small effect sizes in our study is that children in our sample generally reported high levels of motivation (mean = 2.51–2.60). On the one hand, it is possible that children did not use the scale fully; however, the pilot study of the scale yielded high alphas (α = .57-.78) suggesting that the four subscales captured four distinct motivation constructs (Ruzek et al., 2020). On the other hand, these high ratings are congruent with studies that find high motivation during early elementary years (Nurmi & Aunola, 2005; Patrick et al., 2008). It is possible that teacher-child relationships may play a more prominent role in later years as children's motivation declines. Future longitudinal studies can capture how the role of teacher-child relationships in children's motivation changes across elementary years. Moreover, we found consistency in the direction of associations, such that closeness was positively associated with various constructs of motivation whereas conflict was negatively associated with motivation. In addition, compared to the significance and effect sizes of other child-level covariates (e.g., vocabulary skills, pre-K attendance), teacher-child relationships appear to be the strongest predictor of motivation. Thus, although impacts may be relatively small at this stage, creating classrooms that best support children's motivation early may be critical in promoting and sustaining motivation in later years.

Implications

Taken together, our study adds to the literature by highlighting the role of teacher-child relationships in early elementary children's motivation and how these associations may vary by gender. Our findings point to possible areas of intervention to help address the persistent decline in motivation that starts early in elementary school (e.g., Bouffard et al., 2003).

Professional development programs that help teachers develop and maintain high-quality relationships with students can be beneficial. Programs that use observations and coaching have been effective in improving the quality of teacher-child interactions in early childhood classrooms (Pianta, Mashburn et al., 2008). These programs can provide teachers the opportunity to reflect on their classroom instruction and identify areas of improvement or unintentional biases that may be displayed toward certain children. Intervention can also be provided during pre-service training to help teachers recognize and dispel gender stereotypes in the classroom.

Our findings also indicate that high-quality teacher-child relationship is important for all children regardless of linguistic background. Additional support to help teachers overcome linguistic and cultural barriers and develop positive relationships with children from diverse backgrounds may be helpful (McGrath & Van Bergen, 2015). Preservice training programs can also support teachers' cultural competence through recognition of one's own cultural values and through preservice teaching in diverse school settings (Kumar et al., 2018).

In sum, our findings highlight the role of teachers in fostering kindergarten children's motivation. Warm, supportive relationships are associated with higher motivation. In contrast, conflictual relationships may have negative implications, especially for young boys' motivation. Establishing these warm and positive relationships can be critical in creating a strong foundation for children's motivation during early years and setting the stage for future academic success.

Note

1. In accordance with best practices for testing cross-level interactions in multilevel models (Heisig & Schaeffer, 2019), the closeness and conflict slopes were specified as varying (random) across teachers. In all cases, model fit (information criteria) improved when allowing for such varying associations, suggesting that the associations between closeness/conflict and motivation outcomes were stronger in some classrooms and weaker in others.

Acknowledgments

We gratefully acknowledge the support of our many partners: school district leaders, community programs, teachers, parents, and children. Their enthusiastic cooperation and participation made much of this work possible. We also extend appreciation and recognition to Marcia Kraft-Sayre, Marianna Lyulchenko, Laura Helferstay, Brittany Rettig, Arya Ansari, Tara Hofkens, and Tutrang Nguyen who each made valuable contributions to the project.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Institute of Education Sciences (IES) [R305B170002]; Institute of Education Sciences (IES) [R305N160021].

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