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Trajectories of teacher–child relationships across kindergarten and first grade: The influence of gender and disruptive behavior

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ABSTRACT

The present study examined whether teacher–child closeness and conflict across kindergarten and first grade varied by gender and disruptive behavior at kindergarten entry within a sample of 324 predominantly Black children from low-income, urban households. Three main findings emerged from the analyses. First, contrary to findings from previous work that revealed stability in closeness and conflict across the first few years of elementary school, this study identified significant changes in closeness across the kindergarten and first grade years. Second, girls experienced more closeness with teachers than boys across both kindergarten and first grade, and the rate of change in teacher–child closeness differed by child gender across time. Finally, across both school years, associations between gender and teacher–child conflict varied by level of disruptive behavior at the beginning of kindergarten, such that boys with high levels of disruptive behavior experienced more overall conflict with teachers than girls with high levels of disruptive behavior.

1. Introduction

Teachers' perceptions of closeness and conflict within teacher–child relationships in early elementary school are linked to children's emotional and academic well-being (Mashburn & Pianta, 2006; McCormick & O'Connor, 2015; Sabol & Pianta, 2012). More specifically, teacher–child relationships that are high in closeness have been linked to positive emotional, behavioral, and academic outcomes for students, while conflictual relationships have been associated with internalizing and externalizing behaviors (Buyse, Verschueren, Verachtert, & Damme, 2009; Collins, O'Connor, Supplee, & Shaw, 2017; O'Connor, Collins, & Supplee, 2012). Given this wide and growing body of work, supporting close relationships and preventing conflictual ones is an important goal for educational practitioners (e.g., Collaborative for Academic, Social, & Emotional Learning, 2015; Roorda, Koomen, Spilt, & Oort, 2011). Identifying factors related to closeness and conflict in the relationship is critical. In this paper, child characteristics, such as child gender and early disruptive behavior, will be discussed as contributors to teacher's perceptions of their relationships with their students.

Child gender and disruptive behavior within the classroom contribute to teachers' perceptions of their students. As early as the start of formal schooling, teachers perceive their relationships with girls as closer and less conflictual than their relationships with boys, with the gap increasing across time (Henricsson & Rydell, 2004; Jerome, Hamre, & Pianta, 2009; Gluer & Gregoiadis, 2017). Another factor related to teacher–child relationships is children's behavior; children who are perceived by teachers as disruptive have more conflict with their teachers (Bierman, Nix, Domitrovich, Welsh, & Gest, 2015; Hibel, Farkas, & Morgan, 2010). Boys are consistently more likely than girls to begin elementary school with higher levels of disruptive behaviors (Hamre & Pianta, 2001; Silver, Measelle, Armstrong, & Essex, 2005). Early disruptive behaviors are of concern to policymakers and practitioners alike, as they have been linked to children's future mental health challenges, difficulties in peer relationships, and poor academic outcomes (Alexander, Entwisle, & Kabbani, 2001; Dodge, Pettit, & Bates, 1994; Duncan & Magnuson, 2011; Ladd, Buhs, & Troop, 2002).

Further, associations between early disruptive behavior and lower perceived closeness and higher perceived conflict may be stronger among students of color and/or historically marginalized students. Teachers may have biased perceptions of their rela-

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tionships with students of color from low-income backgrounds (Gilliam, 2016). Prior research indicates that teachers tend to have lower educational expectations for Black and Latinx boys from low-income households in urban settings, and Black boys in particular are over-represented in school discipline procedures (Fenning & Rose, 2007; Giordano, Interra, Stillo, Mims, & Block-Lerner, 2020; Thomas & Stevenson, 2009; U.S. Department of Education Office for Civil Rights, 2018; Wood, Kaplan, & McLoyd, 2007; Younger, Warrington, & Williams, 1999). Conversely, because of this racialized disproportionality of expectations and discipline, Black and Latinx children may benefit greatly from teacher–child relationships characterized by high closeness and low conflict. Previous studies have suggested that positive teacher–child relationships are more strongly associated with decreased aggression for Black and Latinx children than for White children (Meehan, Hughes, & Cavell, 2003; Murray, Murray, & Waas, 2008).

Few studies, however, have examined differential trajectories of teacher–child closeness and conflict for girls and boys with and without disruptive behavior problems within an urban, low-income sample across the first two years of school. This area of study is important for further understanding and early identification of children who are in need of additional support within the classroom. Further, it will both provide teachers and administrators with more knowledge about children with whom teachers may need more support to build positive relationships and create more awareness about potential teacher biases within those relationships.

This study, therefore, explores changes in teacher–child closeness and conflict across kindergarten and first grade in a sample of predominantly Black children from low-income and urban contexts. We will examine whether trajectories of teacher–child closeness and conflict differ for boys and girls during the critical early years of schooling. Finally, we will consider whether disruptive behavior at kindergarten entry moderates associations between gender and teacher–child relationship quality. Through this exploration, we seek to better understand the interaction of gender and disruptive behavior in predicting teacher–child relationship quality over a key transitional period in children's educational experience.

1.1. Stability and change within the teacher–child relationship

Previous research has indicated that, while often stable, the amount of closeness and conflict within the teacher–child relationship may vary across time. Higher correlations across years are typically found for conflict than for closeness, suggesting that conflictual relationships are maintained across grades for children whereas closeness may be teacher-specific (McCormick, Turbeville, Barnes, & McClowry, 2014; O'Connor & McCartney, 2006; Pianta & Stuhlman, 2004; Sabol & Pianta, 2012). Although these studies suggest that there is relative stability in the quality of the teacher–child relationship, there is reason to believe that changes occur in the ways children and teachers relate to each other across the first two years of school.

One possible explanation for change within the teacher–child relationship is the large shift in teacher expectations and classroom structure from kindergarten to first grade. While kindergarten is typically child-paced with time for play, first grade is more structured with more emphasis on developing academic competencies (Pianta, La Paro, Payne, Cox, & Bradley, 2002). In first grade, children are expected to sit still and pay attention for longer periods of time (La Paro, Rimm-Kaufmann, & Pianta, 2006; Sink, Edwards, & Weir, 2007). The transition to formal schooling may be especially difficult for urban students from low-income households, as research indicates that teachers in under-resourced schools use more didactic teaching strategies and have fewer interactions with their students of color (Stipek, 2004).

Further, prior studies have indicated that child factors contribute to change in teachers' perceptions of the teacher–child relationship across kindergarten and first grade. Ponitz, Rimm-Kaufman, Brock, and Nathanson (2009) found that boys generally have more difficulty adjusting to first grade than girls do, particularly with respect to behavioral and emotional regulation. Given that most previous studies have examined the trajectories of teacher–child relationships across time with boys and girls together rather than separately (O'Connor, Dearing, & Collins, 2011; Spilt, Hughes, Wu, & Kwok, 2012), they may not have captured the differences between groups. Additionally, findings have suggested that, within a low-income sample as well as in samples of children with high levels of disruptive behavior, teachers' perceptions of their relationships with students may be subject to more change in the early years of school, in comparison to middle- to high-income children and those with lower levels of disruptive behavior (Mashburn & Pianta, 2006; O'Connor et al., 2012; Sabol & Pianta, 2012; Webster-Stratton & Taylor, 2001). Attachment theory and the bioecological model help to explain why the relationships between children and their teachers are malleable during early childhood.

1.2. Theoretical understanding of teacher–child relationships

Attachment theory can be used to explain stability and change within the teacher–child relationship across the first few years of elementary school. According to this framework, early relationships with attachment figures, such as a mother or a teacher, provide a framework for all other adult relationships within a child's life. Specifically, attachment theory posits that repeated interactions between an attachment figure and a child establish an early representation, or an internal working model, of the caregiver, the relation of the self to the caregiver, and the attachment relationship altogether (Bowlby, 1973).

From the perspective of attachment theory, the relationship that a child has with a teacher in kindergarten serves as a relational model for subsequent teacher–child relationships (O'Connor & McCartney, 2007; Pianta, Steinberg, & Rollins, 1995). When teacher–child relationships are characterized by the presence of positivity and warmth, and the absence of conflict, a child is able to use their teacher as a secure base in order to safely explore the school environment (Howes, Phillipsen, & Peisner-Feinberg, 2000; Hughes, Cavell, & Wilson, 2001). In subsequent relationships, children will continue to expect support from teachers and seek out a similarly positive and supporting relationship with them. In contrast, when a child's first experience with a teacher is characterized by negativity and conflict, they are more likely to assume that future teacher interactions will be similarly marred by conflict and a lack of closeness (Doumen et al., 2008; Granic & Patterson, 2006; Hartz, Williford, & Koomen, 2016). Because these children do not have a positive foundational model for relationships with their teachers, they are less likely to view them as a secure base from which they can explore the learning environment, try new things, make mistakes, and grow as learners.

From a slightly different perspective, ecological models of development suggest there is room for change within the teacher–child relationship, as the relationship consists of bidirectional interactions that take place in proximal microsystems within the child's context (Bronfenbrenner & Morris, 1998, 2006; McCormick & O'Connor, 2015). In other words, both the child and teacher influence the relationship independently, and their individual characteristics further interact to contribute to the relationship (Collins et al., 2017; Myers & Pianta, 2008). Prior research examining the bidirectional or transactional nature of the teacher–child relationship showed that child characteristics, particularly the presence of

internalizing and externalizing behaviors, accounted for a significant amount of variance in teachers' perceptions of teacher–child relationship quality (Murray & Murray, 2004). Further study pointed to reciprocal relations between the presence of children's disruptive behavior and teachers' ratings of teacher–child conflict (Zhang & Sun, 2011). The current study focused on how child characteristics are associated with teacher–child relationships, but it is important to note that teachers' attributes also influence these relationships. For example, some research has shown that teacher race/ethnicity and gender may influence their perceptions of students. Specifically, teacher ratings of relationships with their students are more positive when they have the same race/ethnicity and gender as their students (Downer, Goble, Myers, & Pianta, 2016; Gilliam, Maupin, Reyes, Accavitti, & Shic, 2016; Graves & Howes, 2011; Kesner, 2000; Saft & Pianta, 2001; Spilt, Hughes et al., 2012).

Further, with disruptive behaviors in particular, teachers' perceptions of their control over student behavior influences how they rate teacher–child relationships (Doumen et al., 2009). Thus, if teachers do not have the tools to effectively manage children's disruptive behaviors, they are likely to perceive relationships with their students as less close and more conflictual (Myers & Pianta, 2008). Conceptualizing the teacher–child relationship through attachment and ecological lenses therefore suggests that, while the early teacher–child relationship acts as a model for future interactions with teachers, there is room for change in teacher–child relationship quality over time, as the relationship is dependent on each child and teacher.

Yet, more work is needed to understand how unique child factors interact during the development of teacher–child relationships, particularly across several school years. Given the literature on the changes that occur within the classroom between kindergarten and first grade as well as adjustment differences between boys and girls in the early years of school (Pianta et al., 2002; Ponitz, Rimm-Kaufman, Brock, & Nathanson, 2009; Sink et al., 2007), one would expect that teacher–child relationships would show differential trajectories across kindergarten and first grade when boys and girls are explored separately.

1.3. Child gender and teacher–child relationships

Historically, it has been argued that girls are placed at a disadvantage in the classroom in terms of their relationship with teachers. Specifically, this view holds that low-achieving or aggressive boys receive most of the negative attention (e.g., anger, tension, criticism) from teachers, while high-achieving boys or boys presenting with "appropriate" behavior disproportionately receive positive attention and constructive feedback (e.g., warmth, praise, positive affect) (Serbin, O'Leary, Kent, & Tonick, 1973; Spencer, Porche, & Tolman, 2003). With so much time and attention spent on boys, there is little room left for girls to establish relationships with teachers. On the other hand, it has also been suggested that boys receive less attention and instruction in the classroom compared to girls, which may result in less time for boys to interact with teachers (Corbett, Hill, & St. Rose, 2008; Sadker & Zittleman, 2004). Perhaps these opposing views reflect that the relationship between gender and teacher–child relationships is context-specific, with teachers' differential treatment of boys and girls depending on factors such as classroom environment or behavior management style.

Boys' and girls' relationships with teachers also develop differently over time. Longitudinally, both boys and girls appear to increase in conflict and decrease in closeness with their teachers throughout elementary school (Ewing & Taylor, 2009; Jerome et al., 2009). However, boys experience higher levels of conflict overall with teachers, whereas girls have higher levels of support and warmth from their teachers (Hughes, Zhang, & Hill, 2006; Hughes, 2011; McCormick & O'Connor, 2015; Spilt, Hughes et al., 2012; Wu, Hughes, & Kwok, 2010). In addition, while boys and girls followed similar patterns in reported teacher–child closeness and conflict, boys experienced greater stability in conflict and steeper declines in closeness than girls (Ewing & Taylor, 2009; Jerome et al., 2009; Spilt, Hughes et al., 2012).

One possible explanation for these differing trajectories may be that classroom-based education favors typically "female" characteristics. For example, girls are often socialized to be compliant, pay attention, and be responsible—all characteristics associated with a "traditional" student—while boys are taught that these characteristics are not masculine (Leaper & Friedman, 2007; Legewie & DiPrete, 2012; Mickelson, 2003; Morris, 2011). Further, the development of the prefrontal cortex, which is related to some social-emotional skills (e.g., attention, self-regulation, and decision making) may differ by gender, such that girls experience earlier development than boys (Hooper, Luciana, Conklin, & Yarger, 2004; Kerr & Zelazo, 2004).

When considering race and ethnicity, another explanation is that teachers and parents have different expectations for Black and Latinx boys compared to their female peers (Leath et al., 2020; Mahatmya, Lohman, Brown, & Conway-Turner, 2016; Wood et al., 2007). Specifically, teachers tend to have lower expectations of academic abilities for both Black and Latinx boys, which may predispose them to greater difficulty in school (Marsh & Noguera, 2018; Wood et al., 2007). Parents of Black boys in particular also tend to report lower educational attainment expectations, citing concerns about how teachers' perceptions of boys, as well as potential learning disabilities (e.g., hyperactivity, distractibility, difficulties with self-regulation), may affect their academic success (Leath et al., 2020; Wood et al., 2007). In contrast, Latinx parents tend to have high expectations and aspirations for their children, regardless of gender (Chavira, Cooper, & Vasquez-Salgado, 2016). These explanations suggest that boys, especially Black boys, might be placed at a higher risk for poor relationships with teachers throughout elementary school than their female counterparts. However, further research is necessary to better understand how teacher–child relationship trajectories differ for boys and girls from predominantly Black, low-income backgrounds during the early years of schooling.

1.4. Gender, disruptive behaviors and teacher–child relationships

When students enter elementary school today, they are expected to demonstrate readiness skills (Blair, 2002; Raver, 2003) such as academic preparedness and social-emotional development, including the ability to regulate emotions and behaviors. Low social-emotional skills are linked with more disruptive behavior (Greenberg et al., 2003). Children's ability to control their emotions and behaviors at the start of kindergarten contributes to the development of the early teacher–child relationship (Myers & Pianta, 2008). For example, teacher interactions tend to be more negative (e.g., characterized by minimal closeness and higher conflict) with children who exhibit aggressive behaviors at the beginning of kindergarten (Doumen et al., 2008). Over time, if this pattern of interaction continues, the problematic behaviors increase, and the relationship becomes even more negative. Coercion theory may account for these teacher–child transactions, as teachers may inadvertently reinforce disruptive behavior of children through negative reinforcement, which then leads to increased disruptive behavior and negative perceptions of students (Patterson, 1982; Reid, Patterson, & Snyder, 2002). The coercive interaction style may be pronounced in boys with disruptive behavior (Patterson et al., 2002).

Prior research has found that girls begin school with greater social-emotional skills and continue to develop social emotional skills at a faster rate throughout the early school years, while

their male counterparts lag behind throughout elementary school (DiPrete & Jennings, 2012). Because low social-emotional skills have been linked to more disruptive behavior (Greenberg et al., 2003), it is not surprising that boys tend to enter elementary school with higher levels of disruptive behaviors than girls (Graves & Howes, 2011; Hamre & Pianta, 2001; Hibel et al., 2010; Silver et al., 2005). Previous findings indicate stronger associations between teacher–child conflict and hostile-aggressive behavior for boys than for girls in the early school years (Ewing & Taylor, 2009). Boys of color, particularly Black boys, with high levels of disruptive behavior may be placed at even greater risk for the development of poor relationships with their teachers, perhaps in part due to teacher biases (Giordano et al., 2020; Henricsson & Rydell, 2004; Hibel et al., 2010; Meehan et al., 2003; Murray et al., 2008; Silver et al., 2005; Wood et al., 2007). Thus, it is expected that the presence of disruptive behavior may be linked to higher conflict and lower closeness within teacher–child relationships over time for boys within this study's sample.

1.5. The current study

Given the gaps in the current literature outlined above, this study sought to answer the following research questions:

1) Do teacher–child closeness and conflict demonstrate significant changes over kindergarten and first grade?
2) Do teacher–child closeness and conflict trajectories differ by child gender?
3) Do longitudinal associations between child gender and teacher–child closeness and conflict vary based on early behavior problems over the course of kindergarten and first grade?

Examining how the quality of the early teacher–child relationship, child gender, and disruptive behavior interact over the course of the kindergarten and first grade school years could provide valuable insight into who should be targeted for school-based interventions aimed at improving school adjustment and when those interventions should be implemented.

2. Method

Data for this study came from a randomized control trial (RCT) of a universal social-emotional intervention program, which included twenty-two elementary schools serving families from low-income urban neighborhoods (O'Connor, Cappella, McCormick, & McClowry, 2014). Randomization took place at the school-level, such that 11 schools were randomized to the intervention and 11 schools were randomized to the control condition, a supplemental reading program. However, the current study did not address intervention effects. Given that the current study aimed to better descriptively understand the teacher–child relationship during the early years of school and not the impact of the intervention on the teacher–child relationship, the current analyses controlled for intervention effects.

Although this study did not focus on intervention impacts, a brief description of the intervention is provided here. The intervention aims to enhance the fit between children's temperaments and their immediate environments at school and at home. As part of the program, parents and teachers learn how to recognize the consistent behavioral style that a child exhibits across settings as an expression of temperament. Parents and teachers then learn to alter their responses to children based on each child's temperament. In the classroom program for children, a focus is also on expanding children's own understandings of temperament, empathy skills, and problem-solving strategies.

Table 1
Descriptive statistics from the full kindergarten sample.

	Girls		Boys	
	Mean	SD	Mean	SD
Child demographics				
Baseline age (years)	5.62	0.42	5.58	0.37
Female (%)	0.49	–	0.51	–
Black (%)	0.75	–	0.74	–
Hispanic (%)	0.17	–	0.18	–
Eligible for free and reduced lunch (%)	0.89	–	0.85	–
Parent demographics (%)				
Less than high school	0.32	–	0.30	–
High school	0.26	–	0.27	–
Some college	0.42	–	0.43	–
Descriptive statistics (teacher report)				
Baseline level of behavior problems	1.96	1.00	2.45	1.23
Baseline teacher–child closeness	4.20	0.67	3.98	0.71
Baseline teacher–child conflict	1.64	0.79	1.97	1.02

2.1. Participants

The full study sample included 435 children and their parents, as well as 120 teachers from kindergarten and first-grade classrooms. All students who enrolled in an intervention or control classroom received the intervention or a supplementary reading program. Approximately four children per classroom participated in data collection. The current analyses evaluated trajectories of children throughout kindergarten and first grade, therefore only students who were enrolled in kindergarten at baseline were included in the study. Individual study participants included 324 participants and their teachers (N = 118). Of these participants, 55% (N = 181) were in the treatment group, and 44% (N = 143) were in the control group.

Participating children ranged from 4 to 7 years of age when they entered the study (M = 5.60 years SD = 0.40 years). Approximately half of the children were female (49%). Seventy-five percent of children were Black, non-Latinx; 17% were Latinx; and the remaining children were biracial. The majority (87%) of children qualified for free or reduced lunch (see Table 1).

Sixty kindergarten teachers and 62 first grade teachers were included in the sample. Two teachers taught both kindergarten and first grade during the consecutive years. Teachers were predominantly female (96%). Sixty-one percent of teachers were Black; 23% were White; 10% identified as Latinx; and 6% were mixed race/other. All teachers had a bachelor's degree, and 96% of teachers had a master's degree. On average, teachers had 13.85 years of teaching experience and had been teaching at their current school for 9.86 years.

Thirty-seven percent of children had teachers of the same race or ethnicity. One hundred and fifteen Black children had Black teachers; three Latinx students had Latinx teachers; and one biracial student had a biracial teacher. Forty-four percent of students had teachers who matched their gender. One hundred and thirty-three girls had a female teacher, and eight boys had a male teacher.

2.2. Research procedures

Research and recruitment efforts were approved by the university and school system research boards. Teacher and parent consents, along with child assent, were obtained before participation in the study.

2.2.1. Selection and recruitment schools

Elementary schools serving students from low-income households within a large, urban school system in the New York City area were recruited to participate in this study. Schools were contacted based on the percentage of their students (greater than 50%) who

were eligible for free or reduced-price lunch. Twenty-three schools initially agreed to participate, but one school withdrew prior to data collection or randomization after a principal transition occurred.

2.2.2. Selection and recruitment of teachers

Kindergarten and first grade teachers from participating schools were eligible for the study. Teachers were recruited through small groups or individual meetings. Ninety-six percent of the kindergarten and first grade teachers consented to participate. All teachers who consented participated for the entire study. Teachers answered questions about participating students' behaviors and their own relationship with each student. For their participation, teachers received a $50 gift card to purchase classroom supplies at each data collection time point.

2.2.3. Recruitment of children

After parents provided consent to participate in the study, child assent was obtained. Recruitment ended after all possible efforts to recruit students were exhausted and a minimum of four students per classroom was enrolled.

2.2.4. Data collection

Parents and teachers provided data for these analyses. Before each of the five data collection periods, researchers and field staff participated in group training about procedures and measures. Time 1 (T1) data were collected in the winter of the kindergarten year and Time 2 (T2) data were collected during the late spring of the kindergarten year. Time 3 (T3) data were collected in the fall of first grade, Time 4 (T4) data were collected during the winter of first grade, and Time 5 (T5) data were collected in the late spring of the first-grade year.

2.3. Measures

2.3.1. Demographics

When children enrolled in the study at the beginning of kindergarten (T1), parents reported on their children's demographic characteristics (gender, race, ethnicity, age, and eligibility for free/reduced price lunch). Parents also answered questions about themselves, including their education level. Child gender (female = 1; male = 0), child age (in years), child race (four variables that were dummy coded for Latinx, Black, White, or other race/ethnicity), child eligibility for free or reduced price lunch (eligible = 1; not eligible = 0), and parent education level (dummy coded as 4 binary variables representing educational completion: less than high school, high school, some college, and college), are included in all models as covariates. The demographic information was included as covariates as they all might influence the likelihood of having a high-quality teacher–child relationship (Ewing & Taylor, 2009; Jerome et al., 2009; Saft & Pianta, 2001).

2.3.2. Child level disruptive behavior

Child disruptive behaviors were measured with the Sutter-Eyberg Student Behavior Inventory (SESBI), which is a 36-item teacher report that can be used with children ages 2–16 (Eyberg & Pincus, 1999). Two scales result from the SESBI items—the Intensity scale and the Problem scale. On a 7-point Intensity scale (1 = never, 3 = seldom, 5 = sometimes, 7 = always), teachers reported on the frequency with which each student exhibited a range of disruptive behavior, such as "has difficulty entering groups," "verbally fights with other children," and "is overactive and restless." For each behavior, teachers also indicated whether they found the behavior to be problematic on the Problem scale (1 = yes; 0 = no). A mean score was calculated for the intensity scale by averaging the individual items for the full scale. In order to use the SESBI clinically, the intensity scores are added together, and if the sum is greater than 150, the score is considered to be clinically significant (Eyberg & Pincus, 1999). The SESBI was collected at all five time points. The Intensity score for time 1 (measured at baseline) was used for these analyses. The scale has demonstrated strong reliability and validity (Querido & Eyberg, 2003). Cronbach's alpha for the intensity scale in the current study (0.94 to 0.97 across five time points) was consistent with the Cronbach's alpha obtained in the norming sample ($\alpha = 0.98$) (Eyberg & Pincus, 1999). The SESBI was highly correlated with all subscales of the Conners Teacher Rating Scale-Revised: Long Form (CTRS-R:L), demonstrating convergent and discriminant validity (Querido & Eyberg, 2003).

2.3.3. Teacher–child relationship quality

The short version of the Student-Teacher Relationship Scale (STRS; Pianta, 2001) was used to evaluate teacher–child relationship quality at all 5 time points. The short version of the measure includes 15 items. The closeness subscale consists of eight items and indicates the amount of affection, warmth, and open communication that the teacher experiences when relating to a student (e.g. "This child openly shares his/her feelings and experiences with me"). The conflict subscale consists of seven items and measures the teacher's perceptions of negativity and conflict in their relationship with a student. Both subscales are completed using a 5-point Likert scale that ranges from 1 (definitely does not apply) to 5 (definitely applies). Teachers completed the scale for each of their students participating in the study. Scores for the subscales were obtained by averaging the items of the closeness and conflict scales separately. Possible scores on both scales ranged from 1 to 5, with one indicating low closeness and low conflict, and 5 signifying high closeness and high conflict. Cronbach's alpha ranged from 0.91 to 0.94 across the time points and subscales.

2.4. Analytic approach

2.4.1. Missing data

For the child-level variables, there was 0–20% missing data across study variables. Participants with missing data points were compared to participants without missing data points on all characteristics collected at the beginning of kindergarten, including parent education status, child age, child gender, child race/ethnicity, and child disruptive behaviors. Our comparisons indicated that missingness patterns between baseline variables were not completely at random. Black students and students with high levels of disruptive behaviors at baseline were more likely to have missing data. As such, the assumptions required for complete case analysis (or listwise deletion) were not met (Hill, Waldfogel, Brooks-Gunn, & Han, 2005; Little & Rubin, 1989). To maximize power, covariates were imputed. A multiple imputation method was utilized, and 20 separate datasets were imputed by chained equations, using SAS PROC MI in SAS version 9.2. Final parameter estimates were generated by calculating the mean of the twenty estimates. A maximum likelihood estimator was employed within all models to account for missing data within the outcome variables.

2.4.2. Growth curve modeling

Individual growth modeling was used to assess change over time in closeness and conflict within the teacher–child relationship. Data were from an RCT intervention study, and treatment status was included as a control in all models. A sample of 324 children was included in the predictive models. Models were fitted with STATA 14, using a maximum likelihood estimator. The assessment time point (T1-T5) was used as a measure of time. Equal intervals were assumed between time points. Thus, time was centered at the initial time point (T1) so that the intercept would represent the level of the outcome, i.e. teacher–child closeness or conflict, at T1. A quadratic time variable was also tested in the closeness and conflict models.

Closeness within the teacher–child relationship appeared to significantly change non-linearly as well as linearly, however conflict only significantly changed linearly. Thus, quadratic time was included in all closeness models, but not in the conflict models. Individual characteristics measured at kindergarten entry were included as covariates in models to improve the precision of estimates (Shadish, Cook, & Campbell, 2002). Child age and disruptive behavior at the beginning of kindergarten were separately centered around their grand mean in order to make the intercept and interactions interpretable. Level of disruptive behavior at the kindergarten transition was utilized rather than a time varying disruptive behavior variable in order to assess how initial levels of disruptive behavior at kindergarten entry influence trajectories of teacher–child closeness and conflict within the first two years of school.

Since repeated measures were nested in children, who were also nested within schools, the appropriateness of a three-level model was examined. Initial analyses, consisting of three-level unconditional models (Level 1 = repeated measures; Level 2 = students; Level 3 = schools), were run for each of the outcomes to determine whether there was significant between-individuals and between-schools variation in the predictors. Unconditional means models suggested significant between-individual variation in each outcome. Thus, a random effect was included at Level 2 in all models, allowing the intercept to vary at the student level (Raudenbush, 2009). Through examination of the unconditional growth models, the need for the inclusion of random slopes for child gender and level of behavior problems at the beginning of kindergarten was evaluated. When random slopes were added, residual variation did not change, and model fit was not improved. Therefore, random slopes were not included in the subsequent predictive analyses. Further examination of unconditional models at Level 3 suggested some outcome variation based on contextual factors at the school level. When a random effect was added, allowing the intercept to vary randomly around the school mean, model fit was improved in all Level 3 models. Thus, a three-level model was chosen for all analyses. For all significant findings, effect sizes were calculated by dividing the regression coefficients by pooled standard deviations. The effect sizes within our study are consistent with effect sizes seen in other studies that have examined gender as a moderator in relation to teacher–child relationships (see Hajovsky, Mason, & McCune, 2017; Ewing & Taylor, 2009; and McCormick & O'Connor, 2015).

Research question 1. Do teacher–child closeness and conflict demonstrate significant changes over kindergarten and first grade?

To examine the first research question, time, child gender, level of disruptive behavior at the beginning of kindergarten, child age, child race, child free/reduced price lunch eligibility, parent level of education, and treatment condition were entered into separate models predicting teacher–child closeness and conflict. For teacher–child closeness, quadratic time was added to the model next. Disruptive behavior at the kindergarten transition was included as a covariate in all models to adjust for this potentially confounding factor. Treatment status was controlled for in all models. In order to rule out treatment effects within our models, all models were run with interactions between predictors and treatment status. No statistically significant interactions were found.

Research question 2. Do teacher–child closeness and conflict trajectories differ by child gender?

In order to answer research question 2 of teacher–child closeness, interactions between quadratic time and gender and time and gender were added to the models described above. The interaction between quadratic time and gender was added first to test whether the acceleration rate differs by gender. Only a time by gender interaction was added to the conflict model. A significant time by gender interaction indicated a difference in rate of change at time 1 for teacher–child closeness and conflict between boys and girls. A significant quadratic time by gender interaction suggested a difference in rate of change differences in rate of change over time in teacher–child closeness and conflict between boys and girls.

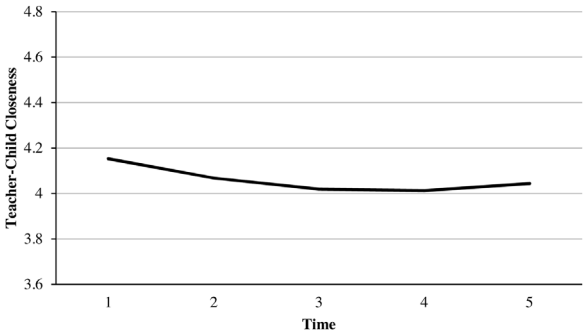

Fig. 1. Teacher–child closeness trajectory for full sample.

Research question 3. Do longitudinal associations between child gender and teacher–child closeness and conflict vary based on early behavior problems over the course of kindergarten and first grade?

An interaction between gender and disruptive behavior at the beginning of kindergarten was then added to the analytic models. The gender by level of disruptive behavior interaction indicates whether level of disruptive behavior is differentially associated with the relation between gender and the quality of the teacher–child relationship. Within the closeness models, an interaction of quadratic time, gender and disruptive behavior at the beginning of kindergarten was added first, and then an interaction between time, gender, and disruptive behavior was included. For the conflict models, the interaction of time, gender, and disruptive behavior at the beginning of kindergarten was added. A significant gender by disruptive behavior by time interaction term indicates differential growth in outcomes, i.e. teacher–child closeness and conflict, over time between boys and girls at different levels of disruptive behavior at kindergarten entry.

3. Results

3.1. Research question 1

Analyses revealed a significant effect of time on teacher–child closeness (γ = -0.03, p = 0.01, E.S. = 0.17) (see Model 1 in Table 2). When time was controlled for in Model 2, the quadratic time effect was also significant for closeness (γ = 0.02, p < 0.05, E.S. = 0.11) (see Fig. 1). Additionally, child gender was a significant predictor for teacher–child closeness (γ = 0.27, p < 0.001, E.S. = 1.49) (see Table 2). The effect of time on conflict was not significant (see Model 1 in Table 3). These closeness results indicate that, at the start of kindergarten, the slope of change in teacher–child closeness was negative for the full sample. Combined with the positive quadratic time effect, the findings indicate a decelerated decrease of perceived teacher–child closeness, such that closeness decreased at a slower rate over time. Further, across the time period, teachers perceived their relationships with girls, on average, as higher in closeness than their relationships with boys.

3.2. Research question 2

When the quadratic time by gender interaction was entered into the closeness model, a significant interaction was revealed (γ = 0.02, p < 0.01, E.S. = 0.16) (see Table 2). The interaction indicates that the rate of acceleration in teacher–child closeness over kindergarten and first grade was different between boys and girls.

Table 2
Growth models predicting teacher–child closeness from child gender and level of behavior problems at the beginning of kindergarten.

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7		
Fixed effects	γ		SE	γ		SE	γ		SE	γ		SE	γ		SE	γ		SE	γ		SE
Between-student variables																					
Treatment (vs. control)	0.02		0.10	0.02		0.10	0.02		0.10	0.02		0.10	0.01		0.10	0.01		0.10	0.01		0.10
Eligible for free/reduced lunch	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01
Child black	−0.17	*	0.08	−0.17	*	0.08	−0.16	*	0.08	−0.16	*	0.08	−0.16	*	0.08	−0.16	*	0.08	−0.16	*	0.08
Child Latinx	−0.16		0.09	−0.15		0.09	−0.15		0.09	−0.15		0.09	−0.15		0.09	−0.15		0.09	−0.15		0.09
Child age	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Parent with less than hs education	−0.04		0.06	−0.04		0.06	−0.04		0.06	−0.04		0.06	−0.03		0.06	−0.03		0.06	−0.04		0.06
Parent with hs education	−0.04		0.06	−0.04		0.06	−0.04		0.07	−0.04		0.07	−0.05		0.07	−0.05		0.07	−0.05		0.07
Child gender	0.27	**	0.05	0.27	**	0.05	0.19	**	0.06	0.17	*	0.08	0.17	*	0.08	0.17	*	0.08	0.16	*	0.08
Baseline behavior problems	−0.06	**	0.02	−0.06	**	0.02	−0.06		0.02	−0.06	**	0.02	−0.08	**	0.03	−0.08	**	0.03	−0.08	**	0.03
Gender by behavior problems													0.05		0.05	0.05		0.05	0.02		0.06
Within-student variables																					
Time	−0.03	*	0.01	−0.11	**	0.04	−0.11	**	0.04	−0.12	*	0.06	−0.12	*	0.06	−0.12	*	0.06	−0.12		0.06
Time*Time				0.02	*	0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01
Gender by time*time							0.02	**	0.01	0.01		0.02	0.01		0.02	0.01		0.02	0.01		0.02
Gender by time										0.03		0.08	0.03		0.08	0.03		0.08	0.04		0.09
Gender by behavior problems by time*time																0.00		0.00	−0.01		0.02
Gender by behavior problems by time																			0.05		0.06
Random effects																					
Student-level variance	0.10		0.02	0.10		0.02	0.10		0.02	0.1		0.02	0.10		0.02	0.10		0.02	0.01		0.02
School-level variance	0.05		0.02	0.05		0.02	0.05		0.02	0.05		0.02	0.05		0.02	0.05		0.02	0.05		0.02
Residual variance	0.36		0.02	0.36		0.02	0.35		0.02	0.35		0.02	0.35		0.02	0.35		0.02	0.35		0.02

* $p < 0.05$.
** $p < 0.01$.

Table 3
Growth models predicting teacher–child conflict from child gender and level of behavior problems at the beginning of kindergarten.

	Model 1		Model 2		Model 3		Model 4	
Fixed effects	γ	SE	γ	SE	γ	SE	γ	SE
Between-student variables								
Treatment (vs. control)	−0.04	0.06	−0.04	0.06	−0.04	0.06	−0.04	0.06
Eligible for free/reduced lunch	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01
Child black	0.11	0.07	0.11	0.07	0.11	0.07	0.12	0.07
Child Latinx	0.00	0.08	0.00	0.08	0.00	0.08	0.00	0.08
Child age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parent with less than hs education	0.05	0.06	0.05	0.06	0.05	0.06	0.05	0.06
Parent with hs education	0.09	0.06	0.09	0.06	0.09	0.06	0.10	0.06
Child gender	−0.07	0.05	−0.09	0.06	−0.09	0.06	−0.07	0.07
Baseline behavior problems	0.55 **	0.02	0.55 **	0.02	0.56 **	0.03	0.56 **	0.03
Gender by behavior problems					−0.02	0.05	0.05	0.06
Within-student variables								
Time	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.02
Gender by time			0.01	0.02	0.01	0.02	−0.01	0.03
Gender by behavior problems by time							−0.04 *	0.02
Random effects								
Student-level variance	0.10	0.02	0.10	0.04	0.10	0.02	0.10	0.02
School-level variance	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Residual variance	0.35	0.02	0.35	0.02	0.35	0.02	0.35	0.02

* $p < 0.05$.
** $p < 0.01$.

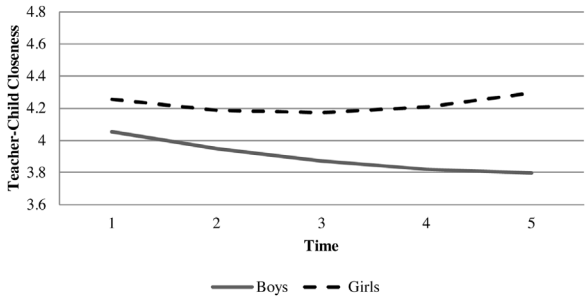

Fig. 2. Teacher–child closeness trajectories for boys and girls.

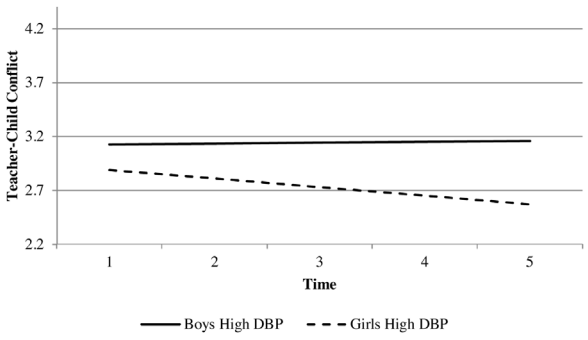

Fig. 3. Teacher–child conflict by child gender and high disruptive behavior.

As shown in Fig. 2, teachers perceived their closeness with girls as fairly stable across the first two years of school. However, teachers' perceptions of closeness with boys decreased across kindergarten and first grade. When the interaction between time and gender was added next to the closeness model (see Model 4 in Table 2), neither interaction was significant. Thus, across kindergarten and first grade, boys and girls differed in the rate of change of teachers' perceptions of closeness, with the slope of closeness for boys decreasing across time. A significant time by gender interaction was not found in the teacher–child conflict model (see Model 2 in Table 3).

3.3. Research question 3

Within the study's sample, nine percent of students met clinical cut-off criteria for disruptive behavior, which is in line with research on other non-clinical samples within urban settings (Raver et al., 2009). This nine percent accounted for approximately 46 percent of the high disruptive behavior group, indicating that not all members of the group with the greatest level of disruptive behavior met clinical criteria. Yet, students who did not meet clinical criteria still exhibited more disruptive behavior, according to their teachers, relative to other students in the sample.

To first test whether disruptive behavior moderated the association between gender and teacher–child closeness and conflict, an interaction term was added to both models. Results did not indicate a significant gender by disruptive behavior interaction for closeness or conflict. Although the time by gender interaction was not significant in the teacher–child conflict model, findings suggested a time by gender by level of disruptive behavior at kindergarten entry interaction on teacher–child conflict ($\gamma = -0.04, p = 0.05$, E.S. = -0.11) (see Table 3). This interaction effect suggests that level of disruptive behavior at the beginning of kindergarten moderated the relation between gender and teachers' perceptions of teacher–child conflict over time, such that the slope of perceived teacher–child closeness for boys and girls differed by baseline disruptive behavior.

In addition, teachers rated both boys and girls with high disruptive behavior, even if they did not meet clinical criteria, as having greater teacher–child conflict compared to those with average or low levels of disruptive behavior. But, as can be seen from Fig. 3, teachers' perceptions of teacher–child conflict for boys with high disruptive behavior remained fairly high and stable throughout kindergarten and first grade. For girls with high disruptive behavior, however, perceived teacher–child conflict appeared to decrease across the two school years. The gender by disruptive behavior by quadratic time and gender by disruptive problem by time interactions were not significant in the closeness model.

4. Discussion

This study explored teachers' perceptions of teacher–child closeness and conflict across kindergarten and first grade in a predominantly Black, low-income sample, and considered variation in closeness and conflict trajectories by gender and level of disruptive behavior at the start of kindergarten. Previous research utilizing

more economically advantaged samples has indicated stability in the quality of teacher–child relationships across the first two years of elementary school, with higher stability in conflict rather than closeness (O'Connor & McCartney, 2006; Pianta & Stuhlman, 2004; Sabol & Pianta, 2012). Contrary to these previous findings, we found modest, yet significant, change in teachers' perceptions of closeness. Perceived closeness within the teacher–child relationship decreased over kindergarten and first grade in our overall sample. However, similar to previous studies, significant change was not found in teachers' perceptions of teacher–child conflict for the full sample. These results are important as they may point to systematic educational differences within the classroom setting that place Black and other children of color from low-income backgrounds at a disadvantage.

The findings for teachers' perceptions of teacher–child closeness suggest that the decline in the quality of the teacher–child relationship seen throughout elementary school might begin in the very early school years for Black and Latinx students from low-income households (O'Connor, 2010; O'Connor et al., 2012; Pianta & Stuhlman, 2004). A potential reason for the decrease in perceived closeness could be related to teacher biases regarding students of color from low-income backgrounds, particularly boys (Wood et al., 2007). Importantly, teachers' perceptions of their closeness with students is influenced by teacher–child racial/ethnic match, with teachers rating closeness as higher when they are of the same race/ethnicity as the children (Saft & Pianta, 2001). It is concerning that perceived closeness with teachers declined so early in schooling for a sample of children from primarily Black, low-income households, given that high quality teacher–child relationships in the early years of school may act as a protective factor for these students who are particularly in need of support (Mashburn & Pianta, 2006; O'Connor et al., 2012; Sabol & Pianta, 2012; Webster-Stratton & Taylor, 2001).

In contrast to closeness, teachers' ratings of conflict with children in kindergarten seems to have carried over to their relationship with their first-grade teacher. Despite the change in teachers and differences between kindergarten and first grade, teachers perceived similar levels of conflict. This finding is consistent with attachment theory, which posits that children form an early working model, or representation of the teacher–child relationship, that continues in subsequent teacher–child relationships (Bretherton, 1985; Howes et al., 2000; O'Connor & McCartney, 2007; Pianta et al., 1995).

Our findings also indicate that, throughout kindergarten and first grade, teachers perceived closer relationships with girls than with boys. The interaction, which is small yet significant, corroborates the findings of other research that girls generally have higher quality teacher–child relationships than boys (Ewing & Taylor, 2009; Hamre & Pianta, 2001). However, previous research also has found that teachers' perceptions of closeness decline for both girls and boys, which was not the case with our sample (Ewing & Taylor, 2009; Jerome et al., 2009). Societal expectations of girls as compliant, attentive, and responsible may enable teachers to perceive greater closeness with them, while negatively gendered expectations of disruptive behavior and inattention in males may contribute to teachers' poorer perceptions of closeness with boys (Wood et al., 2007). Further, previous research has indicated that teachers may have particularly negative expectations for Black boys from low-income backgrounds (Wood et al., 2007, Gilliam, 2016). Within our sample, these predispositions for negative expectations may manifest as perceptions of relationships that are less close with their students early in elementary school. teacher–child relationships in kindergarten and first grade that are characterized by less closeness are troubling, considering that the relationships formed in the first years of elementary school predict concurrent and subsequent academic and social outcomes (Maxwell & Eller, 1994; Parker & Asher, 1987).

In addition to our findings that boys seem to be placed at a disadvantage in terms of perceived teacher–child closeness, the results also indicated that teachers rated boys with high levels of disruptive behavior as having greater and more stable conflict than girls with disruptive behavior across kindergarten and first grade, placing boys at an even greater disadvantage. One possible explanation for the stability of conflict for boys with high levels of disruptive behavior is communication between kindergarten and first grade teachers before the transition to first grade. If transition meetings occur, it is possible that kindergarten teachers draw attention to the children who were more disruptive in the classroom throughout the year such that, before the school year begins, first grade teachers are already biased toward the children who might present more difficulty (La Paro, Pianta, & Cox, 2000). While these meetings can often help ease the stress of the kindergarten-first grade transition for children and families, they may also reinforce teachers' gendered and behavioral expectations of higher levels of closeness in their relationships with some of their future students and higher levels of conflict with others.

Further, studies have examined the bi-directional relationship between teacher–child conflict and child disruptive behavior. Doumen et al. (2008) demonstrated that children's aggressive behavior at the beginning of kindergarten led to increases in conflict with the teacher during the middle of the year, which then led to more aggressive behavior at the end of kindergarten. While we did not look at time-varying disruptive behavior in this study, our findings seem to be consistent with this transactional pattern for boys (Doumen et al., 2008). Teacher ratings indicated that boys with disruptive behavior in kindergarten tend to form relationships that are perceived by teachers as conflictual; these perceptions may help maintain or increase the level of actual or perceived disruptive behavior by the end of the kindergarten year. This cycle can reinforce both children's and teachers' perceptions of their relationship as negative, which in turn places the children at further risk of forming another teacher–child relationship characterized by perceived conflict in first grade. This interaction style is somewhat complimentary to coercion theory, which posits that children with disruptive behavior engage in negative behaviors that are reinforced through the removal or escalation of commands (e.g., in a conflictual manner) by teachers, making the behaviors likely to continue in the future (Patterson, 1982). Over time, these children may continue to use this counterproductive strategy in their interactions because it is the primary interaction style they have learned (Granic & Patterson, 2006; Reid et al., 2002).

However, this similar pattern was not seen for girls in our sample, suggesting that relationships between teachers and girls with high levels of disruptive behavior may be more dependent on the specific teacher. Teachers may not have the same societal predisposition in their relationships with girls, which may enable girls to form independent relationships with their teachers that are not as related to their level of disruptive behavior. Another possible explanation is that girls who exhibit high levels of disruptive behavior at the beginning of kindergarten may decrease in disruptive behavior during the first two years of school, which may contribute to differences in the level of perceived teacher–child conflict between kindergarten and first grade (DiPrete & Jennings, 2012). Further research should be conducted with disruptive behavior varying across time for boys and girls separately in order to test these hypotheses. Nonetheless, our findings suggest that girls and boys from predominantly Black, low-income backgrounds may experience different relationships with their teachers in the early years of elementary school, and boys in particular may be at a disadvantage in these co-constructed interactions and relationships. These findings further point to the importance of creating interventions

aimed at improving the early teacher–child relationship for these students, as this relationship is essential for future development.

4.1. Limitations

There are several limitations to this study. First, the current study does not allow for causal inference. Instead, it provides descriptive information on teacher–child trajectories for different groups across kindergarten and first grade. Next, there are a number of potential confounding factors, including teacher and parent characteristics, to which the researchers did not have access and thus could not be included in the analyses as controls. Relatedly, factors such as teacher–child gender and racial/ethnic match were not examined within this study, although they have been shown to influence teacher ratings of relationships with students (Downer et al., 2016; Gilliam et al., 2016; Kesner, 2000; Saft & Pianta, 2001; Spilt, Hughes et al., 2012). While our data limits us in studying these factors, future research should be conducted on these topics. Third, although significant effects of control variables, particularly race, were found in the teacher–child closeness models, the finding was not highlighted within this paper. Future studies, using samples with greater variability in race and ethnicity, should include moderation analyses of race/ethnicity on the teacher–child relationship. Fourth, future research should take into account different theoretical frameworks and methodology that may contribute further explanations for the findings within this study. For example, critical race theory (CRT) should be considered, particularly in regard to potential teacher biases. Fifth, the teacher–child relationship measure (STRS) and measure of child behavior problems (SESBI) are both teacher reports, which could result in a possible mono-method bias in measures. Further, both measures are teachers' perceptions of relationships and behaviors, rather than objective measures, which should be considered when interpreting the findings. Teacher perceptions of students, particularly those of color and from low-income backgrounds, may be biased (Wood et al., 2007). Sixth, the mean level of disruptive behavior within our sample was not high, potentially limiting the variability in results. Finally, although the socioeconomic and racial-ethnic composition of our sample is a core contribution of the study to the literature, it also limits generalizability.

4.2. Conclusion

Our results indicate that boys, when compared to girls, from low-income, predominantly Black backgrounds are at risk for developing relationships with teachers characterized by perceived lower levels of closeness early in elementary school. When boys exhibit high levels of disruptive behavior at school entry (both clinically and relative to their peers), they experience further disadvantage through the formation of early relationships with teachers that are perceived as highly conflictual. While research with children from more economically advantaged samples has indicated that the teacher–child relationship can serve a protective role for children, specifically those who present with disruptive behavior, the current results indicate that early teacher–child relationships might not have the same protective quality for low-income boys of color (O'Connor et al., 2012). Although child race/ethnicity was not examined as a moderating factor, as the study sample was comprised predominantly of Black students from low-income backgrounds, it is important to situate the findings within a broader discussion of race, ethnicity, disproportionality, and equity in education. Thus, findings from the current study suggest that boys from low-income backgrounds, particularly those who are Black, who begin school with disruptive behavior are in need of additional supports from schools and practitioners, and that early teacher–child relationships may be a point of prevention and intervention entry. The results also highlight the importance of promoting critical reflection and cultural awareness in teacher professional development so that educators can be more aware of the ways they may be perpetuating gendered and racialized stereotypes of and expectations for the children in their classrooms (Gay, 2018; Ware, 2006). School psychologists and administrators should focus on improving the relationships that are formed early in school between teachers and boys from low-income households, specifically for those with disruptive behavior.

CRediT authorship contribution statement

E. Parham Horn: Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing, Visualization. **Meghan P. McCormick:** Conceptualization, Methodology, Investigation, Writing - review & editing, Supervision, Project administration, Funding acquisition. **Erin E. O'Connor:** Conceptualization, Methodology, Investigation, Writing - review & editing, Supervision, Project administration, Funding acquisition. **Sandee G. McClowry:** Conceptualization, Investigation, Writing - review & editing, Supervision, Project administration, Funding acquisition. **Frances C. Hogan:** Writing - review & editing.

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