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Behavior Problems in Elementary School among Low-Income Males: The Role of Teacher-Child Relationships

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Abstract

The present study identified trajectories of teacher-child relationship conflict and closeness from first through sixth grades, and associations between these trajectories and externalizing and internalizing behaviors at age 11 among low-income, urban males ($N = 262$). There were three main findings. Nagin cluster analyses indicated five trajectories for conflict with all children evidencing increases in conflict, and four trajectories for closeness with all children demonstrating decreases in closeness. Trajectories with higher levels of conflict and lower levels of closeness were associated with higher levels of externalizing and internalizing behavior problems at age 11. Moreover, conflictual teacher-child relationships exacerbated the effects of externalizing and internalizing behavior problems in early childhood; children with conflictual teacher-child relationships had higher levels of behavior problems in middle childhood relative to children with low conflictual teacher-child relationships. Implications of targeting teacher-child relationships as interventions to help prevent behavior problems are discussed.

Teacher-child relationships are central to children's socioemotional and behavioral development during elementary school (Hamre & Pianta, 2001; Howes, Hamilton, & Matheson, 1994; Pianta, 1999). A high-quality teacher-child relationship is characterized by closeness, warmth and positive affect, and a lack of conflict, discordance and anger (Baker, 2006; Davis, 2003; Pianta & Nimetz, 1991; Spilt & Koomen, 2009). Close relationships provide children with the developmental context for acquiring necessary self-regulation, emotional security and social information-processing skills that promote successful social interactions and positive adaptation (Buyse, Verschueren, & Doumen, 2010; O'Connor, Collins, & Supplee, 2012; Silver, Measelle, Armstrong, & Essex, 2005). In contrast, conflictual relationships are related to externalizing behavior problems manifested in children's outward behavior, including hyperactivity, impulsivity, or aggression and internalizing behavior problems directed towards oneself, such as depression and social

withdrawal (Birch & Ladd, 1998; Howes, 2000; Howes, Phillipsen, & Peisner-Feinberg, 2000; Ladd & Burgess, 1999;).

A growing body of research indicates that teacher-child relationships are associated with children's internalizing and externalizing behavioral development. Yet, the majority of prior research on teacher-child relationships and behavior problems has focused on children from middle income and low-risk backgrounds (O'Connor, Dearing, & Collins, 2011; Pianta, Hamre, & Stuhlman, 2003). The few studies of at-risk students conducted to date have found robust associations between teacher-child conflict and closeness and externalizing and internalizing behavior problems during elementary school (Decker, Dona, & Christenson, 2007; Murray & Zvoch, 2011). No prior research, however, has examined the effects of teacher-child relationships on behavior problems in a sample of low-income, urban males in early and middle childhood. Thus, the present study first investigates trajectories of closeness and conflict in teacher-child relationships among low-income, urban males throughout elementary school. Second, we examine associations between these trajectories and externalizing and internalizing behavior problems at age 11.

The Teacher-Child Relationship across Elementary School

An important consideration in longitudinal research on teacher-child relationships and behavior problems is the dynamic nature of the relationship. Indeed, teacher-child relationships often change in levels of closeness and conflict across elementary school, with alterations of the relationship environment and individuals in the relationship (Kontos, 1992; Mantzicopoulos, 2005; Pianta & Walsh, 1996). Previous research indicates multiple trajectories for relational conflict and closeness across elementary grades with some children evidencing an increase in conflict, followed by a subsequent decrease across key transition points (Rudasill, Reio, Stipanovic, & Taylor, 2010). For example, several researchers have found significant changes in average levels of relational closeness and conflict among children during the elementary school years (Jerome, Hamre, & Pianta, 2009; O'Connor, 2010; Rudasill et al., 2010). Utilizing person-centered approaches to investigate teacher-child relationships across childhood and early adolescence, researchers have identified individual variation in the teacher-child relationship over time (O'Connor et al., 2011). As conflict tends to increase and closeness decreases in the relationship during the later school years it is particular important to consider the teacher-child relationship among children who may otherwise be at risk for behavioral problems.

Changes in closeness and conflict during childhood may have important consequences for children's socioemotional development. In a recent study using a national sample of elementary school aged children, O'Connor and colleagues (2012) found that increases in conflict were associated with elevated levels of externalizing behaviors and low levels of closeness were related to internalizing behaviors. Furthermore, unique developmental trajectories for closeness and conflict in the teacher-child relationship have been linked to externalizing and internalizing behavior problems in later childhood. Children in trajectories marked by elevated levels of teacher-child conflict during childhood tend to have elevated levels of externalizing behaviors in later childhood. In contrast, children's relational trajectories over elementary school characterized by low levels of closeness were more

likely to be associated with elevated levels of internalizing behaviors later in childhood (O'Connor et al., 2012).

Many studies to date using person-centered analyses of teacher-child relational closeness and conflict, however, have been conducted using the National Institute for Child and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD) dataset, which includes predominately, white, middle class, children. It is important to examine patterns of teacher-child relationships within samples that have demonstrated higher levels of conflictual relationships. For instance, male children from low income families are likely to have higher levels of conflict and lower levels of closeness in their relationships with teachers than female and middle and higher income children (Bracken & Craine, 1994; Hamre & Pianta, 2001; Ladd, Birch, & Buhs, 1999; Saft & Pianta, 2001; Wyrick & Rudasill, 2009). For example, Rudasill and colleagues (2010) found that male students from lower-income families were likely to have more conflict and less closeness in relationships with teachers in grades four to six. Furthermore, Jerome et al. (2009) found increasing gaps in teachers' reported closeness between males and females from kindergarten to sixth grade. The developmental trajectories of teacher-child relationships and their association with behavior problems in elementary school may thus differ between low-income males and their more affluent, lower risk peers.

Controlling for Additional Risk Factors Facing Low-Income Males

An important issue in previous research on teacher-child relationships and behavior problems, however, is potential endogeneity bias (i.e. omitted variable bias). Because children are not randomly assigned to teacher-child relationship quality conditions in non-experimental designs, correlations between teacher-child relationships and behavior problems may be attributed to unobserved, omitted variables. Previous research suggesting factors possibly correlated with teacher-child relationship quality and behavior problems over the course of elementary school may offer useful controls that can help adjust for potential endogeneity bias.

For example, a number of studies have found evidence that early child experiences and attributes including maternal attachment style, child temperament, maternal education and depression, and behavior problems are related to both teacher-child relationship quality and later behavior problems. More specifically, low-income children are more likely to experience stressors such as poor living conditions, single parenting, an unstable family life, and inadequate alternative child care resources (Shanks & Danziger, 2010). In addition, low-income children are more likely to have mothers with lower levels of education and/or higher levels of depression, which have been linked to children's externalizing and internalizing behavior problems (Ashman, Dawson, & Panagiotides, 2008; Birch & Ladd, 1997; Nagin & Tremblay, 2001). Furthermore, poverty factors are also associated with attachment insecurity, difficult temperament, maternal depression, and early childhood behavior problems (Shaw & Vondra, 1995). Nevertheless, there are a number of developmental assets documented among low-income families, such as strong kin relationships (e.g., Lareau, 2002) that may serve as protective factors. Thus, it is critical to

consider variation in family-level risk factors in this population of low-income urban males when examining behavioral outcomes.

Maternal attachment security is another possible explanatory variable predicting both teacher-child relationship quality and behavioral development. Indeed, maternal attachment security may act as a protective factor whereas an insecure attachment may act as a risk factor for the development of behavior problems. Children with insecure maternal attachments are at-risk for maladjustment later in childhood (O'Connor, Scott, McCormick, & Weinberg, 2014). Researchers have identified associations between insecure maternal attachment and elevated levels of both externalizing and internalizing behaviors as well as less close, more conflictual relationships with teachers (Lyons-Ruth & Jacobvitz, 2008; O'Connor et al., 2012; O'Connor et al., 2011). Furthermore, children of depressed mothers are more likely to acquire behavior problems, lower emotional expression, and lower perception of self-worth through social learning processes. They may then model these behaviors later in childhood (Hammen, Burge, & Stansbury, 1990). In addition, children whose mothers have lower levels of education tend to evidence less close, and more conflictual relationships with teachers and higher levels of externalizing and internalizing behaviors (Silver et al., 2005).

During early childhood, the direct effects of family risk factors on children appear to be largely mediated by the caregiver's parenting and well-being. At the entry of school, however, there is an increase in the amount of time children spend with other adults, namely teachers. Accordingly, early childhood experiences and internal attributes and dispositions are likely to influence the relationships and socioemotional adjustment of children during elementary school (Shaw et al., 2003). Likewise, Pianta and Walsh (1996) have demonstrated the influence of the teacher-child relationship on children's development within the context of risk and protective factors in the child's environment.

When considering cumulative ecological effects, teacher-child relationships must be considered as proximal processes within the child's context (Bronfenbrenner & Morris, 2006). For example, a close teacher-child relationship may decrease the likelihood of externalizing and internalizing problems among children who experienced behavior problems in early childhood (Hughes, Cavell, & Jackson, 1999). As such, it is critical to consider the role of child attributes such as gender, race and socioeconomic status when examining the relationships that children develop with their teachers. For example, girls are more likely to establish positive relationships with their teachers than boys of similar backgrounds (Birch & Ladd, 1997). Likewise, teachers are more likely to have negative perceptions of low-SES students than higher-SES students (Alexander, Entwisle, & Thompson, 1987; McLoyd, 1998). Low-income males with early behavior problems are thus at higher risk for experiencing low-quality teacher child relationships given their gender and socioeconomic status.

Even given these demographic risks, students who form close relationships with their elementary school teachers may experience positive behavioral outcomes (Baker, 2006). To determine if relational closeness and conflict with teachers relate uniquely to children's externalizing and internalizing behaviors in middle childhood among low-income, urban

males, it is important to consider child characteristics and family factors related to relationships and externalizing and internalizing behaviors.

The Present Study

The present study investigates teacher-child closeness and conflict across the course of elementary school in relation to levels of externalizing and internalizing behaviors among low-income, urban males, adjusting for a number of risk factors facing this population. The focus of this study was motivated by research showing higher rates of behavior problems in low-income boys than low-income girls (Shaw et al., 1998). The potential benefits of supportive teacher-child relationships among this high-risk population, and the greater frequency of negative teacher-child relationships reported among males and low-income students underscore the need for additional research in this area. Using a longitudinal, person-centered approach, this study is guided by the following research questions:

1. What are the developmental trajectories of closeness and conflict in the teacher-child relationship across elementary school among low-income, urban males?
2. How do trajectories of closeness and conflict in the teacher-child relationship across elementary school relate to externalizing and internalizing behavior problems at sixth grade among low-income, urban males?
3. Do the effects of relational closeness and conflict on externalizing and internalizing behaviors at sixth grade vary as a function of early externalizing and internalizing behavior problems at school entry, among low-income, urban males?

Method

Participants

Low-income mothers with male infants were recruited from Women, Infants, and Children Nutritional Supplement (WIC) sites in an urban area of the Northeast U.S., as part of a larger, ongoing study of behavior problems (Shaw et al., 2012). Only boys were selected to participate in the study because of the higher rates of behavior problems evidenced among boys during childhood, relative to girls (Campbell et al., 1996; Shaw et al., 2012). When the boys were 18 months old, 310 families participated in the first assessment. Follow-up assessments occurred between every 6 months to 2 years, and 86% of participants completed at least one assessment between the ages of 5.5 and 11. The current sample included 262 boys with data on the teacher-child relationship at one or more time points. At the time of the 18-month assessment, families had an average income of \$12,567 (SD = \$7,689) with the majority of families living below the federal poverty line. Mothers had an average of 12.6 years of education (SD = 1.70). Initially, mothers ranged in age from 17 to 43, with a mean age of 28. Fifty-three percent of participants were Caucasian, 36% were African American, 5% were biracial, and 6% reported being of "other" race.

Procedures

Mothers and sons completed an assessment series when the children were 18-months, 5.5, 7, 8, 10, and 11 years of age. Assessments at 18 months, 7 years, and 11 years old were completed in a lab. Assessments at ages 5.5, 8 and 10 took place in children's homes. Mothers reported on family demographics, child temperament and maternal depression. Classroom teachers completed questionnaires when the children were 6, 7, 8, 10, and 11 years of age. During these times, most children were in first, second, third, fifth and sixth grades respectively. Each packet of questionnaires took approximately 30 minutes to complete per child.

Measures

Externalizing and internalizing behavior problems—Mothers reported on children's externalizing and internalizing behavior problems when children were 5.5 years of age using the parent version of the Child Behavior Checklist (CBCL; Achenbach, 1991a), which contains 118 items describing a broad range of behavior problems. Teachers reported on externalizing and internalizing behavior problems at age 11 with the Teacher Report Form (TRF; Achenbach, 1991b), a teacher version of the CBCL. The TRF contains 120 items describing child behavior problems almost identical to those in the parent version. On both measures, the respondent is asked to report how well the item describes the child currently or within the last 6 months on a scale from 0 (not true), 1 (somewhat or sometimes true), to 2 (very true or often true). Higher scores indicate more problems.

Two broadband scales for externalizing and internalizing behaviors exist in the CBCL and TRF. The externalizing scale results from summing responses to items on the Aggressive and Destructive/Delinquent Behaviors subscales and measure the child's antisocial and disruptive behavior. Internalizing scale scores are created by summing responses to items on the Withdrawn, Somatic, and Anxious/Depressed subscales, and measure inhibition and anxiety. Standardized *T*-scores with mean of 50 and SD of 10 are used for the internalizing and externalizing broadband scales. The CBCL and TRF are widely used measures of psychological adaptation for children and have well established psychometric qualifications, good test-retest reliability, concurrent and predictive validity, and parallel structures reflecting adults' observations of the child in the home and school settings (Achenbach & Rescorla, 2001). They are also cross-culturally validated and widely in numerous cultures. The measures correlate well, respectively, with parent and teacher perceptions of child mental health and clinical levels of emotional and behavioral problems (Bird, 1996). Internal reliability for the externalizing and internalizing scales at 5.5 and 11 years of age with the current sample was high ($\alpha = .89, .87$ for externalizing and internalizing respectively at 5.5 years; $.97, .88$ for externalizing and internalizing respectively at 11 years).

Teacher-child relationship—The 15-item Student Teacher Relationship Scale (STRS; Pianta, 1992) was used to assess teacher perceptions of teacher-child relationship quality in the spring when children were 6, 7, 8, 10, and 11 years of age. STRS questions were based on behaviors used to classify parent-child attachments and the Attachment Q-set (Waters & Deane, 1985), through observations of teachers' and children's classroom interactions and teacher descriptions of children's behaviors toward them (Pianta & Nimetz, 1991).

Using a 5-point Likert scale that ranges from 1 (definitely does not apply) to 5 (definitely applies), teachers rate statements' applicability to conflict and closeness in their current relationship with a particular child. Individual items on each scale are subsequently summed to create overall subscale scores. The conflict subscale measures relationship antagonism and disharmony, and includes 7 items with possible scores of 7 to 35. The 8-item closeness subscale, which has a possible score of 8 to 40, indexes the amount of warmth and open communication in the relationship.

The STRS has shown evidence for convergent and discriminant validity (Pianta & Nimetz, 1991). STRS scores correlate with observational measures of teacher-child relationship quality (Birch & Ladd, 1997; Howes & Hamilton, 1992; Howes & Ritchie, 1999; Pianta & Nimetz, 1991). Additionally, STRS scores relate to Attachment Q-Set ratings of teachers and students in that higher scores correlate with more secure relationships (Howes & Ritchie, 1999). Furthermore, research has indicated that the conflict subscale represents a different underlying construct of child behavior than assessing externalizing behaviors on their own (Doumen et al., 2008). In the current sample, the conflict and closeness subscales had good internal consistency at all time points (range of $\alpha = .81-.89$).

Child attachment—Maternal attachment styles were assessed at 18 months using the Ainsworth and Witting (1969) Strange Situation, a 25-minute procedure with brief episodes of increasing stress for the child, including two mother-child separations. Strange Situation assessments were categorically coded as secure, insecure-avoidant, insecure-ambivalent, and insecure-disorganized. Secure infants demonstrate minimal stress during separation and seek comfort from mothers upon reunion. Avoidant infants show little overt separation distress, and turn from or ignore their mothers upon reunion. Ambivalent infants are distressed and angry during separation, and unsure about contact when their mothers return. Disorganized infants are stressed by the separation and demonstrate bizarre, unorganized behaviors upon reunion. Trained individuals coded the interactions according to Ainsworth, Blehar, Waters and Wall (1978). Inter-rater agreement was assessed between coders on 20% of the tapes, although a higher percentage of cases would be preferable, a mean of 80% agreement was demonstrated across all classifications with satisfactory to excellent ICC values (.76–.96).

Child temperament—When the children were 5.5 years of age the mothers completed the Emotionality, Activity, Sociability, and Impulsivity Temperament Survey (EASI; Buss & Plomin, 1984), a widely used, parent-rated child temperament scale. The EASI contains 40 items rated on a 5-point Likert scale, assessing the Buss & Plomin dimensions of emotionality, sociability, and impulsivity. EASI scores correspond to observational ratings of child temperament and scores on other parent and self-report measures (Rowe & Plomin, 1977). The current sample's subscale internal consistency was: Impulsivity $\alpha = .78$; Emotionality $\alpha = .81$; Sociability $\alpha = .68$.

Maternal depression—Mothers completed the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) to assess symptoms of depression. The BDI is a widely used measure of depressive states. Respondents rate the intensity of 21 depressive symptoms on a "0 (no symptomatology)" to "3 (severe symptomatology)" scale, and a score is derived by summing these ratings. Total scores range from 0 through 63, with 14–19

considered mild, 20–28 moderate, and 29–63 severe. Depression criterion are in line with the *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition* (American Psychiatric Association, 1994). The BDI-II has demonstrated adequate content and factorial validity and high internal consistency. As the scores at each time point were highly correlated across the years in the current sample ($\alpha = .92$), a composite of the four ratings of maternal depressive symptoms averaging reports from when the children were 7, 8, 10, and 11 years to reduce collinearity in the analyses.

Demographics—Mothers were asked basic demographic questions, including educational levels, at each assessment. Average values for maternal education when children were 6, 7, 8, 10, and 11 years were used as controls in models predicting externalizing and internalizing behaviors.

Statistical Analyses

We included all children with at least one assessment of teacher-child closeness and conflict in the analyses. For the 262 families included in the present analyses, there was a limited amount of missing data for the early childhood antecedent variables and the outcomes. Over 98% of the sample had data for each of the early childhood antecedents, and a small percentage of missing data on the outcomes (.3%) that was consistent with overall attrition in the study. For all other variables we tested whether missingness was associated with other study variables. The boys with missing teacher-reported data did not differ significantly on maternal education ($F(1, 309) = 1.58, p = \text{n.s.}$), family income ($F(1, 305) = 2.95, p = \text{n.s.}$), externalizing ($F(1, 309) = 1.58, p = \text{n.s.}$) or internalizing ($F(1, 299) = 1.56, p = \text{n.s.}$) behavior problems. As data could not be assumed to be missing at random (MAR) we fitted models using full information maximum likelihood (FIML), which estimates missing values using all available data and can be used with data not MAR (see Enders, 2001).

Research Question 1—We used Nagin's semi-parametric group modeling (SGM; Nagin, 1999, 2005; Nagin & Tremblay, 2001) method to empirically identify developmental trajectories of teacher-child relational closeness and conflict during elementary school. Developmental scholars have noted the importance of longitudinal analyses to empirically examine change over time (Singer & Willett, 2003). Hierarchical linear modeling (Bryk & Raudenbush, 1992) and latent growth curve analysis (McArdle & Epstein, 1987; Willett & Sayer, 1994) are commonly used to model differences in developmental trajectories across a specific population, yet, these methods are most appropriate for examining developmental processes characterized by uniform patterns of growth or decline over time, even at varying rates. Therefore, it may be less helpful to use standard growth curve methods to describe developmental processes with possible clusters of qualitatively distinct developmental trajectories over time within a population. Comparatively, SGM uses a multinomial strategy to identify relatively homogenous clusters or groups of developmental trajectories. SGM has advantages over conventional developmental process analysis methods in that it makes no assumptions about underlying developmental trajectories and uses existing data to generate distinct patterns of stability and change that can differ in intercepts and developmental function.

As a first step in Nagin analysis, individual growth curves for each individual are estimated. The semi-parametric analysis uses a polynomial function to model the relationship between the dependent variable and age (for a complete description see Nagin & Tremblay, 1999; Nagin, 1999). Maximum likelihood is used to estimate parameter trajectories (Shaw, Gilliom, Ingoldsby, & Nagin, 2003). Prototypic curves are then identified based on the individual curves (Nagin, 1999; NICHD ECCRN, 2005). The group curves are chosen to represent developmental trajectories in a manner that best describes the data (NICHD ECCRN, 2005). Parameters can vary across groups allowing for different shaped trajectories. The number of groups is determined by the Bayesian Information Criterion (BIC). A lower absolute BIC statistic indicates a better fit. The posterior probability or the extent to which each individual's growth curve is similar to a group's prototypic growth curve is also estimated. These posterior probability estimates are used as a basis for classifying individuals into the trajectory group for which they have the highest probability of membership.

We first empirically examined the fit to see if multiple trajectory groups were present and continued fitting increasing numbers of groups until the last two models tested produced substantially worse fit statistics. The lowest absolute BIC scores considered to have the best fit were used to select the most parsimonious model based on the number of trajectory groups and the type of slope. To determine the optimal number of trajectories for teacher-child relationship quality, models with two, three, four, five, and six groups were estimated. The most parsimonious model was adjusted to eliminate non-significant growth parameters. Once the number of groups was finalized, based on comparisons of BIC statistics across numbers of groups, we determined the order of the polynomial for the shape of each group's trajectory (i.e., linear, quadratic or cubic). Model fit was also evaluated by individuals' posterior probability estimates.

Research Question 2—We used separate, ordinary least squares regressions to examine if membership in a specific trajectory for closeness and conflict in the teacher-child relationship was linked to externalizing or internalizing behaviors at age 11, over and above early levels of externalizing/internalizing behaviors and family and child characteristics. Our model included two blocks of variables added hierarchically. The first block was for child and family characteristics, including children's early externalizing and internalizing behaviors, maternal attachment style, child temperament, maternal education, and maternal depression. We included these child and family characteristic variables to account for potential endogeneity bias. The second block included variables of closeness and conflict trajectory group membership.

Research Question 3—Lastly, we added interaction terms between early externalizing and internalizing behaviors and conflict and closeness group membership to investigate if aspects of the teacher-child relationship moderated the effects of early externalizing and internalizing behaviors on behavior problems at age 11. Externalizing and internalizing behaviors were tested in separate models with interactions to avoid potential threats posed by multicollinearity.

Results

Descriptive Statistics

Descriptive statistics are in Table 1. On average, at age 5.5 the children had externalizing and internalizing behavior scores close to the normed mean of 50. However, 41 children (16%) were above the normed borderline clinical cutoff of 65 ($> 93^{\text{rd}}$ percentile) for the externalizing scale and 12 (5%) children exceeded a borderline clinical cutoff of 65 for the internalizing scale. This finding suggests that upon entering school, some children already exhibited high levels of behavior problems. At age 11, overall levels of externalizing and internalizing behaviors were also near the normed mean. However, extensive score variation was evidenced by large standard deviations, and there were 47 children (18%) with scores above the borderline clinical cutoff. Children in the present study had higher percentages of clinical levels of behavior problems compared to middle income children in similar studies (O'Connor, Dearing & Collins, 2011) where 4% of all children were in the clinical range at first grade and demonstrated no significant change over the course of elementary school.

Overall, children had average levels of closeness and conflict in teacher-child relationship. However, closeness decreased and conflict increased from first through sixth grades. These changes in relationship quality differ from other studies of lower-risk samples where averages of closeness and conflict were generally found to be more consistent across time (O'Connor, Collins, & Supplee, 2012).

In regards to research question 1, results for separate SGM analyses for both conflict and closeness in the teacher-child relationship indicated multiple developmental trajectories. For conflict, the BIC scores for one to seven group models ranged from -2709 to -2839 , with a five-group model providing the best fit (BIC score = -2709). Parameter estimate inspection indicated that the constant/intercept, linear and quadratic terms were significant in all groups and the cubic term was significant in one. Therefore, we estimated a five-group model with one group defined by a cubic trajectory and four groups by a quadratic trajectory. We also evaluated model fit for each child's assigned trajectory. Mean probability scores for individual membership in each trajectory group ranged from .68 to .98, demonstrating a good to very good model fit (NICHD ECCRN, 1999).

Conflict trajectory groups are presented in Figure 1 and descriptive statistics on conflict scores are summarized in Table 2. These trajectory groups evidenced differences in mean level of conflict and rates of change over time from first through sixth grades. We characterized the groups as Low, Low increasing, Moderate, Moderate increasing and High peaking. The Low group, 59% of the sample, demonstrated low levels of conflict at first grade, as indicated by scores approximately one standard deviation below the mean, with a slight, non-linear change from first through sixth grades. The Low increasing group was evident in approximately 10% of the sample with low levels of conflict at first grade, as evidenced by scores below the mean, and a non-linear increase in conflict from first through sixth grades, with a steep increase at fifth grade. The Moderate group was evident in 18% of the children, who had scores within one standard deviation of the mean at first grade, and evidenced a slight non-linear increase in levels of conflict from first through sixth grades, with the greatest increase at third grade. About 9% of the sample was in the Moderate

increasing group, demonstrating moderate levels of conflict at first grade, as indicated by scores approximately one standard deviation above the mean, and a non-linear increase in conflict from first through sixth grades, with a substantial increase at third grade. Lastly, the High peaking group was seen in about 4% of the sample who demonstrated high levels of conflict in the first grade teacher-child relationship, as indicated by scores approximately one and half standard deviations above the mean, and a non-linear change in conflict from first through sixth grades, with a peak at third grade.

We next examined relationship closeness. The BIC scores for one to seven group models ranged from -2039 to -2301, with a four-group model providing the best fit (BIC score = -2039). The constant/intercept, linear, quadratic and cubic terms were significant in all four groups, so a four-group model was selected with all four groups defined by a cubic trajectory. Model fit was also evaluated by how well each child fit his/her assigned trajectory. The mean probability score for individuals in each trajectory group ranged from .64 to .99, demonstrating good to excellent model fit (NICHD ECCRN, 1999).

Results for closeness are presented in Figure 2, with descriptive statistics summarized in Table 3. The groups were characterized as Low decreasing, Low peaking, High decreasing and High peaking. The Low decreasing group was evident in 7% of the sample who demonstrated low levels of closeness in first grade, with scores almost one standard deviation below the mean, and a non-linear decrease in closeness from first through sixth grades. The Low peaking group was evident in approximately 16% of the sample who demonstrated low levels of closeness at first grade, as demonstrated by scores almost one standard deviation below the mean, and a non-linear change in closeness in their relationships from first through sixth grades and a substantial drop at fifth grade. The High decreasing group, 39% of the sample, demonstrated high levels of closeness in first grade, as evidenced by scores about one standard deviation above the mean, and a non-linear decrease in closeness from first through sixth grades with substantial drops in second and fifth grades. Lastly, the High peaking group was evident in 38% of the sample. Children in this group demonstrated scores approximately one standard deviation above the mean at first grade, and continued close relationships through third grade, with a substantial drop in closeness in fifth grade.

To investigate research question 2, we used multiple regression analyses to explore main effects between conflict and closeness in the teacher-child relationship and externalizing and internalizing behaviors at age 11. Each model was adjusted for early externalizing and internalizing behavior problems and family and child factors. In Table 4 we list the results from the main effects models predicting internalizing and externalizing behaviors from group membership in closeness and conflict trajectories. The standardized beta coefficient estimates indicate the variables that were significantly associated with externalizing and internalizing behavior problems at age 11, after controlling for the other main effects in the model. The use of standardized betas allows one to compare the relative effect sizes across predictor variables. The Low group for conflict and the High decreasing group for closeness – the most optimal relationship patterns – served as the excluded reference group for dichotomous group membership variables. We examined whether less optimal group membership was a risk factor for externalizing and internalizing behaviors at age 11.

After adjusting for child and family characteristics, and early externalizing and internalizing behavior problems, significant associations were evident between conflict in teacher-child relationships and externalizing behaviors. More specifically, children in the Low increasing ($\beta = .33, p < .001$), Moderate ($\beta = .22, p < .001$), Moderate increasing ($\beta = .28, p < .001$) and High peaking ($\beta = .25, p < .001$) conflict groups evidenced significantly more externalizing behaviors at age 11 than their peers in the Low group. No significant differences were noted in externalizing behaviors among children in each trajectory group for teacher-child closeness. The teacher-child relationship explained an additional 20% of the variation in externalizing behaviors after considering child and family characteristics and early behavior problems. In terms of covariates, early externalizing behaviors ($\beta = .11, p < .10$) and maternal depression ($\beta = .19, p < .001$) were positively associated with externalizing behaviors at age 11.

Column 4 in Table 4 presents the final model for internalizing behaviors. After adjusting for child and family characteristics and early externalizing and internalizing behavior problems, results indicate that variation in internalizing behaviors at age 11 was attributable to children's experiences in the teacher-child relationship, as well as child and family characteristics. For teacher-child conflict, children in the Low increasing ($\beta = .18, p < .01$) and Moderate increasing ($\beta = .12, p < .01$) groups evidenced higher levels of internalizing behaviors at age 11 than their Low group peers. In relation to teacher-child closeness, children in the Low decreasing group ($\beta = .16, p < .01$) demonstrated significantly higher levels of internalizing behaviors than their peers in the High group. Closeness in the teacher-child relationship explained 8% of the variation in internalizing behaviors. As for child and family factors, children with higher levels of internalizing behavior problems in early childhood ($\beta = .15, p < .05$) and higher levels of impulsivity ($\beta = .27, p < .001$) had higher levels of internalizing behavior problems at age 11. Children who demonstrated higher levels of sociability ($\beta = -.23, p < .001$) had lower levels of internalizing behavior problems. Also, children whose mothers had more education ($\beta = .14, p < .05$) tended to have higher levels of internalizing behavior problems.

Lastly in regards to research question 3, we identified a significant interaction between early externalizing behaviors and membership in the Moderate increasing group for conflict ($\beta = .45, p < .01$). Children with higher levels of externalizing behaviors at age 5.5 in the Moderate increasing conflict group evidenced higher levels of externalizing behaviors at age 11 than their similar peers in the Low conflict group (see Figure 3). Similarly, a significant interaction was identified between early internalizing behaviors and membership in the Moderate increasing group for conflict ($\beta = .39, p < .05$). Children with higher levels of internalizing behaviors at age 5.5 in the Moderate increasing conflict group demonstrated higher levels of internalizing behaviors at age 11 than their similar peers in the Low conflict group (see Figure 4). No significant interactions were evident between early externalizing and internalizing behaviors and membership in the closeness group trajectories.

Discussion

The current study contributes to the literature by identifying trajectories of relational closeness and conflict among low-income, urban males, an understudied population in this

area of research. In addition, we investigated whether teacher-child relationships contribute to persistent elevated levels of behavior problems among this higher-risk group (Campbell, Pierce, Moore, & Marakovitz, 1996; Shaw et al., 2003) and whether close teacher-child relationships act as protective factors. The majority of previous studies have primarily considered younger mixed gender low-risk samples (McCormick & O'Connor, 2015; O'Connor et al., 2011; O'Connor et al., 2012). Research indicates that teacher-child relationships are of particular importance for higher risk children (Hamre & Pianta, 2001; Hamre & Pianta, 2005), as is understanding differences in developmental trajectories for these higher risk children. Findings from the present study used group-based modeling techniques to identify unique trajectories of teacher-child conflict and closeness. Results demonstrated that relational conflict and closeness are related to low-income, urban males' externalizing and internalizing behaviors in middle childhood. These findings extend prior research by indicating an association between teacher-child relationship quality and problem behaviors in samples of low-income, urban males (Hughes & Kwok, 2007; Murray, Murray, & Waas, 2008; Spilt, Hughes, Wu, & Kwok, 2012).

Developmental Trajectories of Teacher-Child Closeness and Conflict

With respect to teacher-child relational conflict, on average, children demonstrated some increase across time. However, the majority of children (59%) were in the Low group, and evidenced relatively little conflict in their relationships with teachers at first grade and only a moderate, albeit significant, increase in conflict from first through sixth grade. It is of note that 31% of children demonstrated substantial increases in conflict in third grade. This finding may reflect changes in the academic demands that typically occur at this time. For example, a recent national study found that 90% of observed activities on a typical day in third grade involved either whole class instruction or individual seatwork (NICHD ECCRN, 2005) and were low in directed, designed interactions between children and teachers (Pianta, 2006). Fewer interactions between teachers and individual children may result in less time spent resolving relational difficulties likely to arise during later middle childhood as children attempt to renegotiate dependency bonds (Blos, 1967). Such experiences may be especially detrimental for low-income, urban males' relationships with teachers, who, due to a range of environmental stressors, are more likely to be in need of continued scaffolding and extended teacher interaction.

Relatively extensive variation was also evident in trajectories of closeness in the teacher-child relationship. The majority of children were in the High decreasing (39%) and High peaking (38%) groups, evidencing relatively close relationships with teachers in first grade, but generally non-close relationships by sixth grade. On average, children demonstrated significant decreases in closeness with teachers from first through sixth grade, with a substantial decrease in closeness in fifth grade for most children. This decrease underscores research reporting a decline in supportive teacher-child interactions in later elementary school (Bokhorst, Sumter, & Westenberg, 2010; Demaray & Malecki, 2002). The more academically focused interactions between children and teachers and increased transitions across multiple teachers may make it harder for children to develop close relationships with teachers in the later elementary school years. There is a wide body of research demonstrating that children's relationships with their teachers tend to decline in closeness

and increase in conflict across elementary school (Hamre & Pianta, 2001; 2005). Notably, recent national longitudinal studies suggest that levels of teacher-child conflict may be highest when children are in third grade (Maldonado-Carreno & Votruba-Drzal, 2011; McCormick & O'Connor, 2015; O'Connor et al., 2011). As such, middle childhood may be an inopportune time to have multiple teachers, each of whom is likely less familiar with individual children's social and academic needs than one primary teacher (Lynch & Cicchetti, 1997).

Children in the Low increasing, Moderate, Moderate increasing and High peaking conflict groups evidenced substantially higher levels of externalizing behaviors at age 11 than their peers in the Low conflict group. These findings suggest the need for future work to consider how variation in children's experiences in relationships with teachers explains why some children are more prone than others to developing elevated levels of externalizing and internalizing behaviors problems. Conflict in the relationship may lead children to interpret others' behaviors negatively and to respond with aggressive behavior (Dodge et al., 2003). Additionally, children in the Low increasing and Moderate increasing groups for conflict demonstrated higher levels of internalizing behaviors than their peers in the Low conflict group. Through conflictual interactions with teachers, children may develop models of relationships characterized by acrimony that inhibit their social interactions with others.

Children's experiences of relationship closeness were also related to internalizing behaviors. Children in the Low decreasing closeness group evidenced higher levels of internalizing behaviors than peers in the High decreasing group. Through distant interactions with teachers, children may form relationship models characterized by rejection that lead to withdrawal. Children in relationships high in closeness, on the other hand, may develop positive models of self and others that foster social development. A close teacher-child relationship may provide support for children in the classroom (Baker et al., 2008) similar to that found in close therapeutic relationships (Mufson & Dorta, 2003).

It is notable that the sizes of the effects for conflict group membership on externalizing behaviors at age 11 were greater than the effect of early externalizing behaviors. Also, the sizes of the effects of closeness and conflict group membership for internalizing behaviors were similar to those of early internalizing behaviors. These findings indicate that relational conflict and closeness are robust predictors of externalizing and internalizing behaviors in middle childhood among low-income, urban males.

Based on studies of person-by-environment development and previous research on teacher-child relationships (Baker et al., 2008; Buyse et al., 2010; Hughes et al., 1999; Silver et al., 2005), we expected effects of relational conflict and closeness on children's externalizing and internalizing behaviors to vary as a function of these behaviors in earlier childhood. Results indicated that membership in the Moderate increasing group for conflict exacerbated the effects of early externalizing and internalizing behaviors on the same behaviors in early adolescence (see Figures 3 and 4). These results suggest that teacher-child relationships higher in conflict may contribute to elevated, persistent externalizing and internalizing behaviors evident among some low-income, urban males. In contrast, in the predominately middle income, mixed gender NICHD SECCYD sample most children evidenced relational

trajectories marked by low levels of conflict and high levels of closeness during elementary school (O'Connor et al., 2012). In the current sample a substantial proportion of children evidenced elevated levels of conflict at one or more time points prior to fifth grade, as well as relatively low levels of closeness during elementary school. This comparison of findings, although purely descriptive, suggests that the relational experiences of low-income, urban males in elementary school may be very different from their more affluent peers.

Limitations and Future Directions

More research is needed to better understand associations between teacher-child relationships and behavior problems in samples of low-income urban males. Indeed, the present findings cannot be interpreted causally. It is important to further consider the direction of effects between teacher-child relationships and behavior problems and to examine potential causal mechanisms. There are a number of additional factors which may account for reductions in internalizing and externalizing behavior problems over time in populations of high-risk students. These factors include improved classroom management (Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Schaeffer, Petras, Ialongo, Poduska, & Kellam, 2003) and improvements in peer relationships and social competence (Hinshaw & Melnick, 1995; Bornstein, hah, & Haynes, 2010). It is also possible that a number of classroom-level factors (e.g., teaching quality, teacher experience and education, rate of teacher turnover) influenced teacher-child relationship quality and its association with student behaviors. It is also necessary to examine school and classroom contexts related to changes in teacher-child closeness and conflict. As students change classrooms each year it is important to consider the effect of different teachers and contexts over time. Children at risk of behavior problems may benefit from the consistency of having the same teacher over multiple years. There are a number of covariates specific to low-income urban males that we were not able to model in the current study (e.g., school climate, teacher disciplinary style) which should be taken into account in the interpretation of the present findings. Considering these factors in future work can help elucidate specific relations between teacher-child relationships and students' behaviors for this unique population of students.

In addition, the reliance on teacher reports of the main predictors and outcomes presents potential reporter bias. Although we used a mother report of behaviors at age 5.5 in order to control for potential bias, future work may consider more fully triangulating measures and also collecting student reports and observed measures of teacher-child relationship quality. It is important to gauge teacher-child relationship quality and behavior problems with observational reports that could richly supplement data on the role of teacher-child relationships in children's externalizing and internalizing behaviors. It would be interesting for future research to explore the dyadic nature of the teacher-student relationship to unpack whether one positive, close relationship may change a child's probability of developing future close relationships. For example, mixed-methods could be used to explore the relationship between observed interactions between teachers and children and the teacher's rating of their perception of the quality of the relationship. Observations may reveal a similar coercive cycle to that identified in parents and children (Patterson, Reid, & Dishion, 1992).

Finally, the relatively small sample size of the present study limits how results can be generalized outside the population of low-income male students. Using larger samples, future work should consider how these trajectories look for high-risk samples across different geographic locations.

Implications

The present study extends the literature on teacher-child relationships and behavior problems in at least two critical ways. First, to the extent that teacher-child relationships are a dynamic phenomena, examining their development over time is likely to improve the ecological validity of research on teacher-child relationships and behavior problems. Second, by investigating the independent effects of closeness and conflict in the teacher-child relationship on behavior problems, the results may reveal those aspects of the relationship that should be targeted in prevention and intervention efforts aimed to reduce and prevent externalizing and internalizing behavior problems. Moreover, the current study is unique due to the longitudinal data collected on a sample of low-income male children. This study is, therefore, well situated to examine whether close, non-conflictual teacher-child relationships can act as protective factors for the development of behavior problems.

Although the present findings are based on correlational associations, they do have implications for preventive intervention programs, teacher education programs, and educational leadership. Our results indicate that it may be important for teacher-child relationships to be a stronger focus of school-based prevention and intervention efforts targeted at low-income schools (Hughes et al., 1999). The current study also demonstrates the potential need to help elementary and middle school teachers understand the role of their relationships with students on children's social, emotional, and behavioral development, particularly for low-income males who may be at-risk for externalizing and internalizing behavior problems. For educational leadership, results indicate the need to support teachers and children, especially low-income, urban males, in their relationships during third and fifth grades, periods when these children evidenced the most increases in relational conflict and decreases in relational closeness.

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Figure 1.
Trajectories for Relational Conflict

Figure 2.
Trajectories for Relational Closeness

Figure 3.
Interaction of early externalizing behaviors and conflict group membership

Figure 4.
Interaction of early internalizing behaviors and conflict group membership

Table 1

Descriptive Statistics for Predictor and Outcome Variables

	Mean (%)	SD	Range in sample
Externalizing behavior (age 5.5)	53.94	9.86	30–77
Internalizing behavior (age 5.5)	49.14	9.16	34–72
Externalizing behavior (age 11)	52.06	12.45	34–82
Internalizing behavior (age 11)	50.58	16.82	30–94
Avoidant attachment (18 months)	19%		
Ambivalent attachment (18 months)	18%		
Disorganized attachment (18 months)	8%		
Secure attachment (18 months)	55%		
Child impulsivity	57.68	9.22	32–93
Child emotionality	38.38	9.32	3–68
Child sociability	18.62	3.53	8–29
Maternal education	12.85	1.50	8–18
Maternal depression	7.29	6.62	0–38
Teacher-child closeness (1 st grade; age 6)	31.36	5.52	14–40
Teacher-child closeness (2 nd grade; age 7)	28.39	5.21	12–37
Teacher-child closeness (3 rd grade; age 8)	27.38	5.20	12–37
Teacher-child closeness (5 th grade; age 10)	23.01	3.84	15–32
Teacher-child closeness (6 th grade; age 11)	23.12	3.71	14–35
Teacher-child conflict (1 st grade; age 6)	11.18	1.86	7–18
Teacher-child conflict (2 nd grade; age 7)	10.74	2.09	7–17
Teacher-child conflict (3 rd grade; age 8)	11.59	5.00	7–30
Teacher-child conflict (5 th grade; age 10)	14.40	4.77	7–28
Teacher-child conflict (6 th grade; age 11)	14.69	4.36	7–28

Table 2
Means (M) and Standard Deviations (SD) of Conflict Scores at Each Age by Trajectory Group

Trajectory	First grade M (SD)	Second grade M (SD)	Third grade M (SD)	Fifth grade M (SD)	Sixth grade M (SD)
Low	9.60 (2.53)	10.13 (1.69)	10.56 (1.36)	12.43 (3.00)	12.50 (2.85)
Low increasing	10.17 (1.66)	10.02 (1.67)	9.23 (1.91)	17.20 (4.44)	19.73 (3.33)
Moderate increasing	13.07 (2.17)	13.91 (1.45)	20.00 (4.41)	23.17 (3.54)	22.13 (3.83)
Moderate	12.38 (2.06)	12.04 (2.43)	15.48 (6.07)	16.43 (4.88)	15.57 (3.72)
High peaking	14.50 (1.80)	13.81 (0.89)	22.56 (5.03)	18.00 (4.20)	15.75 (2.37)

Table 3
Means (M) and Standard Deviations (SD) of Closeness Scores at Each Age by Trajectory Group

Trajectory	First grade M (SD)	Second grade M (SD)	Third grade M (SD)	Fifth grade M (SD)	Sixth grade M (SD)
Low peaking	24.03 (4.09)	28.72 (4.24)	29.12 (4.51)	22.74 (4.13)	22.50 (2.67)
Low decreasing	27.17 (4.41)	22.41 (4.50)	21.81 (4.65)	20.93 (4.03)	20.94 (4.01)
High decreasing	33.91 (3.63)	29.34 (4.11)	28.84 (4.21)	22.93 (4.02)	23.18 (3.58)
High peaking	33.19 (4.39)	32.43 (3.68)	32.13 (3.91)	24.30 (2.76)	24.40 (3.31)

Table 4**Predictors of Externalizing and Internalizing Behaviors**

	Externalizing Behavior: Model 1 β	Externalizing Behavior: Model 2 β	Internalizing Behavior: Model 1 β	Internalizing Behavior: Model 2 β
Step 1: Child and family factors				
Early externalizing	.27**	.11~	.09	.05
Early internalizing	.09	.09	.22**	.15*
Avoidant attachment	.03	.03	.03	.01
Ambivalent attachment	.02	.01	.03	.01
Disorganized attachment	.03	.01	.04	.02
Child impulsivity	.10	.10	.27***	.27***
Child emotionality	-.10	-.11	.03	.02
Child sociability	.02	.07	-.28***	-.23***
Maternal education	.04	.06	.12*	.14*
Maternal depression	.27***	.19**	.10~	.06
Step 2: Teacher-child relationships				
Low increasing conflict	.33***		.18**	
Moderate conflict		.22***		.04
Moderate increasing conflict	.28***		.12**	
High peaking conflict		.25***		.06
Low decreasing closeness	-.06		.16**	
Low peaking closeness	.08		.09	
High decreasing closeness	-.05		.04	
R ²	.24	.44	.36	.44
R ²		.20***		.08**