

THE ROLE OF THE TEACHER-CHILD RELATIONSHIP IN THE  
SOCIOEMOTIONAL OUTCOMES OF ETHNICALLY DIVERSE AND  
LOW INCOME CHILDREN IN DAYCARE SETTINGS

AN ABSTRACT

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

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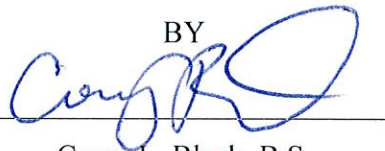
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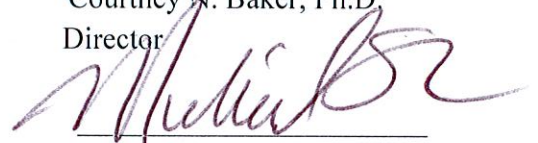


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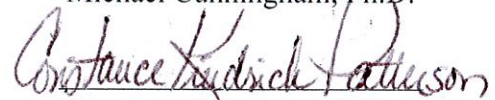
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## Abstract

Disparities in health and achievement are greater for low income ethnic minorities. There is a growing evidence base that supportive teacher-child relationships are associated with positive socioemotional outcomes and can act as a protective factor for children, including those at risk for poorer outcomes due to their racial/ethnic backgrounds and socioeconomic status. Research suggests that the reverse is also true. Specifically, children's behaviors can also reciprocally impact the quality of teacher-child relationships. While there is an abundance of research on associations between the teacher-child relationship and child outcomes in school-aged children, this is one of the first studies to focus on these associations in a low-income, ethnically diverse population of preschoolers. In the current study, data on preschoolers (N = 2152) and their teachers (N = 229) were gathered during the beginning and end of the preschool year in the context of a larger study evaluating a kindergarten readiness program (Baker, Kupersmidt, Voegler-Lee, Arnold, & Willoughby, 2010). Teachers completed questionnaires about preschooler social skills, inattention, and oppositional/defiant behaviors. Project staff conducted assessments of preschooler behavior regulation and also gathered information about the teacher-child relationship using observational measures. The influence of teacher-child relationships on preschooler functioning was examined using hierarchical linear modeling. The influence of preschooler functioning on teacher-child relationships was analyzed using linear regression. Results indicate that teacher-child relationships established early in the preschool school year impact preschooler social skills, behavior regulation and oppositional/defiant behaviors later in the same school year. Additionally, behaviors exhibited by preschoolers early in the year appear to influence the levels of sensitivity and permissiveness in teacher-child relationships later in the year. These reciprocal relationships were also moderated by preschooler age, gender and race/ethnicity. Limitations of the study and implications of the findings as they relate to the professional development and training of professionals in preschool settings are also described.



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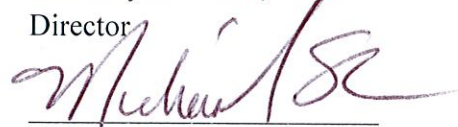
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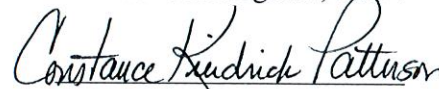


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## **Introduction**

The affective bond between a child and caregiver captures the expressions of positive affect and the apparent security and comfort derived from the caregiver's presence, and later, the internal representation of the caregiver. This bond is the psychological tether that joins infant and caregiver (Sroufe & Waters, 1977). Bowlby (1969), the driving force behind the development of attachment theory, described internal working models of relationships as largely unconscious interpretive filters through which relationships and other social experiences are construed. He believed that individuals with secure working models of relationships seek and begin to expect supportive, satisfying encounters in relationships, such as responsiveness and emotional availability from mothers. The rules for relating to others that are implicit in this relational model cause an individual to behave in a positive, open manner that elicits such support. In contrast, individuals with insecure working models, because of the distrust or uncertainty engendered by their relational expectations, anticipate less support from others and may actually deter the kind of supportive care from which they would benefit. This tends to characterize individuals who experienced insensitive and unresponsive care from their mothers (Belsky & Fearon, 2002; Thompson, 1999).

Thus, the attachment relationships that individuals form as young children have significant, long-lasting effects. Though traditionally conceptualized as the mother-child relationship, alternative caregiving relationships like the relationships that young children have with their teachers are also critically important. Understanding the ways in which the teacher-child relationship and the socioemotional wellbeing of young children are interrelated is imperative in facilitating later positive outcomes for all children, and

especially for children at-risk for poorer outcomes due to ethnic minority or low income status. This study investigates the reciprocal nature of the teacher-child relationship and its role in the socioemotional outcomes of ethnically diverse children from low income backgrounds.

### **Attachment Relationships with Primary Caregivers**

Attachment relationships are thought to play a role in socioemotional development early in life, to influence peer interactions and relationships across developmental stages, and to impact functioning throughout life (Nickerson & Nagle, 2005; O'Connor, Bureau, McCartney, & Lyons-Ruth, 2011). A secure or insecure attachment in infancy can shape many aspects of the developing personality, including sociability, emotional predispositions, curiosity, self-esteem, independence, cooperation and trust (Thompson, 1999). Positive attachment relationships with mothers are also predictive of positive social functioning (Belsky & Fearon, 2002; Bohlin, Hagekull, & Rydell, 2000) and later academic skills (Aviezer, Sagi, Resnick, & Gini, 2002). Conversely, insecure attachment relationships with mothers have been associated with negative outcomes in youth, such as higher levels of internalizing and externalizing behaviors (O'Connor et al., 2011) and increases in stress-related enzymes, which are known to activate the "fight-or-flight" response system (Frigerio et al., 2009).

### **Attachment Relationships with Teachers and Other Caregivers**

The construct of child attachment has considerable theoretical and empirical support. However, the early attachment literature focused primarily on mother-child dyads, in line with Bowlby's (1951) assertion that a young child should experience a warm, intimate and continuous relationship with his mother in order to establish a

foundation for good mental health. As a result, much of the work done in this area has been conducted with mothers and their children (Hock, McBride, & Gnezda et al., 1989; Schwarz, 1968; Wahler, 1967) and has not examined the role of other caregivers, such as fathers, other family members, and teachers.

There is evidence that infants can be attached to a hierarchy of figures (Schaffer & Emerson, 1964), including fathers and other family caregivers, and that these attachment relationships also contribute to concurrent child functioning (Farmer, Selwyn, & Meakings, 2013; Kazura, 2000). Included in this hierarchy of attachment figures are teachers. When parents entrust the care of their children to teachers, they are communicating to their child that the teacher will care for them in the parents' absence. The implicit message from parent to child in the context of early childhood education is that the childcare provider is a primary caregiver along with the child's parents (Howes & Hamilton, 1992).

Though research on the teacher-child relationship in early childhood is somewhat limited, there is a growing evidence base that children's attachment relationships with their preschool teachers have positive impacts on childhood functioning. For example, Silva and colleagues (2011) examined the relationship between child behavior regulation and the quality of teacher-child relationships in an ethnically diverse and low income sample of 3 to 5-year-olds and found that attention focusing and behavior inhibition was positively correlated with teacher-child closeness. Ewing and Taylor (2009) examined the teacher-child relationship in a sample of ethnically diverse Head Start children and found that behavioral competence (e.g., attentive to classroom proceedings, considerate of others) was associated with having a close relationship with the teacher.

Additional research suggests that secure attachment relationships with preschool teachers may partially compensate for insecure mother-child relationships. Specifically, Mitchell-Copeland, Denham, and DeMulder (1997) reported that young children with insecure mother-child attachments but with secure teacher-child attachments had higher teacher-rated social competence and exhibited more prosocial behaviors compared to their peers who had insecure attachments with both their mother and teacher. Similarly, Hamre and Pianta's (2005) study of kindergarteners at risk due to difficulties with inattention, externalizing behaviors, social skills deficits or low levels of maternal education demonstrated that when these students were placed in instructionally and emotionally supportive first-grade classrooms, they had achievement scores and teacher-child relationships similar to those of their low-risk peers. These results suggest that supportive relationships with teachers not only positively contribute to the socioemotional and academic functioning of young children, but may also serve as a protective factor.

Alternatively, children who experience a great deal of friction with their teachers are limited in the extent to which they are able to rely on that relationship as a source of support (Birch & Ladd, 1997). Consequently, this may be associated with poorer child outcomes. For example, Baker (2006) demonstrated that conflict in the teacher-child relationship was correlated with externalizing behaviors, poor classroom adjustment and poor social skills in school-age children. This was also demonstrated by Pianta, Steinberg, and Rollins (1995) in a sample of young elementary school students, where children rated as having a relatively negative relationship with their kindergarten teachers

tended to obtain worse than expected scores on measures of classroom behavior the following year in first grade.

### **Conceptualization and Measurement of Attachment Relationships**

Early attachment researchers identified four categories that describe attachment behavior. Ainsworth and colleagues (1978) described three types of attachment classifications based on infant behaviors observed during the Strange Situation experiment. These classifications are labeled as secure, anxious-avoidant and anxious-resistant/ambivalent. Main and Solomon (1986) added an additional category, disorganized/disoriented, to complete the classification scheme. Secure attachments can be thought of as having stability in that the child can reliably anticipate that the caregiver will be accessible and demonstrate sensitive interactions. Anxious-avoidant and disorganized/disoriented classifications also feature components of stability, in that these infants experience reliable insensitivity. The anxious-resistant/ambivalent category is marked by the attachment figure being unpredictable (O’Gorman, 2012). In examining these relationships, observational measures have tended to be the gold standard (e.g., Strange Situation Procedure) although interview and self-report measures of attachment are also used.

The teacher-child relationship has been conceptualized similarly, with a focus on describing the interactions between the child and teacher based on their levels of closeness, conflict and dependency (e.g., Baker, 2006; Peisner-Feinberg et al., 2001; Silva et al., 2011). These domains are largely based on the first scale developed to evaluate teacher-child relationships (i.e., the Student Teacher Relationship Scale), which was based on attachment theory and research on parent-child and teacher-child

relationships (Pianta & Nimetz, 1991; Solheim, Berg-Nielsen, & Wichstrom, 2012). Specifically, closeness is defined as experiences of affection, openness and warmth with a particular child; conflict is defined as the level of discord in the teacher-child relationship; and dependency is defined as possessive and clingy behavior. Other measures of the teacher-child relationship include comparable constructs such as sensitivity, harshness, detachment and permissiveness. The evaluation of teacher-child relationships is similar to that of parent-child relationships, in that child behaviors toward caregivers (i.e., teachers) are indicative of the teacher-child relationship. However, typical measurement approaches used to assess the teacher-child relationships are limited by relying upon the teacher's report. As a result, input from the child is not typically considered, and these reports are not as objective as observational methods.

Additionally, attachment between parents and children is typically conceptualized within a dyadic framework. Therefore, it is unsurprising that measures of the teacher-child relationship mirror this dyadic approach. However, although teachers interact with students on an individual basis at times, teachers spend much of their time interacting with the class as a whole. As such, the quality of the teacher-student interaction pattern can arguably be conceptualized at the classroom level. For example, Burchinal and Cryer (2003) used classroom levels of teacher sensitivity in their investigation of outcomes related to the teacher-child relationship in preschools, in which teacher sensitivity was correlated with higher levels of cognitive and social skills. Also, Mashburn's (2008) examination of the teacher-child relationship found that teacher sensitivity and responsiveness at the classroom level was positively associated with academic and literacy skills in a sample of preschool students. Additionally, Ghazvini and Mullis

(2002) observed classroom level sensitivity in early childhood classrooms to examine predictors of childcare quality. Thus, classroom-level teacher behavior and relational style appear to have important effects on the behavioral and academic functioning of multiple students. Additionally, when considering prevention and intervention techniques to use with at-risk students in underresourced daycare settings, approaches that involve classroom-wide modifications are more practical than methods aimed at addressing specific teacher-student dyadic concerns.

### **Reciprocal Impacts of Child Functioning and the Attachment Relationship**

Research has also shown that the teacher-child relationship is reciprocal in terms of the influence that both the child and teacher have on relationship outcomes. For example, in line with the research on the teacher-child relationship, Zhang and Sun (2011) demonstrated that teacher-child conflict early in the school year was correlated with later externalizing problems in first-year preschoolers. Notably, externalizing problems of students in this sample early in the preschool year were also reciprocally related to later teacher-child conflict. Similarly, Berry (2012) illustrated that higher levels of teacher-child conflict were associated with lower levels of inhibitory control longitudinally in a sample of students followed through elementary school. This was also true of the reverse relationship; that is, children with lower levels of inhibitory control in first grade had greater levels of teacher-child conflict in second grade. In a sample of elementary school students followed from first to third grade, Hughes, Luo, Kwok, and Loyd (2008) demonstrated that the teacher-child relationship and effortful cooperation related to learning in students shared a reciprocal relationship between second and third grade. Similarly, Doumen and colleagues (2008) demonstrated that aggressive behavior



in kindergarten students led to increased levels of teacher-child conflict in the middle of the school year, which then led to increased levels of aggressive behavior by the end of the school year. In sum, the literature suggests that critical reciprocal relationships exist between the quality of the teacher-child relationship and child outcomes. However, the majority of these studies were conducted with elementary school students and the descriptions of teacher-child relationships were based on teacher ratings, suggesting the need for research extending these findings to early childhood and using objective, observational measures.

### **Moderators of the Teacher-Child Relationship**

The growing literature base on the important and reciprocal impacts of the teacher-child relationship in preschool supports the premise that early childhood is an opportune time to investigate this construct (O'Connor & McCartney, 2007; Pianta, Nimetz, & Bennett, 1997; Ramos-Marcuse & Arsenio, 2001; Silva et al., 2011). Better understanding the role of the teacher-child relationship can provide information to guide intervention development and staff training. By providing teachers with the skills needed to foster positive relationships and repair negative relationships with students, teachers have the opportunity to positively impact the functioning of many children at once. The apparent protective nature of a positive teacher-child relationship is especially important for at-risk students, such as low-income, ethnic minority children. Though the evidence-base is growing, there are several key moderators of the teacher-child relationship that remain understudied.

**Child Age.** Attachment theory posits that a secure attachment with a primary caregiver early in life is ideal for developing positive relationships throughout life

(Bowlby, 1957). Similarly, the role of the teacher as an attachment figure is considered to be of greater importance with younger children when compared to older children (Verschueren & Koomen, 2012). Thus, early childhood is a critical period of development in which to focus on building positive or repairing negative relationships with teachers. Suggestive of the importance of the early childhood period regarding attachment-related functioning are findings by Peisner-Feinberg and colleagues (2001). They reported that childcare teachers' ratings of closeness in their relationships with children were predictive of children's social skills through second grade. Additionally, teachers reported fewer problem behaviors in second grade for children who had closer relationships with their preschool teachers. Similar outcomes have also been demonstrated in an ethnically diverse, low-income sample of preschoolers, where conflict in the teacher-child relationship was negatively related to student school liking and positively related to teacher-reported school avoidance across the school year (Silva et al., 2011). Researchers have also demonstrated that differences in child age within the same classroom are related to child outcomes. For example, Spitzer, Cupp, and Parke (1995) illustrated that Kindergartner age was positively correlated with prosocial behaviors and negatively correlated with being verbally and physically aggressive, suggesting that older Kindergartners were better able to function independently in classrooms compared to their younger classmates. Though these studies do not test the moderating effect of age on the teacher-child relationship and child outcomes within the preschool year, they are suggestive that younger children may benefit more from supportive teacher-child relationships and that the quality of the teacher-child relationship

may be affected more by younger children, as teachers may have to play a larger role in helping them function compared to their older classmates.

**Child Gender.** Gender is believed to play a role in academic achievement and levels of positive social skills in children, and many researchers have investigated the relationship between gender and teacher-child relationships. Research has suggested that teachers report closer relationships with female students and more conflictual relationships with male students (e.g., Birch & Ladd, 1997; Howes, Phillipsen, & Peisner-Feinberg, 2000). Given research suggesting that the quality of the teacher-child relationship can impact child social outcomes (Ewing & Taylor, 2009), it is notable that differences in social skills based on gender can explain differences in math and reading achievement longitudinally in elementary school students (DiPrete & Jennings, 2012). Though these different findings complement one another theoretically, few researchers have investigated whether the quality of the teacher-child relationship matters more for girls or boys in the context of one study. One study by Baker (2006) reported that elementary school-aged girls with positive relationships with teachers evidenced better social skill-related outcomes than boys with similar quality relationships. A second study by Ewing and Taylor (2009) found that teacher-child closeness was more predictive of school competence for girls than for boys in a sample of Head Start students. Based on these limited findings, it appears that child gender likely plays an important role in the impact that teacher-student relationships have on the subsequent social and behavioral outcomes of children, such that girls and boys have different outcomes when exposed to similar relationships with teachers and that their behaviors differentially predict their relationships with teachers.

**Racial/Ethnic Match.** African American children and youth are disproportionately more likely to experience social circumstances that may increase their chances of developing a mental illness according to the National Alliance on Mental Illness (2004). Youth from African American families have also been shown to be at academic risk compared to their White peers, and low income status is a prominent factor contributing to the lower educational achievement of this population (National Alliance on Mental Illness, 2004). Research has begun to elucidate the mechanisms of these racial and ethnic disparities in achievement, and both racial gaps in family SES and implicit measures of teacher prejudice have been associated with differences in achievement levels for minority youth (Duncan & Magnuson, 2005; van den Bergh, Denessen, Homstra, Voeten, & Holland, 2010). Given evidence suggesting that the teacher-child relationship can be protective (Hamre & Pianta, 2005; Mitchell-Copeland, Denham, & DeMulder, 1997), understanding and developing interventions that improve teacher-child relationships for these low-income ethnic minority children has the potential to ameliorate some of this risk.

Research has demonstrated that racial match between children and teachers has been shown to be associated with warmer teacher-child interactions and teachers rating relationships with children more positively (Ho, Gol-Guyen, & Bagnato, 2012; Saft & Pianta, 2001). In addition, there is evidence that the teacher-child relationship can have differential effects on child outcomes based on child race and ethnicity. For example, Burchinal, Peisner-Feinberg, Pianta, and Howes (2002) demonstrated that teacher-child closeness was a stronger predictor of children's language for children of color compared to White children in a sample of elementary school students. Along these lines, Murray,

Waas, and Murray (2008) found that African American kindergarteners were more likely to dislike school when experiencing conflict with the teacher compared to Caucasian and Latino students.

The majority of these studies investigated low income samples. However, in much of the research in this area, race and ethnicity tend to be confounded with socioeconomic status (SES). For example, Ramos-Marcuse and Arsenio (2001) examined how student conceptions of victimization-related emotions (e.g., attribution of positive emotions to victimizers) relate to attachment relationships and emerging behavior problems in a sample of mostly African American and Latino young children. They found that positive attachment relationships with primary caregivers and teachers were associated with fewer externalizing problems in this ethnic minority sample. However, although their sample varied in SES, subgroup analyses for low SES children were not possible due to the small sample size. The findings reported by Ramos-Marcuse and Arsenio (2001) suggest that the relationship between the student and teacher is a critical factor not only for academic success but also for social-emotional functioning in ethnic minority children from low income backgrounds. Specifically, findings suggest that teacher-child relationships could have differential effects on student socioemotional and behavioral outcomes based on child race/ethnicity and SES, such that low-income ethnic minority children may have different outcomes than White children when exposed to similar relationships with teachers. However, these findings touch on the possibility that child race/ethnicity may influence different interactions from teachers, such that racial/ethnic minority children may have more difficult relationships with teachers than their White peers.

## **The Present Study**

In sum, the teacher-child relationship in early childhood has significant, long-lasting, and reciprocal effects related to children's socioemotional wellbeing. As such, it is imperative that researchers know how to best support teachers in developing and repairing these relationships through professional development activities and relationship-focused interventions. These alternative caregiving relationships in early childhood are even more important for children at-risk for later problems due to their low-income, ethnic minority status. The goal of this study is to evaluate these relationships in the context of a large, longitudinal evaluation of ethnically diverse preschoolers from low income families.

### **Hypotheses**

First, I hypothesize that teacher-child relationships with greater levels of sensitivity in the beginning of the school year will predict greater levels of social skills and behavioral regulation, and lower levels of inattention/overactivity and oppositional/defiant behaviors at the end of the school year. Conversely, it is predicted that teacher-child relationships with greater levels of harshness, permissiveness and detachment in the beginning of the school year will predict lower levels of social skills and behavioral regulation and more inattention/overactivity and oppositional/defiant behaviors at the end of the school year.

Second, I hypothesize that greater levels of social skills and behavioral regulation, and lower levels of inattention/overactivity and oppositional/defiant behaviors in students in the beginning of the year will predict teacher-child relationships with higher levels of sensitivity at the end of the school year. Conversely, I hypothesize that more

inattention/overactivity and oppositional/defiant behaviors, and lower levels of social skills and behavioral regulation in the beginning of the school year will predict teacher-child relationships with greater levels of harshness, detachment and permissiveness at the end of the school year.

Finally, potential moderators will be investigated. I hypothesize that age will moderate the relationship between teacher-child relationship and socioemotional and behavioral outcomes, such that younger preschoolers with teacher-child relationships characterized by high levels of sensitivity will have greater levels of social skills and behavior regulation, and lower levels of inattention/overactivity and oppositional/defiant behaviors compared to older preschoolers with similar teacher-child relationships. I also hypothesize that age will moderate the reciprocal relationship, in that younger preschoolers with greater levels of social skills and behavior regulation and lower levels of inattention/overactivity and oppositional/defiant behaviors will have teacher-child relationships characterized by higher levels of sensitivity, compared to older preschoolers with similar levels of social skills, behavior regulation, inattention/overactivity and oppositional/defiant behaviors.

I also hypothesize that gender will moderate the relationship between teacher-child relationship and socioemotional and behavioral outcomes, such that female preschoolers with teacher-child relationships characterized by greater levels of sensitivity will have greater levels of social skills and behavior regulation and lower levels of inattention/overactivity and oppositional defiant behaviors, compared to male preschoolers with similar relationships. I hypothesize that gender will also moderate the reciprocal relationship, such that female preschoolers with greater levels of social skills

and behavior regulation and lower levels of inattention/overactivity and oppositional/defiant behaviors will have teacher-child relationships with greater levels of sensitivity, compared to male preschoolers with similar levels of social skills and behavior regulation.

Lastly, I hypothesize that preschoolers with teachers of the same race/ethnicity will have teacher-child relationships characterized by greater levels of sensitivity and greater levels of social skills and behavioral regulation, as well as lower levels of inattention/overactivity and oppositional/defiant behaviors, compared to preschoolers whose race/ethnicity differs from that of their teacher. I also, hypothesize that race/ethnicity match between teachers and preschoolers will moderate the reciprocal relationship, such that preschoolers whose race/ethnicity matches that of their teacher and have greater levels of social skills and behavior regulation, and lower levels of inattention/overactivity and oppositional/defiant behaviors will have teacher-child relationships characterized by greater levels of sensitivity compared to preschoolers whose race/ethnicity does not match that of their teacher. The conceptual model of proposed relationships between variables is presented in Figure 1.

### **Method**

The current study examines information gathered from a larger study that involved the evaluation a kindergarten readiness program conducted in Head Start and community child care programs called the Building Bridges (BB) program (Baker, Kupersmidt, Voegler-Lee, Arnold, & Willoughby, 2010). Eligibility for participation in the study was limited to programs with one or more classrooms comprised of at least 50% 4-year-old children. Participating Head Start programs were located in both urban



and rural counties. Community child care centers that represented the same geographic locations were then identified and matched to Head Start centers. Community child care centers were eligible if at least 50% of their students were low-income or enrolled in subsidized slots in order to match the socioeconomic status of the Head Start population. Eligible centers were required to have a three-star rating or higher, based on North Carolina's five-star quality rating system (North Carolina Division of Child Development, 2005).

### **Participants**

Participants in the current study included 3 to 5-year old preschoolers ( $N = 2048$ ) who were assessed, along with their teachers ( $N = 126$ ) from 75 Head Start and community childcare centers. Child assessments were completed on a subset of children ( $n = 526$ ). The majority of participating teachers identified as either African-American (65.5%) or White (31.7%). Similarly, the majority of children identified as either African-American (50.9%) or White (29.3%). See Table 1 for teacher and child demographic information. The distribution of gender among preschoolers was approximately evenly distributed, with males representing a slight majority (50.4 %). However, the gender of participating teachers was heavily skewed with 97 percent of the sample being female. The average age of preschoolers during the fall semesters was about four and a half years. The descriptive statistics for both teacher and child demographics are presented in Table 2.

### **Procedure**

**Observational data.** Information on the teacher-child relationship was gathered through classroom observations conducted by project staff members.

**Teacher data collection.** Project staff members interviewed teachers and collected teacher ratings of the children in their respective classrooms. Teachers provided information about each of the children in their classrooms, including demographics and ratings in social and behavioral domains. Specifically, teachers provided information about child gender, race/ethnicity, social skills, inattention and externalizing problems. Teachers also provided information about their own demographics, including gender and race/ethnicity. The interviews, including rating measures, occurred during the fall and spring of the intervention year. Each interview took 60 to 90 minutes to complete, and teachers were compensated with \$15.00.

**Child data collection.** Parents consented for their children's participation in the project. Child assessments were conducted in a private setting at the center the child attended and included measures of behavior regulation. Child assessments included in this study were conducted during the fall and spring semesters of the intervention year.

### **Measures**

**Teacher-child relationship.** The teacher-child relationship was examined through classroom observations using the Caregiver Interaction Scale (CIS; Arnett, 1989). The CIS is a 26-item global rating system that is designed to provide information on the teacher-child relationship at the classroom level across four domains: sensitivity, harshness, detachment and permissiveness. Observers used a 4-point Likert scale (1 = not at all, 4 = very much) to rate caregivers according to characteristics presented in the measure. Example descriptions include "encourages the children to try new experiences" and "seems unnecessarily harsh when scolding or prohibiting children." The current study used average subscale scores from the sensitivity ( $\alpha = .94$ ), harshness ( $\alpha = .80$ ),

detachment ( $\alpha = .78$ ) and permissiveness ( $\alpha = .79$ ) subscales. The reliability of these scales have been established in student populations from various socioeconomic and racial/ethnic backgrounds, with reported Cronbach alphas ranging from .76 to .93 (e.g., Burchinal & Cryer, 2003; Raikes et al., 2013). The CIS has been demonstrated to be valid, as it is moderately to highly correlated with other established measures of classroom environments (Burchinal & Cryer, 2003).

**Social Skills.** Teachers completed the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), a 30-item teacher-report measure of social skills and problem behaviors. Teachers were asked to report the frequency of behaviors such as “cooperates with peers without prompting” and “participates in games or group activities” on a 3-point Likert scale (0 = never, 1 = sometimes, 2 = very often). The social competency score, which is an average of the raw scores from individual items, of the SSRS teacher-report version has been found to be reliable and valid within a variety of child populations including preschoolers, children with diverse ethnic and racial backgrounds and children with a variety of clinical and non-clinical presentations (Fantuzzo, Manz, & McDermott, 1998; Lyon, Albertus, Birkinbine, & Naibi, 1996; Van der Oord et al., 2005; Walthall, Konold, & Pianta, 2005). Cronbach’s alpha for the current study was .90.

**Inattention and Externalizing Behaviors.** Teachers completed the IOWA Conners Teacher Rating Scale (IOWA CTRS; Loney & Milich, 1982), a 10-item teacher-report measure designed to assess oppositional/defiant behavior and inattention/overactivity in children. Items present problematic behaviors such as “quarrelsome” or “inattentive, easily distracted,” and teachers are asked to rate a child’s behavior using a 4-point Likert scale ranging from “not at all” to “very much.” Subscale

scores are created by averaging items. These subscale scores have been found to be reliable and valid with a various range of child aged populations, with an internal consistency of .89 (Pelham, Milich, Murphy, & Murphy, 1989). Similar versions have reported internal consistency upwards of .87 with preschoolers (McGoey, DuPaul, Haley, & Shelton, 2007). Cronbach's alphas for the current study were .87 (oppositional/defiant scale) and .81 (inattention/overactivity scale).

**Emotion and Behavior Regulation.** Students completed the Preschool Self-Regulation Assessment (PSRA; Smith-Donald, Raver, Hayes, & Richardson, 2007), which included assessments of children's self-regulatory abilities. The PSRA has been found to be reliable and valid in populations of preschool children with diverse ethnic and racial backgrounds (Bassett, Denham, Wyatt, & Warren-Khot, 2012; Smith-Donald, Raver, Hayes, & Richardson, 2007). The current study utilized the following tasks: Balance Beam, Pencil Tap, Toy Sorting, Snack Delay and Tongue Task.

During the Balance Beam task, children were asked to walk a six foot line three times. During each trial, the student was asked to walk slower. Specifically, the instructions for each trial are as follows: (1) "walk on the balance beam"; (2) "see how slow you can walk"; (3) "walk as sloooow as possible." Each time, the evaluator recorded the time (in seconds) it took for the child to walk the length of the line. The difference between the quickest and slowest walk times, measured in seconds, was used as an index of motor inhibition.

During the Pencil Tapping task, the evaluator and the child each had a pencil and the child was provided with instructions regarding the number of times to tap his or her pencil. When the evaluator tapped her pencil once, the child was to tap his or her pencil

twice and when the evaluator tapped her pencil twice, the child was to tap his or her pencil once. After a series of practice trials with feedback provided to the student, scored trials were administered and no feedback was provided. The number of correct responses was used as an index of cognitive inhibition.

During the Snack Delay task, children were required to place their hands flat on the table as the evaluator placed a snack under a cup in front of them. They were informed that they could have the snack if they were able to wait until the evaluator told them that “time is up.” A practice round was administered and if the child reached for the snack prior to being instructed, he or she was told to wait. After this trial, the evaluator administered three scored trials (10, 20 and 30 seconds, respectively). The trials were scored based on the following four point rating: 1 = eats snack, 2 = touches snack, 3 = touches cup or timer, 4 = waits for “time” and does not touch cup or timer. The average of these trials was used as an index of self-regulation.

During the Tongue Task, children were told that they would play a game that involved seeing “who could hold a piece of candy (e.g., M&M) on their tongue the longest without chewing it, sucking it or swallowing it.” A 10-second teaching trial was administered, during which the evaluator and the child each placed a piece of candy on their tongues and left their mouths open. The evaluator observed the child and prompted him or her to keep their mouth open if it closed for three or more seconds. Following the 10-second trial, a 40-second test trial was administered. The time, measured in seconds, that the child waited before eating the candy was used to index self-regulation.

In the Toy Sort Task, the evaluator dumped out toys on the floor and asked the child to clean them up and put them where they go. The evaluator indicated a separate bin

for each category of toys and the child was given two minutes to clean them up. If the child had not begun cleaning after 60 seconds, the instructions were repeated. The amount of time, measured in seconds, it took the child to start cleaning and to complete clean-up was recorded. This task was used as a measure of the children's ability to follow instructions.

A composite score for the behavior regulation tasks was calculated through the use of principal component analysis (Jolliffe, 2002). The resulting factor score was standardized to a mean of zero with a variance of 1. This factor score was used in analyses as an indicator of preschooler behavior regulation.

**Demographic Variables.** The racial/ethnic match between teachers and preschoolers was expressed as a coded variable based on teacher and preschooler demographic variables. Teachers and preschoolers were coded into four groups: African American, White, Hispanic and Other Minority. Matched race/ethnicity, coded as 1, was based on matches between African American, White and Hispanic teachers and preschoolers. Teachers and preschoolers coded as Other Minority, as well as teachers and preschoolers whose race differed from one another, were coded as 2. Demographic variables for teachers and preschoolers are presented in Table 1.

### **Analytic Approach**

First, descriptive statistics were calculated for domains related to both teachers and preschooler, including age, gender and race/ethnicity. Descriptive statistics were also calculated for teacher-level and preschooler-level measures for fall and spring semesters. Bivariate correlations were calculated for both child-level and teacher-level measures.

Due to the limited research related to teacher-child relationships with low income minority preschoolers, the initial step was to examine the direct relationships between the teacher and child variables of interest. These include the reciprocal relationships between the teacher-child relationship (i.e., sensitivity, harshness, detachment and permissiveness) and child outcomes (i.e., social skills, inattention/overactivity, oppositional/defiant behaviors and behavioral regulation). First, I fit a series of models evaluating whether the teacher-child relationship in the beginning of the school year predicted child functioning at the end of the school year. Because children were grouped within classrooms, I examined two-level random-intercepts mixed linear models using hierarchical linear modeling with full maximum likelihood estimation (HLM; Raudenbush & Bryk, 2002). Fitting models using HLM allows the associations between the predictors and outcomes to be evaluated accounting for the hierarchical data structure of children within classrooms.

The equations for both level 1 and level 2 data are as follows, where the outcome variables are preschooler-level outcomes (i.e., social skills, inattention/overactivity, oppositional/defiant behaviors and behavior regulation). For the first set of results, I explored the relationship between the teacher-child relationship based on an observational measure (i.e., the CIS) and teacher-rated preschooler functioning. Child demographic data and preschooler functioning were entered at Level 1; teacher demographics and observational data about the teacher-child relationship were entered at Level 2. Each child outcome was explored separately, resulting in 4 separate models. A second set of analyses included the age, gender and racial/ethnic match by CIS interaction effects.

The equation for the Level-1 model is displayed below:

$$(\text{Outcome Variable Spring})_{ij} = \beta_{0j} + \beta_{1j} * (\text{Child Age})_{ij} + \beta_{2j} * (\text{Child Gender})_{ij} + \beta_{3j} * (\text{Race Match})_{ij} + \beta_{4j} * (\text{Outcome Variable Fall})_{ij} + r_{ij}$$

The equation for the level-2 model is displayed below:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} * (\text{CIS Sensitivity Fall})_j + \gamma_{02} * (\text{CIS Harshness Fall})_j + \gamma_{03} * (\text{CIS Detachment Fall})_j + \gamma_{04} * (\text{CIS Permissiveness Fall})_j + u_{0j}$$

I next evaluated a series of models that predicted teacher-child relationships at the end of the school year by child functioning in the beginning of the year. The classroom averages were used in linear regression models to predict spring semester teacher level outcomes (i.e., the CIS) for the associated teachers. Second, in order to evaluate the moderating effect of child age, gender and racial/ethnic match, similar models were fit as described above, that also included the predictor by moderator interaction terms.

## **Results**

### **Descriptive Statistics**

Overall, classrooms were characterized by moderate to high levels of teacher sensitivity ( $M = 3.19$ ), with lower levels of harshness ( $M = 1.65$ ), detachment ( $M = 1.35$ ) and permissiveness ( $M = 1.52$ ) (see Table 2). These results suggest that teachers were generally rated as being warm, attentive and engaged with the children in their classrooms. Similarly, preschooler functioning in the classroom was characterized by moderate levels of social skills ( $M = 1.41$ ), behavioral regulation ( $M_{\text{Toy sort}} = 34.9$ ;  $M$



$M_{Balance\ Beam} = 7.68$ ;  $M_{Tongue\ Task} = 37.66$ ;  $M_{Pencil\ Tap} = .58$ ;  $M_{Snack\ Delay} = 3.85$ ), and low levels of inattention ( $M = 0.97$ ) and oppositional behaviors ( $M = 0.62$ ) (see Table 2).

Bivariate correlations were calculated for child-level and teacher-level outcomes. Fall measures of the teacher-child relationship domains of sensitivity ( $r = .08$ ) and permissiveness ( $r = .07$ ) were significantly positively correlated with spring level social skills. Similarly, the fall measure of the teacher-child relationship domain of harshness was positively and significantly correlated with spring levels of inattention/overactivity ( $r = .08$ ) and oppositional/defiant behaviors ( $r = .12$ ). A complete description of bivariate correlations is presented in Table 2.

### **Teacher-Child Relationship Quality Predicts Child Functioning**

**Social Skills.** In order to determine if HLM analyses were appropriate for these data, the intra-class correlations (ICC) were calculated. The ICC for the model predicting preschooler social skills from the teacher-child relationship indicated that about 27 percent of the variance in preschooler social skills was explained by differences between classrooms (see Table 3). Thus HLM analyses were deemed appropriate. In the model evaluating direct effects, hypotheses of relationships between the individual domains of the teacher-child relationship and preschooler social skills were not supported. However, a relationship was observed when moderators were entered into the model. In particular, and contrary to hypotheses, higher levels of teacher sensitivity predicted lower levels of social skills more strongly for girls,  $B = -.07$ ,  $se = .03$ ,  $p = .02$ , than for boys (see Figure 2). Additionally, and unsurprisingly, older preschoolers had better social skills than younger preschoolers,  $B = .004$ ,  $se = .001$ ,  $p < .001$ . Hypotheses regarding harshness, detachment, and permissiveness were not supported.

***Inattention/Overactivity.*** The ICC for the model predicting preschooler inattention and overactivity from the teacher-child relationship indicated that about 36 percent of the variance in preschooler levels of inattention and overactivity was explained by differences between classrooms (see Table 4). Thus HLM analyses were deemed appropriate. In the model of direct effects, there were not any significant relationships between the individual domains of the teacher-child relationship and preschooler levels of inattention and overactivity in this model. When potential moderators were entered into the model, the relationship between the teacher-child relationship and preschooler inattention and overactivity remained the same. Overall, older preschoolers,  $B = -.01$ ,  $se = .003$ ,  $p = .009$ , and female preschoolers,  $B = -.09$ ,  $se = .03$ ,  $p = .01$ , had lower levels of inattention and overactivity. These results also contradicted hypotheses, in that inattention and overactivity were not significantly predicted by any particular domain of the teacher-child relationship.

***Oppositional/Defiant Behaviors.*** The ICC for the model predicting preschooler oppositional and defiant behaviors from the teacher-child relationship indicated that about 49 percent of the variance in preschooler levels of oppositional and defiant behaviors was explained by differences between classrooms (see Table 5). Thus HLM analyses were deemed appropriate. In the model of direct effects, there were not any significant relationships between the individual domains of the teacher-child relationship and preschooler levels of oppositional and defiant behaviors. However, relationships were observed when moderators were entered into the model. Specifically, higher levels of harshness predicted lower levels of oppositional and defiant behaviors for girls but not for boys,  $B = -.29$ ,  $se = .09$ ,  $p = .003$  (see Figure 3). On the other hand, higher levels of

harshness predicted higher levels of oppositional and defiant behaviors for boys. Additionally, for preschoolers whose race differed from that of their teachers, higher levels of teacher harshness,  $B = -.30$ ,  $se = .08$ ,  $p < .001$ , and higher levels of permissiveness,  $B = -.18$ ,  $se = .07$ ,  $p = .009$ , in the fall predicted lower levels of oppositional and defiant behaviors in the spring (see Figures 4 and 5). Thus, hypotheses were partially supported. Hypotheses related to the other domains of the teacher relationship as well as child age were not supported.

***Behavior Regulation.*** The ICC for the model predicting preschooler behavior regulation from the teacher-child relationship indicated that only about 4 percent of the variance in preschooler behavior regulation was explained by differences between classrooms (see Table 6). However, in order to address the hypotheses using these nested data and avoid violating assumptions of independence inherent to regression, HLM analyses were used to evaluate hypotheses. Teacher sensitivity significantly predicted preschooler behavior regulation when modeling the direct relationships,  $B = .26$ ,  $se = .08$ ,  $p = .001$ . When moderators were entered into the model, multiple domains of the teacher-child relationship significantly predicted preschooler behavior regulation. Specifically, the effects of teacher sensitivity, harshness and detachment on preschooler behavior regulation were moderated by age and race match. For older preschoolers, higher levels of teacher sensitivity more strongly predicted greater levels of behavior regulation,  $B = .06$ ,  $se = .02$ ,  $p = .02$  (see Figure 6). Additionally, for preschoolers whose race differed from that of their teachers, higher levels of harshness predicted lower levels of behavior regulation,  $B = -.57$ ,  $se = .27$ ,  $p = .03$  (see Figure 7). For preschoolers whose race differed from that of their teacher, higher levels of detachment predicted greater levels of behavior

regulation,  $B = .45$ ,  $se = .20$ ,  $p = .03$  (see Figure 8). These results partially support hypotheses. However, hypotheses regarding teacher permissiveness and child age were not supported.

### **Child Functioning Predicts Teacher-Child Relationship Quality**

The second set of analyses examined the relationship between preschooler functioning in fall and measures of the teacher-child relationship in the spring. Specifically, statistical models were fit to determine whether fall child measures of social skills, inattention/overactivity, defiant/oppositional behaviors and behavior regulation predicted levels of teacher sensitivity, harshness, detachment and permissiveness in the spring. In order to do this, for each teacher, the fall semester child level measures for that classroom were averaged. Variables were centered in order to create interaction terms. Results of these analyses are presented in Tables 7, 8, 9, and 10.

***Teacher Sensitivity.*** In the model evaluating the direct effects of preschooler functioning on teacher sensitivity, hypotheses were partially supported. In particular, oppositional/defiant preschooler behaviors predicted lower levels of teacher sensitivity,  $B = -.46$ ,  $se = .22$ ,  $p = .04$ . However, other hypotheses, including the influence of moderators, were not supported.

***Teacher Harshness.*** In the model evaluating direct effects of preschooler functioning on levels of teacher harshness, hypotheses of relationships between the individual domains of preschooler functioning and teacher levels of harshness were not supported.

***Teacher Detachment.*** In the model evaluating direct effects of preschooler functioning on levels of teacher detachment, hypotheses of the relationship between the

individual domains of preschooler functioning and teacher detachment were not supported.

***Teacher Permissiveness.*** In the model evaluating direct effects of preschooler functioning on levels of teacher permissiveness, hypotheses of the relationship between the individual domains of preschooler functioning and teacher permissiveness were partially supported. In particular, greater levels of preschooler behavior regulation predicted greater levels of teacher permissiveness,  $B = .31$ ,  $se = .11$ ,  $p = .002$ , based on the model including interaction terms. Additionally, the impact of social skills on teacher permissiveness was moderated by preschooler age. In particular older preschoolers who demonstrated more social skills resulted in more permissive teachers, compared to younger preschoolers with similar levels of social skills,  $B = .25$ ,  $se = .08$ ,  $p = .002$  (See Figure 9). However, other hypotheses, including the influence of moderators, were not supported.

## **Discussion**

The goal of the present study was to examine the reciprocal effects of teacher-child interactions and preschooler functioning in a sample of preschoolers from ethnically diverse and low income backgrounds. Similar to previous research, overall results demonstrated that there are reciprocal, bidirectional effects present in the relationship between teacher-child interactions and preschooler functioning (Birch & Ladd, 1997; Hamre & Pianta, 2005). Additionally, results indicated that these relationships are moderated by child level variables, including gender, age and the racial/ethnic match between teachers and preschoolers. However, these results were not universal across all constructs included in this study; thus, study hypotheses were partially supported.

## **Effects of the Teacher-Child Relationship**

Given that young children can be attached to multiple caregivers, including teachers, the teacher's role in the development of preschoolers is significant (Ewing & Taylor, 2009; Schaffer & Emerson, 1964; Silva et al., 2011). Research has demonstrated the importance of the teacher-child relationship on the social-emotional and behavioral functioning of preschoolers (Baker, 2006; Birch & Ladd, 1997; Pianta, Steinberg & Rollins, 1995). The current study replicated these findings across some, but not all, theoretically important domains of teacher behavior.

First, this study evaluated the simple relationships between teacher interaction styles and preschool behavioral outcomes. As predicted, teachers who interacted with preschoolers in a warm and attentive manner influenced these children to exhibit greater levels of behavior regulation. This is not surprising, as previous research exploring the role of sensitive teacher interactions on the functioning of young children has demonstrated similar results (Merritt, Wanless, Rimm-Kaufman, Cameron, & Peugh, 2001). Surprisingly, however, other hypotheses of simple relationships were not supported. This was most likely due to these relationships varying by preschooler age, gender and ethnic/racial match with teachers as indicated by descriptions that follow.

Based on theory and the empirical literature, age, gender, and preschooler-teacher racial match were hypothesized to moderate the relationships between teacher behavior in the classroom and child outcomes. However, the influence of teacher sensitivity on preschooler social skills was the opposite of what was predicted and this was especially true for female preschoolers. This result might be explained by a combination of factors, including teachers having sensitive interactions with students, but not having the skills

necessary to foster positive relationships between preschoolers. For example, Mashburn and colleagues (2008) demonstrated that measures of positive teacher-child interactions were negatively correlated with measures of classroom quality, which included classroom routines, structure and activities. The moderating effects are also supported by previous research that demonstrates the greater importance of these relationships for female preschoolers, compared to their male peers (Baker, 2006; Ewing & Taylor, 2009).

The proposed impact of teacher harshness on preschooler functioning was also partially supported by the findings of this study. Specifically, teachers rated as being harsher had preschoolers with lower levels of behavior regulation in their classrooms later in the preschool year. However, this relationship was only present for teachers whose race differed from that of the preschooler. This relationship has been observed in previous research that examined the relationship between conflictual teacher-child interactions and child functioning (Birch & Ladd, 1997; Pianta, Steinberg, & Rollins, 1995). On the other hand, preschoolers with race-matched teachers who exhibited greater levels of harshness had increased levels of behavior regulation. Additionally, greater levels of teacher harshness predicted lower levels of oppositional and defiant behaviors and this relationship was moderated by both gender and the racial/ethnic match between students and teachers. Specifically, this relationship was observed in female students whose race differed from that of their teacher. These results are in contrast to work done by Miller-Lewis, Sawyer, Searle, and Sawyer (2014) in which the authors found that teacher conflict predicted greater levels of externalizing and internalizing behaviors. However, these findings could be explained as a result of CIS items that make up the harshness domain. For example, several scale items in the harshness domain are

reflective of practices that may be used to maintain order in classrooms. The behaviors described by these items (e.g., threatening children to control them, expecting students to exercise self control, punishing children without explanation) may be interpreted as teacher behaviors that result in preschooler compliance, as opposed to actions that are considered harsh or conflictual. The conceptualization of harshness in the current study differs from the concept of conflict in the study by Miller-Lewis and colleagues (2014), where scores high in conflict indicated that the teacher viewed his or her relationship with the child as negative and described the student as angry and unpredictable.

Teachers who exhibited greater levels of detachment were more likely to have preschoolers in their classrooms at the end of the preschool year who demonstrated greater levels of behavior regulation. Along these lines, teachers who were rated as being more permissive had preschoolers with lower levels of oppositional/defiant behaviors. However, this trend was only observed for preschoolers who differed from their teachers on the basis of race/ethnicity and results for race-matched preschoolers were in the opposite direction. This could be related to teacher-child relationships that have greater levels of warmth based on racial/ethnic match between students and teachers, as demonstrated by previous research (Ho, Gol-Guyen, & Bagnato, 2012; Saft & Pianta, 2001) of the same race/ethnicity. It is possible that children in the race matched teacher-student dyads expect to have a more positive relationship with teachers and are negatively impacted when the levels of detachment and permissiveness are greater.

### **Effects of Preschooler Functioning**

As the research has demonstrated, child behavioral functioning also has the ability to impact how teachers interact with the children in their care. Understanding how child



functioning impacts teacher behaviors is the second, and equally important, half of the story. The current study found support for two of the four theoretically important domains of child behavior.

Similar to the previous sets of analyses, this study first evaluated the simple relationships between preschool behavior and teacher outcomes. Specifically, preschooler functioning appears to have a longitudinal effect on how warmly teachers interact with them. In particular, preschoolers who exhibited more oppositional/defiant behaviors in the beginning of the preschool year had teachers who interacted with less sensitivity by the end of the preschool year. These lower levels of teacher sensitivity may reflect teacher-child relationships with increased levels of conflict, as this relationship between child behavior difficulties and teacher-child conflict has been demonstrated by previous researchers (Berry, 2012; Zhang & Sun, 2011). Additionally, greater levels of preschooler behavior regulation led to teachers with greater levels of permissive behaviors. This is also unsurprising, as previous research has demonstrated similar relationships between behavioral outcomes and teacher-child interactions (Hughes, Luo, Kwok, & Loyd, 2008).

Given that these associations are complex, age, gender, and racial match were investigated as moderators of child behavior and teacher interaction style. In contradiction of hypotheses, preschooler social skills were associated with greater teacher permissiveness, but only for older preschoolers. Contrary to hypotheses, no other domains of preschooler functioning significantly predicted aspects of the teacher-child relationship in the context of simple or moderated relationships. One reason that hypotheses may not have been supported is analytic limitations associated with the

second set of models. Specifically, HLM cannot accommodate outcome variables at the group level, requiring all data to be evaluated aggregated at the classroom level. As a result, these analyses not only lost variability in the predictors but also lost power due to reductions in sample size.

### **Limitations**

The current study provides an in-depth explanation of the reciprocal effects observed in the association between the teacher-child relationship and preschooler functioning in low-income childcare settings. In addition, these research questions are answered using a large sample of ethnically diverse preschoolers, which allows for an examination of potential moderators, such as teacher and preschooler ethnicity, preschooler age and preschooler gender. However, this study does have some limitations. One potential limitation is related to the measure that was used to assess teacher-child interactions. The fact that only one measure of teacher-child relationships and classroom processes was considered for these analyses is a potential limitation. Although this measure provided information on four domains of the teacher-child relationship, a better understanding of dyadic teacher-child relationship may have been obtained from combining it with other established measures of this construct. Additionally, the measure of the teacher-child relationship was completed at the classroom level and the behaviors that the teacher directed towards the class as a whole served as a proxy for the teacher-child relationship. A large portion of teacher-child interactions occur at the group level and conceptualization of the teacher-child relationship at this level has been demonstrated to be sufficient for observing the impact of teacher behaviors on child functioning (Burchinal & Cryer, 2003; Mashburn, 2008). However, teachers develop individual

relationships with children, which are known to have an impact on children's development. Future studies measuring the teacher-child relationship at the individual level may result in more fine-tuned results.

Another consideration involves the race and ethnicity of the project staff, which was not considered in analyses. Project staff were responsible for completing the CIS rating scale for each teacher. It is possible that project staff race could play a role in the measurement of teacher-child relationships in this study, such that similar behaviors exhibited by teachers are rated differently by observers (Harvey et al., 2009). Thus, teacher harshness, for example, may be rated high for different teachers, although their behavioral profiles may differ greatly in their particular presentations. In addition, the current study provides more information about preschooler functioning in classroom settings and how this relates to the teacher-child relationship. However, the impact of preschooler experiences outside of the classroom (e.g., parent-child interactions, exposure to traumatic events) was not considered. These experiences are also likely to impact how these children function across all settings, including their preschool classrooms (Farver, Xu, Eppe, Fernandez, & Schwartz, 2005; Sharkey, Tirado-Strayer, Papachristos, & Raver, 2012.)

Lastly, the impact of preschooler functioning on teacher behaviors should be further explored. The results from the current study indicate that the behaviors of young children in preschool settings can impact how teachers interact with them. However, because of the limitations of multilevel modeling, the data in the current study were aggregated at the classroom level. Thus, power related to statistical analyses was lost.

Further research in this area is recommended to more fully understand the impact of preschooler characteristics on later teacher behavior in the classroom.

### **Future Directions**

Future research that is involved with teacher-child relationships in preschool settings should consider the role of other variables that may have an influence on the relationship between teacher-child interactions and child functioning. For example, in the context of the developmental ecological model, the home-school connection also plays an important role in how the preschoolers function in classroom settings (Bronfenbrenner, 1977). In particular, the nature of the interactions between caregivers and teachers may influence how preschoolers function in their classroom settings and these adult interactions may provide insight to the underlying mechanisms involved in child functioning in these settings. For example, Iruka, Winn, Kingsley and Orthodoxou (2011) demonstrated that strong relationships between teachers and parents predicted positive social skills in a racially diverse sample of kindergarteners. Thus, future research should broaden the scope to explore the impacts of both parent and teacher interactions on preschooler functioning.

Through this research, school based service providers may have a better understanding of which factors are most important for the success of the preschoolers in these classrooms. The supportive relationships that teachers have with children can positively impact the socioemotional and academic functioning of young children, as well as serve as a protective factor (Hamre & Pianta, 2005; Mitchell-Copeland, Denham, & DeMulder, 1997). The potential to develop interventions that are relationship focused will provide a platform for teachers to affect the functioning of multiple students. This

approach to addressing the needs of preschoolers has been demonstrated through the use of interventions that focus on developing positive interactions between teachers and preschoolers to enhance preschooler functioning (Lyon et al., 2009). Based on the findings of the current study, interventions aimed at addressing the socioemotional needs of preschoolers in classroom settings should focus on the areas of teacher harshness and sensitivity. To better inform best practices related to the socioemotional functioning of preschoolers, further analyses are needed to understand the specific components of teacher sensitivity and harshness that are the most important for impacting preschooler functioning.

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Table 1

*Teacher and Child Demographic Information as a Percentage of the Sample*

Characteristic	Teacher ( <i>n</i> = 126)	Child ( <i>n</i> = 2048)
<b>Ethnicity</b>		
African-American	65.5	50.9
White	31.7	29.3
Hispanic	3.0	13.0
Asian	0.6	1.6
Native American/Alaska Native	0.9	0.5
Pacific Islander/Native Hawaiian		0.05
Other		0.8
No race data		3.8
<b>Age in Months (SD)</b>		
Fall Semester		54.9 (4.76)
Spring Semester		59.5 (4.16)
<b>Gender</b>		
Male	2.3	50.4
Female	97.7	49.6

Table 2

## Summary of Intercorrelations for Teacher and Preschooler Measures

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. CIS – Sensitivity (Fall) <sup>b</sup> (M = 3.19, SD = .62)	1	-.33**	-.63**	-.37**	-.19**	-.13**	-.11**	-.03	-.21**	-.13**	-.16**	-.15**	.08**	-.07**	-.14**	-.04
2. CIS – Harshness (Fall) <sup>b</sup> (M = 1.65, SD = .32)	-.33**	1	.15**	-.22**	-.13**	.09**	.10**	.01	-.18**	.24**	.06**	.00	-.17**	.08**	.12**	.04
3. CIS – Detachment (Fall) <sup>b</sup> (M = 1.35, SD = .50)	-.65**	.15**	1	.54**	-.11**	.09**	.06**	.11*	-.06**	.09**	.02	.01	-.08**	.03	.13**	.03
4. CIS – Permissiveness (Fall) <sup>b</sup> (M = 1.52, SD = .55)	-.37**	-.22**	.54**	1	-.09**	.16**	.11**	.08	-.02	-.07**	-.07**	-.04	.07**	.06*	.04	.06
5. Social Skills (Fall) <sup>c</sup> (M = 1.42, SD = .28)	.19**	-.13**	-.11**	-.09**	1	-.47**	-.41**	.17**	.07**	-.03	-.03	.03	.56**	-.33**	-.39**	.15**
6. Inattention/Overactivity (Fall) <sup>f</sup> (M = .97, SD = .70)	-.13**	.09**	.09**	.16**	-.47**	1	.64**	-.12**	-.04	-.07**	.04	-.01	-.37**	.61**	.48**	-.11*
7. Oppositional/Defiant (Fall) <sup>g</sup> (M = .62, SD = .75)	-.11**	.10**	.06**	.11**	-.41**	.64**	1	-.06	-.10**	-.02	.08**	.01	-.32**	.45**	.66**	-.01
8. Self-Regulation <sup>a, d</sup> (Fall) (M = 0, SD = 1)	-.03	.01	.11*	.08	.17**	-.12**	-.06	1	.04	-.06	-.01	.16**	.18**	-.14**	-.05	.52**
9. CIS – Sensitivity (Spring) <sup>e</sup> (M = 3.14, SD = .65)	.21**	-.18**	-.06**	-.02	.07**	-.04	-.10**	.04	1	-.51**	-.77**	-.30**	.09**	-.02	-.12**	-.01
10. CIS – Harshness (Spring) <sup>e</sup> (M = 1.67, SD = .44)	-.13**	.24**	.09**	-.07**	-.03	-.07**	-.02	-.06	-.51**	1	.46**	-.16**	.04	-.05	.11**	.01
11. CIS – Detachment (Spring) <sup>e</sup> (M = 1.47, SD = .59)	-.16**	.07**	.02	-.07**	-.03	.04	.08**	-.01	-.77**	.46**	1	.35**	-.00	.01	.11**	-.02
12. CIS – Permissiveness (Spring) <sup>f</sup> (M = 1.56, SD = .55)	-.15**	.00	.01	-.04	.03	-.01	.01	.16**	-.30**	-.16**	.35**	1	-.00	-.00	-.00	.05
13. Social Skills (Spring) <sup>g</sup> (M = 1.49, SD = .29)	.08**	-.17**	-.08**	.07**	.56**	-.37**	-.32**	.18**	.09**	.04	-.00	-.00	1	-.47**	-.43**	.16**
14. Inattention/Overactivity (Spring) <sup>h</sup> (M = .89, SD = .72)	-.07**	.08**	.03	.06*	-.33**	.61**	.45**	-.14**	-.02	-.05	.01	-.00	-.47**	1	.59**	-.16**
15. Oppositional/Defiant (Spring) <sup>h</sup> (M = .62, SD = .72)	-.14**	.12**	.13**	.04	-.39**	.48**	.66**	-.05	-.12**	.11**	.11**	-.00	-.43**	.59**	1	-.04
16. Self-Regulation <sup>a, h</sup> (Spring) (M = 0, SD = 1)	.04	.04	.03	.06	.15**	-.11*	-.01	.52**	-.01	.01	-.02	.05	.16**	-.16**	-.04	1

Note. \*  $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

<sup>a</sup> Self-Regulation measures were standardized; <sup>b</sup>  $n = 126$ ; <sup>c</sup>  $n = 2028$ ; <sup>d</sup>  $n = 456$ ; <sup>e</sup>  $n = 117$ ; <sup>f</sup>  $n = 116$ ; <sup>g</sup>  $n = 1377$ ; <sup>h</sup>  $n = 526$

Table 3

*HLM results modeling the effect of CIS Scores (Fall) on Social Skills (Spring)*

<i>Fixed Effects</i> <sup>a,b</sup>		
	Coefficient	se
Intercept	1.50***	.02
CIS – Sensitivity (Fall)	-.06	.04
CIS – Harshness (Fall)	-.08	.06
CIS – Detachment (Fall)	-.07	.06
CIS – Permissiveness (Fall)	.07	.05
Social Skills (Fall)	.76***	.05
<i>Random Effects</i> <sup>a,b</sup>		
	Variance Component	SD
Social Skills (Fall)	.04***	.19
slope	.16***	.40
<i>Fixed Effects</i> <sup>c,d</sup>		
	Coefficient	se
Intercept	1.51***	.02
CIS – Sensitivity (Fall)	-.07	.04
CIS – Harshness (Fall)	-.11	.06
CIS – Detachment (Fall)	-.08	.07
CIS – Permissiveness (Fall)	.07	.05
Child Age	.004***	.00
CIS – Sensitivity (Fall)	-.003	.00
CIS – Harshness (Fall)	.01	.01
CIS – Detachment (Fall)	-.01	.00
CIS – Permissiveness (Fall)	.003	.00
Child Gender	.05***	.01
CIS – Sensitivity (Fall)	-.07*	.03
CIS – Harshness (Fall)	.01	.05
CIS – Detachment (Fall)	-.04	.04
CIS – Permissiveness (Fall)	.01	.03
Race/Ethnicity Match	.01	.01
CIS – Sensitivity (Fall)	-.03	.02
CIS – Harshness (Fall)	.05	.04
CIS – Detachment (Fall)	-.04	.04
CIS – Permissiveness (Fall)	.01	.03
Social Skills (Fall)	.69***	.05
<i>Random Effects</i> <sup>c,d</sup>		
	Variance Component	SD

Social Skills (Fall)	.03***	.18
Gender slope	.01*	.07
Social Skills (Fall) slope	.15***	.38

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; <sup>a</sup> $n_{\text{level1}} = 1377$ , <sup>b</sup> $n_{\text{level2}} = 123$ , <sup>c</sup> $n_{\text{level1}} = 1189$ , <sup>d</sup> $n_{\text{level2}} = 119$ .

Table 4

*HLM results modeling the effect of CIS Scores (Fall) on Inattention/Overactivity (Spring)*

Fixed Effects <sup>a,b</sup>	Coefficient	se
Intercept	.89***	.04
CIS – Sensitivity (Fall)	-.002	.09
CIS – Harshness (Fall)	.06	.12
CIS – Detachment (Fall)	-.06	.08
CIS – Permissiveness (Fall)	.03	.08
Inattention/Overactivity (Fall)	.66***	.04
	Variance	
Random Effects <sup>a,b</sup>	Components	SD
Inattention/Overactivity (Fall)	.13***	.36
Inattention/Overactivity (Fall) slope	.08***	.28
Fixed Effects <sup>c,d</sup>	Coefficient	se
Intercept	.89***	.04
CIS – Sensitivity (Fall)	-.01	.09
CIS – Harshness (Fall)	.07	.14
CIS – Detachment (Fall)	-.09	.09
CIS – Permissiveness (Fall)	.06	.09
Child Age	-.01**	.00
CIS – Sensitivity (Fall)	.01	.01
CIS – Harshness (Fall)	.01	.01
CIS – Detachment (Fall)	.02	.01
CIS – Permissiveness (Fall)	.01	.01
Child Gender	-.09**	.03
CIS – Sensitivity (Fall)	-.02	.06
CIS – Harshness (Fall)	-.04	.14
CIS – Detachment (Fall)	.04	.09
CIS – Permissiveness (Fall)	.01	.09
Race/Ethnicity Match	-.01	.04
CIS – Sensitivity (Fall)	.11	.07
CIS – Harshness (Fall)	-.01	.13
CIS – Detachment (Fall)	.05	.10
CIS – Permissiveness (Fall)	-.07	.09
Inattention/Overactivity (Fall)	.63***	.04

Random Effects <sup>c,d</sup>	Variance Components	SD
Inattention/Overactivity (Fall)	.14***	.38
Gender slope	.04***	.19
Inattention/Overactivity (Fall) slope	.09***	.30

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; <sup>a</sup> $n_{\text{level1}} = 1377$ , <sup>b</sup> $n_{\text{level2}} = 123$ ,  
<sup>c</sup> $n_{\text{level1}} = 1189$ , <sup>d</sup> $n_{\text{level2}} = 119$ .

Table 5

*HLM results modeling the effect of CIS Scores (Fall) on Oppositional/Defiant Behaviors (Spring)*

Fixed Effects <sup>a,b</sup>	Coefficient	se
Intercept	.64***	.03
CIS – Sensitivity (Fall)	-.04	.06
CIS – Harshness (Fall)	-.02	.10
CIS – Detachment (Fall)	.05	.09
CIS – Permissiveness (Fall)	-.04	.06
Oppositional/Defiant (Fall)	.69***	.04

Random Effect <sup>a,b</sup>	Variance Component	SD
Oppositional/Defiant (Fall)	.11	.33
Oppositional/Defiant (Fall) slope	.08	.28

Fixed Effects <sup>c,d</sup>	Coefficient	se
Intercept	.64***	.03
CIS – Sensitivity (Fall)	-.04	.06
CIS – Harshness (Fall)	-.05	.10
CIS – Detachment (Fall)	.01	.08
CIS – Permissiveness (Fall)	-.04	.06
Child Age	-.001	.00
CIS – Sensitivity (Fall)	.01	.01
CIS – Harshness (Fall)	.02	.02
CIS – Detachment (Fall)	.01	.01
CIS – Permissiveness (Fall)	-.003	.01
Child Gender	-.07*	.03
CIS – Sensitivity (Fall)	-.03	.06
CIS – Harshness (Fall)	-.29**	.10
CIS – Detachment (Fall)	-.01	.09
CIS – Permissiveness (Fall)	-.04	.07
Race/Ethnicity Match	-.04	.03
CIS – Sensitivity (Fall)	-.003	.05
CIS – Harshness (Fall)	-.30***	.09
CIS – Detachment (Fall)	.01	.08
CIS – Permissiveness (Fall)	-.18**	.07
Oppositional/Defiant (Fall)	.70***	.04

Random Effect <sup>c,d</sup>	Variance Component	SD
Oppositional/Defiant (Fall)	.11***	.33
Age slope	.00**	.01
Gender slope	.01**	.11
Oppositional/Defiant slope	.16***	.30

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; <sup>a</sup> $n_{\text{level1}} = 1371$ , <sup>b</sup> $n_{\text{level2}} = 123$ ,  
<sup>c</sup> $n_{\text{level1}} = 1184$ , <sup>d</sup> $n_{\text{level2}} = 119$ .



Table 6

*HLM results modeling the effect of CIS Scores (Fall) on Behavior Regulation (Spring)*

Fixed Effects <sup>a,b</sup>	Coefficient	se
Intercept	.09	.05
CIS – Sensitivity (Fall)	.23**	.08
CIS – Harshness (Fall)	.17	.20
CIS – Detachment (Fall)	.15	.11
CIS – Permissiveness (Fall)	-.004	.10
Behavior Regulation (Fall)	.46***	.06
Random Effect <sup>a,b</sup>	Variance Component	SD
Behavior Regulation (Fall)	.07	.26
Behavior Regulation (Fall) slope	.05	.22
Fixed Effects <sup>c,d</sup>	Coefficient	se
Intercept	.09	.04
CIS – Sensitivity (Fall)	.27**	.08
CIS – Harshness (Fall)	.34	.21
CIS – Detachment (Fall)	.09	.12
CIS – Permissiveness (Fall)	.06	.10
Child Age	.01	.013
CIS – Sensitivity (Fall)	-.06*	.03
CIS – Harshness (Fall)	-.03	.05
CIS – Detachment (Fall)	-.01	.04
CIS – Permissiveness (Fall)	-.04	.03
Child Gender	.01	.07
CIS – Sensitivity (Fall)	.02	.15
CIS – Harshness (Fall)	.04	.25
CIS – Detachment (Fall)	-.30	.20
CIS – Permissiveness (Fall)	-.08	.18
Race/Ethnicity Match	-.05	.09
CIS – Sensitivity (Fall)	.20	.16
CIS – Harshness (Fall)	-.57*	.27
CIS – Detachment (Fall)	.45*	.20
CIS – Permissiveness (Fall)	-.35	.20
Behavior Regulation (Fall)	.50***	.06

Random Effects <sup>c,d</sup>	Variance Component	SD
Behavior Regulation (Fall)	.01	.11

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; <sup>a</sup> $n_{\text{level1}} = 363$ , <sup>b</sup> $n_{\text{level2}} = 112$ ,  
<sup>c</sup> $n_{\text{level1}} = 358$ , <sup>d</sup> $n_{\text{level2}} = 112$ .

Table 7  
*Predicting Teacher Sensitivity Scores from Measure of Child Functioning*

Predictor (Fall Measures)	B	se	$\Delta R^2$
Step 1			.025
Social Skills	.03	.31	
Conners - Inattention/Overactivity	.35	.22	
Conners - Oppositional/Defiant	-.46*	.22	
Behavior Regulation	.04	.11	
Preschooler Age	-.01	.02	
Preschooler Gender	-.33	.58	
Preschooler Race	.34	.21	
Step 2			.125
Social Skills	-.1	.33	
Conners - Inattention/Overactivity	.36	.24	
Conners - Oppositional/Defiant	-.45	.23	
Behavior Regulation	.07	.13	
Preschooler Age	-.01	.03	
Preschooler Gender	-.26	.61	
Preschooler Race	.37	.22	
Social Skills x Age	-.08	.10	
Social Skills x Gender	4.05	3.12	
Social Skills x Race	.46	1.16	
Conners - I/O x Age	.04	.09	
Conners - I/O x Gender	-.09	2.18	
Conners - I/O x Race	.48	.85	
Conners - O/D x Age	-.12	.09	
Conners - O/D x Gender	.17	2.21	
Conners - O/D x Race	.53	.92	
Behavior Regulation x Age	-.04	.04	
Behavior Regulation x Gender	-1.89	1.18	
Behavior Regulation x Race	-.77	.46	

*Note.* \*  $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ;  $n = 117$ ; all models control for pretest score on teacher sensitivity.

Table 8  
*Predicting Teacher Harshness Scores from Measure of Child Functioning*

Predictor (Fall Measures)	B	se	$\Delta R^2$
Step 1			.025
Social Skills	-.15	.21	
Conners - Inattention/Overactivity	-.12	.15	
Conners - Oppositional/Defiant	-.09	.15	
Behavior Regulation	-.06	.08	
Preschooler Age	-.01	.02	
Preschooler Gender	.26	.38	
Preschooler Race	-.18	.15	
Step 2			.109
Social Skills	-.12	.23	
Conners - Inattention/Overactivity	-.17	.16	
Conners - Oppositional/Defiant	-.08	.16	
Behavior Regulation	-.10	.09	
Preschooler Age	-.02	.02	
Preschooler Gender	.21	.40	
Preschooler Race	-.09	.15	
Social Skills x Age	-.05	.07	
Social Skills x Gender	-2.49	2.09	
Social Skills x Race	-.37	.79	
Conners - I/O x Age	-.08	.06	
Conners - I/O x Gender	-2.11	1.5	
Conners - I/O x Race	-.08	.58	
Conners - O/D x Age	.07	.06	
Conners - O/D x Gender	.87	1.46	
Conners - O/D x Race	-.02	.62	
Behavior Regulation x Age	.00	.03	
Behavior Regulation x Gender	.92	.81	
Behavior Regulation x Race	.51	.32	

*Note.* \*  $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ;  $n = 117$ ; all models control for pretest score on teacher harshness.

Table 9  
*Predicting Teacher Detachment Scores from Measure of Child Functioning*

Predictor (Fall Measures)	B	se	$\Delta R^2$
Step 1			.005
Social Skills	.17	.30	
Conners - Inattention/Overactivity	-.26	.21	
Conners - Oppositional/Defiant	.36	.20	
Behavior Regulation	-.04	.11	
Preschooler Age	-.01	.02	
Preschooler Gender	.10	.54	
Preschooler Race	-.08	.20	
Step 2			.123
Social Skills	.25	.31	
Conners - Inattention/Overactivity	-.20	.23	
Conners - Oppositional/Defiant	.35	.22	
Behavior Regulation	-.03	.13	
Preschooler Age	.00	.02	
Preschooler Gender	-.04	.57	
Preschooler Race	-.19	.21	
Social Skills x Age	.08	.09	
Social Skills x Gender	.25	2.92	
Social Skills x Race	-.43	1.10	
Conners - I/O x Age	.04	.08	
Conners - I/O x Gender	2.65	2.07	
Conners - I/O x Race	-.36	.81	
Conners - O/D x Age	.08	.08	
Conners - O/D x Gender	-.92	2.02	
Conners - O/D x Race	-.20	.87	
Behavior Regulation x Age	.04	.04	
Behavior Regulation x Gender	1.06	1.12	
Behavior Regulation x Race	.72	.44	

*Note.* \*  $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ;  $n = 117$ ; all models control for pretest score on teacher detachment.

Table 10  
*Predicting Teacher Permissiveness Scores from Measure of Child Functioning*

Predictor (Fall Measures)	B	se	$\Delta R^2$
Step 1			.015
Social Skills	.26	.26	
Conners - Inattention/Overactivity	-.15	.19	
Conners - Oppositional/Defiant	.21	.18	
Behavior Regulation	.31**	.09	
Preschooler Age	-.01	.02	
Preschooler Gender	-.56	.47	
Preschooler Race	.04	.18	
Step 2			.133
Social Skills	.24	.28	
Conners - Inattention/Overactivity	-.14	.20	
Conners - Oppositional/Defiant	.20	.20	
Behavior Regulation	.31**	.11	
Preschooler Age	-.02	.02	
Preschooler Gender	-.61	.51	
Preschooler Race	.01	.19	
Social Skills x Age	.25**	.08	
Social Skills x Gender	-2.72	2.45	
Social Skills x Race	-.27	.99	
Conners - I/O x Age	.06	.07	
Conners - I/O x Gender	-.23	1.84	
Conners - I/O x Race	-.31	.68	
Conners - O/D x Age	.00	.07	
Conners - O/D x Gender	.50	1.8	
Conners - O/D x Race	-.16	.74	
Behavior Regulation x Age	.01	.03	
Behavior Regulation x Gender	-.39	1.01	
Behavior Regulation x Race	.31	.39	

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ;  $n = 116$ ; all models control for pretest score on teacher permissiveness.

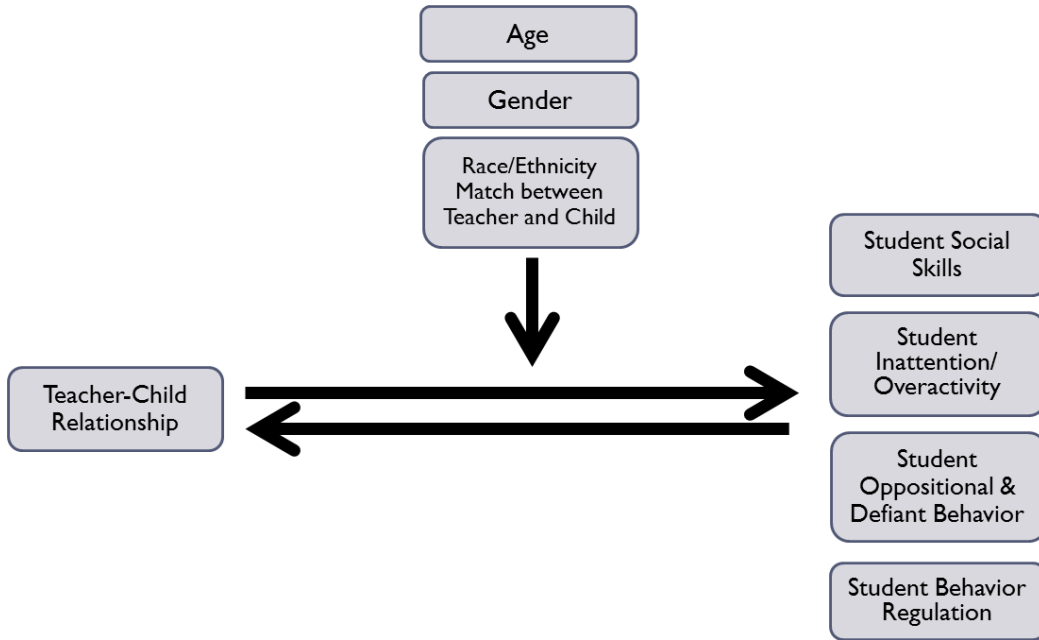
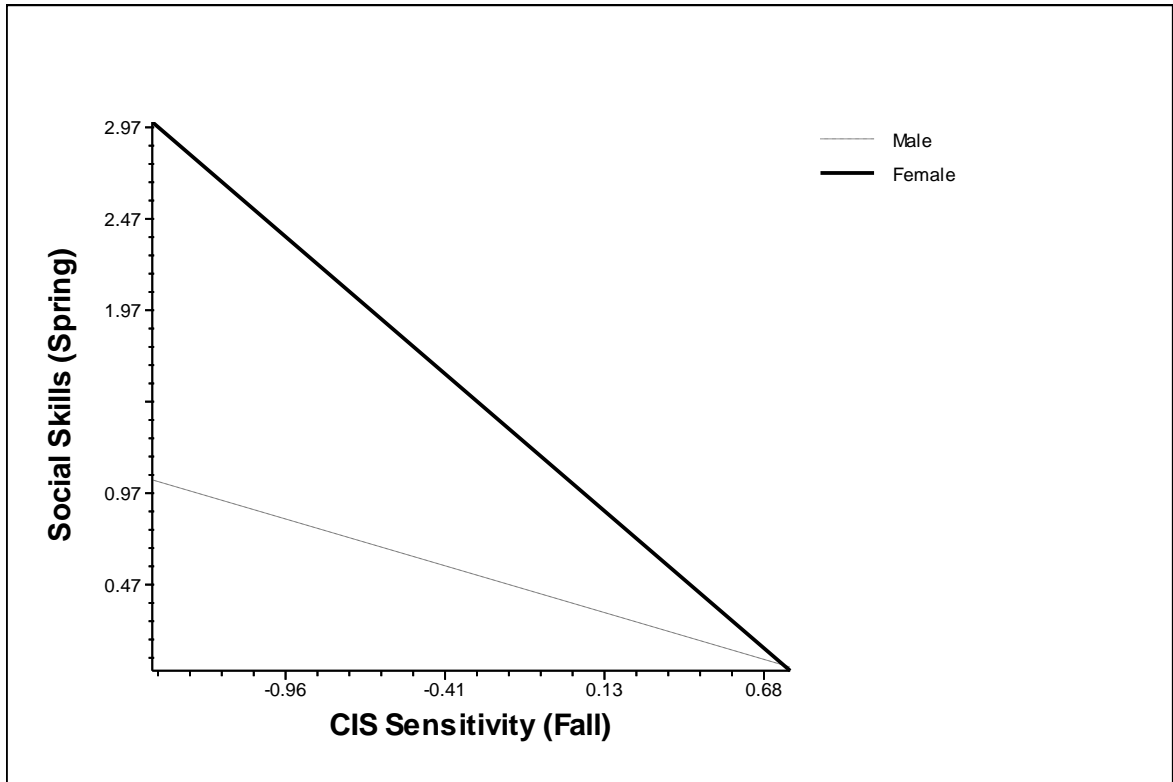
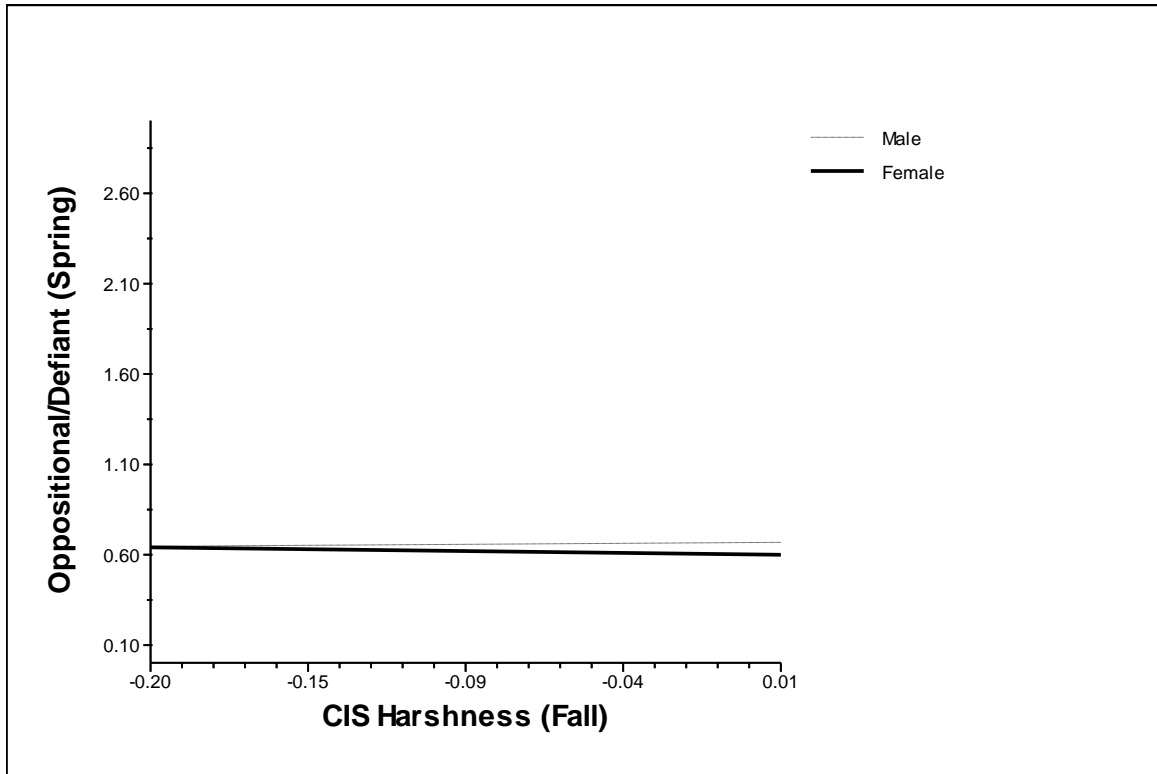


Figure 1. Proposed model of reciprocal influences of teacher-child relationship and child functioning domains, moderated by teacher and child demographic information.

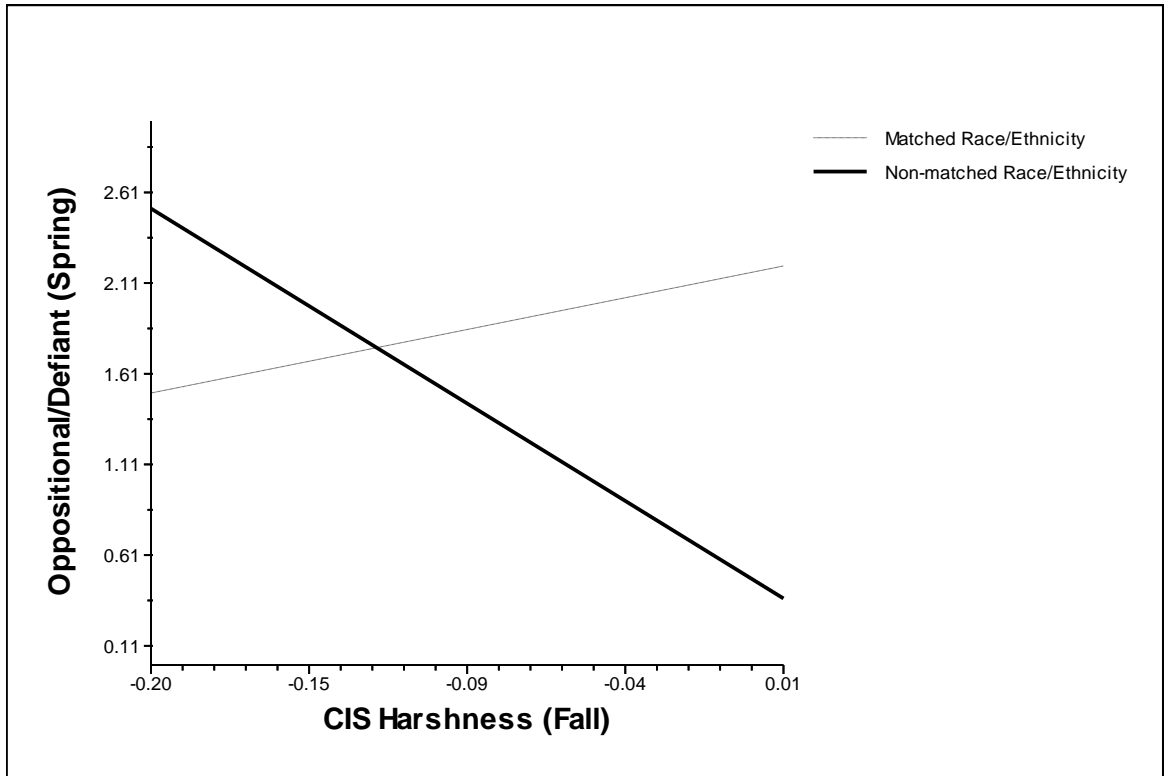


*Figure 2.* The moderating effect of child gender on the relationship between CIS Sensitivity scores in the fall and social skills scores in the spring.

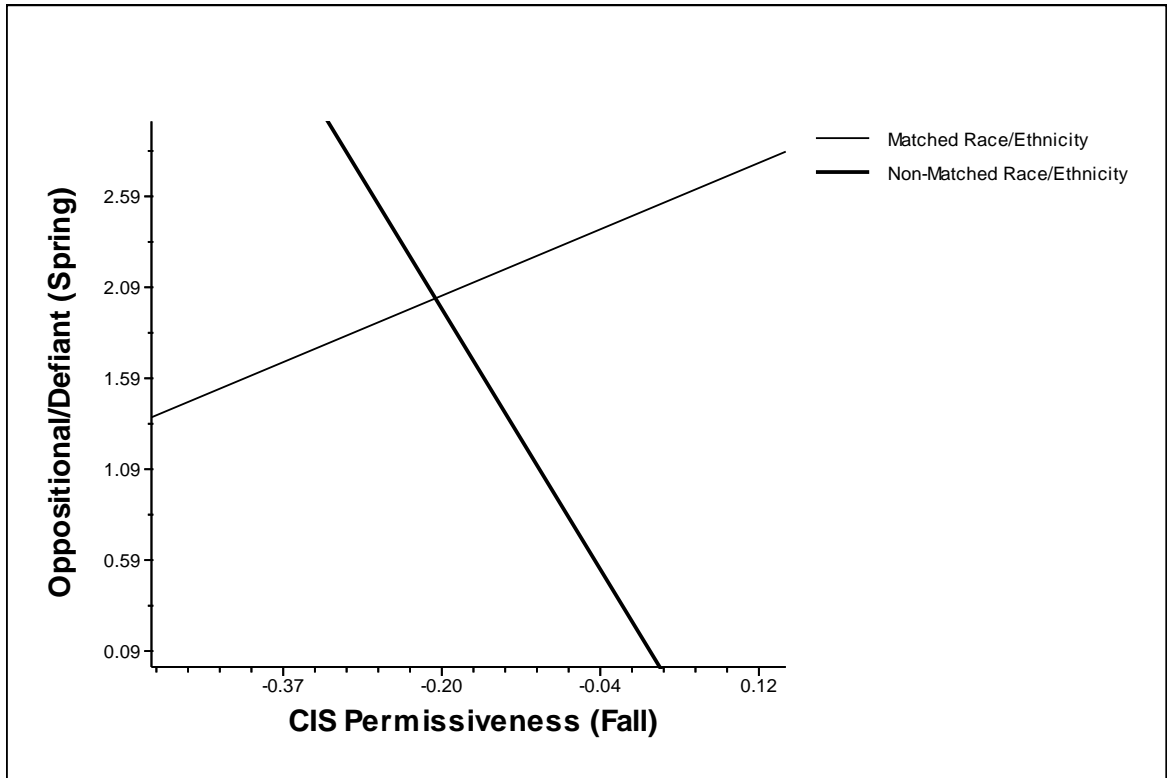




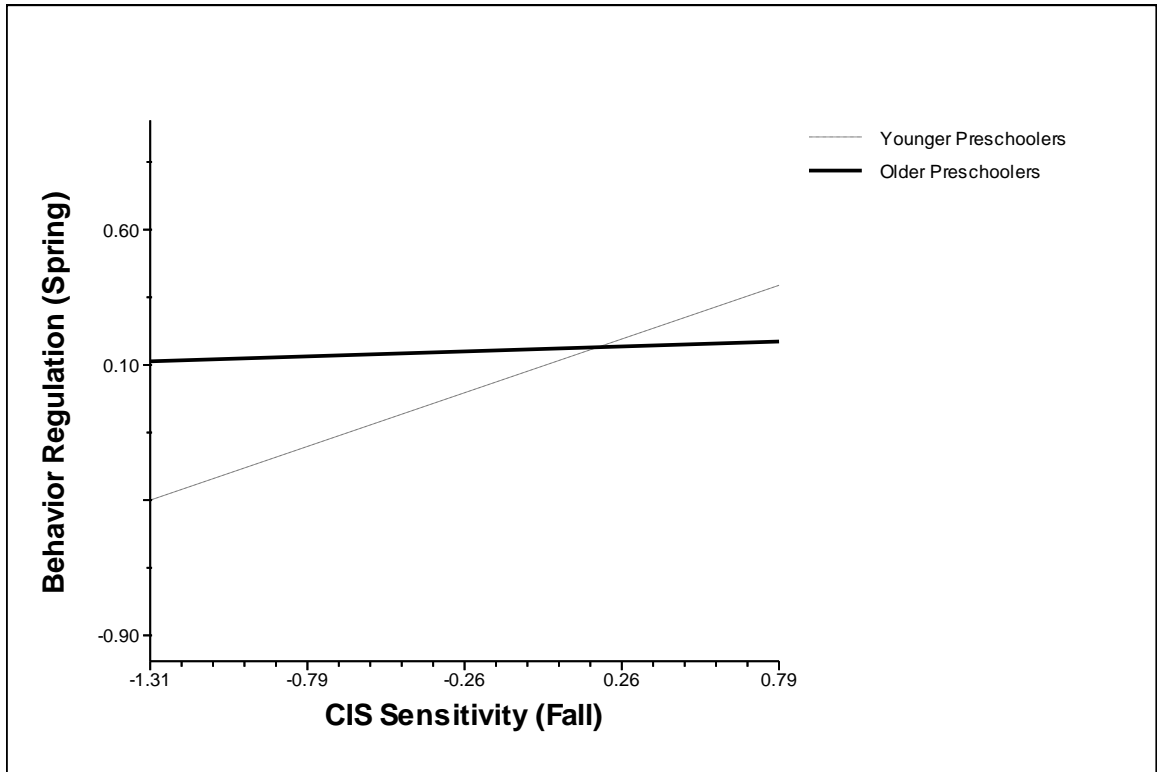
*Figure 3.* The moderating effect of gender on the relationship between CIS Harshness scores in the fall and Conners – Oppositional/Defiant scores in the spring.



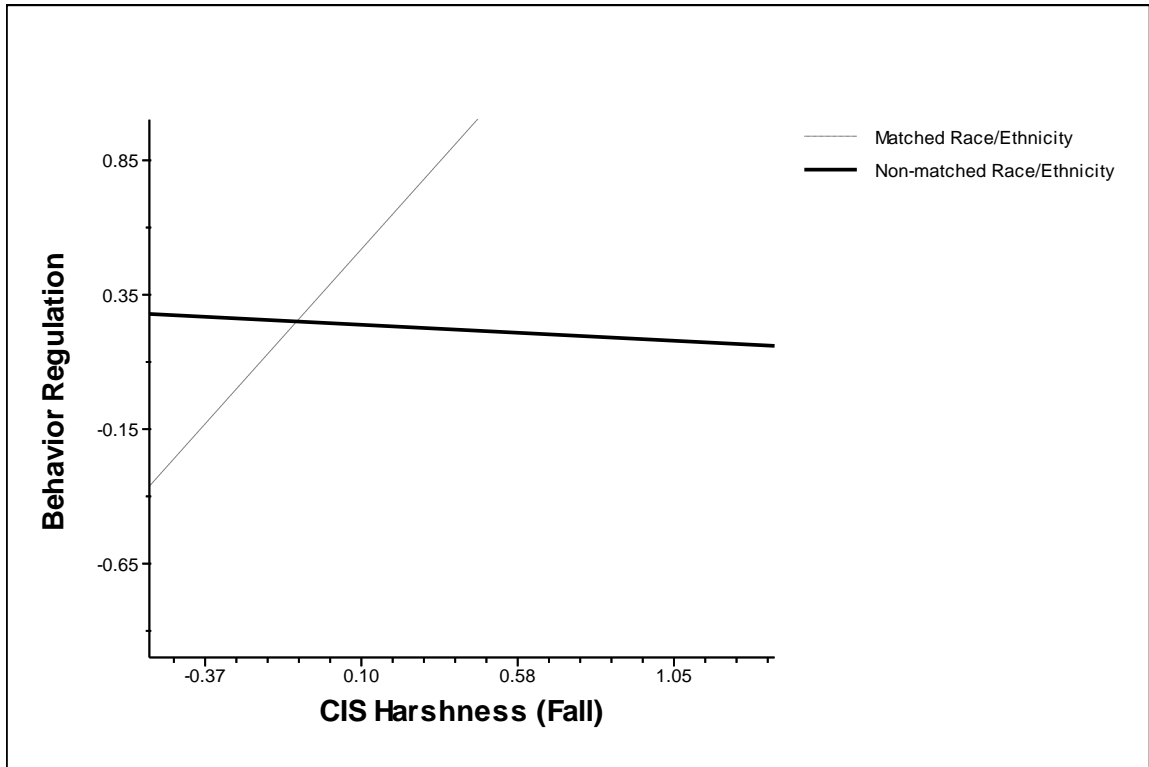
*Figure 4.* The moderating effect the racial/ethnic match between students and teachers on the relationship between CIS Harshness scores in the fall and Conners – Oppositional/Defiant scores in the spring.



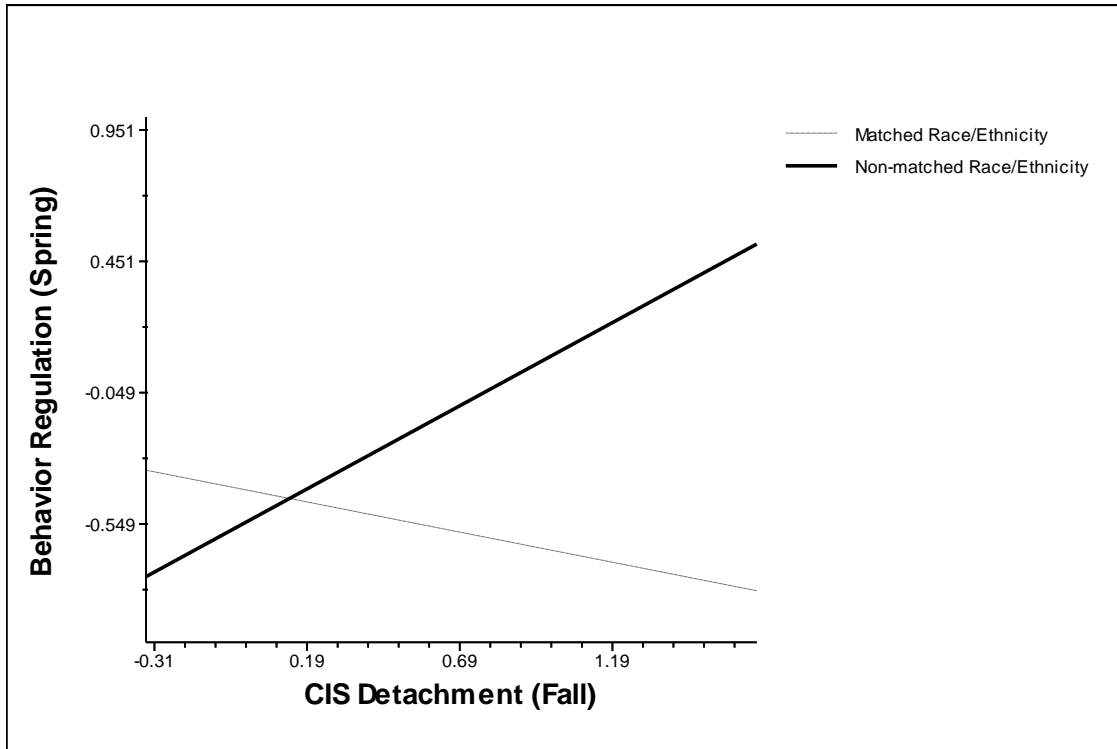
*Figure 5.* The moderating effect the racial/ethnic match between students and teachers on the relationship between CIS Permissiveness scores in the fall and Conners – Oppositional/Defiant scores in the spring.



*Figure 6.* The moderating effect of child age on the relationship between CIS Sensitivity scores in the fall and behavior regulation scores in the spring.



*Figure 7.* The moderating effect the racial/ethnic match between students and teachers on the relationship between CIS Harshness scores in the fall and behavior regulation scores in the spring.



*Figure 8.* The moderating effect the racial/ethnic match between students and teachers on the relationship between CIS Detachment scores in the fall and behavior regulation scores in the spring.

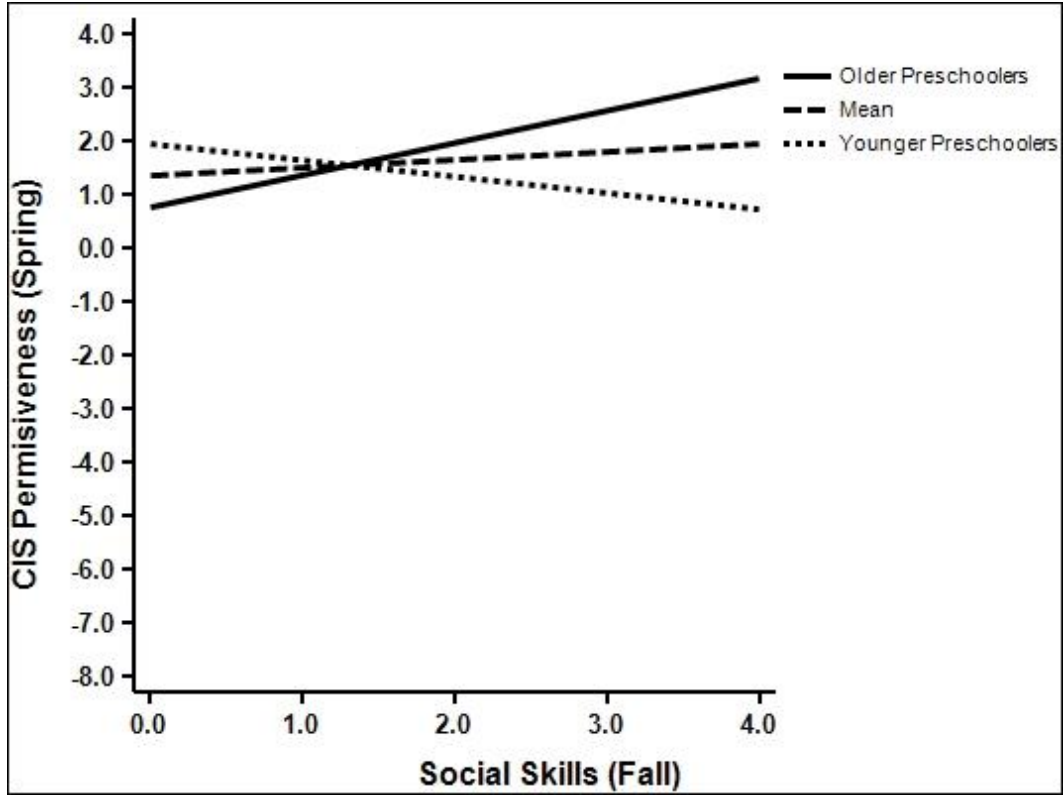


Figure 9. The moderating effect of age on the relationship between social skills scores in the fall and CIS Permissiveness scores in the spring.