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## Teacher-Child Relationships and Parental Support: Association with Academic Achievement among Preschoolers

Authors	Lim, Chaehyun
Citation	Lim, Chaehyun. "Teacher-Child Relationships and Parental Support: Association with Academic Achievement among Preschoolers." Dissertation, Georgia State University, 2018. <a href="https://doi.org/10.57709/12051237">https://doi.org/10.57709/12051237</a>
DOI	<a href="https://doi.org/10.57709/12051237">https://doi.org/10.57709/12051237</a>
Download date	2026-05-20 04:24:13
Link to Item	<a href="https://hdl.handle.net/20.500.14694/4327">https://hdl.handle.net/20.500.14694/4327</a>

## ACCEPTANCE

This dissertation, TEACHER-CHILD RELATIONSHIPS AND PARENTAL SUPPORT: ASSOCIATION WITH ACADEMIC ACHIEVEMENT AMONG PRESCHOOLERS, by CHAEHYUN LIM, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education and Human Development, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chairperson, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty.

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CHAEHYUN LIM

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**TEACHER-CHILD RELATIONSHIPS AND PARENTAL SUPPORT: ASSOCIATION WITH  
ACADEMIC ACHIEVEMENT AMONG PRESCHOOLERS**

by

**CHAEHYUN LIM**

Under the Direction of Gary E. Bingham, Ph.D.

**ABSTRACT**

Despite the importance of positive teacher-child relationships and supportive home environments to children's academic achievement, research is limited in notable ways. First, studies often utilize only teachers' perceptions about the relationships they have with children limiting understanding of bidirectional nature of these connections. Second, little is known about how teacher-child relationships and parental support additively influence children's academic achievement. Thus, the purpose of the present study was to explore associations between teacher-child relationships and children's academic achievement among preschool-aged children. Both teachers' and children's perceptions about teacher-child relationships were examined, and differences were discussed. Additionally, to investigate how parental support and teacher-child relationships are associated with children's academic outcomes, home learning environment (i.e., the frequency of school-related activities at home) was examined. Participants for this study

included 179 preschool aged children, their parents, and teachers ( $N = 28$ ). Children's language, literacy, and mathematics skills were assessed directly through standardized assessments, while their perceptions of the teacher-child relationship (i.e., warmth, negativity, encouragement for autonomy) were assessed through an interview. Parents completed questionnaires about family demographics and home learning experiences. Teachers completed a survey about demographic information and perceptions about relationships (e.g., closeness, conflict, dependency) with each child. Structural equation modeling was conducted to examine associations among teacher-child relationships, parental support, and academic outcomes. Findings revealed limited concordance between teachers' and children's perception of the quality of the teacher-child relationship, with only teachers' perceptions of children's dependency being meaningfully correlated children's perception of teacher negativity. Both parental support and teacher-child relationships were significant predictors of children's mathematics and literacy outcomes. Specifically, teachers' perception of children's dependency and children's perception of teacher negativity were negatively associated with children's academic achievement. Findings from this study provide implications for teachers and parents about how teacher-child relationships and parental support improve children's academic achievement.

**INDEX WORDS:** Teacher-child relationships, Children's perceptions, Academic achievement, Home learning environment, Parental support, Parent involvement

TEACHER-CHILD RELATIONSHIPS AND PARENTAL SUPPORT: ASSOCIATION WITH  
ACADEMIC ACHIEVEMENT AMONG PRESCHOOLERS

by

CHAEHYUN LIM

A Dissertation

Presented in Partial Fulfillment of Requirements for the

Degree of

Doctor of Philosophy

in

Early Childhood Education

in

Early Childhood and Elementary Education

in

the College of Education and Human Development

Georgia State University

Atlanta, GA

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## ACKNOWLEDGMENTS

First and foremost, I would like to express my sincere gratitude to Dr. Kyong-Ah Kwon. It has been an honor to be her first Ph. D. student. She always challenged me in helping me grow as a scholar. I appreciate her contribution of time and ideas. I have been extremely lucky to have her care so much about my work and who mentored me in more ways than one could think possible.

I am also deeply thankful to Dr. Gary Bingham for his guidance and support. He has always made himself available to help me despite his busy schedule. He found out what my strengths are and encouraged me in helping me pursue my dreams. His encouragement and help made me feel confident to fulfill my desire as a researcher and an educator.

I would also like to thank my committee: Dr. John Kesner, Dr. Hongli Li, and Dr. Chenyi Zhang, for their time, critical comments, and insightful questions. I would not have made it without their help and encouragement.

Last but not the least, I would like to thank my family for all their love and encouragement. I would like to thank my parents who raised me with love and supported me in all my pursuits. I want to thank my loving, supportive, and patient husband, and my lovely baby, Chloe, who provide unending inspiration.

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# 1 THE PROBLEM

## Introduction

The environments in which young children live have immediate and long-lasting impact on their development and learning. According to bioecological systems theory, children develop and learn through interactions within their environmental contexts, and they are the products of their lived experiences in multiple environments (Bronfenbrenner, 1979). In particular, the most proximal factors include children's home and school, and their influence on child development is more remarkable than other systems such as community (Bronfenbrenner & Morris, 1998; Bornstein & Leventhal, 2015). Research on the importance of home and school contexts on children's development establishes that each independently plays a key role in children's early learning (O'Connor, 2010; O'Connor & McCartney, 2007). These systems also act jointly as a mesosystem (i.e., interactions between two microsystems) to impact children's learning and development and provide the impetus for exploring home and school connections that appear central to children's learning and the establishment of overlapping educational goals (Epstein & Hollifield, 1996; Galindo & Sheldon, 2012).

When understanding the role that school contexts play in children's development and learning, one important factor to consider is the relationships between teachers and children. Teacher-child relationship quality in early childhood has been found to have significant associations with children's school adjustment and academic outcomes (Birch & Ladd, 1997). Close teacher-child relationships, defined as the degree of affection, warmth, and open communication between teachers and children, facilitate learning (Pianta, 1994). Children who have close relationships with teachers are more likely to experience interactions that provide social-emotional foundation for learning and more likely to take academic risks. Numerous

studies document that children who have closer relationships with their teachers tend to adjust to the school environment more easily and show better academic performance than children who have less close relationships with teachers (Birch & Ladd, 1997; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Ly, Zhou, Chu, & Chen, 2012; McCormick & O'Connor, 2015; Palermo, Hanish, Martin, Fabes, & Reiser, 2007). In addition, close teacher-child relationships predict children's later academic achievement (McCormick, O'Connor, Cappella, & McClowry, 2013), while conflictual teacher-child relationships (i.e., degree of negative and conflict between teachers and children) are negatively associated with children's participation in school activities and school liking (Birch & Ladd, 1997). Taken together, these studies highlight the importance of teacher-child relationships regarding children's academic performances.

Although studies demonstrate an association between teacher-child relationships and children's academic outcomes, one important limitation of the existing research is an over reliance on teacher's self-reported quality of their relationships with children. This limitation is concerning because relationships are established through bidirectional interactions between two individuals. In other words, teachers' perceptions of the relationships do not represent children's perceptions of, or experiences within, relationships. To understand teacher-child relationships and how these relationships are related to child outcomes, both teachers' and children's perceptions of teacher-child relationships need to be investigated. It is important to examine children's perceptions of their relationships with teachers as findings of previous research reveal that child reported teacher-child relationships are significantly associated with children's academic achievement (Mantzicopoulos & Neuharth-Pritchett, 2003), and children have a good understanding of items for measures of their perception of teacher-child relationships (Spilt, Koomen, & Mantzicopoulos, 2010). Specifically, Mantzicopoulos and Neuharth-Pritchett

(2003) found that children who reported closer relationships with their teachers tended to have higher scores of reading skills than children with less close teacher-child relationships. On the other hand, children's perceptions of conflictual relationships with their teachers were associated with low scores of both reading and math skills. Additional support for the importance of examining children's perceptions of the quality of their relationships with teachers is found in studies documenting little association between teachers' report and child report of the same relationships. For example, in their study using both teachers' and children's perceptions of teacher-child relationships, Murray, Murray, and Waas (2008) found minimal concordance between teachers' and children's perceptions about their relationship quality. This discrepancy may occur because teachers' and children's perception of the relationship is influenced by different factors. Although teachers and children appear to perceive their relationships differentially, little research has explored how teachers' and children's perceptions of the relationships are differentially related to academic outcomes. Hence, child-reported-relationship quality needs to be further explored.

In addition to school environments and consistent with the bioecological approach, the family system plays a central role in children's development. Family contexts are important factors for child development as the home environments that they establish have a direct impact on children. Specifically, parents should provide their children with home learning experiences and an educational environment that is consistent with the school environment to improve children's academic performance (Hill & Taylor, 2004; Powell, Son, File, & San Juan, 2010). In addition, how families and schools connect and how parents get engaged in school activities matter to children's development. In other words, children's environments such as home and school settings can be connected to each other enhancing teacher's understandings of children.

The connection between home and school can appear in multiple ways, which make various terms and definitions in the field of parental support. The myriad of ways in which parents connect to schools has been conceptualized in multiple ways, and it is represented using various terms such as parent involvement, engagement, and support. Traditional models of parental involvement or engagement generally focus on activities that parents do in their home to promote children's development and parents' connection to or involvement in their child's school. Parent involvement refers to parents' attitudes and actions toward children's learning behaviors at home, participating in school activities, and interactions with teachers and other parents (Barton, Drake, Perez, St. Louis, & George, 2004). Although used, at times, synonymously with parental involvement, parent engagement and support tend to represent a more general concept than parent involvement. For instance, parent engagement consists of partnerships between families, schools, and communities, enhancing parents' awareness of the importance of involving in children's education. It also includes provision of experiences that facilitate children's autonomy to learn (Sheridan, Knoche, Kupzyk, Edwards, & Marvin, 2011). Additionally, the term 'parent engagement' has been used to emphasize the roles of schools or teachers who want parents to become more involved in school-based activities. These multiple definitions and components are often not consistent across studies, making it difficult to assess the definitive association between parental support on children's learning or to compare results across various studies.

The terms (e.g., parental support, parent involvement, parent engagement, etc.) have common ideas that parents get engaged in children's education and school activities. However, the various terms can be used, and they can be defined in different ways depending upon main roles of home and school. Epstein (1995) suggested that there are six types of methods to

encourage parents to get involved with schools or their child's education: parenting, communicating, volunteering, learning at home, decision making, and collaborating with community. Parent involvement, as part of parent support, tends to focus on strengthening education through communication between schools, homes, and community (Epstein, 1995). Based on Epstein's typology of parent involvement, Fantuzzo, Tighe, and Perry (1999) suggested that parent involvement includes three dimensions consisting of: Home-Based Involvement, School-Based Involvement, and Home-School Conferencing. Home-Based Involvement reflects a home learning environment which improves children's learning at home (e.g., reviewing their child's school work, spending time with their child working on reading). School-Based Involvement represents parental participation in school activities. Home-School Conferencing refers to communication between parents and teachers about school activities or a child's learning experiences (Fantuzzo et al., 1999). The term, 'parent support' will be used in the current study because it more broadly focuses on a host of parental school-related activities that parents might do at home to support their child's preacademic competence (i.e., children's academic skills which help children succeed their later school performance).

As a part of parental support, the learning opportunities parents provide children at home that are classified as home-based involvement in Fantuzzo's definition, make an important contribution to their development (Son & Morrison, 2010). Research has shown that home learning environment (e.g., providing learning materials, language stimulation, academic stimulation, variety of experience) was positively related to children's development of language skills (Froyen, Skibbe, Bowles, Blow, & Gerde, 2013; Sénéchal, & LeFevre, 2002; Son & Morrison, 2010). Specifically, more frequent home learning activities were associated with higher levels of children's literacy achievement indicating that the learning environment in the

family is directly related to learning outcomes for children (Froyen et al., 2013). Home-based involvement (e.g., reading to a child at home) is also positively related to preschoolers' learning competencies and receptive vocabulary skills (Fantuzzo, McWayne, Perry, & Childs, 2004). Preschoolers who experienced home environment improvement (e.g., providing learning materials, language stimulation, academic stimulation, and variety of experience) showed developmental changes in language (e.g., vocabulary, grammar, morphology, and language reasoning), suggesting that such opportunities and experiences have long term impacts (Son & Morrison, 2010).

Children's experiences at home, experiences at school, and the connection between home and school play a significant role in children's academic achievement. Children are influenced by these environments as they interact with them continuously (Bronfenbrenner & Morris, 1998). Numerous studies suggest that children's home and school contexts uniquely play a role in children's development (Burchinal et al., 2002; Galindo & Sheldon, 2012; O'Connor & McCartney, 2007). Beyond the unique contributions to child development, it is important to examine how the home and school systems work together to influence children's academic outcomes since children are influenced by both home and school simultaneously. Thus, it is important to consider how both home and school settings are related to children's academic outcomes. Regarding school settings, teacher-child relationships can act as emotional support for children contributing to positive adjustment in school and improved academic performance (Burchinal et al., 2002; O'Connor & McCartney, 2007). Regarding the home setting, parental support (e.g., doing school related activities at home) can be considered as academic support in that it is related to children's academic achievement.

Although children are influenced by home and school simultaneously, little research explores how teacher-child relationships and parental support are associated with children's academic achievement. Further, few studies examine teacher-child relationship quality as a school factor despite evidence suggesting that relationships with teachers are one of the most primary social connections that children experience during their schooling. Hence, this study will investigate how the quality of teacher-child relationships and parental support are associated with children's academic achievement using both teachers' and children's reports. In regard to home contexts, the term 'parental support' will be used including the concept of home-based involvement, home learning environment, and parental school-related activities at home.

### **Research Questions**

The purpose of the present study is to examine the unique and shared impact of family and school contexts on children's development. To examine these impacts, this study explores how teacher-child relationships (with attention to how teachers and children differentially perceive their relationships) and parental support are associated with children's academic achievement, including mathematics and literacy. Because teachers and children may experience the relationship differently, both teacher and child reporting on their relationships were used. Regarding parental support, both home learning environment and parent involvement were examined to explore how teacher-child relationships and parental support are associated with children's academic outcomes. This study extends previous research by enhancing understanding of how teacher-child relationships play a role in child academic outcomes along with other parental support factors such as home learning environment. Specifically, this study aims to address the following questions:

- (1) How are teachers' and children's perceptions of their relationship related?

- (2) How are teacher-child relationships and parental support associated with children's academic outcomes?

### **Assumptions**

It is hypothesized that teacher's and children's perceptions regarding their relationships are different (e.g., children think their relationships with their teachers are very positive while teachers think otherwise) and that individual factors, such as child's race, child's gender, and family incomes, contribute to the differences. Previous research found minimal concordance between teachers' and children's perceptions of their relationships because children tend to focus on different parts of the relationships than teachers (Mantzicopoulos & Neuharth-Pritchett, 2003). Hence, associations between children's academic outcomes and teacher's and children's perceptions may have different correlations with teacher's and children's perceptions. It is also hypothesized that children who have closer relationships with their teachers will display better academic performance than children who have less close relationships with their teachers. Additionally, children who have close teacher-child relationships and receive higher levels of parental support (e.g., more opportunities to do school-related activities at home) are expected to perform better than children with less close relationships with their teachers and lower levels of parental support (e.g., less opportunities to do school-related activities at home). It is also hypothesized that conflictual or dependent relationships between teachers and children and low levels of parental support will be associated with poor academic achievement.

## **2 REVIEW OF THE LITERATURE**

This chapter will present an overview of the literature on teacher-child relationships focusing on associations with child academic achievement. Additionally, how teacher-child relationships and parental support can be associated with children's academic outcomes will be discussed. First, theoretical foundations of teacher-child relationships and parental support will be reviewed, including attachment theory and bioecological systems theory. Second, the review will examine how teacher-child relationships can be conceptualized from multiple theoretical frames. It will also discuss influences of teacher-child relationships and parental support on children's academic outcomes.

### **Theoretical Framework**

To explore how the quality of teacher-child relationships and parental support are associated with children's academic outcomes, two theoretical frames will guide this study: (1) attachment theory and (2) bioecological systems theory. Attachment theory will provide ideas about how teachers and children establish emotional construct through relationships. A discussion of Attachment theory and how it can be applied to teacher-child relationships, even though Attachment theory was originally developed to explain interactions and relationships between parents and children, will also be presented. Bioecological systems theory will guide ideas that children are influenced by environments where they live. Particularly, roles of home and school, which are proximal factors, on child development will be discussed. Bioecological theory is used to highlight factors that impact children's learning and development, while attachment theory is used to detail the importance of children's relationships with caring adults and how they are established.

**Attachment theory.**

Attachment theory (Bowlby, 1969) explains that children's attachment functions as a social-emotional foundation for their learning and social development. For children, attachment is formed with people who are close to them, such as their parents and primary caregivers, meet children's emotional needs in supportive ways. These attachments are then used as secure bases, that allow children to interact with environments actively in the context of learning and exploration. The primary concept of attachment theory is that children establish attachment relationships with their primary caregivers through enduring interactions (Ainsworth, Blehar, Waters, & Wall, 1978). Children form secure or insecure attachments depending upon experiences with their primary caregivers.

Attachment theory highlights that positive relationships (e.g., close relationships) between parents and children allow children to form emotional security, which in turn serves as a basis to interpret others' behaviors or intentions in new relationships (Wentzel, 2009). When children interact with their caregivers, the caregivers' sensitivity and responsiveness play a key role in establishing healthy and secure attachment relationships. In other words, children whose parents are more likely to be responsive and sensitive to their children's behaviors tend to recognize their parents as a secure base. Ainsworth developed the Strange Situation procedure which evaluates babies' attachment to their parents by observing the babies' reactions to the parents after short separations from each other. The types of attachments were classified into a secure attachment pattern and three patterns of insecurity (e.g., avoidant, resistant, disoriented) depending upon the babies' behaviors and responses (Ainsworth et al., 1978).

Although attachment theory has been primarily used to understand parent-child relationships, it also provides a useful frame for understanding teacher-child relationships. Attachment theory provides a fundamental framework to explain how teachers' emotional support to their children affects children. Specifically, children can use their teacher as a secure base when their teacher is responsive and sensitive to their needs. Similar to how children's attachment with their parents influence children's emotional security, children who have positive relationships with their teacher use their teacher as a secure base (e.g., children consider their teachers as a source of comfort). The emotional security that children develop in their relationships with teachers enables them to explore the classroom environment and interact with others in that environment more actively (Birch & Ladd, 1997; Wentzel, 2009).

When adopting an attachment perspective, one of the first questions to ask is whether the teacher-child relationship can be considered as an attachment relationship. Teacher-child relationships do not share the same interaction mechanisms as parent-child relationships since the two relationships are established in very different contexts. In most educational systems, children share their teachers with other children and change their teachers every school year. Thus, teachers and children need to establish new relationships each year. Although some children continue their relationships with the same teachers because child care centers allow teachers to work with the same children depending upon their policy and the age of children (i.e., continuity of care), these children still share their teachers with other children. Because of the temporary nature of the relationship, young children may have some difficulty establishing attachment easily with teachers. In addition, Ainsworth et al. (1978) pointed out that attachment is a unique relationship that is established through continuous interactions between primary

caregivers and children. Therefore, the importance of establishing attachment relationships between teachers and children should not be taken for granted.

Researchers who view teacher-child relationships from an attachment theory perspective document that the attachment relationships with primary caregivers can be applied to relationships between teachers and children. For example, in the Strange Situation experiment (Ainsworth et al., 1978) with teachers, children showed separation-reunion behavior patterns which are similar to the patterns between parents and children (Hamilton & Howes, 1992). Evidence was also found for similarities of adults' sensitivity and children's attachment relationships with the adults. Specifically, children's security with teachers was influenced by teachers' responsiveness and sensitivity (Ahnert, Piquart, & Lamb, 2006). Researchers have also examined how teacher-child relationships are built through continuous interactions between teachers and children. In order to maintain close relationships between teachers and children, teacher sensitivity and responsiveness are important because they influence the relationship quality (O'Connor, Collins, & Supplee, 2012; Verschueren & Koomen, 2012). Sensitive teachers are more likely to be responsive to children's demands and to form close relationships with children in ways that contributes to children's classroom behavior and academic performances.

Additionally, researchers who explore teacher-child relationships from an attachment perspective have argued that temporary attachment relationships can be established between teachers and children because teachers play the role of a secure base for children when they maintain close relationships (Verschueren & Koomen, 2012; Zajac & Kobak, 2006). Maternal attachment is associated with children's academic self-concept as well as teacher-child relationship quality (Verschueren, Doumen, & Buyse, 2012). It also has an impact on later teacher-child relationship quality (O'Connor & McCartney, 2006). According to O'Connor and

McCartney (2006), children with poor maternal attachments tend to have poor relationships with teachers. However, they also found that the impact of poor maternal attachment can be remedied with good relationships with teachers. For example, high quality teacher-child relationships can improve social skills even for children who do not have secure attachment with mothers. Hence, the experiences of good teacher-child relationships may be critical for children's academic well-being when children have not developed enough positive relational skills in interactions with their mothers. Additionally, Oades-Sese and Li (2011) found that both secure attachment relationships with parents and close teacher-child relationships were significantly associated with bilingual children's (aged 3 to 5 years) language skills (e.g., language use, linguistic proficiency) (Oades-Sese & Li, 2011). Importantly, associations between teacher-child relationship quality and the children's language skills existed beyond the quality of parental attachment relationships. Based on the understandings of influence of emotional support on children's academic achievement, some researchers extended the theory to examine teacher-child and other adult-child relationships (Verschueren & Koomen, 2012).

Although attachment theory provides theoretical framework to understand the importance of relationships, specific attachment with teachers was not assessed in the present study. Attachment theory has also provided a fruitful framework for teacher-child relationship research by highlighting the importance of the affective relationship quality between teachers and children (Verschueren & Koomen, 2012). Researchers who use attachment theory focus on dyadic relationships between teachers and children. However, attachment theory does not provide a framework to explain how teacher-child relationships act with other environmental factors (e.g., parental support) and their influences on child academic outcomes. Thus, bioecological systems

theory is also used as a theoretical frame in the present study to assist in understanding how children are influenced by home and school and their interactions.

**Bioecological systems theory.**

While attachment theory focuses on dyadic relationships between children and adults and the affective quality of these relationships, bioecological systems theory focuses on dynamic systems that affect how the relationships are established. Within the bioecological systems theory, teacher-child relationships are embedded within multiple dynamic systems, including the classroom and the community. In particular, as both family and school contexts are the most proximal system to children, they need to be considered when researchers explore how children's relationships relate to their learning and development.

Bronfenbrenner (1979) described five bioecological systems, which are; microsystem, mesosystem, exosystem, macrosystem, and chronosystem. These systems explain the ecological levels involved in human development. The microsystem is defined as a pattern of activities, social roles, and interpersonal relations experienced in a direct setting (e.g., family, peer groups, and school). Family system is the most influential and proximal microsystem in children's early learning (Bronfenbrenner, 1979), and interactions with other people in the classroom are also proximal system for children. In the present study, parental support (e.g., home learning environment, home-based involvement, school-related activities at home) and teacher-child relationships will be considered as a part of the microsystem. The mesosystem consists of interrelationships between two or more microsystems in which the individual is situated (e.g., school and home). The mesosystem also recognizes the importance of establishing beneficial connections between families and schools (Christenson & Sheridan, 2001). By considering the

two microsystems (i.e., teacher-child relationships & parental support), we can explore how the two contexts play roles in children's academic achievement as a mesosystem. The exosystem refers to factors or events that take place in settings in which children do not actively contact with, but they influence children's development indirectly. For instance, when a mother needs to work until late at night due to a harsh, or unsupportive, working environment, this situation may impact her ability to form and sustain positive relationships with her children. The macrosystem consists of cultural influences and social beliefs which situate in society where children live. Lastly, the chronosystem refers to the impact of time on children's development and their lives (e.g., parent-child relationships and teacher-child relationships change over time). Thus, when children's development and learning are discussed, home and school contexts can be considered as one of the most proximal factors.

The bioecological systems framework has also been applied to relationships between teachers and children by Pianta (1997) in order to discuss how these relationships function as a system. The systems are defined as "units composed of sets of interrelated parts that act in organized, interdependent ways to promote the adaptation and survival of the whole" (Sabol & Pianta, 2013, p. 202). The systems consider different types of relationships such as families, classrooms, parent-child, and teacher-child relationships. These relationships are formed, maintained, and changed in the contexts where people belong. In order to have relationships between individuals, there are main components: (a) individual features, (b) information exchange processes of the relationships, and (c) external features of the systems (Sabol & Pianta, 2013). According to the bioecological systems theory, teacher-child relationships are facilitated by reciprocal associations of characteristics of individuals, interactions between teachers and children, and external influences of the systems on the relationships (Hamre & Pianta, 2006). In

other words, relationships reflect external factors as well as internal characteristics of teachers and children.

According to Hamre and Pianta (2006), the most basic level of the systems includes individual factors such as demographic, psychological, and developmental characteristics. For example, demographic characteristics of teachers and children (e.g., gender, ethnicity, socioeconomic status) influence on their relationships. Particularly, children's gender has been reported as one of primary factors which are linked to teacher-child relationships. Boys tend to experience more conflicts with their teachers while girls experience more closeness (Birch & Ladd, 1997; Hamre & Pianta, 2001; Hughes, Gleason, & Zhang, 2005). Also, because girls value their relationships with teachers more than boys do, girls tend to get negatively affected regarding academic achievement when they experience conflicts with teachers (Ly et al., 2012; McCormick & O'Connor, 2015). In the present study, children's age and parents' socioeconomic status (e.g., parent education, family income) are considered as individual factors.

Relationships between teachers and children are affected by the quality of interactions while exchanging information in reciprocal processes (Pianta, 2006). When teachers and children interact with each other, they have positive or negative perceptions of the relationships, and these perceptions play a critical role in maintaining their dyadic relationships. At this level, how the information is exchanged has more impact on the relationships than contents of the information itself. For instance, if teachers encouraged children's ideas and effort even when their results were not successful, they can maintain positive relationships while providing opportunities for teachers to further understand their children (Fumoto, 2011). The present study is interested in examining teacher-child affective relational behaviors.

Relationships reflect not only individuals' features, but also characteristics of whole systems. Teachers and children are parts of a larger community (e.g., schools, county), so their relationships are influenced by the external factors of the systems where the interactions take place (Hamre & Pianta, 2006). External factors of teacher-child relationships include structural aspects of school environments, school climate, and culture (Pianta, 1999). Sabol and Pianta (2013) mentioned that even teachers' personal lives that experience outside of schools may be considered as external factors which potentially affect teacher-child relationships. In the present study, the most proximal factors and systems (i.e., home and school) are examined, rather than larger community or societal factors, as they are thought to be more impactful to children's learning and development.

Based on understanding of bioecological systems theory, researchers have explored multiple levels of systems, including individual features and classroom climate. For instance, O'Connor and McCartney (2007) examined how children, family, and cultural characteristics play roles in the effect of teacher-child relationship quality on child academic achievement. They focused on how each microsystem affects child outcomes rather than exploring mesosystem, which represents interactions between the microsystems. Their findings revealed that the family system (e.g., maternal education, episodes of poverty, authoritarian parenting) had the largest influence on children's academic outcomes. In addition, Hindman and colleagues (2010) explored effects of child, family, and classroom factors on children's literacy and mathematics skills by considering ecological contexts of early learning. They found that child level factors such as demographic characteristics accounted for early literacy and mathematics development while family (e.g., parent involvement, parent education) and school factors (e.g., teacher background, classroom size) were not related to early learning (Hindman et al., 2010).

How home and school contexts contribute to children's learning is complicated, but their impact should not be ignored in early childhood education because children grow and learn in the two proximal contexts. Thus, more research is needed to examine how the two proximal factors are related to children's development and learning.

Overall, Bioecological framework helps us consider influential figures and environments that are critical for children's relationships (e.g., parents, teachers, children). However, the framework is limited in that it does not provide theoretical explanations for how the factors within such environments work help children establish close relationships with adults. On the other hand, Attachment theory explains the ways that relationships are built and maintained. Thus, both of these theories are employed to bring depth and perspective to the importance of studying how children's experiences with teacher in the preschool setting and parents within the home setting relate to their development and learning.

### **Conceptualization of Teacher-Child Relationships**

As previously mentioned, attachment theory provides a theoretical foundation for explaining mechanisms of teacher-child relationships. Teacher-child relationship literature has built upon substantial research on parent-child relationships, which has resulted in a shared understanding that teacher-child relationships can be conceptualized similarly. Children whose teachers are responsive to them tend to use their teachers as a secure base. Based on the understanding of attachment theory, children who use their teachers as an emotional security, they are more likely to explore environment and have more chances to learn from their teachers than children who do not use their teachers as a source of security (Birch & Ladd, 1997; Wentzel, 2009).

In order to understand the concept of teacher-child relationships, how relationships are established and maintained needs to be discussed. A relationship is built through bidirectional and continuous interactions between two or more individuals (Pianta, Hamre, & Stuhlman, 2003). When the interactions have certain types of patterns, they shape relationships between individuals. Pianta (1994) characterized teacher-child relationships as the degree of engagement between teacher and child. Teacher-child relationships are represented by the positive or negative emotional quality of engagement (Pianta, 1994). The quality of teacher-child relationships is classified by three dimensions: closeness, conflict, and dependency (Pianta, 1997). Attachment theory provided Pianta (2001) solid foundations to develop measures to assess the quality of teacher-child relationships. For instance, Pianta (2001) created the Student-Teacher Relationships Scale (STRS) to measure teachers' perceptions of relationships with their children by classifying three dimensions of these relationships: closeness, conflict, and dependency. Closeness refers to the degree of warmth and affection in the relationships. Conflict reflects the degree of negative and conflictual interactions between teachers and children. Lastly, dependency represents the tendency of children to rely on their teachers. These are based upon widely understood views of parenting style research. High levels of closeness and low levels of conflict and dependency between teachers and children are regarded as indicators of high quality relationships (O'Connor, 2010).

Before STRS (Pianta, 2001) was developed, some researchers used attachment measures to assess teacher-child relationship quality (Howes & Hamilton, 1992). For example, Howes and Hamilton (1992) used the Attachment Q-Set (Waters & Deanne, 1985) to examine children's (age range from 10 to 56 months) relationships with teachers. Teacher-child relationships were characterized into 3 types: emotionally secure, avoidant, or ambivalent. When children received

a score of 7 or higher on the items about positive mood and comfort, they were classified as secure. When children received a score of 3 or lower, they were classified as avoidant. When children received a score of 7 or higher on no physical contact, demanding initiation, they were classified as ambivalent. Although the Attachment Q-Set presents an important approach to measuring relationships, existing research relies heavily on using the STRS.

Additionally, researchers have used terms ‘positive relationships’ or ‘negative relationships’ in order to represent the quality of teacher-child relationships without clear definition of the terms (Howes, Phillipsen, & Peisner-Feinberg, 2000; Hughes, Cavell, & Willson, 2001; Rudasill & Rimm-Kaufman, 2009). On the other hand, positive or negative teacher-child relationships have been defined using classifications of the quality of relationships between teachers and children. For instance, Birch and Ladd (1997) referred to positive teacher-child relationships as relationships that were relatively close, nonconflictual, or nondependent. In order to form a composite relational negativity score, Hamre and Pianta (2001) added conflict and dependency scores together. In many studies, positive teacher-child relationships are marked by closeness between teachers and children while negative relationships are mainly reflected by conflict and dependency (Hamre & Pianta, 2001).

The quality of interactions can be explained as tone of voice, gesture, and timing of behaviors, and it may be more important for relationships than actual contents of behaviors as it carries more meanings and information (Sabol & Pianta, 2013). For the quality of teacher-child relationships, high quality interactions can help teachers build positive relationships with children and improve the children’s academic performance. Findings of numerous studies on the associations between the quality of teacher-child relationships and children’s school performance revealed that relationships play a significant role in children’s academic achievement and school

adjustment (Birch & Ladd, 1997; Burchinal et al., 2002; Choi & Dobbs-Oates, 2013; Ly et al., 2012; Palermo et al., 2007). This is because children who have close relationships with their teachers are more likely to receive warm and positive responses from their teachers and are encouraged to explore learning environments.

In the area of teacher-child relationships, numerous researchers have explored associations between teacher-child relationship quality and child development. In most studies, however, Pianta's (2001) STRS was used to measure teacher-child relationship quality. The constructs of closeness and conflict within these relationships have received more attention than dependency (e.g., Ly et al., 2012; McCormick & O'Connor, 2015; O'Connor, 2010) because these two dimensions represent relationship quality more clearly than dependency. Of existing research, most only investigates the degree of closeness in order to represent the quality of teacher-child relationships (e.g., Burchinal et al., 2002; Choi & Dobbs-Oates, 2013). For example, Burchinal et al. (2002) used closeness as a classroom experience with teachers and found that closeness predicted children's (mean age = 51.6 months) language skills in their longitudinal study. Choi and Dobbs-Oates (2014), also only investigated closeness in order to represent relationship quality. They found positive association between teacher-child closeness and preschooler's mathematics development. In their two time point study, children who had closer relationships with teachers were more likely to gain in mathematics than children who had less close teacher-child relationships. In many studies, the dependency subscale was not used because of convenience of using two contrary dimensions (e.g., closeness and conflict) and low internal reliability of dependency (e.g., Cronbach's alpha of the dependency subscale is .64 in the Student-Teacher Relationships Scale manual, Pianta, 2001). Additional research should examine the totality of the teacher-child relationship in order to establish its association with children's

learning and development. Importantly, dependency should be considered within this totality as it may be an important factor in the formation of teacher-child relations for preschool aged children because they are still learning to develop their independence.

### **Teacher-Child Relationships and Child Academic Achievement**

Research highlights the importance of teacher-child relationship quality by exploring its associations with child outcomes. Findings of numerous studies reveal that relationships play a significant role in children's academic achievement and school adjustment (Birch & Ladd, 1997; Burchinal et al., 2002; Choi & Dobbs-Oates, 2013; Ly et al., 2012; McCormick & O'Connor, 2015; Palermo et al., 2007). These associations between teacher-child relationships and children's academic outcomes can be attributed to the fact that children who have close relationships with their teachers are more likely to receive warm and positive responses from their teachers and are encouraged to explore learning environments or opportunities more freely. For example, teacher-child closeness was found to be positively linked with children's language skills (e.g., letter recognition, reading comprehension skills), as well as teachers' ratings of school liking (Birch & Ladd, 1997). Palermo et al. (2007) also found that preschool children's close relationships with their teachers were directly associated with their school readiness in kindergarten. In this longitudinal study, children who had close relationships with their teachers showed greater academic readiness, while dependency and conflict were associated with diminished academic readiness.

Teacher-child relationships also influence child adjustment in preschool, in the early grades, and beyond (Lynch & Cicchetti, 1992; Pianta, 1992). Additionally, a meta-analysis by Roorda and colleagues (2011) found that there were positive associations between high quality teacher-child relationships and both children's school engagement and academic achievement,

while conflictual relationships were negatively associated with both school engagement and achievement. Their findings also revealed that younger children (e.g., preschool aged children) were more likely to be influenced by affective quality of teacher-child relationships (Roorda et al., 2011). Thus, it is particularly meaningful for preschoolers that researchers explore how teacher-child closeness plays a role in children's academic performance.

On the other hand, negative relations with school outcomes have been found for teacher-child dependence and conflict. For example, dependency in the teacher-child relationship emerged as a strong correlate of kindergarten children's school adjustment difficulties, including poorer academic performance, more negative school attitudes, and less positive engagement with the school environment (Birch & Ladd, 1997). Conflict was negatively associated with teachers' ratings of children's school liking, school avoidance, self-directedness, and cooperative participation in the classroom (Birch & Ladd, 1997).

One reason that some studies do not find associations between the teacher-child relationship and children's outcomes may relate to the distribution of scores. There is relatively little variation in teachers' ratings of closeness as revealed by the standard deviation (*SD*) of closeness being quite small in comparison to the *SDs* of conflict and dependency. For example, *SD* of closeness ranged between 0.58 and 0.69, whereas *SD* of dependency and closeness ranged between .76 and .84 on the scale of 1 to 5 (Choi & Dobbs-Oates, 2013; Driscoll, Wang, Mashburn, & Pianta, 2011; Palermo et al., 2007). This tendency in scoring may make it more difficult to find associations with outcomes for the closeness scale than for conflict and dependency, since variation of closeness in the samples is relatively limited.

Other research does not find significant associations between teacher-child relationship quality and children's academic achievement. For example, teacher-child relationship quality was not significantly related to reading (McCormick et al., 2013) or math (Burchinal et al., 2002) achievement. Specifically, McCormick et al. (2013) found that teacher-child relationships did not predict prekindergarten children's (mean age = 5.38,  $SD = .61$  years) reading achievement. One explanation for the absence of the associations between teacher-child relationships and these academic outcomes may be that preschool aged children are primarily influenced by family factors such as maternal education levels and the home learning environment. Additionally, teachers' emotional support for children may not help children improve their academic achievement directly. Rather, emotional support may relate to children's social functioning which may relate to children's academic achievement.

In the area of teacher-child relationships, children's literacy is the most frequently explored academic outcome. Many studies have found associations between the quality of teacher-child relationships and children's literacy (Ly et al., 2012; McCormick & O'Connor, 2015). In particular, closeness tends to be positively linked with children's language skills. Specifically, close teacher-child relationships were positively associated with children's reading comprehension skills and school adjustment (Birch & Ladd, 1997; Ly et al., 2012; McCormick & O'Connor, 2015). Teacher-child closeness was modestly correlated with receptive language during the preschool years (Burchinal et al., 2002), while dependency and conflict was associated with poorer language skills (Birch & Ladd, 1997).

Associations between teacher-child relationships and child math outcome were less explored compared to its associations with literacy. Some research has found that there are

significant associations between teacher-child relationships and math outcomes (Choi & Dobbs-Oates, 2013; Ly et al., 2012), while other studies found no significant association (Burchinal et al., 2002). For example, teacher-child closeness plays a key role in accounting for children's math development (Choi & Dobbs-Oates, 2013). Children who had closer relationships with their teachers were more likely to experience math gains compared to children who had less close relationships. Particularly, Ly et al. (2012) found that conflict was negatively associated with Chinese American girls' math achievement and closeness was positively related with Chinese American boys' reading achievement. Their study provides ideas teacher-child relationship and its associations with math and literacy may vary depending upon children's backgrounds such as cultural differences and gender.

Although prior research on teacher-child relationships has established important roles of teacher-child relationship quality on children's academic outcomes, there are methodological issues related to measuring perceptions of the relationships. Researchers measure these relationships primarily in two different ways: using teacher reports and child reports. Most of the studies on teacher-child relationships have primarily relied on teachers' perceptions of their relationships with children. Numerous studies have used teachers' perceptions of teacher-child relationships and found their associations with children's academic outcomes (Burchinal et al., 2002; Choi & Dobbs-Oates, 2013). Some studies used child reports (Blankemeyer, Flannery, & Vazsonyi, 2002; Jellesma, Zee, & Koomen, 2015; Koepke & Harkins, 2008; Mercer & DeRosier, 2010; Skipper & Douglas, 2015), but most of them have been conducted with elementary school-aged or older children. The number of studies on teacher-child relationships using preschool aged children's perception is extremely limited. One possible reason for the lack of research using child reporting is that collecting child reported data is more difficult than

using teacher reported measures because children need to be interviewed, while teachers can simply provide their perception of teacher-child relationships using questionnaires (Murray et al., 2008). However, children's reports of teachers' emotional support had acceptable internal consistencies indicating that it is identified as reliable, and its importance has been highlighted in multiple studies (Mantzicopoulos & Neuharth-Pritchett, 2003; Spilt et al., 2010).

The other reason that we need to consider using child reported data is that children's perceptions of teacher-child relationships are crucially associated with children's academic outcomes. For example, Mantzicopoulos and Neuharth-Pritche (2003) found that children's perceptions of conflictual relationships with teachers were associated with children's low scores of reading and mathematics. Moreover, teachers' perceptions about relationships with their children may not be consistent with children's perception about relationships with their teachers. For example, research found minimal concordance between teachers' and children's perception about the quality of the teacher-child relationship (Spilt et al., 2010). One reason for these limited associations may be related to each respective respondent as well as the nature of these relationships. Teachers' perceptions of teacher-child relationships do not represent children's perceptions of the relationships and only capture one side of reciprocal interactions between two individuals. Based on the understanding teacher-child relationships and capture reciprocity between those in these relationships, necessities of child report have been suggested (Sabol & Pianta, 2013; Split et al., 2010).

Additionally, in order to use child reported teacher-child relationships, researchers need to consider possible factors that contribute to the formation of these relationships as well as to the differences. Individuals' characteristics (e.g., child gender, child ethnicity, family income)

may contribute to differences in reports of relationship quality for both teachers and children. For example, teachers reported that they maintained more positive relationships with children (mean age = 4 years, range = 37 to 83 months) of their same race (Saft & Pianta, 2001). Children's racial and economic backgrounds are associated with how teachers perceive their relationships with children. Teachers tend to report more conflicts with African American children (Saft & Pianta, 2001), while also reporting closer relationships with Caucasian children (Ladd, Birch, & Buhs, 1999). In addition, Caucasian teachers with high concentrations of African American children tended to report a higher degree of burden for helping them adjust to a school (Rimm-Kaufman, Pianta, Cox, & Bradley, 2000). However, in another study, the teacher-child racial match did not affect children's perceptions about their relationships with their teachers (Murray et al., 2008). Although individual factors likely do not determine the quality of the teacher-child relationship, paying attention to individual factors at the teacher and child level may be important to understanding variation in how these relationships established and maintained.

### **Parental Support and Child Academic Outcomes**

As an additional proximal factor in children's lives, parents and the home learning opportunities they create directly impacts children's preacademic development and later academic achievement. Based on understandings of bioecological systems theory, research documents that parental support (i.e., home learning environment and parent involvement) is associated with children's academic outcomes (Fantuzzo et al., 2004; Froyen et al., 2013). Specifically, the home learning environment that parents establish leads to improved prekindergarten children's developmental outcomes (Powell et al., 2010). In addition, parent support, which is typically defined as parental engagement in school through school related

activities (e.g., volunteering in the classroom) or communication with teachers, relates to children's school adjustment and academic outcomes (Powell et al., 2010; Topor, Keane, Shelton, & Calkins, 2010).

Although some studies document the importance of parental support and children's academic outcomes, and the importance of parental support is believed to be central to children's development in policy statements and early childhood programming (National Association for the Education of Young Children, 2009; Office of Head Start and the National Center on Parent, Family, and Community Engagement, 2011), research demonstrate mixed results for the construct. A portion of literature shows that there are no direct associations between parental support and children's academic achievement (El Nokali, Bachman, & Votruba-Drzal, 2010; Okpala, Okpala, & Smith, 2001; White, Taylor, & Moss, 1992). For example, El Nokali et al. (2010) found that parental support did not predict children's receptive vocabulary and mathematics skills. Okpala et al. (2001) also found that there were not associations between parental support (e.g., parents' participations in school activities) and children's achievement. However, some of the non-significant associations between the parental support and children's academic outcomes are likely related to the ways in which parental support was conceptualized and measured. Specifically, Okpala et al. (2001) measured parental support by calculating how many hours parents volunteered at school. The parental volunteered hours cannot represent multi-dimensions of parental support, which includes school-based involvement and home-based involvement. Similarly, El Nokali et al. (2010) included a general parental support measure which was conceptualized as parents' encouragement of education and educational attitudes. They did not specify whether this construct included home or school involvement.

On the other hand, other studies found that high levels of parental support in education is positively associated with children's academic achievement (Fantuzzo et al., 2004; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004; Powell et al., 2010; Rimm-Kaufman, Pianta, Cox, & Bradley, 2003; Topor et al., 2010), while low levels of parental support (e.g., rarely participating in school activities) negatively influences children's academic performance (Oyserman, Brickman, & Rhodes, 2007). Specifically, parents' school involvement such as volunteering in school events is crucially related with children's academic outcomes. Children whose parents are more involved in school activities and their children's education perform better on academic assessments than children whose parents are not as engaged. Research found that kindergarten children whose parents are more involved in their school activities performed better in language and math and had higher school competency than children whose parents participated to a lesser extent in their schooling (Rimm-Kaufman et al., 2003). Powell et al. (2010) also found that parental support such as participating in school activities (e.g., volunteering in child's school activities such as field trip, attending meetings, helping with food for events) positively predicted pre-k aged children's mathematics skills. Compared to participants who reported low levels of parental support (e.g., rarely participating in school activities), children whose parents reported relatively higher levels of parental support (e.g., actively participating in school activities) had higher scores in mathematic skills at the end of the school year.

In addition, parental support through shared book reading at home have been identified as significant predictor of children's achievement. For instance, Fantuzzo et al. (2004) found that home-based parental support (e.g., reading to a child at home, asking a child about school) was positively related to preschool children's approaches to learning and motivation, which, in turn,

improved children's receptive vocabulary skills. Another study, which used Epstein's (1995) typology of parent involvement also found a strong association between home learning environment and children's (5 to 7 years old) motivation to learn (McWayne et al., 2004). These studies highlight the importance of parental support in supporting children's learning in the home environment. However, the previous work does not consider children's primary relationships at school (e.g., relationships between teachers and children) when they examine predicting roles of parental support in children's academic outcomes.

When researchers examine parental support and its associations with children's development and learning, socioeconomic (SES) factors need to be considered because parents with fewer educational or economic opportunities are less likely to provide support to their children in ways that are reflected in school (Stacer & Perrucci, 2013). Stacer and Perrucci (2013) pointed that low-income parents were less likely to get involved in their children's school activities that make further impact children's learning and development. Parental employment status also can influence the time that parents participate in their children's school activities and spend with their children at home (Sayer, Bianchi, & Robinson, 2004). Thus, children's SES needs to be considered carefully when parental support is investigated as a factor for children's development and learning.

### **Role of Teacher-Child Relationship and Parental Support**

In the line with bioecological systems theory (Bronfenbrenner, 1979), children develop and learn from their environments. In particular, home and school are the most proximal contexts where they live influencing the children's development directly. The importance of support from both home and school contexts for children's academic achievement has been highlighted in many studies. For instance, Connor and colleges (2005) found that both children's

home learning environment and teacher sensitivity were positively related to children's language and reading skills. Specifically, children demonstrated stronger language skills when they had rich home language environment, and when their teachers were responsive (Connor et al., 2005). Additionally, children's reading skills developed when they receive both home tutoring and classroom instruction (Pemberton & Miller, 2015). Findings of these studies indicate that both support from home and school enhances children's development and learning.

On the other hand, studies which use teacher-child relationships as a school factor tended to investigate parents' emotional support as a home factor (Burchinal et al., 2002; O'Connor & McCartney, 2007). For example, Burchinal et al. (2002) found that children's reading competence was less affected by authoritarian parenting style when they maintained high quality of teacher-child relationship. In addition, O'Connor and McCartney (2007) emphasized that family factors had the largest influence on children's academic outcomes. They found that children's achievement was influenced by both teacher-child relationships and family environment (e.g., authoritarian parenting beliefs, maternal attachment). However, in the both studies, the researchers missed that academic support such as home learning environment may influence children's academic performance rather than emotional support such as parenting styles.

In addition, Galindo and Sheldon (2012) discussed parent involvement from both school and home contexts by examining parents' school-related activities and their support for home learning experiences. They also highlighted the importance of family and school factors by considering school outreach efforts (e.g., school outreach efforts to promote family involvement). However, school outreach efforts may not directly influence children's school

experiences rather than relationships between teachers and children. Thus, we need to consider parental support which is the most influential and proximal system by examining both home learning environment and parent involvement in school (Bronfenbrenner, 1979; Bronfenbrenner & Morrison, 1998).

Taken together, research suggests the importance of considering both parental support and school contexts (e.g., teacher-child relationship quality) when examining children's academic achievement. The way in which teachers support children, through the teacher-child relationship, and the way in which parents support children' by becoming involved in their child's school experiences and providing home learning opportunities, are both important to children's school success. Despite such an understanding, only limited literature to date examines how teacher-child relationships and parental support separately and additively relate to children's preacademic outcomes. Rather, the majority of existing research examines these two factors separately. Thus, the present study explores how both teacher-child relationships and parental support (e.g., home learning environment and parent involvement) are associated with children's academic outcomes. Special attention will be paid to the quality of these associations by examining multiple informants (teacher, child, parent) and by methodologies.

### 3 METHODOLOGY

#### Participants

Participants of the present study were 179 preschool children (3- to 5-year-olds, mean age = 50.45 months,  $SD = 8.24$ ), their parents, and teachers. The participants were recruited from nine childcare centers in a Southeastern metropolitan city. Table 1 represents demographic characteristics of the children. The participants consisted of 93 boys (52%) and 86 girls (48%). Children and families came from diverse ethnic and socioeconomic backgrounds. Among participating children, 35.2% were Caucasian, 42.5% were Black/African American, 6.7% were Hispanic, 4.5% were Asian, and 11.1% represented other ethnic groups such as American Indian or mixed. More than half of the parents had at least a bachelor's degree (63.2%), with the rest of the sample reporting high school degrees or some college. Parents also varied somewhat on family income, with annual income for 27.9% of the families below \$40,000 and 43.6% over \$100,000. Table 2 represents demographic information of the teachers. Twenty-eight teachers participated in the study and they were primarily Black/African American (75.0%) and female (89.3%), with a mean of 10.8 years of teaching experience ( $SD = 6.21$ ). Teachers varied in their education and training with 10.7% of the teachers reporting a CDA, 25% an associate degree, 39.3% had bachelor's degree, and 21.4% reported a master's degree.

Table 1

*Demographic characteristics of children (N = 179)*

Variable	<i>N</i>	%
Gender		
Male	93	52.0
Female	86	48.0
Ethnicity		

African-American	76	42.5
European-American	63	35.2
Latino/Hispanic	12	6.7
Asian-American	8	4.5
Other	20	11.1
<hr/>		
Parent education		
< High school	2	1.1
High school	32	17.9
Some college / Associate degree	22	12.3
Bachelor's degree	37	20.7
Master's degree	41	22.9
Doctoral/professional degree	35	19.6
missing	10	5.5
Family income		
\$0 to \$20,000	28	15.6
\$20,001 to \$40,000	22	12.3
\$40,001 to \$60,000	12	6.7
\$60,001 to \$80,000	8	4.5
\$80,001 to \$100,000	14	7.8
Over \$100,001	78	43.6
missing	17	9.5
<hr/>		

Table 2

*Demographic characteristics of teachers (N = 28)*

Variable	N	%
<hr/>		
Gender		
Male	3	10.7
Female	25	89.3
<hr/>		
Ethnicity		
African-American	21	75.0

European-American	5	17.9
Latino/Hispanic	1	3.6
Others	1	3.6
<hr/>		
Teacher education		
High school	1	3.6
CDA	3	10.7
Associate degree	7	25.0
Bachelor's degree	11	39.3
Master's degree	6	21.4

## Measures

A variety of measures at the child, parent, and teacher level were used to examine research questions. As a result of the systems focus of this study, teacher-child relationship quality, parental support, and children's mathematical knowledge and literacy skills were assessed. Regarding teacher-child relationships, both teachers' and children's perceptions about the relationships were measured. Teacher perceived teacher-child relationships and parental support were measured using surveys. Child perceived teacher-child relationships were measured through an interview. Children's literacy/language and math skills were measured through direct assessment. Each measure is described in detail below.

### **Teacher-child relationship quality.**

*Student-teacher relationships scale.* The Student-Teacher Relationships Scale (STRS; Pianta, 2001) was used to assess teachers' perceptions of their relationship with each child. This measure consists of the following three dimensions: Closeness, Conflict, and Dependency. The Closeness subscale measured warmth and affection between the teacher and child (12 items: e.g., "This child is uncomfortable with physical affection or touch from me"). The Conflict subscale

represented the degree of negative and conflictual interactions between the teacher and child (11 items: e.g., “This child and I always seem to be struggling with each other”). The Dependency subscale reflected the degree of teachers’ perceptions of a particular child as overly dependent (5 items: e.g., “This child appears hurt or embarrassed when I correct him/her”). The items were rated on a 5-point scale ranging from 1 (definitely does not apply) to 5 (definitely applies). In the present study, mean scores of each subscale were used for data analyses. Internal consistency of each subscale was .86 for Closeness, .92 for Conflict, and .64 for Dependency (Pianta, 2001). Pianta (2001) pointed out that low internal consistency reliability of Dependency may be because it consists of only 5 items. Thus, he recommended that Dependency needs to be interpreted with caution because of its low internal consistency reliability. Cronbach’s alphas of the present sample were .69 for closeness, .89 for conflict, and .63 for dependency, demonstrating that the scales were performing consistently with previous research.

***Young children’s appraisals of teacher support.*** The Young Children’s Appraisals of Teacher Support (Y-CATS; Mantzicopoulos & Neuharth-Pritchett, 2003) was used to assess children’s perceptions of the quality of the relationship with their teacher. The measure is comprised of three dimensions: Warmth (14 items: e.g., “My teacher likes me”), Negative interactions (9 items: e.g., “My teacher gets angry with me”), and Autonomy (8 items: e.g., “My teacher chooses me to be a special helper”). Children answered each question with a ‘yes’ or ‘no.’ In the original format of the measure, the items were presented on small cards, and children were asked to place each in a mailbox for ‘true’ or ‘untrue.’ In the present study, children were asked to answer to each item verbally, without the cards and mailboxes because young participants might be easily distracted by the additional materials. Mean scores of each subscale were used for data analyses. In the previous research, internal consistency reliability

was .75 for Warmth, .75 for Negativity, and .67 for Autonomy within children in Head Start program, kindergarten, and first grade (Mantzicopoulos & Neuharth-Pritchett, 2003). In the present sample, Cronbach's alphas for two of the three dimensions were acceptable ( $\alpha = .79$  for Warmth and  $\alpha = .76$  for Negative interaction) but unacceptable for Autonomy ( $\alpha = .12$ ). Since Autonomy had low reliability, this domain was dropped for data analyses. The Warmth and Negative interaction corresponded to Closeness and Conflict subscale of STRS (Pianta, 1992), respectively. Autonomy represented children's perception of teachers' encouragement for autonomy, while Dependency of STRS (Pianta, 1992) reflected teachers' perception of children's tendency of relying on teachers. Overall, the three subscales were theoretically consistent with the subscales of STRS (Pianta, 1992).

### **Parental support.**

To factors of parental support were considered for this study. These include parent involvement and home learning environment. Each is described below.

***Family involvement questionnaire.*** The Family Involvement Questionnaire (FIQ; Fantuzzo, Tighe, & Childs, 2000) was used to measure parents' school involvement. The measure included three subscales: School-Based Involvement, Home-Based Involvement, and Home-School Conferencing. School-Based Involvement represented parental engagement related to school activities (12 items: e.g., "I meet with other parents from my child's class outside of school"). Home-Based Involvement referred to the home learning environment, which promotes children's learning behaviors (13 items: e.g., "I spend time working with my child on reading/writing skills"). Home-School Conferencing reflected communication between parents and teachers about a child's learning experiences (11 items: e.g., "I talk with my child's

teacher about school work to practice at home”). The items were rated on a 4-point scale ranging from 1 (rarely) to 4 (always). Mean scores of each subscale were used for data analyses. Internal reliability of this measure was .85 for School-Based Involvement, .85 for Home-Based Involvement, and .81 for Home-School Conferencing. Cronbach’s alphas of the present sample were .89 for School-Based Involvement, .84 for Home-Based Involvement, and .88 for Home-School Conferencing.

***Frequency of home literacy and numeracy activities.*** The Frequency of Home Literacy and Numeracy Activities was modified from a study of LeFevre et al. (2009) and Kleemans, Segers, and Verhoeven (2013) in order to measure how often parents provided learning activities at home. 20 numeracy and 3 literacy items were used from LeFevre et al.’s Frequency of Literacy and Numeracy Activities questionnaire (2009), which includes numeracy, fine motor, general, and literacy activities. Additionally, 6 items were used from Parent-Child Numeracy Activities questionnaire (Kleemans et al., 2013). The modified measures consisted of two subscales labeled Literacy Activities (3 items: e.g., “identifying names of written alphabet letters”) and Numeracy Activities (26 items: e.g., “playing with number fridge magnets”). The participants rated each item using a 5-point scale (i.e., never; a monthly base; a weekly base; a daily base; more than once a day). Mean scores were used for data analyses. Internal consistency reliability of Kemmans et al.’s numeracy activities were .93 (Kleemans et al., 2013). Internal consistency reliability of LeFevre et al.’s numeracy activities ranged from .71 to .84, and literacy activities were .69 (LeFevre et al., 2009). Cronbach’s alphas of the present sample were .79 for Literacy Activities and .90 for Numeracy Activities.

### **Early mathematics.**

Children's mathematical knowledge was assessed using three different measures. These measures represent a wide range of math related skills.

**Woodcock Johnson III.** The Applied Problems subscale of the Woodcock Johnson III (Woodcock, McGrew, & Mather, 2001) to assess children's mathematical understanding and knowledge. The 39-item Applied Problems subtest asked children to count objects, solve simple mathematics word problems and add and subtract small numbers (e.g., "Show me two fingers", "How many ducks are in the water?"). Concurrent validity showed the correlations between WJ III mathematics measures and other established measures such as the Wechsler Individual Achievement Test (WIAT; Wechsler, 1992) and the Kaufman Test of Educational Achievement (KTEA; Kaufman & Kaufman, 1985) were average .52 and .59, respectively. Internal reliability of the Applied Problems subscale was .85 (Woodcock et al., 2001). In the current study, internal consistency reliability was .85 and total score was used.

**Preschool early numeracy skills test.** The Preschool Early Numeracy Skills Test - Brief Version (PENS-B; Purpura & Lonigan, 2013; 2015) was used to assess early numeracy skills. The measure consisted of 25 items (e.g., "How many dogs are there?", "Which set has the most dots?", "When you count, what number comes before 5?") which covered various mathematical domains, including one-to-one counting, cardinality, counting subsets, subitizing, number comparison, set comparison, number order, numeral identification, set-to-numerals, story problems, number combinations, and verbal counting. Total score was used for the current study. Cronbach's alpha of the present sample was .84. Purpura and Lonigan (2015) examined reliability of each task and found that they had acceptable reliability ranging from .71 to .90. They also validated this measure identifying that it was consistent with other instruments (the

Woodcock–Johnson III Applied Problems and Calculation tasks, Woodcock et al., 2001) measuring numeracy (Purpura & Lonigan, 2015).

***Geometry assessment.*** The Geometry Assessment was modified from Clements and Sarama (2014) to measure children’s understanding of shapes. Children were provided four different sets of shapes (e.g., circles, squares, triangles, rectangles) and asked to find particular shapes (e.g., “Could you find circles for me?”, “Could you find squares for me?”). Each set of shapes included different types of shapes. For example, in the set of squares, a rectangle, a trapezoid, a circle, a triangle, and eight squares were included. Children chose the squares by distinguishing them from the other shapes. If the child's answer was correct, it was scored as 1. If it was not correct, it was scored as 0.

**Early literacy.**

***Peabody picture vocabulary.*** The Peabody Picture Vocabulary Test 4<sup>th</sup> Edition (PPVT-4, Dunn & Dunn, 2007) was used to examine children’s oral receptive vocabulary skills. Children were asked to point to the picture that best depicts the word verbally presented by an assessor (e.g., “Point to the chair”). Internal consistency reliability of PPVT-4 was 0.94 and test-retest reliability was 0.93 (Dunn & Dunn, 2007). This measure was also consistent with the Expressive Vocabulary Test, Second Edition (EVT-2; Williams, 2007) ( $r = .81$ ).

***Test of preschool early literacy.*** Print knowledge subscale of the Test of Preschool Early Literacy (TOPEL, Lonigan, Wagner, Torgesen, & Rashotte, 2007) was used to examine children’s early literacy and language development. The measure assessed children’s knowledge of print concepts, letter discrimination, word discrimination, letter-name identification, and letter sound identification (e.g., “Which one is D?”, “What is the name of the letter?”, “What is the

sound the letter makes?"). Internal consistency reliability of the print knowledge subscale of TOPEL ranged from 0.93 to 0.96 among children aged 5 (Lonigan et al., 2007). Criterion-prediction validity of TOPEL print knowledge subscale had high consistency with a criterion measure, Test of Early Reading Ability-Third Edition (TERA-3; Reid, Hresko, & Hammill, 2001) ( $r = .77$ ), which assesses children's alphabet knowledge and its use.

### **Procedures**

After receiving the Institutional Review Board (IRB) approval, 179 children, their parents, and teachers were recruited from nine child care centers in a Southeastern metropolitan city. I sent a letter to centers describing my study and requesting their participation and followed up with a phone call. Once directors agreed to have their center participate, I distributed consent forms and questionnaires to parents and teachers. I requested that the centers distribute the consent forms to families via email. In addition, I requested that directors allow me to recruit families in person at the centers. Once I was allowed to recruit in the centers, I recruited parents and explained procedures of the research when they dropped their children in the morning. Once they agreed to participate, children were individually assessed on their mathematics and literacy skills using the measures described above. I also interviewed children in order to examine their perceptions of teacher-child relationships. Each assessment took about 10-15 minutes and it was conducted in the separate room on four different days. Their parents completed a questionnaire asking about their demographic information, parental support, and frequency of engagement in home activities. Teachers completed a questionnaire collecting demographic information and their perceptions about relationships with each child. Only lead teachers participated in the present study.

## Data Analyses

In the present study, independent variables included teacher-child relationship quality and parental support (e.g., home learning environment, home-based involvement). Children's mathematics and literacy outcomes were used as dependent variables. Multicollinearity of all the independent variables were examined. Multicollinearity exists when correlations among the independent variables is greater than .80, variance inflation factor (VIF) values are greater than 4.0, and tolerance values are less than .10. In the present study, the highest intercorrelation between independent variables was .59 (dependency & conflict subscales of the teacher-child relationship scale). All of the VIF values were over 1.0 and less than 2.0, indicating that there were not multicollinearity issues.

To examine normality of the data, skewness and kurtosis were investigated. When data are normally distributed, skewness and kurtosis should be within 2 to -2 (Garson, 2012). All the variables were within the recommended range except Conflict and Warmth indicating that distribution of the data is non-normal (See Table 3). To address the non-normality issue, robust maximum likelihood estimation procedure was used which is robust to moderate violations of the normality assumption by using robust standard error estimates. The estimator MLR in Mplus was used for the estimation.

Table 3. *Normality of variables (N = 179)*

Variable	<i>Skewness</i>	<i>SE of Skewness</i>	<i>Kurtosis</i>	<i>SE of Kurtosis</i>
Teacher-child relationships (Teachers' perceptions)				
Closeness	-1.12	.18	1.74	.36

Conflict	1.64	.18	2.89	.36
Dependency	.96	.18	1.16	.36
<hr/>				
Teacher-child relationships (Children's perceptions)				
Warmth	-1.95	.18	4.73	.36
Negativity	.44	.18	-.94	.36
<hr/>				
Parental support				
School-based involvement	.43	.18	-.30	.37
Home-based involvement	-.39	.18	-.73	.37
Home-school conferencing	.03	.18	-.65	.37
Home literacy activities	-.66	.18	.19	.37
Home numeracy activities	.44	.18	.20	.37
Early math skills				
WJ	-.21	.18	-.31	.36
PENS-B	-.03	.18	-.74	.36
Geometry	-.59	.18	-.04	.36
Early literacy skills				
PPVT	.26	.21	-.27	.41
TOPEL-PK	-.53	.21	-1.05	.41

*Note.* WJ: Woodcock Johnson III; PENS-B: Preschool Early Numeracy Skills Test - Brief Version; PPVT: Peabody Picture Vocabulary Test 4<sup>th</sup> Edition; TOPEL-PK: Print knowledge subscale of the Test of Preschool Early Literacy.

Descriptive analyses for main variables (e.g., teacher-child relationships, child academic outcomes, home learning environment, home-based involvement) and participants' demographic information were examined. To address research question 1 (i.e., the relation between teacher and child relationships), correlations between the teachers' and children's perceptions of teacher-child relationships were examined. Additionally, how the subscales were correlated to children's academic math and literacy outcomes were investigated. The results of correlations presented

how teachers' and children's perceptions were differentially associated with children's academic math and literacy outcomes. The second research question aimed to explore how teacher-child relationships and parental support are associated with children's academic outcomes. To address research question 2, structural equation modeling with maximum likelihood robust was employed. Structural equation models were tested to evaluate associations among teacher-child relationships, parental support, and children's academic outcomes (See *Figure 1*). Teacher perceived relationships and child perceived relationships were examined separately. SEM analysis was undertaken using *Mplus 7.4* (Muthén & Muthén, 2015). Teachers' and children's perceptions of teacher-child relationships, parental support, children's mathematical outcomes, and literacy outcomes were hypothesized as latent variables. Model fit were determined based on model fit indices. As Chi-square determines the extent to which the data are different from general population, an SEM model is considered to have a good fit when Chi-square value is non-significant. However, non-significant Chi-square value is not mandatory because it is highly sensitive to a sample size (Tanaka, 1987). In addition to Chi-square, which is sensitive to sample size, Tucker and Lewis's fit index (TLI) and the comparative fit index (CFI) were reported. Higher TLI and CFI values (i.e., closer to 1.0) suggest a good fit and are not sensitive to sample size. Root mean square error of approximation (RMSEA), which is an absolute fit index and takes into account the complexity of the model, and standardized root mean residual (SRMR) were examined. In general, the tested model is considered to have good fit if the value of RMSEA is less than .06 and the value of SRMR is less than .08.

Several demographic factors were considered as covariates. Prior research documents that children's demographic information such as child age, parent education level, and family income are significant predictors of children's academic outcomes (O'Connor & McCartney, 2007;

Palermo et al., 2007). Thus, child age, parent education level, and family income were considered as covariates in the present study.

In the present study, children are nested within classrooms because teachers provided their perceptions of relationships with each child and children shared the same teachers. To address the nested nature of the data, a sandwich estimator (Huber, 1967) was employed through Mplus “Type = Complex” function, and standard errors and chi-square tests of model fit were considered.

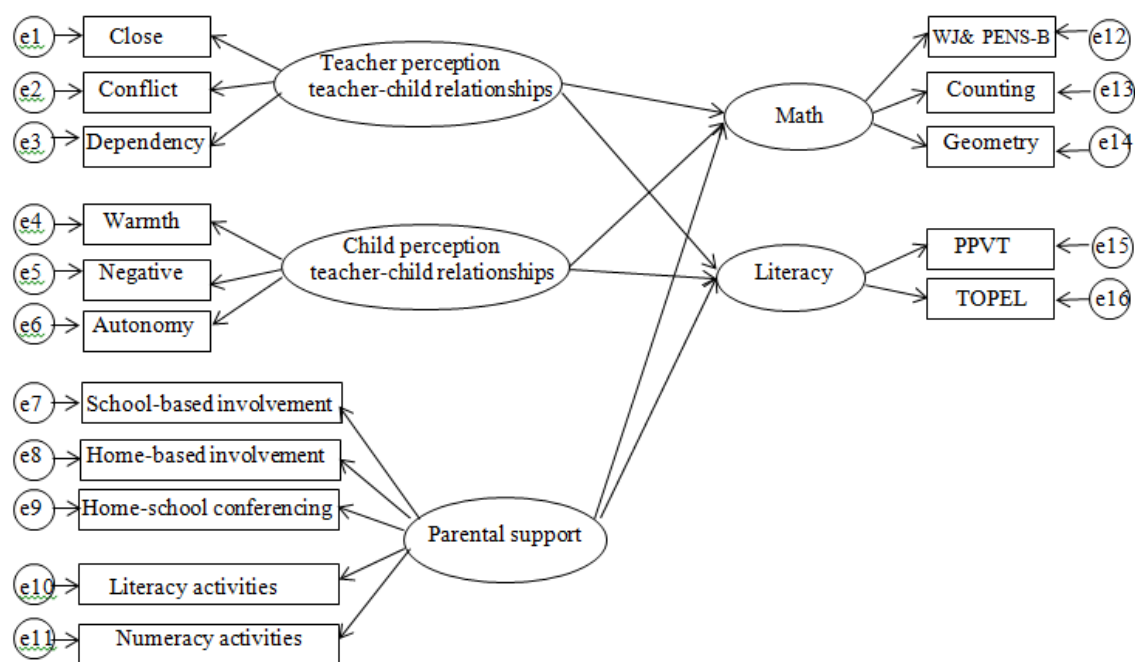


Figure 1. Hypothesized model: Associations among teacher-child relationships, child academic outcomes, and parental support.

## 4 RESULTS

### Descriptive Statistics

Table 3 presents descriptive statistics of key variables. Descriptive statistics allow for the examination of this sample's distribution of scores. An examination of the teacher-child relationship variable revealed that for the closeness domain the mean value was 4.31 on the scale of 1 (definitely does not apply) to 5 (definitely applies) suggesting that teachers felt they kept close relationships with their children. For questions asking how much teachers felt conflictual relationships with their children in the classroom, the average value was 1.73, suggesting that teachers reported low levels of conflict. Total mean scores for each subscale were 47.40 for closeness, 20.74 for conflict, and 11.83 for dependency. An examination of children's perceptions of the teacher-child relationship revealed similar findings. For the warmth domain in the teacher-child relationships of children's perception, the mean value was 0.86 on the scale of 0 (no) to 1 (yes) suggesting that children viewed their teachers as warm and caring about them. An examination of the parental support show that parents frequently provide learning environment at home (mean score = 3.41). The parents provide literacy related activities (mean score = 3.77) more frequently than numeracy activities (mean score = 2.78). Mean scores and standard deviation of children's academic outcomes were also presented in the Table 3. See Table 4 for descriptive statistics.

To address the first research question, bivariate correlations were performed. Table 5 illustrates the correlations among teacher-child relationships (both teachers' and children's perceptions), parental support, and children's academic outcomes. Teachers' perceptions and children's perceptions of their relationships did not show concordance. Specifically, teachers'

Table 4

*Descriptive statistics of variables (N = 179)*

Variable	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Absolute Range</i>
Teacher-child relationships					
(Teachers' perceptions)					
Closeness	4.31	0.48	2.45	5.00	1-5
Conflict	1.73	0.77	1.00	4.67	1-5
Dependency	2.37	0.83	1.00	5.00	1-5
Teacher-child relationships					
(Children's perceptions)					
Warmth	.86	.18	.00	1.00	0-1
Negativity	.43	.30	.00	1.00	0-1
Parental support					
Home-based involvement	3.41	.44	2.23	4.00	1-5
Home literacy activities	3.77	.95	1.00	5.00	1-5
Home numeracy activities	2.78	.68	1.14	4.95	1-5
Early math skills					
WJ	110.21	19.68	0.00	182.00	-
PENS-B	13.13	5.81	0.00	24.00	-
Geometry	40.61	6.70	23.00	54.00	-
Early literacy skills					
PPVT	102.84	18.64	46.00	154.00	-
TOPEL-PK	106.21	17.01	60.00	139.00	-

*Note.* WJ: Woodcock Johnson III; PENS-B: Preschool Early Numeracy Skills Test - Brief Version; PPVT: Peabody Picture Vocabulary Test 4<sup>th</sup> Edition; TOPEL-PK: Print knowledge subscale of the Test of Preschool Early Literacy.

perception of conflict also was not significantly correlated with children's perception of teacher negativity. However, children's perception of teacher negativity was significantly associated with teachers' perception of close teacher-child relationships ( $r = .19, p < .01$ ) and children's dependency ( $r = .25, p < .01$ ).

Examinations of teacher's and children's perceptions of their relationships with each other and child outcomes demonstrated some significant associations. Teachers' perception of children's dependency was negatively correlated with children's WJ Applied Problems ( $r = -.29, p < .01$ ) and PPVT-4 ( $r = -.28, p < .01$ ) scores. Children's perception of teacher negativity was negatively associated with all academic outcomes (e.g., WJ, PENS-B, Geometry, PPVT, TOPEL-PK; See Table 5).

Parental support variables were correlated with each other. Home-based involvement was significantly associated with home literacy activities ( $r = .28, p < .01$ ). The association between home-based involvement and home numeracy activities was of a small magnitude ( $r = .18, p < .05$ ), although statistically significant. Home literacy activities and home numeracy activities were also significantly correlated with each other ( $r = .39, p < .01$ ).

All measures of children's academic outcomes were correlated, including math, literacy and language skills. WJ was significantly correlated with PENS-B ( $r = .75, p < .01$ ), Geometry ( $r = .44, p < .01$ ), PPVT ( $r = .66, p < .01$ ), and TOPEL-PK ( $r = .65, p < .01$ ). PENS-B also was significantly correlated with Geometry ( $r = .37, p < .01$ ), PPVT ( $r = .65, p < .01$ ), and TOPEL-PK ( $r = .73, p < .01$ ). Geometry had significant associations with PPVT ( $r = .27, p < .01$ ) and TOPEL-PK ( $r = .35, p < .01$ ). PPVT and TOPEL-PK also were correlated with each other ( $r = .62, p < .01$ ). These associations lead to the consideration of latent or combined factors for math

and literacy/language outcomes. Children's age and their socioeconomic status (SES), such as parent education and family income, were significantly related to home literacy and numeracy activities and all the academic outcomes (See Table 5).

### Measurement Models

To address the second research question, how teacher-child relationships and parental support are associated with children's academic outcomes, SEM models were estimated. In the suggested model, I hypothesized that parental support variables (e.g., school-based involvement, home-based involvement, home-school conferencing, home literacy activities, home numeracy activities) would represent one latent variable. However, when all of the parental support variables were put into the measurement model, the model did not converge. Hence, in the final model, only home-based involvement, home literacy activities, and home numeracy activities were employed to measure the latent factor "parental support."

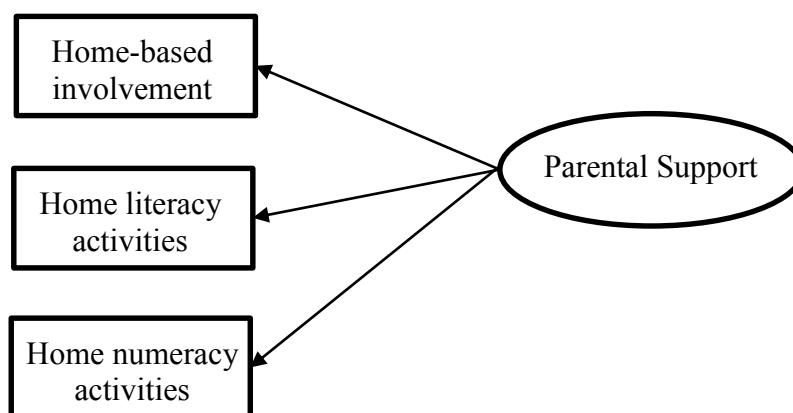


Figure 2. Measure for parental support

Table 5

*Bivariate correlations among study variables (N=179)*

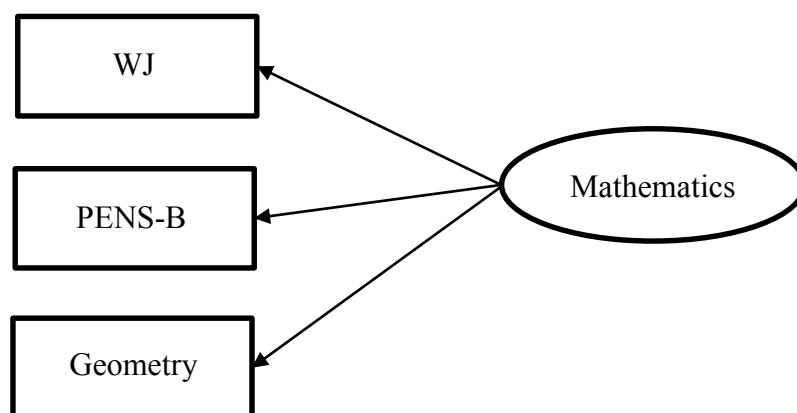
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1. STRS Closeness	1																		
2. STRS Conflict	-.04	1																	
3. STRS Dependency	.22**	.59**	1																
4. Y-CATS Warmth	.08	-.03	.06	1															
5. Y-CATS Negativity	.19**	.10	.25**	.16*	1														
6. School-based involvement	.14	.09	-.02	-.07	.04	1													
7. Home-based involvement	.10	.17*	.14	-.05	.12	.43**	1												
8. Home-school conference	.20*	.10	.06	-.15	.08	.75**	.60**	1											
9. Home literacy activity	-.05	.04	-.01	-.11	-.10	.21**	.28**	.19*	1										
10. Home numeracy activity	.00	.07	.09	-.08	.07	.25**	.18*	.19*	.39**	1									
11. WJ	-.02	-.11	-.29**	-.05	-.39**	.05	.01	-.04	.24**	.05	1								
12. PENS-B	-.01	-.14	-.20**	.01	-.31**	.04	.00	-.09	.26**	.15	.75**	1							
13. Geometry	.00	.00	-.14	-.02	-.25**	.06	.01	-.08	.17*	-.04	.44**	.37**	1						
14. PPVT	-.09	-.11	-.28**	-.05	-.40**	.12	.00	-.01	.20*	.12	.66**	.65**	.27**	1					
15. TOPEL-PK	-.03	-.07	-.15	-.13	-.32**	.12	.13	.08	.31**	.18*	.65**	.73**	.35**	.62**	1				
16. Child age	-.04	.08	.04	.01	-.25**	.05	.12	.03	.32**	.22**	.48**	.60**	.11	.48**	.51**	1			
17. Parent education	-.02	-.05	-.19*	-.10	-.17*	.04	.06	.07	.21**	-.29**	.22**	.18*	.28**	.36**	.29**	-.05	1		
18. Family income	-.12	-.09	-.26**	.03	-.34**	.09	.04	.04	.20*	-.29**	.40**	.24**	.40**	.46**	.34**	.02	.70**	1	

*Note.* STRS: Student-Teacher Relationships Scale; Y-CATS: Young Children's Appraisals of Teacher Support; WJ: Woodcock Johnson III; PENS-B: Preschool Early Numeracy Skills Test - Brief Version; PPVT: Peabody Picture Vocabulary Test 4<sup>th</sup> Edition; TOPEL-PK: Print knowledge subscale of the Test of Preschool Early Literacy.

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

In the suggested model (*Figure 1*), I hypothesized that teacher-child relationships include teacher-perceived teacher-child relationships or child-perceived teacher-child relationships. However, neither of the measurement models converged. Thus, regarding teacher-child relationships (both teachers' and children's perceptions), each domain (e.g., closeness, conflict, dependency, warmth, negativity) used observed variables. This method is consistent with previous research which also used closeness and conflict scales as separate observed variables (McFarland, Murray, & Phillipson, 2016).

Regarding endogenous variables, a mathematics latent variable was hypothesized to be based on three math measures (See *Figure 3*). Regarding early literacy outcomes, because only two observed variables/measures were employed, a latent variable approach was not employed. Rather, a composite early literacy variable was built by adding together the mean score of PPVT and TOPEL-PK. This composite early literacy variable is used in future analyses.



*Figure 3.* Measure for mathematics

### **Testing the Final Model**

As previously discussed, only two latent variables (parental support and mathematics) were employed for the final model (See *Figure 4*). Parental support variables and teacher-child

relationship variables were used as exogenous variables. For endogenous variables, children's mathematics and literacy/language scores were employed. Parental support includes three observed variables, including: home-based involvement, home numeracy activities, and home literacy activities. Each teacher-child relationship domain was used as an observed variable. Composite literacy scores were also used as an observed variable, while mathematics latent variable included the PENS-B, WJ, and geometry assessment. In *Figure 4*, straight lines indicate statistically significant associations while dotted lines indicate insignificant associations.

Table 6

*Summary of the goodness-of-fit of final model*

Fit index	Final model
$\chi^2$	41.10
$df$	37
RMSEA	.03
SRMR	.05
CFI	.99
TLI	.98

*Note.* RMSEA: root mean square error of approximation; SRMR: standardized root mean residual; CFI: comparative fit index; TLI: Tucker-Lewis Index.

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

Table 6 illustrates the results of goodness of fit indices for the final model. In this model,  $p$ -value of the Chi-square ( $\chi^2$ ) was over .05, indicating that the model fit the data adequately ( $p = .296$ ). The final model had an excellent fit (RMSEA = 0.03, SRMR = 0.05, CFI = 0.99, TLI = 0.98). Standardized estimates are reported in *Figure 4*. The standardized estimate of parental support on math ( $\beta = .28, p < .01$ ) and literacy ( $\beta = .35, p < .001$ ) was statistically significant.

Amongst teacher-child relationships, teachers' perception of children's dependency and children's perception of teacher negativity were significant predictors of children's math scores ( $\beta = -.23, p < .05$ ;  $\beta = -.37, p < .001$ , respectively) and literacy ( $\beta = -.23, p < .01$ ;  $\beta = -.33, p < .001$ , respectively).

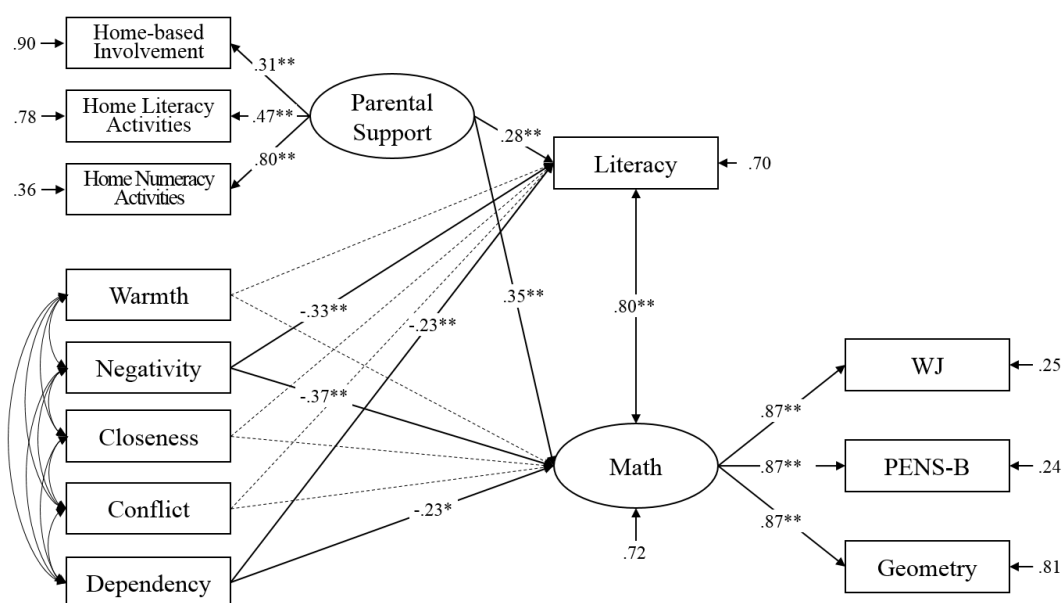


Figure 4. Final model for structural equation modeling (standardized)

To control covariates, children's age and their SES (e.g., parent education level, family income) were included in the final model. When all of the covariates were included in the final model, goodness of fit indices was not satisfactory because adding the three variables increased the number of parameters. As the sample size was limited, each covariate was included one at a time. Parent educational level and family income were standardized and added together into one composite SES score since they were highly correlated with each other. Table 7 illustrates the goodness of fit indices of each SEM model after controlling for SES or child age. After

controlling for SES (composite score of parental education levels and family income), the model fit was mediocre and the standardized estimates of SES on math ( $\beta = .21, p < .01$ ) and literacy ( $\beta = .38, p < .001$ ) were statistically significant (See *Figure 5*). For teacher-child relationship variables, teachers' perception of children's dependency and children's perception of teacher negativity were significant predictors of children's math ( $\beta = -.19, p < .05$ ;  $\beta = -.33, p < .001$ , respectively) and literacy ( $\beta = -.17, p < .05$ ;  $\beta = -.21, p < .01$ , respectively) scores after controlling for SES. The effect of parental support on math ( $\beta = .31, p < .01$ ) and literacy ( $\beta = .38, p < .01$ ) was significant after controlling for SES.

Table 7

*The goodness-of-fit after controlling for SES or child age*

Fit index	Model controlled for SES	Model controlled for child age
$\chi^2$	89.74***	76.00**
<i>df</i>	42	42
RMSEA	.08	.07
SRMR	.07	.07
CFI	.89	.93
TLI	.84	.89

*Note.* RMSEA: root mean square error of approximation; SRMR: standardized root mean residual; CFI: comparative fit index; TLI: Tucker-Lewis Index.

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

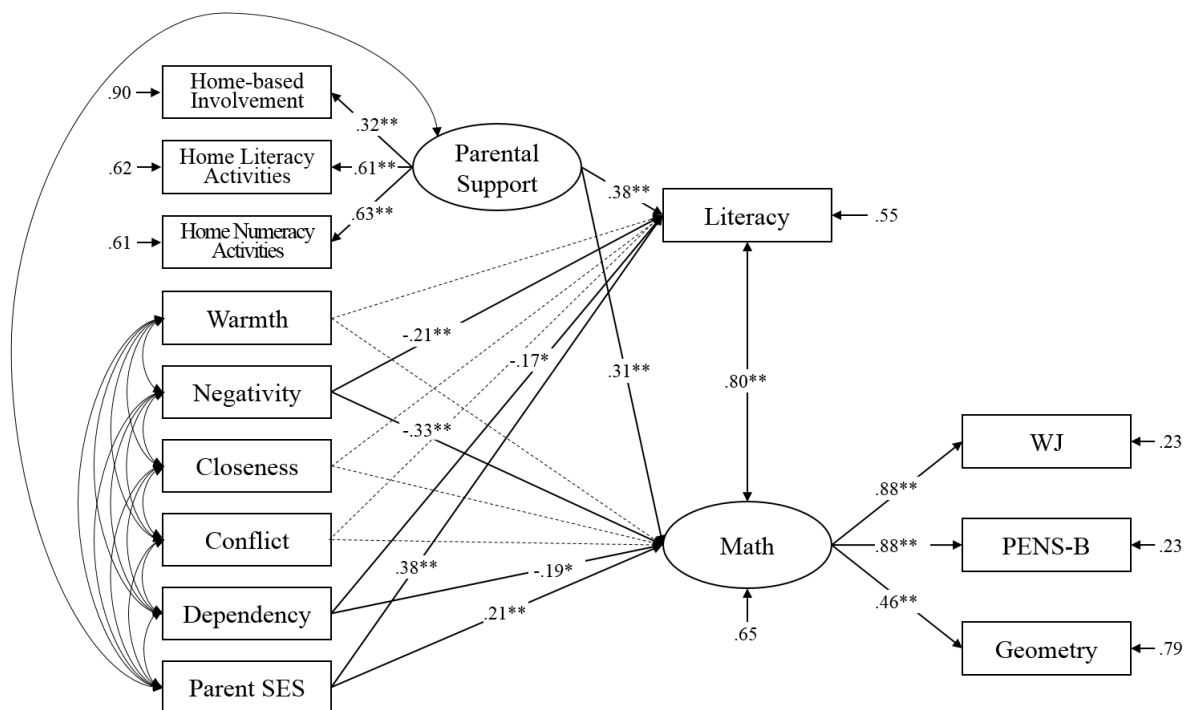


Figure 5. Final model after controlling for SES (standardized)

When child's age was controlled, the model fit was good and the effects of dependency and negativity on children's math and literacy were significant (See Figure 6). The standardized estimate of parental support on math was not statistically significant after controlling for child's age. However, parental support was still a significant predictor of literacy ( $\beta = .19, p < .05$ ) after controlling for child's age. Teachers' perception of children's dependency and children's perception of teacher negativity were also significant predictors of children's math ( $\beta = -.23, p < .05$ ;  $\beta = -.37, p < .001$ , respectively) and literacy ( $\beta = -.23, p < .01$ ;  $\beta = -.33, p < .001$ , respectively) after controlling for child's age.

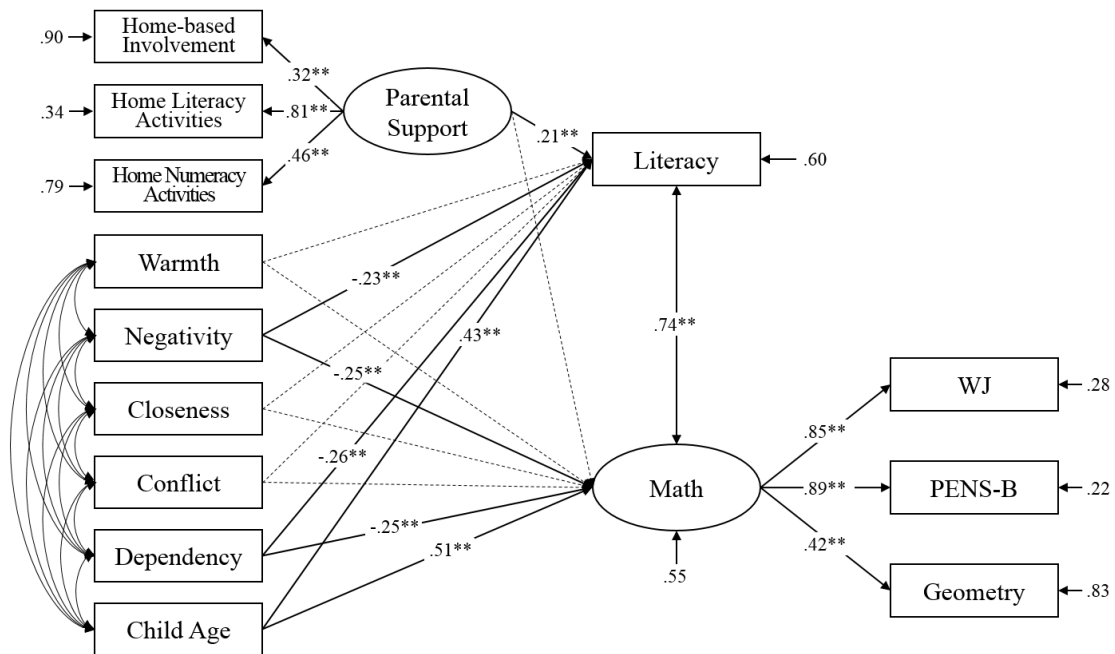


Figure 6. Final model after controlling for child age (standardized)

## 5 DISCUSSION

The focus of this study was on the role of teacher-child relationships and parental support on children's math and literacy outcomes. Of interest in this study was how teacher-child relationships, as rated by teachers and children separately, show concordance. Parental support (e.g., literacy and mathematics activities provided by parents at home) was also examined in relation to children's academic achievement. Hence, the present study adds to existing literature by examining how school (teacher-child relationships) and home (parental support such as home learning environment) factors are related to children's academic achievement. Findings are discussed below in relation to existing research and theory. Implications for future research and practice are proposed. Finally, limitations of the current study are discussed.

### **Teachers' and Children's Perception of Their Relationships**

The first research question was to examine how teachers' and children's perceptions of their relationship are related. Findings revealed that teachers' perception of positive relationships were not shared with children's perceptions of the teacher-child relationship. Children's perception of teacher negativity was positively associated with teachers' perception of closeness and dependency, indicating that teachers and children view their relationships differentially. These results also show that children may feel their teachers have negative behaviors to them even though teachers positively perceive their relationships. These findings confirm the significant association between teachers' perception of dependency and children's perception of teacher negativity rather than autonomy (Mantzicopoulos & Neuharth-Pritchett, 2003). These results support the idea that children tend to perceive their teachers as providing negative and conflictual response to their behaviors when their teachers discourage dependent behaviors. It might be because teachers and children may expect different relational behaviors

from each other. Teachers may want children to be independent and, therefore, actively discouraging of children's dependent behaviors in ways that communicate to children negativity.

Findings from this study are only partially consistent with previous research documenting minimal agreement between teachers and children's view of teacher-child relationships (Mantzicopoulos & Neuharth-Pritchett, 2003; Murray et al., 2008). For example, Murray et al. (2008) found a negative association between children's ratings of closeness and teachers' ratings of conflict. In contrast, Mantzicopoulos and Neuharth-Pritchett (2003) found that there were positive associations between children's and teachers' ratings of closeness. The findings of the present study also do not agree with a previous study (Spilt et al., 2010) that found concordance of teachers' and children's perceptions on their relationships especially on closeness and conflict. In Spilt et al.'s study, they reported that teachers' perception of closeness and kindergarten children's perception of warmth were positively correlated, and teachers' perception of conflict and children's perception of teachers' negativity were positively correlated. In the present study, characteristics of the sample were more diverse than the previous research, with teachers' and children's cultural and SES differences possibly contributing to the nature of ratings. Given that teachers tend to perceive close and positive relationships with their children when they share the same cultural background (Birch & Ladd, 1997; Murray et al., 2008; Saft & Pianta, 2001), more research needs to be conducted on how cultural and SES diversity are related to teacher-child relationship quality.

In the present study, non-concordance between teachers and children's perceptions of their relationships may be because of distinct characteristics of the items in the STRS (Pianta, 2001) and Y-CATS (Mantzicopoulos & Neuharth-Pritchett, 2003). Although the subscales of

the two measures shared similar concepts, specific descriptions of the items are not identical. For example, some items in Y-CATS (Mantzicopoulos & Neuharth-Pritchett, 2003) describe teachers' general relational behaviors (e.g., "My teacher smiles a lot", "My teacher makes the class fun", "My teacher is mean"), not one to one relational behaviors between a teacher and a child. On the other hand, items in the STRS (Pianta, 2001) focus on direct relational behaviors between a teacher and a child (e.g., "I share an affectionate, warm relationship with this child", "This child appears hurt or embarrassed when I correct him/her"). These different descriptions about relational behaviors may be one reason that teacher's and children's ratings demonstrate little concordance with each other.

Findings also revealed that teachers had positive perceptions of their relationships with children and relatively low levels of conflict. Specifically, based on a maximum score of 5, mean score of teacher perceived relationships was greater than 4 on closeness, less than 2 on conflict, and around 2 on dependency. These scores indicate that teachers tend to perceive close relationships with children while they feel some degree of conflict and dependency. This tendency is consistent with previous research (Howes et al., 2000) examining teachers' perceptions on their relationships with preschool aged children. The mean scores in Howes et al. (2000) were very similar to those in this study even though their sample had different racial characteristics (e.g.,  $N = 793$ ; White 75%, African American 10%, Latino 4%) from the sample of the current study. The mean score of closeness was greater than 4, which is consistent with other research that used only the closeness subscale to measure quality of teacher-child relationships (Choi & Dobbs-Oates, 2013). Participants of their study consisted contained a higher proportion of Caucasian and Asian students than in the present study. It appears that

despite differences in the ethnic makeup of samples that teachers' perception of their relationships with children show similar general averages across participants.

Based on a maximum score of 1, mean scores of child perceived relationships were .86 on warmth and .43 on negativity. These scores indicate that children tend to perceive their teachers' warmth while they feel some degree of negativity. This tendency is consistent with previous research (Mantzicopoulos & Neuharth-Pritchett, 2003; Spilt et al., 2010). In the study which was conducted by Spilt and her colleagues (2010), each subscale's mean score was .85 on warmth and .37 on negativity with 150 kindergarten children in the Netherlands. Although the mean scores have similar patterns across the studies, there were not significant correlations between closeness and warmth, or between conflict and negativity indicating that they perceive these relationship constructs independently. Child perceived teacher-child relationships still need more research because African American children tended to perceive more warmth and more negativity than Caucasian children (Mantzicopoulos & Neuharth-Pritchett, 2003) suggesting possibility that children's racial background has an impact on their perception of relationships with teachers. As previously mentioned, literature have reported that teachers are more likely to perceive close and positive relationships with children when they share the same racial groups, or children are White (Birch & Ladd, 1997; Murray et al., 2008; Saft & Pianta, 2001). Thus, future study should examine possible factors that contribute to the teachers and children's perceptions of their relationships by examining both child and teacher characteristics that may contribute to such ratings.

### **Role of Teacher-Child Relationships and Parental Support on Academic Outcomes**

The second research question was to examine how teacher-child relationships and parental support are associated with children's academic outcomes. The hypothesized model

(*Figure 1*) did not converge when the SEM analysis was conducted. Teacher-child relationships failed to converge into one latent variable because each subscale of teacher-child relationships represented unique components of the relationships. To examine how specific characteristics of teacher-child relationships were associated with child outcomes, each subscale was used independently in analyses.

Consistent with Bronfenbrenner's (1979) theoretical framework, children's development and learning were related to their proximal factors within their home and school contexts. Findings revealed that both the teacher-child relationship and parental support were predictive of children's literacy and math outcomes. These results are consistent with previous research suggesting the importance of both home and school contexts on children's learning (Burchinal et al., 2002; O'Connor & McCartney, 2007). Specifically, when parents provide plentiful learning experiences at home, children performed better on math and literacy assessments. In addition to the effects of parental support, teacher's perceptions of dependency and children's perception of teacher negativity were significant predictors of children's literacy and math outcomes. Based on an understanding of the correlation between dependency and negativity, teachers who feel their children are too dependent on them may acknowledge the children's social-emotional challenges, but the children also experience cognitive challenges by showing low performance of literacy and mathematics.

Regarding associations between teacher-child relationships and children's academic outcomes, children's perception of teacher negativity was negatively related to all preacademic outcomes. Similarly, teachers' perception of child dependency was negatively associated with most of the outcomes except the geometry assessment and TOPEL-PK. These findings indicate the importance of both teachers and children's perceptions to child outcomes and bolster the case

for examining children's perceptions of their relationships with teachers. However, child reported relationships have not been adopted in extant research because collecting teacher reports were more convenient (e.g., using survey) than collecting child reports. Additionally, researchers have questioned whether children can provide reliable reports about relationships with their teachers. Consistent with the findings of the present study, Mantzicopoulos and Neuharth-Pritchett's study (2003) found that children's perceptions of conflictual relationships with their teachers were negatively associated with their reading and math skills. Given the fact that existing research prioritizes teachers' perceptions of relationships, despite the finding that children's ratings are uniquely and consistently related to children's outcomes, more research is needed to examine how teacher-reported data and child-reported data contribute to children's learning and academic achievement.

In the line with Attachment theory (Bowlby, 1969), negative associations between children's perception of teacher negativity and children's academic achievement also indicate that children who felt conflictual relationships with their teachers may have fewer opportunities to learn than children who had close relationships. Children who perceive their teachers' negativity may rarely use their teacher as a secure base to explore learning environment, which may be perceived by the teacher as being overly dependent. Particularly, in the early childhood classroom settings, teachers' interactions with children can be more influential on children's academic development than learning materials such as books. Thus, when children perceive their teachers' negativity, they may rarely interact with their teachers, and they may not actively get involved in the classroom activities and teachers' instruction. This study extends previous research by suggesting that both teachers' and children's negative perception about their relationships are connected to children's academic challenges.

On the other hand, closeness and warmth were not significantly related to children's preacademic outcomes. The findings indicate that closeness and warmth may not always facilitate children's learning experiences while negative relationships such as dependency and negativity impede their academic development and learning. These results are not consistent with previous research demonstrating that close relationships were predictors of children's academic achievement (Birch & Ladd, 1997; Burchinal et al., 2002; Ly et al., 2012; McCormick & O'Connor, 2015; Palermo et al., 2007). However, characteristics of population of the studies were different from the current study. Some studies' sample came from mostly Caucasian (Birch & Ladd, 1997) or mostly low income African American (Burchinal et al., 2002; Mantzicopoulos & Neuharth-Pritchett, 2003), while the sample of the current study were very diverse regarding race and SES. Thus, it is important to examine how the differences of sample characteristics play a role in impacts of teacher-child relationship quality on children's outcomes. Also, given the tendency of teachers to report general positive relations with children, another reason for a lack of association between teachers' ratings of warmth may have to do with the relatively high, and uniform, perceptions of warmth that teachers' report.

Nonsignificant associations between positive dimensions of teacher-child relationships and children's academic outcomes may be a function of the nature of the data. Specifically, standard deviations of closeness and warmth evidenced limited variability, suggesting that teachers reported relatively positive relationships with scores bunching close to the mean. Since the majority of participants reported positive perceptions about teacher-child relationships, limited distribution of scores may have been one reason that closeness was not associated with children's outcomes.

In addition, parental support (e.g., home learning environment) predicted high scores of children's literacy and math outcomes. The predicting role of home learning environment on children's academic achievement is consistent with previous research which found that home-based involvement was a strong predictor of children's academic outcomes (Bingham et al., 2017; Fantuzzo et al., 2004; McWayne et al., 2004). For example, McWayne et al. (2004) found that kindergarten children from low income backgrounds with supportive home learning environment (e.g., provide children with learning opportunities at home) evidenced high achievement in mathematics and reading.

In the line with Bioecological Systems theory (Bronfenbrenner, 1979) parental support and school contexts play an important role in children's academic achievement and learning. The present study adds to the literature by exploring how both parental support and teacher-child relationships play a role in children's academic achievement. However, the findings regarding parental support is not consistent with a previous study (Galindo & Sheldon, 2012) which found that parent support such as doing school related activities at home was not related to children's academic achievement gains. These differences may be contributed to the fact that the measure of parental support mainly assessed quantitative indicators of parents' participation in the school related activities at home. Additionally, most of the sample of the current study were from diverse families, while primary participants of the previous study were low income African American families (Fantuzzo et al., 2004). Parents' home support regarding school-related activities at home may be different depending upon their racial background or family income. On the other hand, the standardized estimate of direct effect of parental support on math was not statistically significant after controlling for child's age. This may be because children's math skills are strongly related to children's cognitive development by age. Overall, the present study

highlights the importance of considering children's perception of teacher-child relationships not only because children perceive their relationships with teachers differentially, but also because children's perception of teacher negativity played as a predictor of their math and literacy outcomes.

### **Limitations and Suggestions for Further Research**

Important limitations to the current study should be noted. First, although model fit of the SEM model was good, there was low factor loading on the parental support variable. Specifically, standardized estimates of home-based involvement variable on the parental support latent variable was relatively low (i.e., .313).

Second, the autonomy subscale of child's perception of teacher-child relationship was not used in this study due to low reliability ( $\alpha = .12$ ). Interestingly, the low reliability was not reported as a problem in previous research ( $\alpha = .76$ ; Mantzicopoulos & Neuharth-Pritchett, 2003). One reason for low reliability may be a function of children's varying experiences with their teachers. Children from this study came from 27 different classrooms. In addition, most items in autonomy subscale describe specific teachers' behaviors (e.g., "My teacher lets me choose where I sit", "My teacher lets me choose work that I want to do") than items in warmth (e.g., "My teacher smiles a lot") and negativity (e.g., "My teacher gets angry with me"). The nature of these descriptions, and variation across classrooms, may be one reason that children evidenced low internal reliability. Such behaviors may also not be salient enough for children to consistently respond to them, unlike items relating to teachers' warmth or negativity. It is important that future research examine this construct to better determine its importance, and viability, as an indicator of the teacher-child relationship.

Third, this study was correlational in nature. Although both teachers' and children's perceptions of their relationships were measured, the estimation of teacher-child relationships did not account for the dynamic and, likely reciprocal, nature of this relationship. As relationships are established through continuous interactions between two individuals, correlations do not explain how each person is contributing to the relationship or allow one to examine how they develop across time. As Sabol and Pianta (2012) pointed out in their study, various components of teacher-child relationships may vary as a function of children's age. Given that associations between teacher-child relationships and child outcome tend to be larger when children were younger (Burchinal et al., 2002), future research should explore how teacher-child relationships may change across early childhood

In addition, in order to understand how the relationships between teachers and children are established, future research should examine possible factors that contribute to teachers' and children's perception of their relationships. Findings from this study highlight that teachers and children differentially perceive their relationships. Additional research is needed to better understand these differences and the various factors that may contribute to perceptions of relationships across time.

Fourth, data were only collected at one point in time. Although SEM shows potential causal dependencies between parental support / teacher-child relationships and children's academic outcomes, caution should be taken when interpreting causality of the model. This limitation can be improved by designing longitudinally examining relationships at multiple time points. Relationships change over time and associations between teacher-child relationships and children's outcomes also may change. Moreover, although the present research includes both

teachers' and children's perceptions of their relationships, changes of the relationships were not considered. Relationships are dynamic and change over time, so associations between the quality of teacher-child relationships and children's learning may also change over time. Future studies that include cross lag examinations of teacher-child relationships could examine the stability and bidirectionality of these relations.

Fifth, although numerous studies on teacher-child relationships have used dimensions of closeness, conflict, and dependency, researchers suggest that the nature of relationships cannot be characterized by singular traits (Hughes, Bullock, & Coplan, 2014). To better understand various aspects of relationship quality, future research should consider other ways to characterize teacher-child relationships. For example, Hughes et al. (2014) found that children's social-emotional difficulties differed as a function of their conflictual and dependent relationships with teachers. Thus, future research should explore other possible ways to characterize the quality of teacher-child relationships other than the three dimensions (e.g., closeness, conflict, dependency).

Sixth, future research also should include more diverse and bigger samples than the present study. Although sample size of the present study was large enough to conduct SEM analysis, some issues of power and stability of parameters were encountered. Although the current study includes home factor (e.g., home learning environment, school-related activities at home), possible group differences in associations with key variables were not examined. In the current study, only child's age and SES were considered as covariates. To investigate how child and family characteristics (e.g., child age, child gender, family income, parental education levels)

are precisely associated with the effects of teacher-child relationships and parental support on their academic outcomes, future research should conduct multi-group analyses.

Seventh, teacher-child relationships and parental support were considered and examined as parallel factors in the current study. Importantly, characteristics of the two factors (i.e., what they represent and how they are measured) are relatively different because teacher-child relationships represent social-emotional support within early childhood classrooms while parental support represents academic support within the home. Relations between each context and children's outcomes may differ because of the nature of how each was measured. Thus, future research is needed to examine how social-emotional support from home and school or academic support from home and school are differentially related to children's academic development and learning.

Lastly, regarding parental support, terms are confusing and overlap across studies. Research uses parental support, parent involvement, and parent engagement as similar concepts. Some studies used them different meaning even though they use the same term. Additional theoretical and methodological clarification about these terms and their operationalization is needed.

### **Implications**

Findings of the present study suggest some implications for practice. First, the findings highlight the importance of examining both teachers and children's perception of their relationships. It is important for teachers to consider their children's views about their relationships because teachers and children perceive their relationships differently and children's negative perceptions of their relationships are related to their learning outcomes. Moreover,

children's social-emotional challenges from their relationships with teachers (e.g., dependency, negativity) were related to their academic challenges. The fact that children's perceptions of their relationship with teachers are associated with their academic achievement is rather sobering. Even at a very young age, children seem to be aware of the negative nature of interactions with their teacher and these relations are negatively associated with child outcomes. Findings suggest that early childhood teachers need to be more conscious of the way in which they interact with and support young children's learning and development, particularly for children who may struggle with preacademic competence.

Second, the findings revealed that teachers and children's negative perceptions of their relationships such as dependency and negativity were significantly associated with children's academic achievement. Teachers need to acknowledge how their children view their relationships with teachers and try to improve the quality of their relationships. For children who are dependent, teachers need to find out how they can get engaged in learning environments and activities without discouraging the dependent behaviors. In contrast to the negative teacher-child relationships, there were not significant relationships between positive teacher-child relationships and children's academic outcomes. As mentioned previously, one reason for this finding is the limited variation associated with teacher-child closeness.

Third, the findings highlight that both home and school contexts play a significant role in children's learning. Home and school is the most proximal contexts where children experience relationships with adults and learn every day. Teachers and parents need to consider their role and improve their relationships with children to promote their development. Overall, this study

provides evidence showing that academic support from parents and social-emotional support from teachers are critically important to ensure children's academic achievement.

## REFERENCES

- Ahnert, L., Pinquart, M., & Lamb, M. E. (2006). Security of children's relationships with nonparental care providers: A meta-analysis. *Child Development, 77*(3), 664-679. doi:10.1111/j.1467-8624.2006.00896.x
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Barton, A. C., Drake, C., Perez, J. G., St. Louis, K., & George, M. (2004). Ecologies of parental engagement in urban education. *Educational Researcher, 33*(4), 3-12. doi:10.3102/0013189X033004003
- Bingham, G. E., Jeon, H., Kwon, K., & Lim, C. (2017). Parenting styles and home literacy opportunities: Associations with children's oral language skills. *Infant and Child Development, 26*(5), 1-18. doi:10.1002/icd.2020
- Birch, S. H., & Ladd, G. W. (1997). The teacher-child relationship and children's early school adjustment. *Journal of School Psychology, 35*(1), 61-79. doi:10.1016/S0022-4405(96)00029-5
- Blankemeyer, M., Flannery, D. J., & Vazsonyi, A. T. (2002). The role of aggression and social competence in children's perceptions of the child-teacher relationship. *Psychology in the Schools, 39*(3), 293-304. doi:10.1002/pits.10008
- Bornstein, M. H., & Leventhal, T. (2015). Children in bioecological landscapes of development. In M. H. Bornstein, T. Leventhal, & R. M. Lerner (Eds.), *Handbook of child psychology and developmental science: Ecological settings and processes, Vol. 4, 7th ed* (pp. 1-5). Hoboken, NJ, US: John Wiley & Sons Inc.
- Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment*. New York, NY: Basic Books.

- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon, R. M. Lerner, W. Damon, R. M. Lerner (Eds.), *Handbook of child psychology: Theoretical models of human development, Volume 1, 5th ed* (pp. 993-1028). Hoboken, NJ, US: John Wiley & Sons Inc.
- Burchinal, M. R., Peisner-Feinberg, E., Pianta, R., & Howes, C. (2002). Development of academic skills from preschool through second grade: Family and classroom predictors of developmental trajectories. *Journal of School Psychology, 40*(5), 415-436. doi:10.1016/S0022-4405(02)00107-3
- Choi, J. Y., & Dobbs-Oates, J. (2013). Childcare quality and preschoolers' math development. *Early Child Development and Care, 184*(6), 915-932. doi:10.1080/03004430.2013.829822
- Christenson, S. L., & Sheridan, S. M. (2001). *Schools and families: Creating essential connections for learning*. New York, NY, US: Guilford Press.
- Clements, D. H., & Sarama, J. (2014). *Learning and teaching early math: The learning trajectories approach (2nd edition)*. Routledge
- Connor, C. M., Son, S., Hindman, A. H., & Morrison, F. J. (2005). Teacher qualifications, classroom practices, family characteristics, and preschool experience: Complex effects on first graders' vocabulary and early reading outcomes. *Journal of School Psychology, 43*(4), 343-375. doi:10.1016/j.jsp.2005.06.001
- Driscoll, K. C., Wang, L., Mashburn, A. J., & Pianta, R. C. (2011). Fostering supportive teacher-child relationships: Intervention implementation in a state-funded preschool

program. *Early Education and Development*, 22(4), 593-619.

doi:10.1080/10409289.2010.502015

Dunn, M., & Dunn, L. M. (2007). *Peabody picture vocabulary test—4*. Circle Pines, MN: AGS.

El Nokali, N. E., Bachman, H. J., & Votruba-Drzal, E. (2010). Parent involvement and children's academic and social development in elementary school. *Child Development*, 81(3), 988-1005. doi:10.1111/j.1467-8624.2010.01447.x

Epstein, J. L. (1995). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan*, 76, 701–712.

Epstein, J. L., & Hollifield, J. H. (1996). Title I and school–family–community partnerships: Using research to realize the potential. *Journal of Education for Students Placed at Risk*, 1(3), 263-278. doi:10.1207/s15327671espr0103\_6

Fantuzzo, J., McWayne, C., Perry, M. A., & Childs, S. (2004). Multiple dimensions of family involvement and their relations to behavioral and learning competencies for urban, low-income children. *School Psychology Review*, 33(4), 467-480.

Fantuzzo, J., Tighe, E., & Childs, S. (2000). Family Involvement Questionnaire: A multivariate assessment of family participation in early childhood education. *Journal of Educational Psychology*, 92(2), 367-376. doi:10.1037/0022-0663.92.2.367

Fantuzzo, J., Tighe, E., & Perry, M. (1999). Relationships between family involvement in Head Start and children's interactive peer play. *NHSA Dialog*, 3, 60- 67.

Froyen, L. C., Skibbe, L. E., Bowles, R. P., Blow, A. J., & Gerde, H. K. (2013). Marital satisfaction, family emotional expressiveness, home learning environments, and children's emergent literacy. *Journal of Marriage and Family*, 75(1), 42-55. doi:10.1111/j.1741-3737.2012.01035.x

- Fumoto, H. (2011). Teacher-child relationships and early childhood practice. *Early Years: An International Journal of Research and Development*, 31(1), 19-30.  
doi:10.1080/09575146.2010.535790
- Galindo, C., & Sheldon, S. B. (2012). School and home connections and children's kindergarten achievement gains: The mediating role of family involvement. *Early Childhood Research Quarterly*, 27(1), 90-103. doi:10.1016/j.ecresq.2011.05.004
- Garson, G. D. (2012) Testing statistical assumptions. Retrieved on September 8, 2017 from <http://www.statisticalassociates.com/assumptions.pdf>
- Hamilton, C. E., & Howes, C. (1992). A comparison of young children's relationships with mothers and teachers. In R. C. Pianta, R. C. Pianta (Eds.), *Beyond the parent: The role of other adults in children's lives* (pp. 41-59). San Francisco, CA, US: Jossey-Bass.
- Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72(2), 625-638. doi:10.1111/1467-8624.00301
- Hill, N. E., & Taylor, L. C. (2004). Parental school involvement and children's academic achievement: Pragmatics and issues. *Current Directions in Psychological Science*, 13(4), 161-164. doi:10.1111/j.0963-7214.2004.00298.x
- Hamre, B. K., & Pianta, R. C. (2006). Student-teacher relationships. In G. G. Bear, K. M. Minke, G. G. Bear, K. M. Minke (Eds.), *Children's needs III: Development, prevention, and intervention* (pp. 59-71). Washington, DC, US: National Association of School Psychologists.

- Hill, N. E., & Taylor, L. C. (2004). Parental school involvement and children's academic achievement: Pragmatics and issues. *Current Directions in Psychological Science, 13*(4), 161-164. doi:10.1111/j.0963-7214.2004.00298.x
- Hindman, A. H., Skibbe, L. E., Miller, A., & Zimmerman, M. (2010). Ecological contexts and early learning: Contributions of child, family, and classroom factors during head start, to literacy and mathematics growth through first grade. *Early Childhood Research Quarterly, 25*(2), 235-250. doi:10.1016/j.ecresq.2009.11.003
- Howes, C., & Hamilton, C. E. (1992). Children's relationships with caregivers: Mothers and child care teachers. *Child Development, 63*(4), 859-866. doi:10.2307/1131238
- Howes, C., Phillipsen, L. C., & Peisner-Feinberg, E. (2000). The consistency of perceived teacher-child relationships between preschool and kindergarten. *Journal of School Psychology, 38*(2), 113-132. doi:10.1016/S0022-4405(99)00044-8
- Huber, P. J. (1967). The behavior of maximum likelihood estimates under nonstandard conditions. *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability, Vol. I*, pp. 221-33.
- Hughes, K., Bullock, A., & Coplan, R. J. (2014). A person-centred analysis of teacher-child relationships in early childhood. *British Journal Of Educational Psychology, 84*(2), 253-267. doi:10.1111/bjep.12029
- Hughes, J. N., Cavell, T. A., & Willson, V. (2001). Further support for the developmental significance of the quality of the teacher-student relationship. *Journal of School Psychology, 39*(4), 289-301. doi:10.1016/S0022-4405(01)00074-7
- Hughes, J., Gleason, K. A., & Zhang, D. (2005). Relationship influences on teachers' perceptions of academic competence in academically at-risk minority and majority first grade

classrooms. *Journal of School Psychology, 43*, 303–320.

doi:10.1016/j.jsp.2005.07.001

Jellesma, F. C., Zee, M., & Koomen, H. M. (2015). Children's perceptions of the relationship with the teacher: Associations with appraisals and internalizing problems in middle childhood. *Journal of Applied Developmental Psychology, 36*30-38.

doi:10.1016/j.appdev.2014.09.002

Kaufman, A. S., & Kaufman, N. L. (1985). *Kaufman Test of Educational Achievement*. Circle Pines, MN: American Guidance Service.

Kleemans, T., Segers, E., & Verhoeven, L. (2013). Relations between home numeracy experiences and basic calculation skills of children with and without specific language impairment. *Early Childhood Research Quarterly, 28*(2), 415-423.

doi:10.1016/j.ecresq.2012.10.004

Koepke, M.F., & Harkins, D.A. (2008). Conflict in the classroom: Gender differences in the teacher–child relationship. *Early Education and Development, 19*, 843–864.

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development, 70*(6), 1373-1400.

doi:10.1111/1467-8624.00101

LeFevre, J., Skwarchuk, S., Smith-Chant, B. L., Fast, L., Kamawar, D., & Bisanz, J. (2009).

Home numeracy experiences and children's math performance in the early school years. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement, 41*(2), 55-66. doi:10.1037/a0014532

Lonigan, C. J., Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (2007). *Test of preschool early literacy*. Austin, TX: Pro-Ed.

- Ly, J., Zhou, Q., Chu, K., & Chen, S. H. (2012). Teacher–child relationship quality and academic achievement of Chinese American children in immigrant families. *Journal of School Psychology, 50*(4), 535-553. doi:10.1016/j.jsp.2012.03.003
- Lynch, M., & Cicchetti, D. (1992). Maltreated children's reports of relatedness to their teachers. In R. C. Pianta, R. C. Pianta (Eds.), *Beyond the parent: The role of other adults in children's lives* (pp. 81-107). San Francisco, CA, US: Jossey-Bass.
- Mantzicopoulos, P., & Neuharth-Pritchett, S. (2003). Development and validation of a measure to assess head start children's appraisals of teacher support. *Journal of School Psychology, 41*(6), 431-451. doi:10.1016/j.jsp.2003.08.002
- McCormick, M. P., & O'Connor, E. E. (2015). Teacher–child relationship quality and academic achievement in elementary school: Does gender matter? *Journal of Educational Psychology, 107*(2), 502-516. doi:10.1037/a0037457
- McCormick, M. P., O'Connor, E. E., Cappella, E., & McClowry, S. G. (2013). Teacher–child relationships and academic achievement: A multilevel propensity score model approach. *Journal of School Psychology, 51*(5), 611-624. doi:10.1016/j.jsp.2013.05.001
- McFarland, L., Murray, E., & Phillipson, S. (2016). Student-teacher relationships and student self-concept: Relations with teacher and student gender. *Australian Council for Educational Research, 60*(1), 5-25.
- McWayne, C., Hampton, V., Fantuzzo, J., Cohen, H. L., & Sekino, Y. (2004). A Multivariate Examination of Parent Involvement and the Social and Academic Competencies of Urban Kindergarten Children. *Psychology in The Schools, 41*(3), 363-377. doi:10.1002/pits.10163

- Mercer, S. H., & DeRosier, M. (2010). A prospective investigation of teacher preference and children's perceptions of the student-teacher relationship. *Psychology in the Schools*, 47(2), 184-192.
- Murray, C., Murray, K. M., & Waas, G. A. (2008). Child and teacher reports of teacher-student relationships: Concordance of perspectives and associations with school adjustment in urban kindergarten classrooms. *Journal of Applied Developmental Psychology*, 29(1), 49-61. doi:10.1016/j.appdev.2007.10.006
- Muthén, L. K., & Muthén, B. O. (2015). Mplus 7.4 for Windows [Computer software]. Los Angeles: Muthén & Muthén.
- National Association for the Education of Young Children (2009). *Family engagement, diverse families, and early childhood education programs: An integrated review of the literature*. Retrieved from <https://www.naeyc.org/files/naeyc/file/research/FamEngage>.
- Oades-Sese, G. V., & Li, Y. (2011). Attachment relationships as predictors of language skills for at-risk bilingual preschool children. *Psychology in the Schools*, 48(7), 707-722. doi:10.1002/pits.20583
- O'Connor, E. (2010). Teacher-child relationships as dynamic systems. *Journal of School Psychology*, 48(3), 187-218. doi:10.1016/j.jsp.2010.01.001
- O'Connor, E., Collins, B. A., & Supplee, L. (2012). Behavior problems in late childhood: The roles of early maternal attachment and teacher-child relationship trajectories. *Attachment & Human Development*, 14(3), 265-288. doi:10.1080/14616734.2012.672280

- O'Connor, E., & McCartney, K. (2006). Testing associations between young children's relationships with mothers and teachers. *Journal of Educational Psychology, 98*, 87–98.
- O'Connor, E., & McCartney, K. (2007). Examining teacher-child relationships and achievement as part of an ecological model of development. *American Educational Research Journal, 44*(2), 340-369.
- Office of Head Start and the National Center on Parent, Family, and Community Engagement (2011). *The Head Start parent, family, and community engagement framework: promoting family engagement and school readiness, from prenatal to age 8*. Retrieved from <http://www.hfrp.org/family-involvement/publications-resources/parent-family-and-community-engagement-framework-promoting-family-engagement-and-school-readiness-from-prenatal-to-age-8>
- Okpala, C. O., Okpala, A. O., & Smith, F. E. (2001). Parental involvement, instructional expenditures, family socioeconomic attributes, and student achievement. *The Journal of Educational Research, 95*(2), 110-115. doi:10.1080/00220670109596579
- Osyerman, D., Brickman, D., & Rhodes, M. (2007). School success, possible selves, and parent school involvement. *Family Relations: An Interdisciplinary Journal of Applied Family Studies, 56*(5), 479-489. doi:10.1111/j.1741-3729.2007.00475.x
- Palermo, F., Hanish, L. D., Martin, C. L., Fabes, R. A., & Reiser, M. (2007). Preschoolers' academic readiness: What role does the teacher-child relationship play? *Early Childhood Research Quarterly, 22*(4), 407-422. doi:10.1016/j.ecresq.2007.04.002

- Pemberton, K. D., & Miller, S. (2015). Building home–school relationships to enhance reading achievement for students from families with limited financial resources. *Education and Urban Society, 47*(7), 743-765. doi:10.1177/0013124513508979
- Pianta, R. C. (1992). Conceptual and methodological issues in research on relationships between children and nonparental adults. In R. Pianta (Ed.), *Beyond the parent: The role of other adults in children's lives New directions for child development, No. 57*. (pp. 121–129) San Francisco, CA: Jossey-Bass Inc.
- Pianta, R. C. (1994). Patterns of relationships between children and kindergarten teachers. *Journal of School Psychology, 32*(1), 15-31. doi:10.1016/0022-4405(94)90026-4
- Pianta, R. C. (1997). Adult-child relationship processes and early schooling. *Early Education and Development, 8*(1), 11-26. doi:10.1207/s15566935eed0801\_2
- Pianta, R. C. (1999). How school policy affects the child-teacher relationship. In, *Enhancing relationships between children and teachers* (pp. 169-181). Washington, DC, US: American Psychological Association.
- Pianta, R. C. (2001). *Student-Teacher Relationship Scale*. Lutz, FL: Psychological Assessment Resources, Inc.
- Pianta, R. C. (2006). Classroom management and relationships between children and teachers: Implications for research and practice. In C. M. Evertson, C. S. Weinstein, C. M. Evertson, C. S. Weinstein (Eds.), *Handbook of classroom management: Research, practice, and contemporary issues* (pp. 685-709). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Pianta, R. C., Hamre, B., & Stuhlman, M. (2003). Relationships between teachers and children. In W. M. Reynolds, G. E. Miller, W. M. Reynolds, G. E. Miller (Eds.), *Handbook of*

*psychology: Educational psychology, Vol. 7* (pp. 199-234). Hoboken, NJ, US: John Wiley & Sons Inc.

- Powell, D. R., Son, S., File, N., & San Juan, R. R. (2010). Parent–school relationships and children's academic and social outcomes in public school pre-kindergarten. *Journal of School Psychology, 48*(4), 269-292. doi:10.1016/j.jsp.2010.03.002
- Purpura, D. J., & Lonigan, C. J. (2013). Informal numeracy skills: The structure and relations among numbering, relations, and arithmetic operations in preschool. *American Educational Research Journal, 50*(1), 178-209. doi:10.3102/0002831212465332
- Purpura, D. J., & Lonigan, C. J. (2015). Early numeracy assessment: The development of the preschool numeracy scales. *Early Education and Development, 26*(2), 286-313. doi:10.1080/10409289.2015.991084
- Reid, D., Hresko, W., & Hammill, D. (2001). *Test of Early Reading Ability-Third Edition*. Austin, TX: PRO-ED.
- Rimm-Kaufman, S. E., Pianta, R. C., & Cox, M. J. (2000). Teachers' judgments of problems in the transition to kindergarten. *Early Childhood Research Quarterly, 15*(2), 147-166. doi:10.1016/S0885-2006(00)00049-1
- Rimm-Kaufman, S. E., Pianta, R. C., Cox, M. J., & Bradley, R. H. (2003). Teacher-rated family involvement and children's social and academic outcomes in kindergarten. *Early Education and Development, 14*(2), 179-198. doi:10.1207/s15566935eed1402\_3
- Roorda, D. L., Koomen, H. Y., Spilt, J. L., & Oort, F. J. (2011). The influence of affective teacher–student relationships on students' school engagement and achievement: A meta-analytic approach. *Review of Educational Research, 81*(4), 493-529.

- Rudasill, K. M., & Rimm-Kaufman, S. E. (2009). Teacher–child relationship quality: The roles of child temperament and teacher–child interactions. *Early Childhood Research Quarterly, 24*(2), 107-120. doi:10.1016/j.ecresq.2008.12.003
- Sabol, T. J., & Pianta, R. C. (2012). Recent trends in research on teacher–child relationships. *Attachment & Human Development, 14*(3), 213-231. doi:10.1080/14616734.2012.672262
- Sabol, T. J., & Pianta, R. C. (2013). Relationships between teachers and children. In W. M. Reynolds, G. E. Miller, I. B. Weiner, W. M. Reynolds, G. E. Miller, I. B. Weiner (Eds.), *Handbook of psychology, Vol. 7: Educational psychology (2nd ed.)* (pp. 199-211). Hoboken, NJ, US: John Wiley & Sons Inc.
- Saft, E. W., & Pianta, R. C. (2001). Teachers' perceptions of their relationships with students: Effects of child age, gender, and ethnicity of teachers and children. *School Psychology Quarterly, 16*, 125–141. doi:10.1521/scpq.16.2.125.18698
- Sayer, L. C., Bianchi, S. M., & Robinson, J. P. (2004). Are parents investing less in children? Trends in mothers' and fathers' time with children. *American Journal of Sociology, 110*(1), 1-43. doi:10.1086/386270
- Sénéchal, M., & LeFevre, J. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development, 73*, 445–460. doi:10.1111/1467-8624.00417
- Sheridan, S. M., Knoche, L. L., Kupzyk, K. A., Edwards, C. P., & Marvin, C. A. (2011). A randomized trial examining the effects of parent engagement on early language and literacy: The getting ready intervention. *Journal of School Psychology, 49*(3), 361-383. doi:10.1016/j.jsp.2011.03.001

- Skipper, Y., & Douglas, K. (2015). The influence of teacher feedback on children's perceptions of student–teacher relationships. *British Journal of Educational Psychology*, 85(3), 276-288. doi:10.1111/bjep.12070
- Son, S., & Morrison, F. J. (2010). The nature and impact of changes in home learning environment on development of language and academic skills in preschool children. *Developmental Psychology*, 46(5), 1103-1118. doi:10.1037/a0020065
- Spilt, J. L., Koomen, H. M., & Mantzicopoulos, P. Y. (2010). Young children's perceptions of teacher–child relationships: An evaluation of two instruments and the role of child gender in kindergarten. *Journal of Applied Developmental Psychology*, 31(6), 428-438. doi:10.1016/j.appdev.2010.07.006
- Stacer, M. J., & Perrucci, R. (2013). Parental involvement with children at school, home, and community. *Journal of Family and Economic Issues*, 34(3), 340-354. doi:10.1007/s10834-012-9335-y
- Tanaka, J. S. (1987). "How big is big Enough?": Sample size and goodness of fit in structural equation models with latent variables. *Child Development*, 58(1), 134-146.
- Topor, D. R., Keane, S. P., Shelton, T. L., & Calkins, S. D. (2010). Parent involvement and student academic performance: A multiple mediational analysis. *Journal of Prevention & Intervention in the Community*, 38(3), 183-197. doi:10.1080/10852352.2010.486297
- Verschueren, K., Doumen, S., & Buyse, E. (2012). Relationships with mother, teacher, and peers: Unique and joint effects on young children's self-concept. *Attachment & Human Development*, 14(3), 233-248. doi:10.1080/14616734.2012.672263

- Verschueren, K., & Koomen, H. M. (2012). Teacher–child relationships from an attachment perspective. *Attachment & Human Development, 14*(3), 205-211.  
doi:10.1080/14616734.2012.672260
- Waters, E., & Deane, K. E. (1985). Defining and assessing individual differences in attachment relationships: Q-methodology and the organization of behavior in infancy and early childhood. *Monographs of The Society for Research In Child Development, 50*(1-2), 41-65. doi:10.2307/3333826
- Wechsler, D. (1992). *Wechsler Individual Achievement Test*. San Antonio, TX: Psychological Corporation.
- Wentzel, K. R. (2009). Students' relationships with teachers as motivational contexts. In K. R. Wentzel, A. Wigfield, K. R. Wentzel, A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 301-322). New York, NY, US: Routledge/Taylor & Francis Group.
- White, K. R., Taylor, M. J., & Moss, V. D. (1992). Does research support claims about the benefits of involving parents in early intervention programs?. *Review of Educational Research, 62*(1), 91-125. doi:10.2307/1170719
- Williams, K. T. (2007). *Expressive Vocabulary Test, Second Edition*. Circle Pines, MN: AGS Publishing.
- Woodcock, R., McGrew, K., Mather, N. (2001). *Woodcock Johnson III*. Rolling Meadows, IL: Riverside Publishing.
- Zajac, K., & Kobak, R. (2006). Attachment. In G. G. Bear & K. M. Minke (Eds.), *Children's needs III: Development, prevention, and intervention* (pp. 379-389). Bethesda, MD: National Association of School Psychologists.