Exploring the Relationship between Home and School Experiences and Kindergarten Readiness for Higher and Lower Income Preschoolers

DISSERTATION

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By

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Abstract

The main goal of this study was to determine the degree and pattern of relationship between home and school factors and school readiness outcomes for higher and lower income families. Participants in the study were 171 preschoolers, their parents and their preschool teachers. The analyses considered the relationships between school readiness in preschoolers and the following four factors found to be important for preschoolers: 1) quality of home environment, 2) quality of the classroom environment 3) the attachment relationship with parents, and 4) the attachment relationship with teachers. Differences did exist in what contributed to school readiness for higher and lower income preschoolers. For higher income children living in a two-parent household the teacher-child relationship significantly predicted school readiness outcomes. For lower income children the sole predictor of school readiness was what happened in the home: both the security of the parent-child relationship and the quality of the learning activities within the home. Unlike with the higher income sample, no relationship was seen between teacher attachment and school readiness or parent attachment. Possible reasons for and implications of these differences are discussed.
Dedication

This project is dedicated to my husband- your unwavering faith, support, (and proofreading) made this possible.
Acknowledgement

It is with a tremendous amount of gratitude that I approach the end of this journey. Although I chose to embark on this journey, I am so grateful for how my family and friends have stood by me and so willingly let me take them on this wild ride! I would like to thank first my husband, for always believing I can accomplish anything. He has read nearly every word I have written since we were sophomores in college so many years ago, and listened to my endless theories about child development and education. He is truly my partner in all things. I cannot express how much his support, opinion, love, (and editing skills) are appreciated. I promise this is the last paper over 25 pages I will ever ask him to read.

I also am so grateful to my parents for giving me a love and appreciation for education, and for rearranging their schedules so I could attend classes. As this project accentuates, the importance of education early in a child’s life cannot be overemphasized. Thank you to my parents for laying the foundation for my lifelong love of learning. I must also acknowledge my sister, Julie, for reassuring me I could do this, both in her encouraging words and her own educational achievements.

To my advisor, Dr. Antoinette Miranda, I cannot say how much your classes, encouragement, support, and advice have meant over the last 5 years. The program has helped me develop into a confident, competent professional, and that is largely due to
your efforts. Your willingness to allow me and all of your students to follow our own passions is invaluable. To my other committee members: Dr. Kisha Radliiff and Dr. Joe Wheaton, I extend my warmest thanks. Dr. Radliiff opened my eyes to the possibility of adding attachment to my study, and in the end, it was one of the more important pieces to the puzzle. I am forever grateful for the important role you have played in the development of what I feel is a really interesting study. Thank you to Dr. Wheaton for keeping me focused on the take away message, being excited about my results, and calming my statistical fears. Last, but certainly most importantly, I would like to thank my amazing children, Maggie and Ben, for giving me a reason to better myself and for always being proud of their Mommy.
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# Table of Contents

Abstract ............................................................................................................................. ii

Dedication ........................................................................................................................... iii

Vita ....................................................................................................................................... ii

Table of Contents .............................................................................................................. iii

List of Tables ....................................................................................................................... iv

Chapter 1: Introduction ........................................................................................................ 1

  Importance of the Study .................................................................................................. 4

  Research Questions ....................................................................................................... 5

  Research Question One ................................................................................................. 6

  Research Question Two ............................................................................................... 7

  Research Question Three .............................................................................................. 7

Chapter 2: Literature Review .............................................................................................. 9

  School Readiness .......................................................................................................... 9

  History and Definition ................................................................................................... 9

  Measuring School Readiness ........................................................................................ 12

Attachment ....................................................................................................................... 15

  Definition and History .................................................................................................. 15
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent-Child Attachment and School Readiness</td>
<td>21</td>
</tr>
<tr>
<td>Teacher-Child Attachment</td>
<td>25</td>
</tr>
<tr>
<td>Measuring Attachment</td>
<td>27</td>
</tr>
<tr>
<td>Home Learning Environment</td>
<td>32</td>
</tr>
<tr>
<td>Home Environment and Aspects of School Readiness</td>
<td>35</td>
</tr>
<tr>
<td>Measuring Home Environment</td>
<td>38</td>
</tr>
<tr>
<td>School Learning Environment</td>
<td>40</td>
</tr>
<tr>
<td>Classroom Environment and School Readiness</td>
<td>46</td>
</tr>
<tr>
<td>Children in Poverty</td>
<td>54</td>
</tr>
<tr>
<td>Poverty and School Readiness</td>
<td>55</td>
</tr>
<tr>
<td>Poverty and Attachment</td>
<td>59</td>
</tr>
<tr>
<td>Poverty and Learning Environments</td>
<td>60</td>
</tr>
<tr>
<td>Chapter 3: Methods</td>
<td>66</td>
</tr>
<tr>
<td>Research Design</td>
<td>66</td>
</tr>
<tr>
<td>Sampling Procedures</td>
<td>66</td>
</tr>
<tr>
<td>Instruments</td>
<td>67</td>
</tr>
<tr>
<td>Data Collection Procedures</td>
<td>70</td>
</tr>
<tr>
<td>Study Variables</td>
<td>71</td>
</tr>
<tr>
<td>Demographic information</td>
<td>71</td>
</tr>
<tr>
<td>Dependent variable</td>
<td>71</td>
</tr>
<tr>
<td>Independent variables</td>
<td>72</td>
</tr>
<tr>
<td>Issues of validity</td>
<td>72</td>
</tr>
<tr>
<td>Chapter</td>
<td>Title</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>4</td>
<td>Results</td>
</tr>
<tr>
<td></td>
<td>Participants</td>
</tr>
<tr>
<td></td>
<td>Correlational Relationships</td>
</tr>
<tr>
<td></td>
<td>Combined Relationship of Independent Variables with SRC</td>
</tr>
<tr>
<td>5</td>
<td>Discussion</td>
</tr>
<tr>
<td></td>
<td>Findings for the Full Sample</td>
</tr>
<tr>
<td></td>
<td>Findings for the Higher and Lower Income Groups</td>
</tr>
<tr>
<td></td>
<td>Higher Income Children</td>
</tr>
<tr>
<td></td>
<td>Lower Income Children</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
</tr>
<tr>
<td></td>
<td>References</td>
</tr>
<tr>
<td></td>
<td>Appendices</td>
</tr>
<tr>
<td></td>
<td>Appendix A</td>
</tr>
<tr>
<td></td>
<td>Appendix B</td>
</tr>
<tr>
<td></td>
<td>Appendix C</td>
</tr>
<tr>
<td></td>
<td>Appendix D</td>
</tr>
<tr>
<td></td>
<td>Appendix E</td>
</tr>
<tr>
<td></td>
<td>Appendix F</td>
</tr>
<tr>
<td></td>
<td>Appendix G</td>
</tr>
<tr>
<td></td>
<td>Appendix H</td>
</tr>
<tr>
<td></td>
<td>Appendix I</td>
</tr>
<tr>
<td></td>
<td>Appendix J</td>
</tr>
</tbody>
</table>
List of Tables

Table 1. Demographic Information for Full Sample .......................................................... 77
Table 2. Correlations between SRC and Demographic Variables for Full Sample........ 80
Table 3. Percent Frequency of Storybook Reading by Income Group ......................... 82
Table 4. Correlations between Dependent and Independent Variables for Full Sample .. 83
Table 5. Partial Correlations for the Full Sample ............................................................... 85
Table 6. Summary of Home Learning Activities for Higher Income Group ............... 87
Table 7. Demographic Correlations for Higher and Lower Income Groups ............... 89
Table 8. Partial Correlations for Higher and Lower Income Groups ......................... 91
Table 9. Correlation of Home Factors Variable and Measured Variables..................... 93
Table 10. Hierarchical Multiple Regression Analyses Predicting SRC for Higher Income Group ................................................................................................................. 96
Chapter 1: Introduction

The importance of early learning for children has long been the focus of legislation, public policy, and academic research. The general consensus seems to be that for children to be successful in school and later in life, positive early learning experiences are necessary (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004). However, when entering kindergarten, children living in poverty often are already far behind their peers in those areas that contribute to school readiness (e.g. Greenfield, et. al 2009; Wright, Diener, & Kay, 2000). Research has also found that for children of less educated parents, enrollment in preschool had a more significant impact on school readiness scores than for children with more highly educated parents (Marjanovic, Ljubica, Kranjc, Fekonja, & Bajc, 2008). Parents who are more highly educated may be more attuned to the skills a child needs to be ready for school, and will help to support their child in learning those skills, regardless of whether the child attends preschool. Thus, it seems that although preschool can make an important impact on kindergarten readiness, it is not the only factor. Activities and relationships within a child’s home may also contribute to school readiness outcomes. Exactly how these differences between children living in poverty and their more advantaged peers evolve and combine to produce differential outcomes is not entirely clear.

Although there are a myriad of factors that contribute to a preschooler’s readiness for kindergarten, four specific factors were explored in the current study: parent-child
attachment, home learning environment, teacher-child attachment, and school learning environment. First, the overall quality of the parent-child attachment relationship has been linked to greater academic success and positive school adjustment (DeMulder, Denham, Schmidt, & Mitchell, 2000). Attachment theory, as conceptualized by Bowlby (1988), purports that a caregiver’s responsiveness to a child’s needs early in the child’s development will result in differing levels of security in the infant. Bowlby hypothesized that when caregivers, most often mothers, are sensitive and consistent in their responses to their children, their children develop secure attachments. Children whose needs are not met by consistent and sensitive parental responses develop insecure attachments (Bretherton, 1992), which can influence future relationships with teachers as well as behavioral responses at school (Lyons, Bureau, Riley, & Atlas-Corbett, 2009; Alpern, & Lyons-Ruth, 1993). Specific links between secure attachment and school readiness factors such as better math skills (Dobbs, Doctoroff, Fisher, & Arnold, 2006), pre-literacy skills (Van IJzendoorn, Dijkstra, & Bus, 1995), and social skills (McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008) have been found for preschoolers. Likewise, preschoolers with insecure attachments to their primary caregiver have been shown to have more problematic social interactions and behavior problems that negatively impact relationships with peers and teachers at school (DeKlyen, Biernbaum, Speltz, & Greenberg, 1998). Additionally, insecure attachments have also been linked with general academic performance deficits (Jacobsen & Hofmann, 1997).

Secondly, when home environment is considered, it has been found that children who experience high quality home-based learning activities, such as parent-child book
reading, are better prepared to learn to read, and as a result, are more successful in school (Johnson, Martin, Brooks-Gunn, & Petrill, 2008). Higher quality overall home learning environments have been linked with better literacy and numeracy skills for 5-year-olds entering school (Melhuish, et. al, 2008). For children attending Head Start, students’ home learning environments mediated the impact their low socioeconomic status (SES) had on school readiness (Foster, Lambert, Abott-Shim, McCarty, & Franze, 2005).

Thirdly, attachment to teachers within the classroom has also been found to impact overall success at school. Attachment theory suggests that the security of the child-caregiver relationship at home sets the stage for positive attachments with teachers at school. Securely attached children are more likely to use preschool teachers as a secure base when exploring the environment, they are comforted more effectively by their teachers when upset (Goossens & van IJzendoorn, 1990), and they seem to be better able to maximize their preschool experiences than children who are insecurely attached (Howes, Hamilton, & Matheson, 1994). Children who display higher quality relationships with teachers have also been found to have better academic achievement than children with poor teacher-child relationships (Furrer & Skinner, 2003; Pianta & Nimetz, 1991).

Finally, children’s participation in age appropriate learning activities that occur within the preschool classroom has also been found to be positively related to children’s readiness for kindergarten. For example, deficits in emergent literacy for children from lower socioeconomic backgrounds have been shown to be lessened by preschool education (Barnett, 2005). Specifically, attending a preschool program prior to kindergarten has been linked with better math and literacy achievement and a reduction
in retention rates in kindergarten (Magnuson, Ruhm, & Waldfogel, 2004). Abott-Shim, Lambert, and McCarty (2003) found that when 4-year-olds enrolled in Head Start were compared to their same-aged peers who are on the waiting list for Head Start placement, differences in school readiness growth over a school year were seen. Although both Head Start students and waiting list students had similar levels of school readiness and emergent literacy skills in the fall, by spring, significant differences in skill and skill growth were seen for receptive vocabulary, phonemic awareness, and print concepts. Although the impact of preschool has been documented across SES statuses, the impact is often greatest for disadvantaged children (Magnuson, et. al., 2004).

**Importance of the Study**

In the age of accountability and standards based education, it seems important to have a clear understanding of what influences how ready a child is when entering kindergarten. The main objective of the current study is to determine how activities and interactions within a child’s home interplay with what happens in the preschool classroom to prepare children for kindergarten. Much has been made of the gap between advantaged and disadvantaged children in their readiness for kindergarten (Hanushek, Kain, & Rivkin, 2004; Phillips, Crouse, & Ralph, 1998; Reardon, 2004). Similarly, research has also found differences in how parents across income levels engage their children in learning activities (Whitehurst et. al., 1994) and how different levels of attachment influence preschooler’s achievement (DeMulder, Denham, Schmidt, & Mitchell, 2000). Some have suggested that preschool attendance is more meaningful for disadvantaged children. The question remains “why?” This study was
undertaken to begin to answer this question by considering the relationship between
home and school experiences and relationships have on school readiness scores for the
full sample of children and for lower and higher income families separately. This study is
important because it looks directly at how home and school environments relate to school
readiness individually, how they may combine to produce differential outcomes for
preschools in general, and how these relationships may differ for higher and lower
income children so that more targeted interventions may be developed. Although each of
the factors examined here have been explored individually in the literature, there is a lack
of research that considers if and how they influence each other and how they may predict
different school readiness outcomes for students.

**Research Questions**

The current study will explore the relationship between school readiness
outcomes for preschoolers and the following four factors: 1) the attachment relationship
with parents, 2) quality of home learning environment, 3) the attachment relationship
with teachers, and 4) the quality of the classroom learning environment. The relationship
between school readiness and these four factors will be explored individually across the
entire sample. Then, the contribution of all four will be examined in combination in
predicting school readiness scores. Finally, the impact of parental attachment, home
learning environment, teacher attachment, and classroom learning environment will be
examined separately for both high- and low-income children in an effort to provide
information for future differentiated intervention planning and design for at-risk
preschoolers. The current study will be guided by three primary research questions:
**Research Question One:** What is the relationship between school readiness and each individual independent variable: parental attachment, home learning environment, teacher attachment and classroom learning environment?

**Parental attachment.** Securely attached children are more likely to experience academic success and positive school adjustment (DeMulder, Denham, Schmidt, & Mitchell, 2000): Thus, it is expected that parental attachment will be significantly correlated with school readiness.

**Home learning environment.** Research consistently illustrates that a child’s home environment has an impact on school outcomes. Children with lower quality home environments often have lower levels of school readiness skills (Griffin & Morrison, 1997; Meluish, et. al., 2008). Thus, it is hypothesized that home learning activities will significantly correlate with school readiness.

**Teacher attachment.** Given that children who have strong, positive relationships with teachers in elementary school display higher levels of both academic achievement and cognitive skill than children with lower quality relationships with teachers (Birch & Ladd, 1997; Hamre & Pianta, 2001), it is expected that teacher attachment will also be significantly correlated with school readiness.

**Classroom learning environment.** Research suggests that attending preschool can influence readiness for school. For example, Abott-Shim, Lambert, and McCarty (2003) found that when 4-year-olds enrolled in Head Start are compared to their same-aged peers who are on the waiting list for Head Start placement, significant differences in school readiness growth over a school year were seen despite both groups having similar
levels of school readiness in the fall. Thus, classroom learning environment is expected to correlate with school readiness.

**Research Question Two:** What is the relationship of the independent variables to school readiness when viewed in combination?

Given that it is expected that all four independent variables will significantly correlate individually with school readiness, how these variables relate to school readiness when considered simultaneously will be explored. It is hypothesized that home factors such as parental attachment and home learning environment will be stronger predictors of school readiness than teacher-attachment and classroom learning environment overall. This is consistent with research that suggests that what happens in the home helps to prepare preschoolers for success within the classroom. For example, attachment theory suggests that the security of the child-caregiver relationship at home sets the stage for positive attachments with teachers at school (Goossens & van IJzendoorn, 1990; Howes, Hamilton, & Matheson, 1994). However, some have found that teacher attachment can be a better predictor of academic outcomes and school success than parental attachment (O’Conner & McCartney, 2007), especially when a secure attachment already exists in the home.

**Research Question Three:** Are there differences in the relative importance of parental attachment, home learning environment, teacher-attachment, and classroom learning environment for higher- and lower-income children?

It is hypothesized that the relative importance of each independent variable to school readiness outcomes will differ between income groups. For example, both parental
attachment security and stability have been found to vary with income level (Fish, 2004), and thus, may impact readiness for school differently for higher- and lower-income students. Likewise, children from lower income families are at higher risk for insecure parental attachment and lower home learning environments. Previous research suggests that preschool experiences are more impactful for disadvantaged children (Barnett, 1995; Marjanovic, et. al., 2008); thus, it is expected that classroom learning environment and teacher-child attachment may be found to be relatively more important to school readiness outcomes for lower-income children.
Chapter 2: Literature Review

As a foundation for the current study, a review of the literature concerning school readiness in preschoolers was conducted. This chapter will discuss school readiness as a concept, as well as how it relates to preschoolers’ attachment relationships, home and school learning environments, and family income level.

School Readiness

History and Definition

In 1990, the National Educational Goal Panel (NEGP) was created as a result of the passage of the Goals 2000: Educate America Act (PL 103-227) and brought the concept of school readiness to the forefront of state and national education policy. This bipartisan intergovernmental panel consisted of federal and state officials who were focused on developing and monitoring federal and state progress on the National Education Goals they developed (National Educational Goals Panel, 2002). The first goal entitled “Ready to Learn” stated that by the year 2000, all preschoolers would enter kindergarten ready for school. Although the NEGP fell short of achieving the majority of its goals and was dissolved with the passage of the No Child Left Behind Act (NCLB; PL 107–110) in 2001, properly preparing children for the transition from preschool to kindergarten has remained an important early education movement. Currently, over half of all states require school districts to offer kindergarten to students, and 12 states and the
District of Columbia require students to attend kindergarten (Lohman, 2000). Likewise, in Ohio, full day kindergarten is now required in all public school districts (ORC, 3321.5). Thus, the concept of school readiness is an important one for parents and educators alike.

Despite a continued national focus on school readiness, as expressed through NCLB (2001) and the *Individual With Disabilities Education Improvement Act of 2004* (IDEIA; PL 108-466), no national definition of school readiness exists currently. However, the NEGP pointed out three overarching aspects that interact to determine a child’s overall readiness for school: 1) the readiness of the child for school, 2) the readiness of the school for the child, and 3) the readiness of the family and community to support the child’s transition from home to school (NEGP, 2002, Kagan, 1992). Embedded in these are two often differing approaches to school readiness in the literature and public policy: *ready to learn* versus *ready for school*. Is a ready child one who has a developmental readiness to learn, or is he one who has learned specific skills that deem him ready for school (Kagan, 1992; Diamond, Reagan, & Bandyk, 2000)? The former developmental perspective embodied in the *ready to learn* approach is derived from the work of theorists such as Piaget (1965), who saw a child’s readiness as being determined by the developmental level he/she had achieved through biological maturation. Maturational readiness is determined by individual variables such as attention, motivation, health, emotional maturity, intellect, and developmental status that can be influenced by the environment. The process of becoming school ready from this perspective has little to do with learning prerequisite skills prior to the entry to school,
and more to do with allowing the natural progression of development to unfold (Umek, Kranjc, Fekonja, & Bajc, 2008). Proponents of this approach argue that transitioning children to school should focus more on the school being able to adjust to each child’s developmental level and not the child meeting a fixed standard of physical, social, and intellectual development. Since learning nurtures development, being in environments where adults and peers foster learning is imperative to development and thus, children should be enrolled in school. This is consistent with NEGP’s, NCLB’s, and IDEIA’s call for schools to be ready to educate all students, regardless of socioeconomic status, ethnicity, previous school experiences, or disability (Kagan, 1992; IDEIA, 2004). In other words, all children can be successful if the material is presented at a developmentally appropriate level; and, when approaches are unsuccessful, educators need to be open to adjusting their approach to meet each individual child’s needs (NEGP, 2002; Diamond, Reagan, & Bandyk, 2000).

The ready for school approach focuses less on where a child is developmentally, and more on what the school requires of the child when entering kindergarten. The goal of this approach is for children to meet fixed developmental standards so that they may fulfill specific school requirements and assimilate the curriculum content. Development is measured not by individual factors such as attention or motivation, but rather by specific cognitive and linguistic skills, such as naming colors, counting, and recognizing the alphabet, that often are influenced by individual factors (Umek, Kranjc, Fekonja, & Bajc, 2008). Thus, if a child lacks the prerequisite pre-academic skills, they can be deemed not ready for school, and in some cases, entry to school can be delayed (Uphoff,
& Gilmore, 1986) because it is assumed developmental progress is required for learning to occur. Unlike the ready to learn perspective, where development is fostered by learning, and thus, school placement can be seen as part of the process of development, placing children in school prematurely is not recommended by the ready for school approach. This approach states if children are not developmentally ready to learn the curriculum presented to them, learning is not fostered; instead, children are being set up to fail.

Measuring School Readiness

Regardless of one’s theoretical orientation, the skills a child needs to have acquired by entry to school, or to be developmentally ready to learn as they transition to school, are broad. The NEGP’s definition of school readiness, which many states and researchers continue to use, states that a child’s readiness for school is a five-pronged construct that includes physical and motor skills development, social-emotional development, approaches to learning, language development, and cognitive and general knowledge (NEGP, 1995). Similarly, IDEIA also mandates that, beginning at age 3, children be assessed and interventions be provided if deficits in cognition, communication, social-emotional development, physical development, and/or adaptive behavior are present. Likewise, The Improving Head Start for School Readiness Act of 2007 (P.L. 110-134) reauthorized Head Start through September 30, 2012 and underscores Head Start’s role in improving the school readiness of low-income children by enhancing their cognitive, social, and emotional development. Head Start classrooms are expected to be supportive of “children’s language, literacy, mathematics, science,
social and emotional functioning, creative arts, and physical skills” (The Improving Head Start for School Readiness Act of 2007, sec 2). NEGP, IDEIA, and Head Start legislation alike support the notion that concepts like physical development, social-emotional development, and adaptive behavior are as important for school success as more traditionally discussed concepts such as cognitive skills and communication.

The broadness of the concept of school readiness is also supported by studies that have found that academic success over time is related to a child’s overall language, social, motor, and cognitive development when they enter kindergarten (Hamre, & Pianta, 2001; Jimerson, et. al., 1999; Winsler, et. al., 2008). In general, for children to be successful, they need to have an appropriately large vocabulary, the ability to speak in sentences, understand speech sounds, and be learning the alphabet and numbers. But they also need to be able to listen to the teacher, work in peer groups, and self regulate well enough to handle frustration without shutting down or losing control (Bruner, 2004). Although many studies support the notion that readiness, as a concept, refers to a broad scope of developmental skills, not all developmental skills predict school success to the same degree. Duncan et. al., (2007) conducted a meta-analysis of 6 longitudinal data sets that found that the strongest predictors of later school success were school entry math skills, school entry reading skills, and attention skills. In contrast, as predictors, socio-emotional factors, such as externalizing and internalizing problems and social skills, were largely insignificant even for children with high levels of behavioral problems. This seems to suggest that although all developmental areas are factors in
school readiness, the role played by some may be larger than others (Duncan, et. al., 2007).

It also seems the impracticality of assessing all school readiness areas may also influence how school readiness is defined as a research concept. Often, research focuses on only some of the 5 areas outlined by NEGP when assessing a child’s school readiness. For example, in their study of how home environments of preschool aged Latino children impact school readiness, Farver, Xu, Eppe, & Lonigan (2006) directly measured the children’s oral language skills and collected teacher’s ratings of the children’s social functioning to assess school readiness. Similarly, when assessing school readiness for the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K), a national representative data set that examines the educational stratification in the United States, researchers quantified school readiness by focusing on the direct measurement of cognitive skills including math, reading, and general knowledge with standardized tests, as well as teacher and parent ratings of the children’s social adjustment. Language skills and motor skills were not considered (Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006). When considering the impact a speech-language delay or disorder has on school readiness, Justice, Bowles, Pence Turnbull, & Skibbe (2009) obtained information about children’s language and literacy, mathematical thinking, academic competence, social skills, and externalizing and internalizing behavior all through teacher report. No direct standardized testing was completed.

Some researchers have used standardized measures specifically designed to measure school readiness. However, most do not measure the broader concept of school
readiness, instead focusing on just pre-academic skills such as literacy and math concepts. For example, many studies have used the Bracken Basic Concepts Scale (BBCS; Bracken, 1998) or the Bracken School Readiness Assessment (BSRA; Bracken, 2007) to quickly assess school readiness in children ages 3 years to 6 years 11 months (e.g. Belsky & Fearson, 2002; Ducan, et. al., 2007). The BBCS measures a preschooler’s knowledge of 11 basic concepts: Colors, Letters, Numbers/Counting, Sizes/Comparisons, Shapes, Direction/Position, Self/Social Awareness, Texture/Material, Quantity, and Time/Sequence. The BSRA and the BBCS’s School Readiness Composite Score (SRC) are made up of only 5 of these areas: Colors, Letters, Number/Counting, Size/Comparisons, and Shapes. The Metropolitan Readiness Test (MRT; Nurss, 1994) assesses a child’s (age 4 to 7 years) emergent literacy, language, literacy concept development, and early quantitative and mathematical concept development. The Qualls Early Learning Inventory (QELI; Qualls, Hoover, Dunbar, Frisbie, 2003) is a 10-minute teacher questionnaire that provides an overview of a child’s general knowledge, oral communication, written language, math concepts, work habits, and attentive behavior for children in grades pre-k through first grade.

Attachment

**Definition and History**

Attachment theory, as conceptualized by Bowlby (1969, 1988), purports that a caregiver’s responsiveness to a child’s needs early in the child’s development will result in differing levels of security in the infant. Bowlby hypothesized that when caregivers,
most often mothers, are sensitive and consistent in their responses to their children aged 6 months through 2 years, their children develop secure attachments (Bretherton, 1992). Moreover, Bowlby also hypothesized that there are four factors essential to attachment that impact social behavior in young children: proximity maintenance, safe haven, secure base, and separation distress (Bowlby, 1988). Basically, Bowlby theorized that securely attached children have a desire to be with their mothers, are comforted by their mothers in the face of fear, will use their mothers as a secure base from which to explore the world around them, and will become upset when separated from their mothers (Bowlby, 1988). Bowlby contended that attachment, or “the propensity to make strong emotional bonds to particular individuals [is] a basic component of human nature” (Bowlby, 1988, 3), because through these strong emotional bonds, either healthy development or pathology can be transmitted from parent to child. Plainly stated, children require a secure attachment for healthy social-emotional development (Bowlby, 1988).

Bowlby’s student Ainsworth expanded on his work by demonstrating that behavioral differences are exhibited by securely and insecurely attached children in her Strange Situation assessment (Ainsworth, Blehar, Waters, & Wall, 1978). During the 24-minute Strange Situation, a child is observed in a room as both the caregiver and strangers enter and leave the room. At times, the adults attempt to interact with the child, and during other portions of the assessment, the child is not engaged by the adults at all (Ainsworth, Blehar, Waters, & Wall, 1978). Using the Strange Situation, Ainsworth was able to categorize a child’s attachment to his/her mother by observing the child’s exploration of the room, as well as how the child reacts to the caregiver’s departure from
and return to the room during the assessment (Rutter, 1996). Ainsworth observed three types of attachment during the Strange Situation: secure, anxious-ambivalent insecure, and anxious-avoidant insecure. Securely attached children are made at ease by the presence of their caregiver and utilize her as a secure base from which to explore the environment. The securely attached child is upset by the absence of the caregiver and happy upon her return (Ainsworth, 1978). Anxious-ambivalent children display a combination of positive and negative reactions to the caregiver during the assessment. For example, these children may seek proximity to the caregiver, but they also resist physical contact, running to the caregiver upon her return, but pushing away, hitting, kicking, whining, and crying when held (Ainsworth, 1978). Anxious-avoidant children do not seek to be close to the caregiver, are often not upset by her leaving, and may avoid her upon her return (Ainsworth, 1978). More recently, a fourth category, disorganized attachment, has been described to account for children whose behavior is so scattered and disorganized within the Strange Situation they do not fit into any one of Ainsworth’s original attachment categories (Greenberg, Cicchetti, & Cummings, 1990). Disorganized children often appear to be confused by parental behavior and seem to both feel comforted by and fearful of the caregiver and. Children with disorganized attachments appear to have the lowest level of attachment to the caregiver and often the worst developmental outcomes of all attachment styles (Greenberg, Cicchetti, & Cummings, 1990).

Since the development of the Strange Situation, much research has focused on the predictive power attachment patterns experienced in infancy have on developmental
outcomes. While more secure attachment in infancy has been linked with a wide array of positive outcomes, insecure attachment has been associated with risk for psychopathology into adulthood (Ward, Lee, & Polan, 2006). For preschoolers specifically, secure attachment has been linked with higher levels of empathy (Kestenbaum, Farber, & Sroufe, 1989), curiosity (Arend, Gove, & Sroufe, 1979), interest in reading and written materials (Bus & van IJzendoorn, 1986 & 1988), as well as better math skills (Dobbs, Doctoroff, Fisher, & Arnold, 2006), language skills (Bretherton, 1990) and friendship quality (McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008). Conversely, children who are insecurely attached appear to be at higher risk for social-emotional difficulties and behavior problems. For example, a longitudinal study of 112 children from ages 9 months to 3 years conducted by Kochanska (2001) found that as insecure children aged, they became more angry when compared to their securely attached counterparts, and they seemed less able to cope with both fear- and joy-evoking scenarios. Specifically, the children with the least secure attachments at age 14 months displayed more distress during situations designed to evoke fear, and were less joyful in situations designed to elicit joy at 33 months of age (Kochanska, 2001). Links between insecure attachment types and preschoolers who display hostile behavior toward both parents and peers, (Lyons, Bureau, Riley, & Atlas-Corbett, 2009; Alpern, & Lyons-Ruth, 1993), anxiety, withdrawal behaviors, hyperactivity, and who are demanding of parents, teachers, and peers (Alpern, & Lyons-Ruth, 1993) have also been documented.

When the body of literature is considered as a whole, it is apparent that attachment theorists have emphasized not only the idea that security of attachment in
Infanthood is predictive of later developmental functioning, but also that the differences in developmental trajectories are maintained over time by a child’s internal working model (IWM; Belsky & Fearon, 2002). First conceptualized by Bowlby himself in 1969 as an affective-cognitive process which begins in infancy, the notion that an IWM is the mechanism by which infantile experiences impact toddler, child, and even adult behavior is much described in the literature (e.g. Verschueren, Marcoen, & Schoefs, 1996; Bretherton, Biringen, Rideway, 1991; Pridham, 1993). However, as Belsky & Fearon (2002) point out, although the IWM is implicated as the mechanism by which attachment patterns influence later behavior, less attention has been paid to conducting direct research that supports or disproves this notion. Nonetheless, Belsky, Spritz, & Crnic (1996) have found evidence that 3-year-old children who have positive attachment histories, and likely positively based IWMs, remember more positive experiences than negative experiences after watching an interactive puppet show depicting both types of experiences. Similarly, those preschoolers who had more negative or insecure attachment histories remembered more of the negative experiences depicted in the puppet show than positive events. Kirsh and Cassidy (1997) found similar results with three and a half year old children who were asked to remember stories about mothers and children. Children with secure attachments had better memories for stories about securely attached children, while insecurely attached children remembered more about the stories depicting insecure attachments. These findings seem to suggest that what a child comes to know about how parents and children interact in early infancy can continue to color their understanding of the world as they develop.
Much attention continues to be paid to the importance of secure attachment in development, and recent studies continue to support Ainsworth’s original Strange Situation findings. Specifically, when Ainsworth’s original work is compared with other measures of attachment and applied cross-culturally, her findings are supported both in terms of the behaviors described as typical of each attachment style and the prevalence of each style within the general population (e.g. Vaughn & Waters, 1990; De Wolff & Van IJzendoorn, 1997; Van IJzendoorn, 1990). However, it is important to note that later life experiences (i.e. those that occur after the age of 2) can and do play a role in a child’s developmental outcomes as well. Often, caregivers who provide a sensitive environment, which results in a secure attachment in infancy, continue to provide such sensitive parenting as the child grows. This consistency in parenting approach seems to support the notion that for a large number of children, attachment remains relatively stable from infancy to adulthood (e.g. Hamilton, 2000; Waters & Hamilton, 2000). However, some recent research suggests that when securely attached children encounter intensely negative life events, especially those that interfere with the sensitivity of parenting, such as the loss of a parent, divorce, abuse, significant medical illness, or parental mental illness, insecure IWMs can result despite a secure attachment in infancy (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). For example, a child who is securely attached to his mother in infancy may come to develop an avoidant IWM after his mother develops a mental illness that renders her angry and unpredictable. For this child, his attachment as measured at 14 months of age may not be an accurate assessment of his current attachment behavior or internal understanding of how responsive adults and
caregivers will be to his needs. Thus, it seems that although for many children the attachment forged in infancy is a good predictor of future relationships with the caregiver, it is important to note that this may not be the case for all children. Despite the breadth of attachment research linking early attachment history with developmental outcomes, it is important to acknowledge that the relationship between the process of becoming attached, maintaining that attachment over time, behavior, and psycho-social functioning is transactional in nature (Belsky & Fearon, 2002) and cannot alone account for who a child becomes.

**Parent-Child Attachment and School Readiness**

When considering the link between parent-child attachment and school readiness, an important factor to consider is how securely attached a child is when transitioning to school. Securely attached children are more likely to experience academic success and positive school adjustment (DeMulder, Denham, Schmidt, & Mitchell, 2000). Specific links between secure attachment and school readiness factors such as better math skills (Dobbs, Doctoroff, Fisher, & Arnold, 2006), pre-literacy skills (Van IJzendoorn, Dijkstra, & Bus, 1995), and social skills (McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008) have been found for preschoolers. Likewise, preschoolers with insecure attachments to their primary caregiver have been shown to have more problematic social interactions and behavior problems that negatively impact relationships with peers and teachers at school (DeKlyen, Biernbaum, Speltz, & Greenberg, 1998; Moss, Parent,
Gosselin, Rousseau, & St-Laurent, 1996). Additionally, insecure attachments have also been linked with general academic performance deficits (Jacobsen & Hofmann, 1997).

To help elucidate the more general finding that security of attachment in preschoolers results in better overall kindergarten outcomes, specific aspects of school readiness, as defined by the NEGP and IDEIA (physical and motor development, social-emotional development, language development, cognitive ability), will each be considered in turn to explore how their relationship with attachment may result in different school readiness outcomes for children.

**Physical and motor development.** For children with motor coordination related conditions, such as cerebral palsy, spina bifida, or general developmental delays in gross and fine motor development, research has found that the more severe the impairment, the likelihood of developing an insecure attachment in infancy increases (Stahlecker & Cohen, 1985). Motor skills deficits often impact how a child is able to communicate with their caregiver, which may result in the caregiver’s response being less sensitive than for children without such disabilities (e.g. Clements & Barnett, 2002; Barnett, Kidwell, & Leung, 1998; De Wolff & van IJzendoorn, 1997). This can lead to insecure attachments, as well as undermine the child’s ability to be socially responsive to caregivers and peers (Barden, Ford, Jensen, Rogers-Slayer, & Slayer, 1989). In 1996, Britner, Marvin, and Pianta found that preschool children with cerebral palsy continued to display insecure attachment behavior with caregivers during the transition to preschool, which limited the child’s ability to feel secure in exploring the environment of preschool. Such insecurity
within the classroom has been linked with both learning and social difficulties in preschool and kindergarten (Vondra, Shaw, Swearingen, Cohen, & Owens, 1999).

**Social-emotional development.** The security of attachment can also influence a child’s level of social-emotional stability and social success in school. By kindergarten, disorganized attachment can often lead to more social withdrawal and aggressive behavior with peers than is exhibited by securely attached children (Cyr & van IJzendoorn, 2007). Such insecurely attached children also are at a higher risk for peer rejection and having difficulty maintaining friends over time (Moss, Bureau, Cyr, Mongeau, & St.-Laurent, 2004). This difficulty with friendship maintenance has also been linked with long-term academic achievement difficulties, as well as an inability to benefit from social support from both peers and teachers (Kehle, Bray, & Grigerick, 2007).

**Language development.** Fish and Pinkerman (2002) found that when entering kindergarten, children with higher language skills also were more likely to have highly secure attachment relationships with a caregiver. Similarly, Gleason (2001) found that how a parent and child interact impacts a child’s overall language skills. Mothers who are more sensitive and verbally responsive provide children with more appropriate language experiences that encourage language acquisition than mothers who are verbally directive, intrusive, or controlling. A meta-analysis conducted by van IJzendoorn, Dijkstra, & Bus (1995) found over seven studies of language development in children with differing levels of socioeconomic status, securely attached children had higher language skills than insecurely attached children. Similarly, when engaged in pre-literacy teaching
activities, Bus & van IJzendoorn (1988) found that securely attached mother-child dyads engaged in less disciplinary activities, and the children were less distracted than their insecurely attached counterparts. Secure children listened more to book reading, engaged in more pre-reading activities when reading with their mothers, and scored higher on pre-literacy and language measures than their insecurely attached peers (Bus & van IJzendoorn, 1988). It may be the case that parents who are sensitive and responsive to their child’s needs, especially in teaching situations at home, are able to enhance language development in their children.

**Cognitive ability.** Children with cognitive delays also appear at risk for insecure attachments due to difficulty with effectively communicating their needs to caregivers, as well as the use of ineffective coping mechanisms when faced with stressors during infancy (De Schipper, et.al., 2006). The lack of effective coping strategies makes having a strong attachment to parents very important; however, in many cases, such an attachment is less likely for children with cognitive impairments (De Schipper, Stolk, & Schuengel, 2006). When a meta-analysis was conducted to examine the attachment patterns for children with autism, it was found that having cognitive deficits such as mental retardation in addition to autism greatly increased the likelihood of insecure attachment (Rutgers, Bakermans-Kranenburg, Van IJzendoorn, and Van Berckelaer-Onnes, 2004). Similarly, lower levels of secure attachment with 1- to 4-year old children with Down Syndrome were found as parent’s perceived level of care-giving stress and child-centered stress (the child’s distractibility, demandingness, unacceptability) increased (Roach, Orsmond, & Barratt, 1999). Finally, in their 2007
study, Naber, et. al, found that when compared to typical peers, 3 ½ year olds with mental retardation were more likely to display insecure attachment to a caregiver. For those children in the study classified as insecurely attached, children with mental retardation were found more likely to be classified as disorganized in their attachment than were children in the typical control group.

**Teacher-Child Attachment**

Attachment theory suggests that the security of the child-caregiver relationship at home sets the stage for positive attachments with teachers at school. Securely attached children are more likely to use preschool teachers as a secure base when exploring the environment, they are comforted more effectively by their teachers when upset (Goossens & van IJzendoorn, 1990), and they seem to be better able to maximize their preschool experiences than children who are insecurely attached (Howes, Hamilton, & Matheson, 1994). Children who display higher quality relationships with teachers have also been found to have better academic achievement than children with poor teacher-child relationships (Furrer & Skinner, 2003; Pianta & Nimetz, 1991). However, some studies suggest that a secure parent-child attachment is not required for a secure teacher-child relationship to develop. In fact, some argue that secondary attachments, such as that of a child with a teacher, can compensate for a lack of a secure attachment at home (Goossens, van IJzendoorn, Tavecchio, & Kroonenberg, 1986). Positive relationships with teachers are more likely when children spend more hours at school. The more time at school, the more secure the relationship (Goosen & van IJzendoorn, 1990). The
argument is that children who come to school insecure are less skilled at communicating their needs: thus, having more time at school with teachers increases the potential for development of a positive attachment. Teachers with more years of education tend to develop high quality interactions with children. Additionally, teachers have also been found to be more likely to develop secure attachments with girls than boys, and with white children when compared to minority children. Having the same ethnicity as one’s students also increases the likelihood of secure teacher-child attachment (Goosen & van IJzendoorn, 1990).

O’Conner & McCartney (2007) found teacher-child relationships in third grade to be a stronger predictor of achievement than maternal attachment at age 3 years. However, the sample of this study consisted of 880 children, the majority of whom were of European American background (81.01%), and already had secure attachments at 36 months of age (31.03%). The majority of the children also had mothers with 14.40 years of education. Information about teacher gender and ethnicity was not provided. Children who by third grade had disabilities, lived in dangerous areas, or whose mothers did not speak English were excluded when teacher-child attachment was measured. This study seems to suggest that when secure attachments exist both at home and at school, teacher attachment is more strongly related to academic achievement. However, for children at risk for insecure attachments at home, this may not be the case. Pianta, Nimetz, and Bennett (1997) found that mother-child relationship quality predicted both teacher-child relationship quality and preschool and kindergarten school outcomes, while the teacher-child relationship only predicted concept development in preschoolers and
kindergarteners. This study’s sample of 55 children was primarily African-American and consisted of 33 boys and 22 girls. Even when gender was controlled for, because boys have been found to engage in more negative behavior patterns with mothers and teachers, mother-child attachment was a better and stronger predictor than teacher-child attachment. In this study, children were attending a half-day Head Start preschool program, and although the majority of the children were African American, the teachers were female and white. Unlike the O’Conner & McCartney study, where mothers were typically high school graduates with some college experience, the average highest education level for mothers in this sample was of 10.8 years, and the modal mother did not complete high school. Here, teacher attachment was measured in preschool, not third grade, for children at much higher risk for insecure home attachments. The majority of the children were boys, whose ethnicity did not match the teachers, and who attended school only a few hours a day. It may be due to these factors that the children had not yet developed a strong positive relationship with their teachers (Goosen & van IJzendoorn, 1990).

**Measuring Attachment**

Various methods for identifying the pattern of attachment a parent and child exhibit have been developed and used throughout the literature. Historically, most often, parent-child observations such as the Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978) and the Attachment Q-Set (Waters & Deane, 1985) have been used. However, more recently, parent- and self-report questionnaires and interviews have also been developed to assess attachment in children and adolescents.
The Strange Situation is a laboratory-based observation where the parent and child are videotaped unobtrusively over a 24-minute observation during the child’s second year of life (van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004). During that time, the child’s behavior is recorded over 8 separate episodes:

1. Parent and infant are introduced to the experimental room.
2. Parent and infant are alone. The parent does not participate while infant explores.
3. Stranger enters, converses with parent, then approaches infant. The parent leaves inconspicuously.
4. First separation episode: The stranger’s behavior is geared to that of infant.
5. First reunion episode: The parent greets and comforts infant as the stranger leaves. The parent then leaves again.
6. Second separation episode: Infant is alone.
7. Continuation of second separation episode: The stranger enters and gears behavior to that of infant.

The infant's behavior upon the parent's return is the basis for classifying the infant into one of the three or four attachment categories: securely attached, insecure-avoidant, insecure-resistant (Ainsworth, 1979) and insecure disorganized (Posada, 2006). The Strange Situation paradigm evolved directly from the work of Bowlby himself through Ainsworth’s application. As a result, the Strange Situation has a 30–year history of use.
within the literature as the prototypical, and often most preferred, measure of attachment (Posada, 2006). This does not mean the Strange Situation is without detractors. It has been criticized by some for its overall brevity and artificiality, appropriateness beyond infancy, and cultural sensitivity (e.g. Rutter, 1996; Thompson, Lamb, & Estes, 1982; Kappenberg & Halpern, 2006). However, the literature seems to support the efficacy of the measure, in some cases with modifications to the coding systems used (e.g. Cassidy & Marvin, 1992; Britner, Marvin, & Pianta, 2005) for toddlers, preschoolers, disabled children, and children with different cultural backgrounds (e.g. Rutgers, et. al., 2004; Sternberg & Lamb, 1992; Posada, 2006). However, some contend the benefit of using the Strange Situation is limited. It has been argued that to overcome the artificiality of the laboratory setting, one must conduct observations of each child within several environments and time points to get the most accurate picture of the relationship between parent and child (Kappenberg & Halpern, 2006). This can be both time consuming and financially burdensome for researchers.

The Attachment Q-Set (AQS) was developed in 1987 to accomplish three goals: to economically examine the relationship between secure base behaviors in a child’s home environment with the classifications of attachment provided by the Strange Situation, to better define the behaviors that are associated with secure base behavior in children, and to stimulate interest in normative assessment of attachment in children beyond infancy (Waters, 1987). The AQS Version 3 (AQS-3; Vaughn & Waters, 1990) is a semi-structured home-based observation. After observing the parent-child dyad for 2-3 hours over 2-3 observations, the trained observer then sorts a set of 90 descriptor cards
into a predetermined number of piles that are organized similarly to a Likert scale. Descriptor cards include statements such as “Mother is the only one he allows to comfort him” and “Child is more interested in people than things” (Waters, 1987). The piles created range from those descriptors that do not apply to the child at all to those that are highly characteristic of the child. The distribution of the cards within the piles is then correlated with distributions of cards designed to represent the most securely attached child. The higher the correlation, the more securely attached the child is considered (Kappenberg & Halpern, 2006). Although more naturalistic than a laboratory based observation, and more cost effective in terms of materials used, the observations themselves can be very time consuming and require extensive training of multiple observers to avoid observer bias (Kappenberg & Halpern, 2006).

More recently, questionnaires have been developed to more efficiently assess parent-child attachment through both parent- and self-report. However, the majority of these questionnaires have been designed for children over the age of 5 years. For example, the Randolph Attachment Disorder Questionnaire (RADQ; Randolph, 1997) is a 30-item scale that asks caregivers to rate each statement on a 5-point Likert scale for children ages 5 to 18 years. Higher scores indicate attachment difficulties (Randolph, 1997). However, no independent studies have been done to verify the validity of the measure (Cappelletty, Brown, & Shumate, 2005). Additionally, Cappelletty, et. al., (2005) found the RADQ was better at identifying psychopathology than attachment disorder in a sample of 54 foster children aged 1 to 18 years old. The Attachment Questionnaire for Children (AQ-C; Muris, Meesters, van Melick, & Zwambag 2001) is a
single item self-report questionnaire for children ages 9-18 years based on the Attachment Questionnaire for Adults (AQ; Hazan & Shaver, 1987). The AQ-C consists of 3 statements. Each statement represents a different attachment style: secure, avoidant, and ambivalent. The children then select the statement that best describes themselves, thus classifying themselves into one of the three attachment categories. Such single item self-report instruments have been shown to provide some useful information about older children’s and adult’s attachment behavior; however, some still question the validity of such brief measures (Muris, et. al., 2001).

For preschool age children, one caregiver questionnaire has been developed to quantify the attachment relationship in children under the age 6 years. The Kinship Center Attachment Questionnaire (KCAQ; Kappenberg & Halpern, 2006) was developed to screen children for attachment difficulties, as well as to monitor changes in attachment in younger children placed in foster homes. The KCAQ is comprised of 20 items which are each rated on a 7-point Likert scale. Higher scores indicate high levels of attachment difficulty. Although the KCAQ appears to fill a need for cost and time efficient attachment measurement for children under age 6, no independent studies of the relationship between the KCAQ and more established measures of attachment in younger children such as the Strange Situation and/or the AQS have been carried out thus far. Despite this, Kappenberg & Halpern (2006) found that the measure was successful at differentiating between children with known attachment difficulties and those children with more secure attachments. It was also well correlated with syndrome scales that have
previously been implicated in attachment difficulties on the Child Behavior Checklist for children 1 year, 6 months, to 5 years, 11 months (Achenbach & Rescorla, 2000).

Learning Environments

In addition to the relationships a preschooler has both at home and school, how both the home and school environment support learning has also been linked with school readiness outcomes. Specifically, children living in homes and attending schools with lower levels of stimulation have been found to make less academic gains (e.g., Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001; Brooks-Gunn, Duncan, & Aber 1997).

Home Learning Environment

Research has consistently shown that children’s’ educational outcomes are related to the relationship and activities children engage in with parents within the home (see Bus & Ladd, 1997; Hamre & Pianta, 2001; Magnuson, Ruhm, & Waldfogel, 2007). However, a review of the literature reveals that most often studies have focused on literacy learning activities within the home, such as shared book reading, when considering what activities help prepare children for school (i.e. Crain-Thoreson & Dale, 1992; Dickinson & Tabor, 2001; Stevenson and Fredman, 1990). However, more recently, home learning environment more generally has begun to be assessed and discussed as a research concept. For example, Melhuish et. al., (2008) examined the relationship between home learning environment and literacy and numeracy development in 2,875 children who participated in a longitudinal study from ages three to seven years. It was found that home learning environment was positively related to academic
achievement. For this study, literacy scores were calculated using the Letter Recognition Test (Clay, 1993) and subscales on the Phonological Awareness Assessment (Bryant & Bradley, 1985). Numeracy was assessed by the Early Number Concepts subscale of the British Ability Scales –II. Home learning environment was assessed using a measure developed by the authors called the Home Learning Environment Measure, which asks parents about the presence and frequency of eight learning activities within the home (reading, numeracy, alphabet, art, music, sports, singing and nursery rhymes, and exposure to books). Specifically, the study found that the children’s home environments were related to the children’s level of achievement. Children were classified as over or under achievers in literacy and numeracy using standard scores. The mean home literacy scores for the over achieving (mean = 26.44, SD = 7.26), average (mean = 23.61, SD = 7.45), and underachieving (mean = 21.62, SD = 7.83) groups differed significantly for literacy scores. This pattern was also seen for numeracy, but to a lesser degree. Higher home learning environments also predicted the children being classified at age five as over achievers in both literacy and numeracy, and low home learning environments predicted under achievement in both academic areas using logistic regression procedures. Overall, when analyzing the impact home learning environment has on children’s achievement, the authors found that home learning environment accounted for 21% of the variance in literacy and 18% of the variance in numeracy at age 5 above and beyond demographic factors such as age, gender, birth weight, ethnic group, health, developmental or behavioral problems, mothers’ and fathers’ education, family socioeconomic status, number of siblings, eligibility for free school meals, household
income, and duration of preschool attendance. Clearly, for this sample, what happened in the home could foster academic progress in significant ways.

When home learning environment activities were considered in a sample of 173 families with 3- to 4-year old children attending Head Start programs across the country, links were found between specific home learning activities and school readiness scores (Parker, Boak, Griffin, Ripple, & Peavy, 1999). The home learning environment was assessed by the National Evaluation Information System, Part B (NEIS: Abt Associates, 1988) which is a compilation of several scales and items from other measures. The NEIS was created for the National Even Start Evaluation and assesses the home learning environment in several areas: (1) how frequently the child helps with household tasks, (2) the number of educationally relevant play materials in the home (toys and arts and crafts supplies suitable for young children), (3) the number of school-readiness skills the parent has helped the child learn, (4) how frequently the parent and child participated in school-related activities or talk about school, (5) parent's ability to facilitate the child's learning, and (6) parent's understanding of play. School readiness was assessed by the Cooperative Pre-School Inventory (CPI; Caldwell, 1974). Total school readiness scores were related to mother’s level of education ($r=.239; p<.01$) and the frequency of parents helping children learn school readiness skills ($r=.196; p<.05$). Numeric concept scores were also related to parents helping with learning ($r=.206; p<.05$). Sensory concept scores were related to mother’s education ($r=.176; p<.05$), parent’s understanding of play concepts ($r=.268, p<.01$), and parents’ facilitation of the learning process ($r=.214; p<.05$). These
findings again support the notion that parents can influence children’s school readiness outcomes by supporting learning within the home.

**Home Environment and Aspects of School Readiness**

**Reading.** When parents are asked about what they believe are the most important things they can do with children at home to prepare them for kindergarten, many times they nominate pre-literacy activities such as knowing the letters of the alphabet and parent-child book reading (Barroso-Flannery, 2006). In fact, West, Hausken, & Collins (1995) found that parents are 6 to 8 times more likely than teachers to nominate specific pre-literacy skills such as knowing the alphabet as very important or essential to school readiness. The literature supports the idea that parent-child book reading may be one of the most important aspects of home literacy development for preschoolers. Not only does book reading account for a significant percentage of the variance in both cognitive and literacy achievement outcomes (Bus, van IJzendoorn, & Pellegrini, 1995; Scarborough & Dobrich, 1994), but it is also one area of a child’s school readiness where direct intervention can have a positive impact (Curenton & Justice, 2008).

Stevenson and Fredman (1990) found in a study of 550 13-year-olds a relationship between how frequently parents reported reading with their children as preschoolers and individual differences in measures of reading comprehension and IQ when the children were 13-year-olds. Specifically, children whose parents reported reading to them 4 or more times a week had higher levels of reading achievement as measured by the Neal Analysis of Reading Ability-Comprehension Scale (Neale, 1967) at age 13. Using multiple regression, it was found that reading with preschoolers accounted
for 18.9% of the variance in the children’s reading comprehension scores at age 13, and 13.9% of the variance in the children’s Weschler Intelligence Scale for Children–Revised (WISC-R; Weschler, 1974) Full Scale IQ score at 13 years of age. Similarly, in a longitudinal study of 25 verbally precocious children, Crain-Thoreson & Dale (1992) found that the reported number of times shared-book reading occurred per week at two years of age was predictive of language ability at age two and half years and four and a half years, as measured by the Peabody Picture Vocabulary Test–Revised (PPVT-R; Dunn & Dunn, 1981) and print awareness, as measured by the Concepts of Print Scale (Clay, 1972) at four and a half years of age. It should be noted that all the children in the study were verbally precocious and came from similar backgrounds.

**Math.** In an investigation of preschooler’s cognitive abilities at preschool entry, Sammons, et. al. (2004) found that the frequency of several learning activities in the home related to preschoolers’ numeracy skills as measured by the British Ability Scales Second Edition (BASII; Elliot et al., 1996). Parents were asked to report the frequency with which they engaged in specific learning activities in the home with their children. The authors found that frequency of teaching the alphabet at home and visits to the library were positively related to attainment of language, pre-reading, and early number concepts. Playing with letters and numbers was positively related to pre-literacy and early number concept skills. Painting and drawing in the home was linked with early numeracy skills. Similarly, LeFevre, Skwarchuk, Smith-Chant, Fast, Kamawar, & Bisanz, (2009) considered the relationship between early numeracy activities within the home and mathematics skill in 258 kindergartens, first, and second graders. Parents completed a
questionnaire about the frequency of involvement in home activities, parents’ academic expectations and math attitudes, and children were assessed using the Enumeration, Addition, and Subtraction subtests of the KeyMath Test—Revised, Form B (Connolly, 2000). When regression analysis was carried out, control variables including grade, sex, city, vocabulary, and spatial span accounted for 29% of the variance in numeracy skills. Specifically, math knowledge was found to be greater for children whose parents had higher levels of education, for children with better verbal abilities, and for children with greater spatial memory spans. Home literacy activities were then entered and did not account for any unique variance, suggesting that engaging in general learning activities at home does not necessarily relate to the child’s mathematical skill level. Finally, the home numeracy activities, including number skills activities, number of number books, games, and computer applications were entered into the model. These experiences accounted for 4% additional variances in math scores when considered in combination. Individually, games accounted for 3% of this additional variance. The author argues that the model illustrates that there is a relationship between children’s math skills and parental reports of the frequency with which their children engage in math-related activities within the home.

Social Emotional. Neitzel (2009) recently found a relationship between home socialization practices and kindergartener’s social success at school. The structure of the home significantly correlated with classroom self-control and responsiveness, as well as the child’s tendency to provide peers with instructional support and engage in normative conversations about progress on academic tasks and comparing work. Communication
style modeled in the home was positively correlated with classroom self-control, instructional support, and normative exchanges, and negatively correlated with passive and distracting classroom behaviors with peers. Degree of parental control in the home negatively correlated with children’s responsiveness in the classroom and positively correlated with the children’s tendency to take directions from peers. The author suggests what children learn from early socialization practices at home does influence how children engage with others within the kindergarten classroom.

**Science and Social Studies.** Upon reviewing the literature, no information was found concerning the relationship between home learning environment and science and social studies achievement. Although both concepts are in the Ohio Department of Education (2004) pre-kindergarten academic content standards, which provides parents with examples of science and social studies based activities to foster learning in these areas such as visiting museums, discussing the calendar and family traditions and holidays, planting seeds with children and discussing the changes overtime, indentifying animals in books and in the environment, collecting and studying rocks and bugs, tasting and discussing ingredients before and after cooking, no direct research could be found that considers how well home learning activities prepare children for learning these concepts.

**Measuring Home Environment**

The Home Observation of the Measurement of the Environment (HOME; Caldwell & Bradley, 1984) is an instrument that combines observations of a child’s home and structured interviews with parents during a 45-to 90-minute home visit (Dolan,
Casanueva, Smith, & Bradley, 2009). The HOME measures the quality and quantity of stimulation and support available to a child in the home environment (Cadwell & Bradley, 1984). Four versions of the HOME have been developed: Infant/Toddler for children ages birth to three years, Early Childhood for ages 3 to 6, Middle Childhood for ages 6 to 10 years, and Early Adolescents for ages 10 to 15 years. The early childhood version includes 8 subscales: Learning Materials, Language Stimulation, Physical Environment, Responsivity, Academic Stimulation, Modeling, Variety, and Acceptance (Vasiliki Totsika & Kathy Sylva). The HOME has been used to assess home environment in many countries and cultures and is most often used to estimate the impact of intervention programs (Bradley, Corwyn, & Whiteside-Mansell, 1996).

Melhuish, et al.’s (2008a) Home Learning Environment Measure (HLEM) has been used in several studies to estimate the quality of the learning environment in the home (Melhuish, 2001, Melhuish, 2008b; NESS Research Team, 2005, 2008). The HLEM consists of 8 questions that ask parents to indicate if the target behavior/activity occurs in the home environment. When parents respond “yes” an activity occurs in the home, they are then asked to indicate how frequently the target behavior/activity occurs using a 7-point scale (Melhuish, et. al., 2008). The activities included focus on reading, learning letters, learning numbers, physical activities (e.g. dance, sports), writing, drawing, and painting. Scores on the HLEM have been predictive of achievement at age 5 and age 7 and has been shown to influence academic outcomes above and beyond family SES and parental education (Melhuish, et. al., 2008).
School Learning Environment

Extensive research has been carried out that illustrates that preschool attendance can positively impact childhood outcomes (Slavin et. al., 1994; Schweinhart et. al., 1993). When examining the impact attending preschool has on specific learning outcomes, Sammon, et. al., (2004), examined the relationship between preschool attendance and verbal and pre-reading skills in 2,857 preschool-aged children. Children were assessed using the British Ability Scales- II. Children were classified as “home” children, or those who had less than 50 hours of preschool experiences before entering kindergarten, and “preschool” children who had more than 50 hours of preschool experience. Significant differences were found between the home and preschool children on pre-reading, early number concepts, and language scores. On average home children scored 2.685 (SD 0.943; p>.05) points lower on pre-reading, 1.999 (SD 0.425; p>.05) points lower on early number concepts, and 2.541 (SD 0.526; p>.05) points lower on language scores than children who attended preschool. Interestingly, the gap between home children and preschool children widened with increased preschool experiences. For example, a child with 1 year of preschool experience scored on average 2.641 (SD 0.979; p>.05) points higher on pre-reading than a home child while a child with 3 years of preschool experience scored on average 4.633 (SD 1.135; p>.05) points higher than a home child. This pattern was significant at all levels of preschool experience from 1-3 years, and for all 3 areas assessed, illustrating how important preschool experience can be for children’s school readiness.
Although researchers seem to agree that preschool experience is important for a child’s readiness for school, there is less consensus about the best way to structure the learning experiences within the classroom. Additionally, the majority of research on preschool classrooms, has been carried out in publicly funded preschool programs, such as Head Start, that target children at-risk for school failure. In 2002, the Institute of Education Sciences began the Preschool Curriculum Evaluation Research (PCER) initiative at the request of the US Department of Education to examine the impact 14 preschool curricula (see Appendix A for a list) had on school readiness skill acquisition for low-income children. Classrooms serving low-income children were randomly assigned to a control or intervention curriculum, and children were followed from pre-kindergarten through their kindergarten year. Twenty-seven outcome measures were used to measure the children’s early reading skills, phonological awareness, language development, early mathematical knowledge, and behavior at both the end of preschool and the end of kindergarten. Additionally, aspects of preschool classroom quality, teacher-child interaction, and instructional practices were also explored.

Overall, it was found that no one curriculum was linked with superior student outcomes. Some were better at promoting language and literacy skills, while others were more effective with math or science skills. For example, in the preschool year prior to kindergarten, only *DLM Early Childhood Express* supplemented with *Open Court Reading Pre-K* had positive effects on reading, phonological awareness, and language. Only *Pre-K Mathematics* supplemented with *DLM Early Childhood Express Math* software positively affected mathematics. Both of these were also found to have a
positive impact into the kindergarten year along with *Curiosity Corner*, which was found to positively affect reading scores, *Early Literacy and Learning Model (ELLM)*, which positively affected language scores, and *Project Approach*, which related to low levels of negative behavior displayed within the kindergarten classroom.

When classroom outcomes were considered in preschool, 8 of the 14 curricula were found to have positive impacts on outcomes. For example, *Bright Beginnings* affected early literacy instruction and phonological awareness instruction, and *Creative Curriculum*, which was implemented by 2 different research teams during the study, was found to affect classroom quality, teacher-child interaction, early literacy instruction, and early language instruction, but for only the research teams implementing it. When *Creative Curriculum* was implemented with *Ladders to Literacy*, it affected early literacy instruction. *Curiosity Corner* affected early language instruction. *DLM Early Childhood Express* supplemented with *Open Court Reading Pre-K* affected phonological awareness instruction. *Doors to Discovery* affected early literacy instruction and early language instruction. *Let’s Begin with the Letter People* affected classroom quality and early literacy instruction. Finally, *Literacy Express* affected classroom quality and phonological awareness instruction (US Department of Education, 2002).

Despite positive findings for many of the curricula, there seems to be no one curriculum that is most effective in all areas of school readiness. However, there does seem to be preferences within Head Start programs about which curricula should be used. In the 2003 report, the Head Start Family and Child Experiences Survey (FACES) found in 43 Head Start centers, a majority of teachers reported using one of two curricula:
39.1% of teachers reported using the *Creative Curriculum* (Dodge, Colker, & Heroman, 2002), and 20% reported using *High/Scope* (Hohmann, & Weikart, 2002; Weikart & Schweinhart, 2005), which although was not included as one of the 14 curricula studied by the PCER, it is a curriculum that is frequently used in Head Start Centers and in research as a control curriculum. Bierman, et. al., (2008) also found that the majority of Head Start programs in the country use one of these two curricula.

Initially developed in the 1960-1970s, both *Creative Curriculum* and *High/Scope* utilize both large and small group activities throughout the day to emphasize child-initiated learning as well as positive teacher-child relationships. As part of the curriculum, teachers are also instructed to engage in scaffolding with individual children. This allows teachers to engage in activities that move the child toward educational objectives, but within the context of the child’s personal interest areas (Bierman, et. al., 2008). Larger group activities, such as games and musical activities provide a sense of classroom community and also serve as a practice ground for social skills and group problem solving (see Hohmann & Weikart, 2002; Dodge, Colker, & Heroman, 2002). Additionally, *High/Scope* teachers use formal “plan, do, review” sequences as well, which guide children in anticipatory planning, inquiry-guided exploration, and experimentation (Weikart & Schweinhart, 2005). Finally, both curricula also focus on parent involvement, encouraging parents to understand and assess what their child is learning through open communication with teachers and regular involvement in the classroom (Dodge, Colker, & Heroman, 2002). Interestingly, *High/Scope* was only used as a control curriculum in the PCER, and the outcomes for the *Creative Curriculum* were
mixed, with one research team finding positive outcomes and another finding none (US Department of Education, 2002). Although PCER seems to indicate that Creative Curriculum and High/Scope may not be the best preschool curricula available, FACES (2003) found classrooms using High/Scope or Creative Curriculum yielded higher total classroom quality ratings as well as classroom language scores, which focuses on the degree to which children are encouraged to use language-reasoning within the classroom. The publishers of High/Scope claim their curriculum has also been linked with long-term benefits such as higher high school graduation rates, less involvement in crime, and high employment rates (Schweinhart, et, al., 2005). The publishers of Creative Curriculum cite links between their curriculum and high levels of positive teacher behavior, and greater gains than control group children in caregiver-child interaction and classroom resource and demand use (Lambert, Abbott-Shim, & Sibley, in press).

Additionally, FACES data from 2000 to 2003 indicated that Creative Curriculum became even more popular with teachers after it was revised to include literacy activities. Teachers reported they were spending more time on literacy activities, reading, letter naming, writing, and phonics activities with the revised version of Creative Curriculum (Heid, Mann, Zill, Lombardi, 2003). Despite the fact that both High/Scope and Creative Curriculum programs have recently added literacy components into their programs, neither is rated by the Institute of Education Sciences’ What Works Clearinghouse (WWC) as providing strong literacy interventions for preschoolers (US Department of Education, 2009). A recent review of the literature involving Creative Curriculum by the WWC stated that Creative Curriculum was found to have “no discernible effects on oral
language, print knowledge, phonological processing, or math” (US Department of Education, 2009, para. 4). Instead, both curricula are often used as the control condition in studies of curricula that incorporate more focused school readiness or literacy learning interventions. For example, Farver, Lonigan, & Eppe (2009) used High/Scope as the control curriculum when investigating the impact of The Literacy Express Preschool Curriculum (Lonigan & Farver, 2002). In this study, 94 children enrolled in Head Start classrooms were randomly assigned to a curriculum for a 21-week period. The children who were assigned to the Literacy Express curriculum, which focuses on young children’s oral language, emergent literacy, basic math and science, and socio-emotional development, displayed higher levels of receptive vocabulary, definitional vocabulary, blending, elision, and print knowledge as measured by the Preschool Comprehensive Test of Phonological and Print Processing (P-CTOPPP; Lonigan, Wagner, Torgesen, & Rashotte, 2002) which is the developmental version of the Test of Preschool Early Literacy (TOPEL; Lonigan, Wagner, Torgesen, & Rashotte, 2007).

Han, Roskos, Christie, Mandzuk, & Vukelich (2005) compared Creative Curriculum to the Doors to Discovery curriculum in 5 Head Start classrooms and found that children who experienced the Doors to Discovery curriculum engaged in more meaningful talk, and had teachers who used more rare words and engaged in more vocabulary instruction than children in the Creative Curriculum classrooms. No differences were found in teachers’ degree of meaningful talk and vocabulary diversity between the two curricula.
Classroom Environment and School Readiness

These findings may lead some to inquire about what specifically can happen within a preschool classroom to promote each domain of school readiness. Although there is much research focused on specific interventions conducted in classrooms that focus on specific domains of school readiness or pre-literacy skills, there is little research concerning what the average classroom teacher does to promote readiness for kindergarten.

Science. In the literature there is a noticeable lack of research that specifically considers how preschool prepares children for learning science. In fact, Greenfield and his colleagues’ (2009) three-part study of school readiness in Head Start students was the only study of preschool science outcomes and curricula available. The authors not only found that children come to and leave preschool with low levels of science skills, they also suggest that one of the stumbling blocks to science achievement for preschoolers may be related to teachers’ lack of experience or comfort with the material. A series of focus groups were conducted with Head Start teachers to investigate why science achievement was less robust than other school readiness areas. They found that the majority of the teachers indicated they felt low levels of self-efficacy in teaching science, and despite being provided with science-related materials, teachers indicated they felt inadequately prepared to use them. Overall, teachers expressed difficulty with fitting all mandated areas of school readiness into their instructional day and expressed feeling more specific pressure to focus time on language and literacy activities. Thus, when prioritizing time for different mandated domains of school readiness, teachers found
themselves making time for language and literacy activities much more frequently than for other areas (Greenfield, et. al., 2009).

In the final phase of their study, Greenfield, et. al (2009) matched 9 control classrooms with 9 treatment classrooms to investigate the impact the integration of a science program into the current curriculum would have on school readiness outcomes. Teachers were instructed on how to teach a specific science unit using *Early Childhood Hands-On Science* (ECHOS). The program was designed for this study to provide teachers with appropriate science resources while boosting their confidence in their own ability to teach science. The teachers were also given help in making time for science activities within the daily schedule by integrating other school readiness domains within science activities. The program encouraged teachers to use direct instruction, guided discovery, and inquiry-based science exploration within the classroom. In December, teachers were introduced to 7 hands-on science units and encouraged to manipulate the materials and discuss the activities throughout the 2-day training. Teachers then were asked to implement a science unit in their classrooms and return in one month to discuss how it went. After teaching the unit, the teachers were then asked to incorporate an additional school readiness area into the unit. For example, if teaching a science unit on shells and sea life, the teacher was asked to brainstorm how also to incorporate language and literacy learning into the unit concurrently. Teachers continued to meet monthly throughout spring quarter to discuss and brainstorm teaching strategies as they related to science instruction and the incorporation of other school readiness domains in science activities. At the end of the year, children in the treatment group not only demonstrated
higher levels of school readiness in all eight domains, they also achieved higher levels of improvement in science scores from fall to spring than their peers in the control group. Although the intervention only lasted a few months, the authors argue that with proper training and support, teachers can be effective in instructing preschoolers in science while also focusing on other areas of readiness and literacy learning (Greenfield, et. al., 2009)

Reading. Although, not every preschool classroom utilizes all the strategies described in the literature, it is clear that what happens in preschool can have a positive impact on the children who attend the programs. For example, several studies have found that Dialogic reading, an interactive, discussion-based approach to reading with children, has shown promising results in promoting literacy skills in Head Start students (Justice & Pullen, 2003; Whitehurst et. al., 1999). Similarly, the Early Authors Intervention, which emphasizes highly meaningful language interactions with teachers and parents while writing and creating self-authored storybooks about their own life experiences, was found to boost language and literacy development for urban preschoolers. Likewise, increases for both quality of classroom literacy environment and level of parental involvement in the classroom were also found (Bernhard, Winsler, Bleiker, Ginieniewicz, & Madigan, 2008). Interestingly, the intervention was not focused on explicit teaching of literacy and language skills; instead, the program focused on the children and their parents working together to create a meaningful self-authored story. The assumption made by the authors was that by doing so, parents, children, and teachers would be more motivated to engage in literacy activities because the materials were personally important. Additionally, this approach allowed for the validation of minority children their identity, language, and
culture, all of which have been shown to be important factors in school success for minority children (Bernhard, Winsler, Bleiker, Ginieniewicz, & Madigan, 2008; Corson, 1999).

**Math.** When math outcomes are considered, curricula such as *Building Blocks-Foundations for Mathematical Thinking* (Building Blocks; Clements & Sarama, 2007), and *Preschool Mathematics Curriculum* (PMC; Klein, Starkey, & Ramirez, 2002) have been found to promote mathematical skills in preschool children. *Building Blocks* emphasizes the use of learning trajectories for individual children and consists of small-group mathematics sessions once per week for 10 to 15 minutes per session. Each group is made up of 4 to 6 children. Classroom wide activities are conducted for 5 to 15 minutes at a time, 4 times a week. The students also spent about 10 minutes, twice a week, on computer activities. Parent letters explaining the math concepts the children were learning, as well as family activities to support mathematics learning, were sent home each week as well. PMC also focuses on small-group activities, twice a week, for 15 to 20 minutes per day. Teachers also conduct whole-group math activities for about 10 minutes per day. Parent letters that outline math topics and family mathematics activities as well as *DLM Early Childhood Express* software are also used. Children use the software for 5 to 10 minutes twice a week. In their study, Clements and Sarama (2007) compared these two mathematics curricula with *Creative Curriculum* as a control curriculum. The authors found that both interventions were implemented by classroom teachers with good levels of fidelity, if provided with appropriate amounts of training and support. In this study, teachers attended 34 hours of focused group work and 16 hours of
in-class coaching. Both curricula were also found to have a positive impact on the quality of the mathematics instruction occurring in the classroom. On achievement outcomes, including verbal counting strategies, sequencing, identifying shapes, representing shapes, and patterning using the Early Mathematics Assessment, both curricula significantly increased students’ scores when compared to the control curriculum. All three curricula resulted in similar gains in object counting and comparing numbers. Building Blocks also produced larger gains than the other curricula in verbal counting, recognition of numbers, comparison of shapes, and shape composition. Overall, Building Blocks children appeared to use more sophisticated mental strategies and were more accurate in the use of strategies than children exposed to the other two curricula. These studies illustrate how classroom based activities can have a direct impact on readiness skills in preschoolers.

**Social-Emotional.** Social-Emotional gains have also been found when teachers implement specific activities designed to help increase children’s understanding of important social-emotional concepts such as friendship skills, understanding and expression of emotions, self-control, and social problem solving skills such as negotiation and conflict resolution (Bierman, et. al., 2008). For example, Domitrovich, Cortes, & Greenberg (2007) were able to increase Head Start students’ levels of emotional understanding and social competence using the Preschool PATHS program (Promoting Alternative Thinking Strategies; Domitrovich, Cortes, & Greenberg, 2007). The PATHS curriculum consists of 33 lessons that are presented by the classroom teacher during daily circle time. Teachers use modeling stories and discussions, puppets, character photographs, and teacher role-play demonstrations during each lesson. Extension
activities (e.g., cooperative projects and games) are included in each lesson as well, and provide children with opportunities to practice the target skills with teacher support. Bierman, et. al. (2008) also implemented PATHS in Head Start classrooms and found increases in social emotional skills. For this study, teachers taught one PATHS lesson and conducted one extension activity each week. Generalized teaching strategies were also encouraged with in-classroom mentoring. During mentoring, teachers were encouraged to engage in positive classroom management, the use of praise and support, emotion coaching, and induction strategies to promote appropriate self-control. The results indicated modest effects for the children’s emotional understanding and social problem solving. Smaller, non-significant positive trends were seen for parental reports of level of aggression and teacher reports of social competence.

Similar effects have also been seen with interventions such as the Incredible Years (Webster-Stratton, 2000). The Incredible Years Child Training curriculum, or Dinosaur School, was originally developed to treat clinic-referred children (ages 3–7 years) diagnosed with oppositional defiant disorder or early-onset conduct problems. The program was revised to be used by teachers in early education classroom settings such as preschool and kindergarten to help prevent at-risk children from developing conduct related disorders (Barrera, et. al., 2002). Dinosaur School is implemented up to 2-3 times a week by teachers in the classroom using life-size puppets, picture cue cards for non-readers, and games. During 20-30 minute circle time lessons and small group practice activities throughout the school day, the children are taught about pro-social behaviors such as being a good friend, anger management, and emotional understanding and
expression (Webster-Stratton, Reid, & Hammond, 2004). The program also includes letters to be sent home to parents with suggestions for home activities parents can do with their children. These activities reinforce the classroom learning and promote parent involvement. Webster-Stratton, Reid, & Stoolmiller (2008) provided Head Start teachers with a 4-day training in Dinosaur School and positive classroom management strategies over 4 monthly training sessions. Teachers were taught how to develop positive relationships with students and their families, how to use praise and encouragement in effective ways, how to target prosocial behavior using incentive programs, how to set up hierarchical discipline strategies for the classroom, as well as how to develop specific behavior plans for children who are identified as having issues with problem behaviors. Parental involvement was encouraged by weekly letters home about what the children were learning in Dinosaur School, Dinosaur homework that was to be completed with parents, and encouraging parents to visit the classrooms regularly. Children received 30 Dinosaur School lessons over the school year, and teachers were encouraged to promote those skills taught in Dinosaur School during less structured classroom times, such as on the playground and during lunch.

Results indicated that teachers who implemented the intervention were less harsh/critical, warmer, and more affectionate as rated using the Teacher Coder Impression Analysis. They were also more consistent and less permissive than teachers in control Head Start classrooms. Classroom observations using the Coder Observation of Classroom Adaptation (COCA-R) indicated that children who received the intervention showed significantly more improvement in emotional self-regulation, social competence,
and conduct problems compared to control student’s classroom behavior. Intervention teachers also reported feeling more bonded to the children and their parents. Overall, the authors suggest that interventions such as these, which focus on social-emotional development, can have a positive impact on children’s school competence.

**Physical Development and Creative Arts.** Although included in Head Start legislation as important factors in overall school readiness, physical development interventions as well as creative art interventions are not highlighted on the US Department of Education What Works Clearinghouse website. Similarly, few studies focus on specific interventions for these areas currently. When physical activities in preschool are explored, most often, interventions focus on how to reduce childhood obesity in preschoolers. In a review of studies from 1986 to 2007 of preschooler’s activity level, Tucker (2008) found that nearly half of the 10,000 children studied did not engage in recommended levels of physical activity daily. Tucker also called for more physical activity interventions for preschools with more objective guidelines for what constitutes physical activity in the classroom and on the playground.

When art interventions are considered, little information is available. However, Seeman (2008) did find that teaching at-risk preschoolers music skills did result in increases in receptive language and phonemic awareness scores on the Peabody Picture Vocabulary Test (PPVT-III; Dunn & Dunn, 1999) and Teacher Rating of Oral Language and Literacy (TROLL) respectively. Additionally, children who participated in the intervention generalized their knowledge of music both within the classroom and home.
environments. The author also noted increases in musical identity and self-esteem, and continued practice of music activities in the classroom following the intervention.

**Children in Poverty**

Currently, it is estimated that nearly 1 in every 5 children in the United States lives in poverty (Wight & Chau, 2009). Of the 25 million American children under the age of 6, 44% live in low-income families, which are defined as families making no more than 200% of the federal poverty level. The 2010 federal poverty level for a family of four is $22,050 (U.S. Department of Health and Human Services, 2010). Thus, a family of four making less than $44,100 in 2010 would be considered low-income. Research supports the notion, that on average to adequately meet the most basic needs of a family of four, at least twice the federal poverty level annual income would be needed (Cauthen & Fass, 2008).

Family characteristics of children living in poverty often differ from their more advantaged peers. Specifically, having more highly educated parents decreases a child’s risk of living in poverty. Currently, of children under age six living in low income families, 87% have at least one parent with less than a high school diploma, 68% have at least one parent with a high school degree, and only 26% have at least one parent with some college experience or more (Wight & Chau, 2009). Children under age 6 who live in poverty also are nearly 3 times more likely to come from single parent homes, are more likely to live in urban or rural areas than suburban areas, are more likely to have moved in the last year, are less likely to live in a family-owned home, and are more likely
to be African-American, Hispanic, or Native American. For example, of children under age 6, 69% of Native American children, 64% of African American children and Hispanic children, 30% of white children, and 26% of Asian children are members of low-income families (Wight & Chau, 2009).

**Poverty and School Readiness**

It has been long understood that the number of children living in poverty is concerning, due to the risk of both developmental and academic failure living in poverty brings (Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001; Brooks-Gunn, Duncan, & Aber, 1997; Alpern, Lyons-Ruth, 1993). In 1965, the Head Start Project was developed as part of President Johnson’s “War on Poverty”. At the time, nearly half of all American children were reported to be living at or below the poverty line (Zigler, Gordic, & Styfco, 2007). As a result, the Office of Economic Opportunity (OEO) was developed to determine the best way to eradicate poverty from society. A panel of experts assembled by the OEO determined that poverty was a reversible problem; however, the panel also felt that for the cycle of poverty to be broken, intervention for children needed to occur prior to the transition to kindergarten (Vinovski, 2005). The panel’s solution focused on the development of childcare centers designed specifically to meet the needs of disadvantaged children. It was determined that enrolling disadvantaged children in traditional, middle-class daycare centers and nursery schools scarcely did more than provide them with nutritious lunches (Berkowitz, 1980). Instead, the panel stated that new centers that taught children “modes of learning to understand, on a more abstract level, the world of things and people, of communities with others, and developing
attitudes conducive to school learning” (U.S. Department of Health, Education, and Welfare, 1962, pp. 13-14) were needed to successfully address the inadequacies in education and home environment often experienced by America’s disadvantaged children. In describing Head Start to Congress in 1965, the OEO stated that the program would emphasize efforts to improve the “health and physical abilities of the poor, develop their self-confidence and ability to relate to others, increase their verbal and conceptual skills, involve parents in activities with their children, and provide appropriate social services for families” (Office of Economic Opportunity, p. 59). The assumption was that socially competent children would be more successful not only in school, but in all aspects of societal functioning, and as a result, they would also be better equipped for economic success in the future. Through the years, Head Start’s mission, as expressed through Head Start legislation, has become decidedly more focused on preparing children for school. The Improving Head Start for School Readiness Act of 2007 (P.L. 110-134) reauthorized Head Start through September 30, 2012. The purpose of the program underscores Head Start’s role in improving the school readiness of low-income children by enhancing their cognitive, social, and emotional development. Head Start classrooms are expected to be supportive of “children’s language, literacy, mathematics, science, social and emotional functioning, creative arts, and physical skills” (The Improving Head Start for School Readiness Act of 2007, sec 2).

Although Head Start has not yet eradicated poverty from America, research does support the notion that the average graduate of Head Start gains many important school readiness skills while attending the program. Specifically, FACES (2003) found that
Head Start graduates are able to: identify 10 basic colors by name, count 11 objects, and identify at least 10 letters of the alphabet. In 1997-1998, Head Start students came to the program in the fall being able to identify 3.7 letters, and by spring, they could identify 7.3. By spring 2001, students knew 9.4 letters and in spring of 2004, students could identify 10.1, meeting the Congressional standard of knowledge of 10 letters for the first time. Head Start graduates also can identify the front cover of a story book and open it to start reading, use classroom free time in acceptable ways, help put work materials away, follow the teacher’s directions, join in activities without being told, follow the rules when playing games, wait their turn in a game, accept classmates’ ideas for play, and invite others to join in activities (FACES, 2003).

However, FACES (2003) research also indicated that Head Start students are still behind their advantaged peers in answering simple story comprehension questions and knowing that in English, one reads from left to right and from top to bottom. It was also found that parental involvement was related to higher emergent literacy scores and math scores, as well as higher levels of pro-social behavior. Specifically, paternal involvement, regardless of whether the child resides in a single or two parent home was related to lower levels of aggressive behavior, hyperactive behavior, as well as fewer overall behavior problems reported at school. Similarly, Barbarin, et. al., (2006) found that for 501 children enrolled in publicly funded pre-k programs in 5 states, children from poor families (defined as 150% of the federal poverty level) scored significantly lower on standardized measures of receptive language, letter identification, and math than non-poor. Scores for color identification were not significantly different for the two groups.
Greater academic scores were also seen with higher levels of parental education, and living in a home with multiple adults. This is also consistent with the National Center for Children in Poverty’s report by Klein & Knitzer (2007) which found that developmentally, children living in poverty are 18 months behind at age 4 years and this gap persists through the age of 10 years. When school readiness concepts such as reading, math, and general knowledge are specifically examined across income-levels, only the top 20% of income earning families in the United States have children scoring at the optimal developmental level for all areas. Interestingly, as family income decreases, the child’s level of school readiness achievement also decreases (U.S. Department of Education, 2004). The change in school readiness scores with family income has been found to be gradual, meaning that children’s school readiness scores do not jump substantially toward the optimal level once a family exceeds low-income status. This is especially concerning, since often only the poorest families qualify for targeted, publicly funded preschool programs. For example, in Ohio, to qualify for the child care/early education subsidy (Title XX funding), families cannot earn more than 200% of the federal poverty level. Thus, if a family of four makes 250% of the poverty level or $55,125 a year, they do not qualify for assistance for preschool programming for their child, but also, most likely, cannot afford high quality preschool if such a program exists in their neighborhood (U.S. Department of Education, 2004). Overall, there seems to be a strong link between living in poverty and school readiness.
Poverty and Attachment

Family poverty is often associated with chronic stressors and negative life events that adversely impact parent-child attachment relationships (Duncan, Brooks-Gunn, & Klebanov, 1994; McLoyd & Wilson, 1992). Past research has also shown that children with difficult life circumstances often develop insecure attachments (Lyons-Ruth, Connell, Grunebaum, & Botein, S., 1990) and the impact for preschool aged children is strongest when poverty is persistent (Duncan, Brooks-Gunn, & Klebanov, 1994; Duncan, Yeung, Brooks-Gunn, & Smith, 1998). In their 2003 study, Diener, Nievar, & Wright measured attachment relationships between low income children ages 12 months to 57 months and their mothers. The authors found that attachment scores in this low-income sample were lower than scores typically found in middle class samples. More specifically, maternal characteristics, including level of education and depression, and contextual characteristics, including number of play materials available in the home, account for nearly 25% of the variance in attachment scores. Interestingly, child characteristics such as temperament did not contribute significantly to attachment scores. A total asset score was also calculated to estimate the degree of cumulative resources families had in terms of maternal, child, and contextual factors. When this score was correlated with mother-child attachment scores, it was found that children with more cumulative assets experienced higher levels of attachment with their mothers. These results suggest that there is a cumulative effect of risk factors. The more risk factors a child experiences, the more likely they are to experience an insecure attachment relationship. When families were scored on total assets and separated into three groups
(high, middle, and low assets) it was found that those families with low income but high levels of assets scored similarly in attachment security to middle class, highly educated families.

Nievar & Becker’s (2008) meta analysis concerning maternal sensitivity and attachment for children from lower income families also suggests that lower-income families are at significant risk for insecure attachment. Their analysis found that maternal sensitivity in low-income families has less of an effect on mother–infant attachment than for more financially advantaged families. It may be the case that the extreme environmental conditions many families living in poverty experience may disrupt the formation of attachment despite steps taken by mothers’ to engage in positive parenting behaviors.

Overall, it has been found that children at risk for insecure attachments with parents are at greater risk for developing and maintaining insecure attachments with teachers as well. If a child learns at home that adults are inconsistently meeting their needs and cannot be trusted, that child arrives at school only understanding that adults are inconsistent and not trustworthy (Sroufe, 1983). Likewise, teachers vary in their ability to build secure attachments with children and overcome the child’s preconceived notions about adult-child relationships (Howes & Hamilton, 1992).

**Poverty and Learning Environments**

In examining differences in home environments between income groups, Bradley, et. al. (2001) examined data from nearly 30,000 children who participated in the National Longitudinal Study of Youth from 1986 to 1994. The examination found marked
differences in home environment characteristics between low-income families and their financially advantaged peers. For example, for children between 3 and 5 years of age, significant effects for poverty were found across ethnic groups, including how often parents spank, how often they read to their child, how many books the child owned, how often the child was taken on social outings (to the park, on a picnic, to the store, etc), how often the child was taken on educational outings to a museum, how often parents taught numbers, letters, colors, shapes, and sizes, how many magazines the family had in the home, how much television the children watched, whether the child saw his/her father or father figure on a daily basis, and how often the child ate dinner with both his/her mother and father or father figure. Although when considered separately, each item listed above may seem insignificant in its individual impact of a child’s home experiences, when taken together, this study illustrates the qualitative differences that can exist in this country between the home experience of children living in poverty and their peers who do not.

Although children living in poverty are at-risk for lower quality home learning environments, Foster, Lambert, Abbott-Shim, McCarty, & Franze (2005) found in a sample of 325 Head Start families that home learning environment experiences mediated the relationship between socioeconomic status and school readiness. For this study, home learning environment was defined as reading to the child, engaging in enrichment experiences outside the home, participating in learning and play activities in the home, and having reading materials available in the home. School readiness was defined as emergent literacy competency as measured by The Peabody Picture Vocabulary Test—
Third Edition (PPVT-III; Dunn & Dunn, 1997), The Early Phonemic Awareness Profile (Dickinson & Chaney, 1997), and parent reports of child literacy and language development (FACES, 2003). When children at risk for low school achievement due to poverty experience higher quality learning environments, the impact poverty has on the child’s readiness for school can be lessened. Specifically, the quality and frequency of home learning experienced enhanced emergent literacy scores by lessening the impact lower socioeconomic statuses had on the children’s learning outcomes (Foster, et. al, 2005).

As is the case in Foster, et. al., (2005), often school readiness is conceptualized in the literature as pre-literacy skills. When home literacy activities are considered specifically, Adams (1990) found that, on average, middle class American children experienced between 1,000 to 1,700 hours of one-on-one picture book reading with an adult before entering kindergarten. However, children from low-income families, on average, experienced a total of 25 hours of book-reading with an adult prior to starting school. Similarly, Whitehurst et. al., (1994) found that in a sample of African American, Hispanic, and White families, low income parents from all cultural backgrounds read to their children half as often as their middle-class counterparts. These children also displayed significantly below average vocabulary and expressive skills as measured by the PPVT-R (Dunn & Dunn, 1981) and the Expressive One Word Picture Vocabulary Test (Gardner, 1990). Such differences may be due in part to parental beliefs about learning to read. Specifically, Sonnenschein et. al. (1997) found that low-income parents tend to see learning to read as a skill that must be learned, and thus engage in more direct
teaching and less entertainment based book reading with their children than other income groups. For these families, reading with their child had only one function: to teach reading.

When classroom learning environment is considered, the qualitative differences in classroom experiences between poor children and their peers not living in poverty have long been documented. For example, in *Savage Inequalities*, Jonathan Kozel (1991), documents the vast differences in educational environments, experiences, and funding provided for children in this country for children of poverty versus their more advantaged peers. In describing the differences in school experiences between Chicago’s public school students and their peers attending the more affluent suburb, Winnetka, Kozel explains how often schools and students in poorer areas seem to have to choose between services and experiences to which their more advantaged peers automatically have access:

What rule it is that says poor children in Chicago have to choose between a glass of milk when they are three years old and a glass of milk when they are seven [?] The children of Winnetka do not have to make this choice. They get the best of preschool and the smallest class size in their elementary schools (and they also get superior healthy care, and they also get a lot of milk). This is like exhorting [poor students], “You can have more crayons; or you can be given a real teacher; or you can have a Bunsen burner someday in high school science laboratory. But you cannot have all three. You’ll have to choose” (p.79).

Often when children attend schools in poorer neighborhoods limited resources translate into limited services and eventually discussions need to be made about which services are most important. In the case cited by Kozol in Chicago, the plan to implement guaranteed preschool for all students was not funded by the state or local governments and thus only occurs for those children whose parents can afford it. Thus, the gap
between economically advantaged and disadvantaged students persists, and at times worsens, as they progress through school. Additionally, Kozol points out that even if funding is provided for all students to receive equal educational opportunities, when poor children arrive at school less ready to achieve than their peers, “equal opportunity across the board will not automatically produce equality in school performance” (Kozol, 1991, p 77). As a an interviewee pointed out to Kozol, “one doesn’t force a losing baseball team to play with [only] seven men” (Kozel, 1991, p. 77) however the educational experiences of many preschoolers expect just that; that they make more progress than their advantaged peers with less resources, support, and cultural collateral.

In Valerie Polakow’s review of the classroom experiences of poor children she found that poor children are often marginalized, humiliated, and excluded in classrooms designed to meet their needs. Often preschool classrooms are highly structured and assume that all children arrive with an understanding of what is expected. Children are labeled at-risk for being restless, for failing to follow directions, for being so hungry they cannot wait patiently for snack, and for simply not understanding what to do next (Polakow, 1993). Clearly, this type of educational experience is not effective. Instead, Polakow believes that early intervention programs instead need to:

move away from regulation and compliant, and toward….a perspective that promotes autonomy and empowerment for children in classroom…We also need to begin looking at what the child can do and likes to do, rather than emphasizing what the child cannot do or should not do. To build toward the pedagogy of equity for poor children, we need to think toward the…building [of] imagines that see poor children as resilient and at “at-promise” (p. 172-173) as opposed to “at-risk”.

64
This literature review has found clear links between school readiness, parent-child attachment, home learning activities, teacher-child attachment, and classroom learning environment. Additionally, children from lower-income families appear to be a risk for lower school readiness achievement. However, no specific investigation of how the four may relate and how the combinations of these factors may differ for children living in poverty were found. The current study is proposed to explore these relationships.
Chapter 3: Methods

Research Design

The current study utilized a non-experimental, correlational research design to analyze the relationship between naturally occurring phenomena (Crano & Brewer, 2002). A correlational methodology was selected because it allowed for the examination of preexisting factors in preschooler’s experiences and how they relate to school readiness. This nonprobability method is an appropriate design given the focus of the research is to describe existing relationships, and as a result, lacks both the manipulation of variables and random sampling (Thompson, Diamond, McWilliam, Snyder, & Snyder, 2005).

Sampling Procedures

Non-probability, convenience sampling was used. Although this method of sampling is not ideal, it is often found to be acceptable for preliminary or exploratory educational research, such as the current study, to ascertain a gross estimate of results (Crano & Brewer, 2002). Children were recruited through the use of letters. The first letter (see Appendix B) was sent to district managers for KinderCare Learning Centers and the director of CDC Head Start explaining the project and inviting their organizations to participate. After letters of support were obtained from both organizations, an application
was submitted to the Institutional Review Board (IRB) at The Ohio State University. Once approval from the IRB was gained, invitation packets were sent home with all 3-5 year old children attending the study centers. The invitation packet included an invitation letter to parents explaining the study and requesting their and their child’s participation, a consent form, the Parent Questionnaire, and a raffle ticket (see Appendices D, E, F, respectively). Phone interviews or home visits were offered for those families requiring assistance in completing the forms; however no families requested this assistance.

**Instruments**

For this study, three measures were used. First, parents were asked to complete the Parent Questionnaire (Appendix C). The Parent Questionnaire included two parts: one that addressed the home learning environment and one that addressed parent-child attachment relationship. The questions that assess the quality of the home learning environment were taken from Melhuish, et. al.’s (2008) Home Learning Environment Measure (HLEM). The HLEM consists of 8 questions that ask parents to indicate if target behavior/activity occurs in the home environment. When parents respond “yes” an activity occurs in the home, they are then asked to indicate how frequently the target behavior/activity occurs using a 7-point scale (Melhuish, et. al., 2008; see Appendix D for scoring instructions). The target activities included reading, learning letters, learning numbers, physical activities (e.g. dance, sports), and writing, drawing, and painting. These areas are somewhat consistent with the Ohio Department of Education’s (ODE) pre-kindergarten learning standards. To align the Parent Questionnaire more fully with ODE’s pre-kindergarten standards, two additional questions were added to inquire about
whether children are taught about social studies and science concepts in the home. The second portion of the Parent Questionnaire was taken from the Kinship Center Attachment Questionnaire (KCAQ; Kappenberg & Halpern, 2006), which was developed to screen children for attachment difficulties, as well as to monitor changes in attachment in younger children and has been successfully used with children under the age of six. The KCAQ is comprised of 20 behaviors associated with insecure attachment behavior. Parents were asked to indicate how frequently their child displays each behavior using a 7-point scale. For this study, raw scores were then reversed so that higher scores indicate higher levels of attachment security and lower scores indicated less secure attachments. The measure includes 6 positively worded statements which do not require reversal (Kappenberg & Halpern, 2006; see Appendix E for scoring instructions).

The second measure used was the Teacher Questionnaire (Appendix F), which is identical in content to the Parent Questionnaire. Both the learning environment and attachment sections of the Parent Questionnaire were modified to be appropriate for teachers to answer about the children in their classroom (see Cugmas, 2007, for similar adjustment to existing measures for a school setting). Given that the home learning environment questions included important aspects of home learning that research and legislation also suggest are also important learning experiences within a classroom (including: reading, numeracy, alphabet, art, music, sports, and exposure to books), few modifications were needed to create the teacher version of the questionnaire. Specifically, teachers were asked if the target learning activity occurs in the classroom and how often they occur without the use of the term “your child”. Instead, teachers were asked to
respond about the general experience of children in the classroom. Using the same rating scale for quality of learning environment across settings will also allow for more direct comparisons of home and school environment ratings. Likewise, few adjustments were needed for the attachment portion of the questionnaire to make it appropriate for classroom teachers. Specifically, in all questions, the statement “my child” was changed to “this child”. Otherwise, the measure is identical to the parent questionnaire.

Given that the majority of teachers who participated had more than one student participate in the study from their classroom, the classroom learning environment questionnaire was completed once by all teachers with participating students. Each teacher was also asked to complete the attachment questions for each participating child individually.

The final measure used was the Bracken School Readiness Assessment-Third Edition (BSRA-3, 2007). The BSRA-3 is a standardized assessment for children ages 3:0 to 6:11 that calculates a School Readiness Composite (SRC) score, as well as percentage mastery scores for several subtests that relate to concept knowledge and receptive language skills including Colors, Letters, Numbers/Counting, Size/Comparisons, and Shapes. The BSRA SRC has a mean of 100 and standard deviation of 15. The BSRA-3 directly assesses children on 18 standards included in the Ohio Department of Education pre-kindergarten standards (Ohio Department of Education, 2004). The measure has been found to be a valid predictor for students of different races and both genders (Panter, 2000). Although the BSRA-3 is a fairly new version of this assessment, the Bracken Basic Concept Scale SRC (Bracken, 1989), from which the BSRA was developed, was
found to successfully differentiate between average and at-risk preschoolers (Stebbins & McIntosh, 1996) predicted performance on the Weschler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R; Wechsler, 1989; Laughlin, 1995), and correlated highly with the Stanford-Binet-IV (Thorndike, Hagen, & Sattler, 1986) with African American preschoolers (Howell & Bracken, 1992). The BSRA has also recently been found to predict children’s reading readiness, rate of retention, and rate of referral for special education services (Panter & Bracken, 2009).

Data Collection Procedures

After gaining permission to distribute invitation packets to parents from both KinderCare and CDC Head Start, parents were provided with the invitation packet and an envelope for returning all materials. Parents returned all information in the sealed envelope, and placed it in a lock box in the center’s lobby. Parents who chose to complete the raffle ticket included in the invitation packet returned them to a separate raffle box located in the center’s lobby. Those children with permission were assessed using the BSRA-3 at the preschool, in a quiet area. Children were given stickers, a certificate of completion (Appendix G), and a magnet at the conclusion of testing.

The teachers of participating children completed the Teacher Questionnaire for each participating child. Completed teacher questionnaires were placed in sealed envelopes and placed in the study’s collection box. Teachers also had the option of completing a ticket indicating what type of gift card they would like as a thank you for participating. This ticket was placed in the raffle box. Data was collected from February 2010 to June 2010.
Study Variables

Demographic information. Demographic information was collected for all children concerning age, gender, race, family income level, mother’s level of education, total years attended preschool, length of program year, and information about the classroom they attended. When collecting information about a family’s income, research points out that parents are often hesitant to reveal annual income; thus, when studying children, programs which base participation on the federal poverty line can be used to estimate family income (Entwisle & Astone, 1994; Bradley & Corwyn, 2002). Therefore, information about families’ eligibility for Title XX childcare funding was collected. To qualify for Title XX, families cannot earn over 150% of the federal poverty line for initial participation and not over 200% for ongoing participation (ODJFS, 2009). Family who reported being eligible for Title XX, were coded “lower income” and those who indicated they did not qualify were coded as “higher income or 1”. This approach was chosen because it mirrors the State of Ohio’s current procedure for identifying at-risk preschoolers.

Dependent variable. The dependent variable will be school readiness composite score on the BSRA-3. The BSRA-3 school readiness composite (SRC) has a mean of 100 and standard deviation of 15. The BSRA-3 includes 5 domains (Colors, Letters, Numbers, Size/Comparisons, and Shapes) and directly assesses children on 18 standards included in the Ohio Department of Education pre-kindergarten standards (Ohio Department of Education, 2004). The BSRA-3 has been found to be age and culturally
appropriate for children from different backgrounds, cultures, and socioeconomic statuses (Community Research Partners, 2007).

**Independent variables.** The independent variables for this study included home learning environment quality, and parent-child attachment quality, which are measured by the Parent Questionnaire (part A and B, see Appendix H), and classroom learning environment quality and teacher-child attachment quality, which are measured by the Teacher Questionnaire (part A and B, see Appendix F). Thus, parallel scores for learning environment quality and attachment were obtained for each child’s home and classroom. Learning environment quality scores are summative, with high scores indicating high quality learning environments, as a result of higher frequency of the positive target behavior (Melhuish, et. al., 2008). Scores for learning environment quality can maximally range from 0 to 80. Attachment scores are also summative, with higher scores indicating more secure attachment behavior. Scores for the attachment quality can range from 0 to 120, maximally.

**Issues of Validity and Reliability**

**Issues of validity.** For the current correlational study, several threats to internal validity exist that were addressed. First, subject characteristics can impact correlational research when there is a relationship between two or more characteristics of the individuals in the sample which may be explained by confounding variables which are not accounted for in the research design (Wallen & Fraenkel, 2001). For example, for the current study, steps were taken to accurately measure all variables of interest that may be contributing to the relationship between school readiness and the independent variables.
More specifically, the type of demographic information collected about the children and their families has been found in the research to relate to school readiness outcomes. Namely, information about how long each child has attended preschool, their gender, and the level of mother’s education was collected so that they could be controlled if necessary. Additionally, steps were taken to ensure that all parents and children, regardless of reading ability or native language, could participate equally through the use of phone interviews, home visits to complete questionnaires, and interpreters. It is also important to note that the measurement of all variables was directed by research and theory, as to not violate the assumptions of correlational methods such as regression analysis, which assume that no relevant independent variables are excluded, nor any irrelevant independent variables are included (Hair, Black, Babin, Anderson, & Tatham, 2006).

A second threat to internal validity was location. When the instruments utilized in a study are not administered in identical environments, differences in the environmental experiences during testing, and not in the variables under study, may be responsible for differences in information gleaned from the instruments (Walen & Frankel, 2001). Thus, steps were taken to standardize both the environments in which the preschoolers’ school readiness skills were assessed, as well as the way in which information about both the home and school environments was collected. Standardization rules were adhered to when assessing school readiness. Additionally, all information provided to parents and teachers was identical. A protocol was also developed to address how to request each child’s participation in the classroom and how to respond if the child refused to
participate. However, all children participated willingly, most were very excited to work with the examiner.

Other possible threats to internal validity are instrument decay, data collector bias, and data collector characteristics (Crano & Brewer, 2002). However, for this project, the likelihood that the nature of the scoring procedure for the instruments used changed over time is low. All testing was completed within a 4 month period and standardized measures of school readiness, home environment, and classroom environment were used, thus helping to control for variation in rating of responses and scoring of the instruments. The use of standardized instruments also reduced the risk of collector biases as well. Data collector characteristic threats appear to have been unlikely due to the use of standardized measures. However, it may have been the case that children respond differently based on the examiner’s gender, age, ethnicity, language, or other personal characteristics. However, the majority of the children had a female teacher and all had experience with female teachers, assistant directors, and directors in their centers of similar background and age as the examiner. Additionally 2 data collectors were used, which can help to minimize the threat. Preliminary correlations conducted to check for relationships between examiners and the children’s scores were nonsignificant, \( t(168)= -1.68, p<.05 \).

To avoid extraneous events or history threats to internal validity, teachers were consulted about the best times for testing of students prior to scheduling testing sessions and children were always asked if they would like to come with the examiner. On the two
occasions the children refused initially, they were asked once more at a later time or day and all willingly participated.

The attitude of subjects may also threaten internal validity. If children, parents, or teachers do not take the instruments they complete seriously, or if they deliberately distort their answers in an effort to appear a particular way, validity of the instruments, as well as the study in general, may be affected. This is especially true if the degree to which participants answer varies by group characteristics. For example, if parents from higher-income families answer in ways that they believe make them look like better parents, while lower-income families answer honestly, differences in outcomes could be found that are not the result of the measured variables. To address this, standardized measures were used that have been found to be reliable and valid, and steps were taken to stress to parents that all responses were confidential and that honest answering was important for the study to learn more about how preschoolers learn.

Due to the lack of random sampling for the proposed study, external validity, or the ability to generalize findings to the larger population, is significantly limited (Wallen & Fraenkel, 2001). However, for this study, the goal is exploratory in nature. More information is needed about the role home and classroom environments play in preparing both high- and low-income children for school in order to gain a better understanding of how such variables may relate, and how future interventions and experimental analyses should be undertaken. Steps will be taken to make clear that the findings of this study are not representative of the larger population of preschoolers, and instead, are specific to those who participate.
Chapter 4: Results

Participants

The sample for this study consisted of 171, 3- to 5-year-old preschool students with a mean age of 4.2 years. Initially, 691 children in 19 different centers were invited to participate. All participants were recruited from preschool programs and daycare centers in and around the Columbus, Ohio, area through the use of packets. Each packet included a letter inviting parents and children to participate, a permission form, and a family background questionnaire (see Appendix H). For families who did not return the permission form and background questionnaire, reminder fliers were sent home 1-3 weeks after the initial packets were distributed. At each center, the director was consulted about ways to increase response rates. All declined having a parent meeting or resending the full packet; however, all indicated that a reminder flier would be most effective and was most consistent with the center’s policy about parental contact. All directors also indicated that the return rate was typical for their centers.

For each participating child, the background questionnaire was completed by the primary caregiver and yielded demographic information about the child, as well as their preschool experience and home life.
Table 1

Demographic Information for Full Sample

<table>
<thead>
<tr>
<th></th>
<th>Income Group</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Full Sample</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>N</td>
<td>171</td>
<td>82 (.71)</td>
<td>89 (.69)</td>
</tr>
<tr>
<td>Age in Years</td>
<td></td>
<td>4.27</td>
<td>4.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.20)</td>
<td>(4.20)</td>
</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>African American</td>
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<td>7</td>
<td>34</td>
</tr>
<tr>
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<td>3</td>
<td>19</td>
</tr>
<tr>
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<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
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</tr>
<tr>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>94</td>
<td>43</td>
<td>51</td>
</tr>
<tr>
<td>Female</td>
<td>77</td>
<td>39</td>
<td>38</td>
</tr>
<tr>
<td>Mother’s Age in Years</td>
<td></td>
<td>35.2</td>
<td>30.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.27)</td>
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<tr>
<td></td>
<td></td>
<td>32.63</td>
<td>(5.96)</td>
</tr>
<tr>
<td>A Female Caregiver Living in the Home</td>
<td>171</td>
<td>82</td>
<td>89</td>
</tr>
<tr>
<td>Mother</td>
<td>168</td>
<td>81</td>
<td>87</td>
</tr>
<tr>
<td>Step-mother</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Grandmother</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mother’s Highest Level of Education</td>
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<td></td>
</tr>
<tr>
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<td>6</td>
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<td>5</td>
</tr>
<tr>
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<tr>
<td>Bachelor’s Degree</td>
<td>43</td>
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<td>9</td>
</tr>
<tr>
<td>Graduate’s Degree</td>
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<td>7</td>
</tr>
<tr>
<td>Male Caregiver’s Age in Years</td>
<td></td>
<td>37.39</td>
<td>34.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.48)</td>
<td>(9.51)</td>
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<tr>
<td></td>
<td></td>
<td>36.10</td>
<td>(7.48)</td>
</tr>
<tr>
<td>A Male Caregiver Living in the Home</td>
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<td>72</td>
<td>46</td>
</tr>
<tr>
<td>Father</td>
<td>109</td>
<td>72</td>
<td>37</td>
</tr>
<tr>
<td>Step-father</td>
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<td>5</td>
</tr>
<tr>
<td>Grandfather</td>
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<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
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<td>1</td>
</tr>
<tr>
<td>Male Caregiver’s Highest Level of Education</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>12</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>High School Diploma</td>
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<tr>
<td>Vocational School/Associates Degree</td>
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<td>9</td>
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<tr>
<td>Bachelor’s Degree</td>
<td>30</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
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<td>18</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Primary Caregiver</td>
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</tr>
<tr>
<td>Mother</td>
<td>164</td>
<td>77</td>
<td>87</td>
</tr>
<tr>
<td>Father</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Grandmother</td>
<td>1</td>
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<td>1</td>
</tr>
<tr>
<td>Length of School Day</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Half Day</td>
<td>31</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Full Day</td>
<td>140</td>
<td>61</td>
<td>79</td>
</tr>
<tr>
<td>Length of School Year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 months a year (summers off)</td>
<td>33</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>12 months a year</td>
<td>138</td>
<td>62</td>
<td>76</td>
</tr>
<tr>
<td>Location of Center</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>28</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>Suburb</td>
<td>143</td>
<td>77</td>
<td>66</td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses are standard deviations.
Of the 171 participating children, about half (86) were identified by their caregivers as being Caucasian (50.3%), 41 were African American (24%), 22 were Biracial or Multiracial (12.9%), 10 were Hispanic (5.8%), 5 were Asian/Pacific Islander (2.9%), 5 were Indian (2.9%), and 1 individual each were identified as American Indian (0.6%) and African (0.6%). Forty-five percent (77) of the sample were female and 55% (94) were male. Fifty-two percent (89) of the families indicated they qualify for Title XX assistance, which for this study will be represented as “lower income”.

Of the primary caregivers who completed the background questionnaire, nearly all were mothers (95.9%). Six of the questionnaires were completed by fathers, and 1 was completed by a grandmother. 81.9% of the children attended preschool all day, and 80.7% attended their preschool program year-round. All 171 children lived in a home with a female caregiver. Of those caregivers, 98.25% (168) were mothers, 1.2% (2) were step-mothers, and only 0.6% (1) was a grandmother. Nearly 70% of the children in the sample lived in a home where both a male and female caregiver was present. The majority (109) of the male caregivers were fathers, 5 were stepfathers, 4 were grandfathers, and 1 was listed as “other” with no additional description. Thus, almost a third (52) of the sample lived in single family homes, all of which were headed by a mother (42 low income and 10 high income).

Response rates at the centers ranged from 0 % to 66.67 %. The two centers with 0% response rates both failed to distribute the packets within a 30-day period. When contacted during and after the 30-day period, one center director indicated changes in staffing prohibited her center from continuing to participate. The other center director did
not respond to several emails about continuing participation and was not in when the center was visited. Across the sample, the overall response rate was 24.74%. See Appendix I for a summary of center locations, packets distributed, and response rates.

The analyses for this study were planned to address three major questions: (1) What is the relationship between the School Readiness Composite (SRC) score and each individual independent variable: parental attachment, home learning environment (HLE), teacher attachment, classroom learning environment (CLE)? (2) What is the relationship of the independent variables to school readiness when viewed in combination? (3) Are there differences in the relationships and relative importance of parental attachment, home learning environment, teacher-attachment, classroom learning environment and SRC for higher- and lower-income children?

**Correlational Relationships.** Before addressing each research question, a correlational matrix was created to explore which of the demographic variables related to the variables of interest for the full sample.

The School Readiness Composite score (SRC) significantly correlated with the child’s ethnicity (being white versus from a minority background; \( r=.224, p=.003 \)), if the family was higher income (i.e. did not qualify for Title XX funding; \( r=.280, p=.0001 \)), female caregiver’s age (\( r=.211, p=.006 \)), female caregiver having post-secondary educational experience (\( r=.197, p=.01 \)), the location of the school (suburban versus city; \( r=.163, p=.033 \)), and having a male caregiver in the home (\( r=.257, p=.001 \)). Given that all significant demographic variables except location more strongly correlated with the family’s income level and having a male caregiver in the home than with the SRC,
partial correlations between the SRC and these variables were conducted with income level and presence of a male caregiver in the home controlled respectively. When income level was controlled, having a male caregiver in the home was the only variable that continued to significantly correlate with SRC (r=.165, p=.03). When male caregiver was controlled for, all of the zero-order relationships remained statistically significant (rs≥.155, ps≤.022). Given that a male caregiver in the home did maintain a statistically significant relationship, even when income level was partialed out, the only demographic variables considered were income level and having a male caregiver in the home in subsequent analyses.

Table 2

*Correlations between SRC and Demographic Variables for Full Sample*

<table>
<thead>
<tr>
<th></th>
<th>SRC</th>
<th>Income Controlled</th>
<th>Male in Home Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td>.416**</td>
<td>.123</td>
<td>.155*</td>
</tr>
<tr>
<td>Income level</td>
<td>.380**</td>
<td>.280**</td>
<td>.203**</td>
</tr>
<tr>
<td>Female Caregiver’s Age</td>
<td>.418**</td>
<td>.211**</td>
<td>.108</td>
</tr>
<tr>
<td>Female Caregiver’s Education</td>
<td>.383**</td>
<td>.197**</td>
<td>.101</td>
</tr>
<tr>
<td>Location of school</td>
<td>.074</td>
<td>.163*</td>
<td>.149</td>
</tr>
<tr>
<td>Male Caregiver in the Home</td>
<td>.380**</td>
<td>.167*</td>
<td>.167*</td>
</tr>
</tbody>
</table>

*Note. *p<.05, **p≤.01

Because income level and having a male caregiver in the home were related to SRC, descriptive statistics were carried out in order to better understand their relationship
with the SRC. The mean SRC score for higher income children was 104.06 (SD=16.77),
and for the lower income group, the mean was 94.67 (15.55). The 9.39-point difference
for higher and lower income children was statistically significant, t(169) =-3.80, p=.0001.
For children with a male caregiver present, the mean SRC score was 102.05 (SD=16.71),
and for children without a male caregiver, the mean score was 92.77 (15.20). This 9.28-
point difference was also found to be significant, t(169) =-3.45, p=.001.

When the independent variables’ relationships with the demographic variables
were examined, higher levels of parental attachment correlated with the child being
female (r=.211, p=.006), the school being in a suburban area (r=.174, p=.023), the female
caregiver liking to read (r=.168, p.028) and the female caregiver having post secondary
educational experience (r=.298, p=.0001). Overall on the parent attachment
questionnaire, girls (M=102.84, SD=8.86) scored higher than boys (M=98.47,
SD=11.05), t(169)=2.81, p=.006, children attending preschool in a suburban center
(M=101.33, SD=9.43) scored higher than children attending preschool in the city
(M=95.54, SD=13.18), t(169)=-2.77, p=.006, children whose mothers reported liking to
read (M=101.09, SD=9.97) scored higher than children whose mothers did not like to
read (95.81, SD=11.83), t(169)=2.21, p=.028, and children whose mothers’ had some
post-secondary education (M=102.75, SD=8.54) scored higher than children whose
mother’s education was a high school diploma or less (M=96.37, SD=11.90) , t(169)=-
4.06, p=.0001.

Higher home learning environment scores significantly related to children
watching less than 15 hours of television a week (r=-.177, p=.021), the child being
female (r=.197, p=.01), the child attending a preschool program that is half-day (r=.233, p=.002) nine months of the year (r=.245, p=.001), having a female caregiver with post secondary education (r=.169, p=.027), the female caregiver liking to read to herself (r=.231, p=.002), and the female caregiver reading to herself at least several times a week (r=.340, p=.0001).

Given that income level did not relate to home learning environment, a one way ANOVA was conducted to compare the frequency of all measured learning activities in the home by income level, to explore if there were differences in the frequency of the learning activities for the income groups. The income groups differed significantly only on how often they were read to by an adult in the home, F(1,169)=11.62, p=.001, with higher income parents reporting reading with their children more frequently than lower income parents.

Table 3

<table>
<thead>
<tr>
<th>Percent Frequency of Storybook Reading by Income Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Group</td>
</tr>
<tr>
<td>No reading with child</td>
</tr>
<tr>
<td>Read with child less than once a week</td>
</tr>
<tr>
<td>Once a week</td>
</tr>
<tr>
<td>Several times a week</td>
</tr>
<tr>
<td>Once a day</td>
</tr>
<tr>
<td>More than once a day</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

Teacher attachment was positively related to the child’s age (r=.212, p=.005), there being no male caregiver in the home (r=-1.72, p=.024), attending a 9-month
program (r=.168, p=.028) and the child watching less than 15 hours of television a week at home (r=-.180, p=.018).

Higher classroom learning environment scores were only statistically related to children attending a suburban school (r=.181, p=.018), attending a full-day program (r=.407, p=.0001), and attending a year-round program (r=.393, p=.0001).

Table 4.

*Correlations between Dependent and Independent Variables for Full Sample*

<table>
<thead>
<tr>
<th></th>
<th>Parent Attachment</th>
<th>HLE</th>
<th>Teacher Attachment</th>
<th>CLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRC</td>
<td>.255**</td>
<td>.156*</td>
<td>.215**</td>
<td>.168*</td>
</tr>
<tr>
<td>Parent Attachment</td>
<td>.244**</td>
<td>.269**</td>
<td>- .049</td>
<td></td>
</tr>
<tr>
<td>HLE</td>
<td></td>
<td>.261**</td>
<td></td>
<td>-.190*</td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td></td>
<td></td>
<td></td>
<td>-.040</td>
</tr>
</tbody>
</table>

*Note. *p<.05, **p<.01*

Table 4 summarizes the relationship between the independent and dependent variables. School Readiness Composite scores (SRC) correlated as expected with all four independent variables: parent attachment (r=.225; p=.003), home learning environment (r=.156, p =.042), teacher attachment (r=.215, p=.005), and classroom learning environment (r=.164, p =.028). Additionally, parent attachment significantly correlated with home learning environment (r=.244, p=.001) and teacher attachment (r=.269, p=.005), but it was not significantly correlated with classroom learning environment (r=-.049, p=.529). Home learning environment correlated not only with parent attachment (r=.244, p=.001), but also with teacher attachment (r=.261, p=.001) and classroom
learning environment \( (r=-.190, p=.013) \). Teacher attachment did not correlate with classroom learning environment \( (r=.040, p=.603) \), but as stated above, it did have significant relationships with parent attachment and the home learning environment \( (rs\geq .261, p<.005) \).

Partial correlations between the study variables were also inspected. Correlations among and between the independent, dependent, and demographic variables were calculated while controlling for each dependent and demographic variable separately. When parental attachment was controlled for, SRC continued to correlate with teacher attachment \( (r=.165, p=.031) \), and CLE \( (r=.184, p=.017) \), but it no longer correlated with home learning environment \( (r=.107, p=.166) \). A similar pattern was seen when teacher attachment was controlled for: SRC continued to correlate with parent attachment \( (r=.177, p=.021) \) and classroom learning environment \( (r=.181, p=.018) \), but it no longer correlated with home learning environment \( (r=.107, p=.172) \).

All partial correlations for the full sample are illustrated in Table 5. When both the home and classroom learning environments and the presence of a male caregiver in the home were controlled for respectively, all significant zero-order relationships were maintained \( (rs\geq .157, ps <.046) \). When income level was controlled for, all significant zero-order correlations between SRC and the independent variables were maintained \( (rs \geq .181, ps <.018) \) except for home learning environment \( (r=.142, p=.066) \). Given the relationship home learning environment had with SRC and how it appeared to co-vary with parent attachment, teacher attachment, and family income level, it was excluded from all further analyses for the full sample.
### Table 5

*Partial Correlations for the Full Sample*

<table>
<thead>
<tr>
<th>Controlled: Parent Attachment</th>
<th>SRC</th>
<th>Controlled: Teacher Attachment</th>
<th>SRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Learning Environment</td>
<td>.107</td>
<td>Home Learning Environment</td>
<td>.107</td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.165*</td>
<td>Parent Attachment</td>
<td>.177*</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>.184*</td>
<td>Classroom Learning Environment</td>
<td>.181*</td>
</tr>
<tr>
<td>Controlled: Home Learning Environment</td>
<td></td>
<td>Controlled: Classroom Learning Environment</td>
<td></td>
</tr>
<tr>
<td>Parent Attachment</td>
<td>.195*</td>
<td>Parent Attachment</td>
<td>.237**</td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.183*</td>
<td>Teacher Attachment</td>
<td>.226**</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>.203**</td>
<td>Home Learning Environment</td>
<td>.194*</td>
</tr>
<tr>
<td>Controlled: Male in Home</td>
<td></td>
<td>Controlled: Income Level</td>
<td></td>
</tr>
<tr>
<td>Parent Attachment</td>
<td>.227**</td>
<td>Parent Attachment</td>
<td>.210**</td>
</tr>
<tr>
<td>Home Learning Environment</td>
<td>.157*</td>
<td>Home Learning Environment</td>
<td>.142</td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.237**</td>
<td>Teacher Attachment</td>
<td>.232**</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>.153*</td>
<td>Classroom Learning Environment</td>
<td>.181*</td>
</tr>
</tbody>
</table>

*Note. *p<.05, **p<.01*

A correlation matrix was also done for each income group so that differences between groups could be explored. For the higher income group, the demographic variables that significantly related to the SRC were the female caregiver’s age ($r=.239$, $p=.03$) and post-secondary educational experience ($r=.303$, $p=.006$), as well as the presence of a male caregiver in the home ($r=.317$, $p=.004$). Descriptive statistics indicate that higher income children with mothers who are 34-years-old or older (M=100.17, SD=15.43) have SRC scores that are 7.98-points higher than mothers who are 33-years-old or younger (M= 108.15, SD=17.33), $t(80)=-2.20$, $p=.030$. Additionally, mothers who have completed at least some post-secondary education (M=106.35, SD=16.27) had
children who scored 13.42 points higher than children with mothers who completed no
more than a high school education (M=92.93, SD=15.01). This difference was found to
be significant, t(80) = -2.84, p=.006. The mean score for higher income children with a
male caregiver in the home was 106.03 (SD= 16.52), while for children with no male
caregiver, the mean score was 89.90 (SD=11.17). This 16.13-point difference was
significant t(80)= -2.99, p=.004. For the low income group, none of the measured
demographic variables significantly correlated with the SRC (rs≥ -.039, p≤.064).

For higher income children in the sample, parent attachment was related to home
learning environment (r=.248, p=.025), teacher attachment (r=.451, p=.001), and female
caregiver having post-secondary educational experience (r=.353, p=.001). The
relationship between parent attachment and SRC, although nonsignificant, did approach
significance, (r=.212, p=.056). In addition to being related to parent attachment, home
learning environment was also positively related to teacher attachment (r=.436, p=.0001),
attending a half-day preschool program (r=.364, p=.001), attending preschool nine
months a year (r=.404, p=.0001), and the female caregiver’s educational level (.231,
p=.037). When means for home learning environment were compared for mothers with
post secondary education (M=36.07, SD=9.64) and mothers with a high school diploma
or less (M=29.93, SD=10.91), it was found that children with more educated mothers had
higher quality home learning environment, t(80)= -2.124, p=.037. A one-way ANOVA
was also conducted to examine how these two groups differed on specific aspects of
home learning environment. More highly educated mothers were found to take their
children to the library more frequently, F(1,80) =11.33, p=.001, engaged their child more
often in coloring and writing activities, $F(1.80) = 5.05, p = .027$, and limited the total hours of hours of television watched per week, $F(1, 80) = 13.19, p = .0001$. Home learning environment was also negatively related to classroom learning environment ($r = -.423, p < .01$) and had no relationship with SRC ($r = .061, p = .587$).

Table 6

*Summary of Home Learning Activities for Higher Income Group*

<table>
<thead>
<tr>
<th></th>
<th>Mother Education Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High School or Less</td>
</tr>
<tr>
<td></td>
<td>N=15</td>
</tr>
<tr>
<td>Percentage</td>
<td></td>
</tr>
<tr>
<td>How often is your child is taken to the library</td>
<td></td>
</tr>
<tr>
<td>Child is not taken to the library</td>
<td>64.3</td>
</tr>
<tr>
<td>Only on special occasions</td>
<td>21.4</td>
</tr>
<tr>
<td>Once a month</td>
<td>7.1</td>
</tr>
<tr>
<td>Every 2 weeks</td>
<td>7.1</td>
</tr>
<tr>
<td>Once a week</td>
<td>0.0</td>
</tr>
<tr>
<td>How often is your child is engaged in coloring or writing activities at home</td>
<td></td>
</tr>
<tr>
<td>Child is not engaged in coloring or writing activities</td>
<td>0.0</td>
</tr>
<tr>
<td>1 time a week</td>
<td>21.4</td>
</tr>
<tr>
<td>2 times a week</td>
<td>35.7</td>
</tr>
<tr>
<td>3 times a week</td>
<td>0.0</td>
</tr>
<tr>
<td>4 times a week</td>
<td>14.3</td>
</tr>
<tr>
<td>5 times a week or more</td>
<td>28.6</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Number of hours child watches television per week</td>
<td>21.5</td>
</tr>
</tbody>
</table>

Teacher attachment was positively related to school readiness scores ($r = .338, p = .002$), home learning environment ($r = .436, p = .0001$), parent attachment ($r = .451, p = .0001$), attending a half-day program ($r = .247, p = .025$), attending a nine-month
program (r=.326, p=.003), and female caregiver’s level of education (r=.262, p=.017). Descriptive statistics indicate that children with mothers with higher levels of education (M=103.21, SD=11.82) were more securely attached than children with less educated mothers (M=94.64, SD=12.84), t(80)=-2.43, p=.017. Classroom learning environment was negatively related to attending a half-day program (r=-.503, p=.0001) and attending a nine-month program (r=-.463, p=.0001), and home learning environment (r=-.423, p=.0001).

For the lower income children, parent attachment was related to school readiness scores (r=.208, p=.05), home learning environment (r=.233, p=.028), the child being female (r=.301, p=.004), and the female caregiver having post-secondary educational experience (r=.248, p=.019). Descriptive statistics indicate that mothers with higher levels of education (M=102.41, SD=8.12) had more securely attached children than mothers with a high school diploma or less (M=97.17, SD=11.92), t(87)=-2.384, p=.019. In addition to being related to parent attachment, home learning environment was related to school readiness scores (r=.219, p=.04) and to the child being female (r=.275, p=.009). Teacher attachment was negatively related to having a male caregiver in the home (r=-.312, p=.003) and was not related to school readiness (r=.123, p=.250). Classroom learning environment was negatively related to attending a half-day program (r=-.281, p=.008) and attending a nine-month program (r=-.303, p=.004). It also did not relate to school readiness scores, but did approach significance (r=.203, p=.057).
Table 7

Demographic Correlations for Higher and Lower Income Groups

<table>
<thead>
<tr>
<th>Higher Income</th>
<th>SRC</th>
<th>Parent Attachment</th>
<th>HLE</th>
<th>Teacher Attachment</th>
<th>CLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Caregiver’s (FC) Age</td>
<td>.255**</td>
<td>.036</td>
<td>-.043</td>
<td>.024</td>
<td>.150</td>
</tr>
<tr>
<td>Female Caregiver’s Education</td>
<td>.303**</td>
<td>.353**</td>
<td>.231*</td>
<td>.262*</td>
<td>.000</td>
</tr>
<tr>
<td>Male Caregiver Living in the Home</td>
<td>.317**</td>
<td>-.001</td>
<td>-.007</td>
<td>.032</td>
<td>.114</td>
</tr>
<tr>
<td>Attending Half Day Preschool</td>
<td>-.025</td>
<td>-.164</td>
<td>.364**</td>
<td>.247*</td>
<td>-.503**</td>
</tr>
<tr>
<td>Attending Nine Month Preschool</td>
<td>-.042</td>
<td>-.148</td>
<td>.404**</td>
<td>.326*</td>
<td>-.463**</td>
</tr>
<tr>
<td>Parent Attachment</td>
<td>.061</td>
<td>.353**</td>
<td>.451**</td>
<td>-.166</td>
<td></td>
</tr>
<tr>
<td>Home Learning environment</td>
<td>.212</td>
<td>.248*</td>
<td>.436**</td>
<td>-.423**</td>
<td></td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.338**</td>
<td>.451**</td>
<td>.436**</td>
<td>-.130</td>
<td></td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>.163</td>
<td>.163</td>
<td>-.423**</td>
<td>-.130</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lower Income</th>
<th>SRC</th>
<th>Parent Attachment</th>
<th>HLE</th>
<th>Teacher Attachment</th>
<th>CLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Caregiver’s (FC) Age</td>
<td>-.098</td>
<td>-.045</td>
<td>.047</td>
<td>.002</td>
<td>.006</td>
</tr>
<tr>
<td>Female Caregiver Education</td>
<td>-.048</td>
<td>.248*</td>
<td>.104</td>
<td>.033</td>
<td>.088</td>
</tr>
<tr>
<td>Male Caregiver Living in the Home</td>
<td>.077</td>
<td>-.021</td>
<td>-.016</td>
<td>-.312**</td>
<td>.088</td>
</tr>
<tr>
<td>Attending Half Day Preschool</td>
<td>-.040</td>
<td>.074</td>
<td>-.063</td>
<td>.055</td>
<td>-.281**</td>
</tr>
<tr>
<td>Attending Nine Month Preschool</td>
<td>.026</td>
<td>.065</td>
<td>-.066</td>
<td>.004</td>
<td>-.303**</td>
</tr>
<tr>
<td>Child’s Gender (Being Female)</td>
<td>.087</td>
<td>.301*</td>
<td>.275**</td>
<td>.178</td>
<td>.036</td>
</tr>
<tr>
<td>Parent Attachment</td>
<td>.208*</td>
<td>.233*</td>
<td>.113</td>
<td>.073</td>
<td></td>
</tr>
<tr>
<td>Home Learning environment</td>
<td>.219*</td>
<td>.233*</td>
<td>.109</td>
<td>.051</td>
<td></td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.123</td>
<td>.113</td>
<td>.109</td>
<td>.059</td>
<td></td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>.203</td>
<td>.073</td>
<td>.051</td>
<td>.059</td>
<td></td>
</tr>
</tbody>
</table>

Note. *p<.05, **p<.01
Interestingly, when the correlations were conducted separately for each income group, none of the independent variables significantly correlated with the SRC for both income groups (see Table 7). For example, female caregiver’s age ($r=.255$, $p=.030$) and post-secondary educational experience ($r=.303$, $p=.006$), having a male caregiver in the home ($r=.317$, $p=.01$), and teacher attachment ($r=.338$, $p=.01$) correlated with SRC for the higher income children, but not for the lower income children ($rs\leq .002$, $p=.004$).

Conversely, parent attachment ($r=.208$, $p=.05$) and home learning environment ($r=.123$, $p=.40$) were significantly related to SRC for lower income children, but not for the higher income group ($rs \leq .212$, $p\geq .056$).

When SRC partial correlations (see Table 8) are calculated for higher income children, all zero-order relationships with SRC remain significant when female caregiver’s age and teacher attachment were controlled ($rs\geq .236$, $ps=.02$). However, when teacher attachment was controlled, the relationships between SRC and classroom learning environment became significant ($r=.222$, $p=.046$). When mother’s education level was controlled, all relationship with the SRC except female caregiver’s age ($r=.178$, $p=.112$) remained significant ($rs\geq .267$, $p\leq .016$). A similar pattern is seen when the presence of a male caregiver is controlled: female caregiver’s age becomes non-significant ($r=.163$, $p=.146$), but teacher attachment ($r=.346$, $p=.002$) and female caregiver’s education level ($r=.250$, $p=.024$) remain significantly related to the SRC.
Table 8

*Partial Correlations for Higher and Lower Income Groups*

<table>
<thead>
<tr>
<th></th>
<th>Higher Income</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=82</td>
<td>SRC</td>
<td>SRC</td>
</tr>
<tr>
<td><strong>Controlled: Female Caregiver’s Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Caregiver in the Home</td>
<td>.266*</td>
<td>Male Caregiver in the Home</td>
<td>.267**</td>
</tr>
<tr>
<td>Female Caregiver’s Education</td>
<td>.259*</td>
<td>Female Caregiver’s Age</td>
<td>.178</td>
</tr>
<tr>
<td>Parent Attachment</td>
<td>.192</td>
<td>Parent Attachment</td>
<td>.118</td>
</tr>
<tr>
<td>Home Learning Environment</td>
<td>.083</td>
<td>Home Learning Environment</td>
<td>-.010</td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.348**</td>
<td>Teacher Attachment</td>
<td>.281*</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>.131</td>
<td>Classroom Learning Environment</td>
<td>.172</td>
</tr>
<tr>
<td><strong>Controlled: Male in the Home</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Caregiver’s Age</td>
<td>.163</td>
<td>Female Caregiver’s Age</td>
<td>.254*</td>
</tr>
<tr>
<td>Female Caregiver’s Education</td>
<td>.250*</td>
<td>Female Caregiver’s Education</td>
<td>.236*</td>
</tr>
<tr>
<td>Parent Attachment</td>
<td>.224*</td>
<td>Male Caregiver in the Home</td>
<td>.325**</td>
</tr>
<tr>
<td>Home Learning Environment</td>
<td>.066</td>
<td>Parent Attachment</td>
<td>.071</td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.346**</td>
<td>Home Learning Environment</td>
<td>-.103</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>.135</td>
<td>Classroom Learning Environment</td>
<td>.222*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Lower Income</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=89</td>
<td>SRC</td>
<td>SRC</td>
</tr>
<tr>
<td><strong>Controlled: Parent Attachment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Learning Environment</td>
<td>.179</td>
<td>Parent Attachment</td>
<td>.166</td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.103</td>
<td>Teacher Attachment</td>
<td>.103</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>.192</td>
<td>Classroom Learning Environment</td>
<td>.197</td>
</tr>
</tbody>
</table>

*Note.* *p*.05, **p*.01

Additionally, parent attachment’s relationship with SRC became significant

(r=.224, p=.044). Partial correlations suggested that female caregiver’s age covaried with
level of education and presence of a male caregiver. For a person to achieve higher levels of education, they must be older. For this sample, children with mothers with at least some post secondary educational experience (M=35.69, SD=5.55) were nearly 3 years older than mothers with no more than a high school diploma (M=32.93, SD=2.81). Likewise, the higher income mothers of children who lived with a male caregiver (M=35.74, SD=5.29) were 4.24 years older than mothers raising children alone (M=31.50, SD=3.50), t(80)=-2.45, p<.01. Thus, mother’s age did not express any unique information about the higher income children above and beyond educational level or presence of a male caregiver in the home; thus, it was excluded for all subsequent analyses for the higher income children.

For the lower income children, when parent attachment is controlled, home learning environment no longer correlates significantly with SRC (r=.179, p=.096). Likewise, when home learning environment is controlled, parent attachment no longer correlates with SRC (r=.166, p=.122). Clearly, for the lower income group, the home-based variables parent attachment and home learning environment are highly related to each other, and in fact, may be measuring aspects of the same concept.

Given the degree of covariance between parent attachment and home learning environment for the lower income group, a “Home Factors” variable was created by weighting and combining the parent attachment score with the home learning environment score.
Table 9

*Correlations of Home Factors Variables and Measured Variables*

<table>
<thead>
<tr>
<th>Home Factors</th>
<th>Full Sample</th>
<th>Higher</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Caregiver’s Age</td>
<td>-.010</td>
<td>.012</td>
<td>-.114</td>
</tr>
<tr>
<td>Female Caregiver’s Education</td>
<td>.313**</td>
<td>.383**</td>
<td>.246**</td>
</tr>
<tr>
<td>Male Caregiver in the Home</td>
<td>.024</td>
<td>-.004</td>
<td>-.024</td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td>.327**</td>
<td>.547**</td>
<td>.137</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
<td>-.118</td>
<td>-.310**</td>
<td>.081</td>
</tr>
<tr>
<td>SRC</td>
<td>.248**</td>
<td>.198</td>
<td>.261**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parent Attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Caregiver’s Age</td>
</tr>
<tr>
<td>Female Caregiver’s Education</td>
</tr>
<tr>
<td>Male Caregiver in the Home</td>
</tr>
<tr>
<td>Teacher Attachment</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
</tr>
<tr>
<td>SRC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Home Learning Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Caregiver’s Age</td>
</tr>
<tr>
<td>Female Caregiver’s Education</td>
</tr>
<tr>
<td>Male Caregiver in the Home</td>
</tr>
<tr>
<td>Teacher Attachment</td>
</tr>
<tr>
<td>Classroom Learning Environment</td>
</tr>
<tr>
<td>SRC</td>
</tr>
</tbody>
</table>

*Note. *p<.05, **p<.01

Both the attachment questionnaire and the home learning environment questionnaire yield a cumulative score with higher scores indicating higher quality, and
both used a 7-point scale. However, the attachment questionnaire contains 20 questions while the home learning environment questionnaire contains only 10. To weight these scores so that they equally influence the total Home Factors score, the parent attachment score was multiplied by .33 and the home learning environment score was multiplied by .67. The weighted scores were then summed to create the Home Factors score. The relationship between those variables found to relate to the SRC for the full sample, and the higher and lower income group’s Home Factors scores are examined in Table 9. It was found that for all three groups, the relationships between the Home Factors variables and the SRC mirrored the relationships each group’s parent attachment and home learning environment score had with the other variables, but were stronger than either the attachment score or the home learning score alone.

**Combined Relationship of Independent Variables with SRC.** To address Research Question Two, a hierarchical multiple regression was planned to explore the relationship between SRC and the independent variables in combination for the full sample. However, in reviewing the correlational relationships across the full sample and each income group separately, it seems the relationships seen in the full sample are due to the variance in the higher income group, and thus, are not a good representation of the relationships seen in the lower income group. The two groups are so different; it seems a regression using the full sample would not help elucidate how the predictors relate to school readiness outcomes. Thus, a regression for the full sample was not conducted.
Instead, separate models were developed for each subgroup, to more accurately explore the relationship between school readiness and the measured variables for each group.

**Comparing Higher and Lower Income Children.** To address Research Question Three, analyses were carried out to determine the best model to explain the prediction of SRC for the higher and lower income groups respectively. For the higher income group, 2 multiple regressions were carried out. In the first model, the demographic variables that correlated with SRC, presence of a male caregiver in the home, and female caregiver’s education level, were entered in step one to control their impact on subsequent analyses. As illustrated previously, female caregiver’s age no longer related to SRC when female caregiver’s education was controlled for, and as a result, it was excluded from this analysis. Next, the independent variable teacher attachment was entered, because it was the only independent variable to correlate with SRC for the higher income group. Multicollinearity did not appear to be an issue with the model, with all Variance Inflation Factor (VIF) scores falling between 1.05 and 1.13. Examination of the normal probability plot of residuals, histogram of the standardized residuals, and the residual and standard residual means (Ms=0) indicate that the assumption of homoscedasticity, normality, and independence of error terms was also not violated.

Model 1 predicted 23.3% of the variance in the SRC, with having a male caregiver in the home and female caregiver’s age accounting for 15.7% of the variance, and teacher attachment accounting for 7.6%. However, when the beta weights for the predictors are considered, female caregiver’s education was not a significant predictor in
the full model ($\beta=.167$, $p=.118$). Thus, a second model was carried out with female caregiver’s education excluded.

For the second model, multicollinearity did not appear to be an issue. All Variance Inflation Factor (VIF) scores equaled 1.00. Examination of the normal probability plot of residuals, histogram of the standardized residuals, and the residual and standard residual means (Ms=0) indicate that the assumption of homoscedasticity, normality, and independence of error terms was also not violated. This second model predicted 20.8% of the variance in SRC, with having a male caregiver in the home accounting for 10.0% of the variance and teacher attachment accounting for 10.8%. Teacher attachment was found to be the most important predictor, with a beta weight of .329 ($p=.002$). The presence of a male caregiver in the home was also a significant predictor ($\beta=.306$, $p=.003$).

Table 10

*Hierarchical Multiple Regression Analyses Predicting SRC for Higher Income Group*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\Delta R^2$</td>
<td>$\beta$</td>
<td>$\Delta R^2$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>Step 1</td>
<td>.157</td>
<td>.100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Caregiver in the Home</td>
<td></td>
<td></td>
<td>.270**</td>
<td>.306**</td>
</tr>
<tr>
<td>Female Caregiver’s Education</td>
<td>.167</td>
<td>excluded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.076</td>
<td>.108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Attachment</td>
<td></td>
<td></td>
<td>.286**</td>
<td>.329**</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.233**</td>
<td></td>
<td>.208**</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>7.33**</td>
<td></td>
<td>10.382**</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>82</td>
<td></td>
<td>82</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* *p<.05, **p<.01*
For the lower income group, no demographic variables related to the SRC. Only parent attachment and home learning environment had significant correlational relationships with SRC. However, partial correlations revealed that these two variables covaried to such an extent that controlling one resulted in the other’s relationship with the SRC becoming non-significant. Likewise, although neither parent attachment nor home learning environment correlated with SRC for the higher income group, they did correlate with each other ($r=.248$, $p=.025$). It seems that for both the higher and lower income children, these two variables are closely related. For the lower income children specifically, they are too closely related for their individual relationship with SRC to be parsed out. Thus, the Home Factors variable was created to better express the combined relationship parent attachment and home learning environment have with SRC for the lower income children. Since the Home Factors variable was the only variable with a significant relationship to SRC for the lower income children that did not covary with other variables, a multiple regression was unnecessary to estimate the variance Home Factors alone predicts in the SRC. Instead, the correlation ($r=.233$, $p=.014$) can be squared to estimate the variance in SRC contributed by Home Factors. Thus, ($.261)^2$ or 6.8% of the variance in lower income children’s SRC is due to Home Factors.
Chapter 5: Discussion

This study sought to explore the relationship between school readiness in preschoolers and the activities and relationships that occur within the home and school environments. Although a growing body of work has demonstrated relationships between preschoolers’ readiness for kindergarten and what happens both at home with parents and at school with teachers, there is a lack of research that considers the relationships between school readiness and the home and school environments simultaneously for both higher and lower income children. The findings of the current study indicate that relationships and activities at home and school do, in fact, relate to school readiness outcomes. However, significant differences exist in how these factors relate to school readiness skills for each income group.

Findings for the Full Sample

When the relationships between school readiness scores and demographic variables were examined, it was found that the strongest demographic variable relationships with school readiness scores for the full sample were income level and having a male caregiver in the home. The results suggest that children from lower income families and from families without a male caregiver scored significantly lower than their respective peers on the Bracken School Readiness Assessment. Both the lower
income children and children from single parent homes scored more than nine points lower than their peers. These results are consistent with previous work, which has found that as a family’s level of income decreases, the child’s level of school readiness also decreases (Department of Education, 2004), and that children from less advantaged families score lower on measures of receptive language, letter identification, and math than their more advantaged peers (Barbarin, et al., 2006). Similarly, children living in a home with multiple adults earn higher academic scores (Klein & Knitzer, 2007), and children who continually live in a two-parent home experience better outcomes than those living in a single-parent home (Amato & Keith, 1991). Specifically, children living with two parents have been found to experience less school failure as children (Amato, 2001), and as adults attain higher levels of education (Amato & Booth, 1997) than their counterparts that experienced divorce and resided with a single mother.

As predicted, all four independent variables, parent attachment, home learning environment, teacher attachment, and classroom learning environment, significantly related to school readiness scores for the full sample. This is consistent with a large body of research that suggests that children with higher levels of attachment security (DeMulder, Denham, Schmidt, & Mitchell, 2000), higher quality home environments (Griffin & Morrison, 1997, Meluish, et al., 2008), stronger, more positive teacher relationships (Birch & Ladd, 1997, Hamre & Pianta, 2001), and who attend more academically focused preschools (Abott-Shim, Lambert, and McCarty, 2003) have higher levels of school readiness skills than their peers who do not have these advantages.
Although differences in school readiness scores were seen between income groups, none of the independent variables related to family income level for the full sample. As a result, significant differences were not seen between lower and higher income children for any of the independent variables. This finding was unexpected given past research that has found low income children often display lower attachment security (Diener, Nievar, & Wright, 2003), lower quality home learning environments (Griffin & Morrison, 1997), lower quality teacher relationships (Sroufe, 1983, Howes & Hamilton, 1992), and lower quality classroom environments (Kozol, 1991) than are typically seen in middle class samples. It should be noted, however, that although the groups in this sample are labeled “higher” and “lower” income, they are not necessarily representative of the socioeconomic extremes. For the majority of the sample, the children in the higher and lower income groups share similar backgrounds and experiences. Nievar & Becker (2008) suggest that the differences often seen between income groups may be due to extreme environmental conditions experienced by families in poverty. For this sample, it seems likely that such extreme conditions were not present for the lower income group uniformly or exclusively. Because self-report of the qualification for Title XX funding was used as a proxy for income, it may be the case that children in the “higher income group” came from families that make just over the cut off for Title XX funding. Although all lower income families reported qualifying for Title XX funding, which is based solely on a cut-off of families earning less than 150% of the poverty level, no information was provided about the degree of poverty they were experiencing. It seems likely that the environmental stressors on a family making 5% of the poverty level would
be significantly more intense than a family making 150% of the poverty level. Furthermore, it is likely that some of the children in the higher income group were experiencing similar conditions to those in the lower income group due to living in similar neighborhoods and attending the same schools as the lower income children. Interestingly, of the 19 centers included in the study, only 4 served children from one income group exclusively. The vast majority of higher and lower income children who participated in this study attended classrooms that served both higher and lower income children. Thus, few overall differences were seen in mean level of attachment security, home learning environment quality, teacher attachment security, and classroom learning environment quality between groups.

**Findings for the Higher and Lower Income Groups**

Although all independent variables significantly related to school readiness for the full sample, when the independent variables’ relationships with school readiness scores were considered separately for each income group, an interesting pattern arose. Specifically, home-based factors such as parental attachment and home learning environment were significantly related to school readiness for the lower income group only. Conversely, teacher attachment correlated with school readiness for only the higher income children. Classroom learning environment did not relate to school readiness scores for either income group, although it approached significance for the higher income group.
Higher Income Children

For the higher income group, the strongest relationships with school readiness were seen with the presence of the male caregiver in the home, female caregiver’s educational experience, and teacher attachment. Vast differences in school readiness scores were seen between higher income children with and without a male caregiver living in the home. Those children who had a male caregiver present in their home scored 16-points higher than children without a male caregiver. For these higher income children, living with a father-figure was a rather significant factor in predicting school readiness outcomes. In fact, having a male caregiver predicted 10% of the variance in school readiness for higher income children alone. However, this finding should be interpreted with some caution. Of the 82 higher income children in the sample, only 10 lived in a home without a male caregiver. Clearly, the small size of this group may have influenced this finding. Nonetheless, this result does focus attention on the potential impact being raised in a single family home can have for higher income children. Much research discusses the negative impact a father’s absence can have on lower income children due to the prevalence of single motherhood for lower income families (Kamerman, 1984); however for this sample, the impact on school readiness scores was only seen for higher income children.

Wight & Chau (2009) found that preschool aged children from lower income families are nearly three times as likely to live in a single parent home as higher income preschoolers. For the current sample, over four times as many lower income children lived in a home without a male caregiver than their higher income counterparts. Thus,
novelty of not having a male caregiver in the home may have contributed to the higher income children’s school readiness scores being more directly impacted by the absence of a male caregiver, and thus, it is more highly related to school readiness scores for the higher income group. In fact, research has found that many lower income, African American mothers identify their marital status as single, but also report that there is another adult family member or friend who assists them in childrearing (see McLoyd, Cauce, Takeuchi, & Wilson, 2000, for a review). Jones, Shaffer, Forehand, Brody, & Armistead (2003) found that the quality of the relationship between the single mother and a nonmarital co-parent can impact both the child’s adjustment and the overall functioning of the family. Given that only an eighth of the higher income children had no male caregiver in the home, whereas nearly half of the lower income children had no male caregiver, it may be the case that higher income families, as a group, are less equipped to effectively cope with the absence of a father figure in the home when compared to their lower income counterparts. This may be due in part to the lack of a nonmarital co-parenting relationship. The literature seems to support the notion that lower income mothers may be more practiced at supporting their children’s adjustment needs, including school readiness, without an additional caregiver residing in the home. It may be the case for the current study that the lower income single mothers actually have a positive relationship with a nonmarital co-parent outside the home, whereas the higher income single mothers may not have had such a relationship.

The positive correlational relationship between mothers’ education level and the children’s school readiness found in the current study is consistent with previous research
that has found that higher levels of parental education reduces the risk of poverty and positively relates to school readiness outcomes (Melhuish, et al, 2001). Specifically, mothers with higher levels of education often experience more personal, positive learning experiences, increases in general knowledge and skills, and higher levels of complex thinking than mothers who have less formal education (Taylor, Clayton, & Rowley, 2004). These characteristics can color a mother’s expectation for her own child’s academic experiences, and the choices she makes for her own child’s learning opportunities. For example, mothers with more education have been found to engage in more learning related activities both within the home (i.e. book reading, direct teaching) and outside the home (i.e. music or art lessons) than less educated mothers (Davis-Kean, 2005). Overall, parental expectations and the learning activities provided for their children by mothers with higher levels of education has been specifically linked with children’s cognitive developmental and academic skills (Taylor, Clayton, & Rowley, 2004).

The final significant relationship with school readiness for the higher income children was teacher attachment. This, too, is consistent with previous research which suggests that better relationships with teachers help preschoolers to maximize their school experiences (Howes, Hamilton, & Mathesone, 1994). Overall, children with good teacher relationships achieve more academically than children with insecure relationships with teachers (Furrer & Skinner, 2003, Pianta & Nimetz, 1991). In the literature, however, there is some debate concerning whether a positive attachment with parents is required for a positive relationship to result with a teacher. For the current study,
although it was expected that parent attachment would be the most important predictor of school readiness for the higher income children, teacher attachment was a better predictor of school readiness. Nevertheless, there was also a strong relationship between teacher attachment and parent attachment for the higher income children, which may suggest that parent attachment is not unrelated to school outcomes for this group. The reasons for this are twofold. First, it must be noted that the relationship between school readiness and parent attachment for the higher income group was actually as strong as the significant relationship seen for the lower income group. The difference in sample size between the higher and lower income groups may have impacted the statistical significance, but not the practical significance, of the relationship between parent attachment and school readiness for the higher income group. Secondly, previous work also suggests that secure attachments with parents can set the stage for secure attachments with teachers, especially for higher income children. Secure attachment to parents at home often gives preschoolers practice about how to interact with adults in general. When a teacher is responsive to the child’s needs at school, a secure child knows how to respond, and as a result, develops a secure teacher-child attachment (Goossens & van Ijzendoorn, 1990).

It may be the case that the degree of parent attachment in the home allowed for positive teacher attachments to develop for the higher income children, resulting in teacher attachment being the strongest predictor of school readiness; yet, without the secure attachment at home, such a relationship could not take place. For the current sample, higher income children with higher levels of parental attachment also had higher levels of teacher attachment. This is consistent with O’Conner & McCartney’s work
(2007), which found the teacher-child relationship to be a stronger predictor of
achievement than maternal attachment. The majority of the participants in their study
were securely attached European American children whose mothers, on average,
completed over 2 years of post secondary education. It seems in both this and the current
study, when there exists between a child and his mother with higher levels of education,
teacher attachment is more strongly related to academic achievement than parent
attachment. It is unclear from the current study why this may be the case. In this study,
mothers in the higher income group had significantly higher levels of education than the
lower income mothers. For the higher income children, mother’s level of education was
significantly related to higher quality teacher attachment, having a male caregiver in the
home, higher levels of parent attachment, and higher quality home learning environment.
These relationships were found despite parent attachment and home learning
environment’s lack of relationship with school readiness outcomes. Nevertheless, as
Newcombe (2003) points out, mother’s level of reported education can often be
confounded with other child, parent, and family variables. Unraveling the influences
these related concepts have on children’s academic outcomes can be difficult, if not
impossible (Magnuson, Sexton, Davis-Kean, & Huston, 2009).
Lower Income Children

For the lower income group, none of the measured demographic variables related to school readiness outcomes. The selection and measurement of the demographic variables was based on previous research, and the variables measured have often been found to differentiate between higher and lower income families (e.g., Wight & Chau, 2009; Cauthen & Fass, 2008). However, much of the research done on school readiness outcomes for preschoolers has focused largely on Caucasian, middle class children and their families (e.g., NICHD ECCRN, 2005a). Additionally, many studies have chosen to limit their analyses to more homogenous groups of children (Howes et al., 2008) in order to maximize statistical outcomes and generalizability. As O’Conner and McCartney (2006) point out, often large scale, nationally representative studies provide a good snapshot of what is happening in the country as a whole, but fail to provide specific information about the development of specific subgroups, such as ethnic and economic minority groups (Coll et al., 1996; Johnson et al., 2003). This also seems to be the case for the current study. When the full sample is analyzed, a much different picture is seen than when the groups are separated by income group. For example, for the full sample, it appears that mother’s level of education, having a male caregiver in the home, parent attachment, home learning environment, teacher attachment, and classroom environment are all important correlations with school readiness. However, when the groups are separated, a much different pattern of results is seen, and it becomes clear that presenting data around the entire sample fails to provide specific information about each subgroup.
Despite the lack of demographic significance, parent attachment and home learning environment did significantly relate to school readiness outcomes for lower income children in this study. These results were expected, given that the literature suggests that children with secure attachment to parents experience academic success more often than their insecurely attached peers (DeMulder, Denham, Schmidt, & Mitchell, 2000). Similarly, children with more enriching home learning environments have also consistently had higher levels of academic success (e.g. Barroso-Flannery, 2006; Sammon, et. al., 2004). Interestingly, when partial correlations were carried out, home learning environment and parent attachment were found to co-vary, and when one was controlled, the other become insignificant. This may be due to these two variables measuring different aspects of the same concept. It seems a reasonable assumption that a parent’s degree of attachment to their child highly influences the type of learning environment they provide. For example, a parent with an anxious-ambivalent child, who often displays a combination of both positive and negative reactions to their caregiver, may find it uncomfortable and difficult to engage their child in one-on-one learning activities when the child’s behavior is unpredictable and difficult to manage. This may result in less enriching learning activities in the home. Although it seems that home learning environment did not, in this study, have a unique relationship with school readiness beyond attachment relationships, it did seem to add information about the activities occurring within the home environment that support academic outcomes not captured by attachment scores alone. While a more secure parent attachment may be required for an enriching home learning environment to exist, a secure attachment
relationship may not necessarily result in a high quality learning environment. Parents with securely attached children may not value education and may choose not to engage their children in educationally enriching activities within the home. In order to capture a better picture of how home relationships and activities relate to the lower income children’s school readiness, these variables were weighed and combined to create a home factors variable. 

The home factors score provided information about the quality of the relationships and the activities undertaken in the home. This provides a measure of the overall quality of the home environment. Data from both the higher and lower income groups, as well as the full sample, suggest that parent attachment and home learning environment are highly related to each other for all three groups, regardless of whether they are predictive of school readiness scores. Additionally, the home factors variable more strongly related to school readiness outcomes for the lower income sample than either parent attachment or home learning environment alone. Specifically, the home factor variable predicted 7.6% of the variance in school readiness for the lower income children. 

Interestingly, unlike the higher income group, where a strong relationship existed between security of the parent attachment and teacher attachment, no relationship was seen between parent and teacher attachment for the lower income group. Research concerning the concordance between parent and teacher attachment has found that children whose experiences both at home and at school are predictable are often more secure in their relationships with teachers than children from disorganized homes (Howes
Likewise, the most non-concordance was seen for children where the values, goals, scripts, and routines of the classroom environment clearly differed from those found in the children’s homes (Howes & Matheson, 1992). For this sample, overall parent and teacher attachment were much more similar for children with more educated mothers, the majority of whom were also higher income. It may be the case that, although experiencing secure attachments at home, the children from the lower income group were exposed to values and routines at home that were inconsistent with what was taught at school. Although also securely attached to their teachers, parent attachment outweighed this relationship when predicting school readiness for the lower income children. This pattern of results is similar to Pianta, Ninta, and Bennett’s (1997) finding that for African-American Head Start students, mother-child relationship quality predicted school outcomes for preschoolers and kindergarteners, while teacher-attachment did not. Like the current study, mothers had low levels of educational experience. It may be the case that mothers with less education do not stress the values and routines of school with their children due to their own educational history and values. Despite secure relationships with teachers, the values learned at home remains the primary predictor of school readiness for lower income children.

Despite the fact that parents’ attitudes and values about learning were not measured for this study, the frequency with which they engage in specific learning activities was measured, as part of the home learning environment questionnaire. Although no overall differences in home environment were seen between income groups, when the specific activities included in the home learning environment were analyzed,
higher and lower income groups only differed on one learning activity: the frequency with which the child was read to at home.

Reading with children has long been considered an integral aspect of a child’s readiness to learn to read (Dickinson & Tabor, 2001) as well as to the development of expressive and receptive language skills (Whitehurst, et al, 1994), both of which play an important role in general readiness for kindergarten. Vast differences are found in the literature between lower and higher income families in the frequency of shared book reading with children. For Head Start students, it has been found that although most parents reported reading to their children 1-2 times per week, nearly 12% reported reading only 1-2 times per month or hardly ever (Bracken & Fischel, 2008). For the current sample, 14.6% of the lower income parents reported reading to their child once a week or less, whereas only 4.8% of the higher income parents reported reading with their child once a week or less.

What lower income mothers do when reading to their children has also been found to differ from higher income mothers. Less advantaged mothers have been found to engage in less instructive comments and behaviors, and have also demonstrated lower levels of vocabulary productions than their middle class counterparts (Ninio, 1980). Such differences may be due in part to parental beliefs about learning to read. It has been found that overall, lower income parents tend to see reading as a specific skill that must be taught. For these families, reading with their child had only one function: to teach reading. Conversely, higher income families have been found to engage in reading activities with their children for entertainment sake (Sonnenschein et. al., 1997). This
view is further supported by Piotrkowski’s resource model (2004), which suggests that lower income parents’ beliefs about what their children should know for kindergarten is influenced by the availability of resources within the community. In economically depressed areas, the model posits that parents have concerns about their children succeeding academically in disadvantaged schools. As a result, parents from lower income areas focus on more concrete learning skills and less on fostering their children’s curiosity and interest in an effort to help their children more quickly adjust to the demands of the classroom. For the current sample, it may be the case that despite engaging in similar amounts of educational activities and having similarly attached children, lower income parents’ beliefs about the purpose and value of learning activities within the home and how best to prepare their children for kindergarten are not as consistent with the values articulated at school as those taught by higher income parents. As a result, teacher-child relationships have less of a direct relationship with school readiness outcomes for lower income children due to the mismatch in educational values taught at home and at school.

**Conclusion**

The main goal of this study was to determine the degree and pattern of relationships between home and school factors and school readiness outcomes for higher and lower income families. Despite the families not representing the economic extremes, and despite the majority of the children being ready for kindergarten, different predictors of school readiness scores were seen between income groups. These analyses suggest that
differences did exist in what contributed to school readiness for higher and lower income preschoolers.

Overall, the higher income children lived in a two-parent home with a college educated mother. They were securely attached to both their parent and teacher, yet only the teacher-child relationship predicted school readiness outcomes. It seems probable that these parents valued education, had positive educational experiences themselves, and had a detailed working knowledge of how to be successful in school. In short, they understood and valued the routines and activities a classroom provides, and they directly taught them to their children. This consistency of values between home and school appears to have helped foster the development of secure relationships within the classroom. For higher income children, it seems that the secure attachment at home paves the way for positive teacher-child relationships. These children’s school readiness outcomes were also most affected by the lack of a male caregiver in the home. It is speculated that higher income mothers lacked a nonmarital co-parent, and were not as skilled as their lower income counterparts at supporting their children’s school readiness without a parenting partner residing in the home.

For lower income children, the sole predictor of school readiness was what happened in the home: both the security of the parent relationship and the quality learning activities within the home. Unlike with the higher income sample, no relationship was seen between teacher attachment and school readiness or parent attachment. Past research suggests this may be due to a mismatch between the values and beliefs about education at home and at school. The lower income mothers reported being less educated when
compared to their higher income peers. They also reported reading to their children significantly less often than their higher income counterparts. Although shared-book reading is only one aspect of pre-readiness skills, reading with children has been shown to be a very important component in preparing children for school. It seems that the lower income parents’ view of education may be colored by more negative personal educational experiences, and in turn, they may have a different understanding of the purpose and goals of education than the higher income parents. Thus, the lower income mothers were less able to directly instruct their children on how to be successful in school. Although lower income children were found to be secure in their attachment to their parents and teachers, and participated in learning activities in the home, they did not develop relationships with teachers that related to their overall readiness for kindergarten. For the lower income children, what occurred in the child’s home outweighed what occurred in the preschool classroom in predicting school readiness scores.

**Implications**

There are several implications to this study. First, it seems for all children in the study, what happened at home with parents was related to overall school readiness. For both groups, how securely attached the children were and the learning activities they engaged in at home did impact school readiness outcomes, either directly or indirectly. Thus, continued attention should be paid to what parents are doing at home with their preschoolers to prepare their children for school, and more specifically, how what they are doing in the home may prepare their children for positive relationships with teachers. Secondly, higher and lower income children, even when not representative of the most
advantaged and most disadvantaged children, come to be ready for kindergarten in
different ways, and to varying degrees. For the current sample, higher income children
did outscore their lower income peers by 9 points, although both mean scores fell well
within the average range. Likewise, predictors of school readiness for these groups also
differed, suggesting that perhaps interventions for preschoolers at-risk for school
readiness deficits need to take differences in parent attachment, frequency of book
reading, and parent attitudes about school in general into consideration. Overall, the route
a child takes to being ready for school may differ by income level, and as a result, may
require specific, targeted interventions for different income groups. For instance, higher
income single mothers may require more support and direct training in how to utilize
nonmarital co-parents than lower income single mothers. Whereas, lower income parents
may require more direct training in the importance of fostering creativity and curiosity,
and how to process their own school experiences in ways that help them support and
foster a desire to learn and succeed in their children. The lack of relationship between
parent attachment and teacher attachment for the lower income children in this sample is
concerning. For the current sample, overall, the lower income children were securely
attached and were ready for school. However, this study seems to suggest that what
happened at home for the lower income children was much more impactful on school
readiness than what occurred at school. The implication of this for lower income children
with low quality parent attachments and home learning environments is concerning if, in
fact, school readiness is not related to what happens at school for lower income children.
Limitations of the Study

There were several limitations to this study. First, a significant limitation of this study is the low level of external validity given the nonprobability sample method used. The participants were all willing volunteers, which may, in fact, make them characteristically different than the general population. Thus, the results are specific to the children who participated and definitive generalizations to the larger population of preschool children are not possible. Additionally, the correlational nature of the study is a limitation in that no experimental manipulation was implemented. Manipulation is often used to control for extraneous effects of unmeasured variables that may exist. As such, the possibility for confounding variables was higher for this study than would be with a true experiment, which again limited the generalizability of the findings, despite steps being taken to measure all meaningful variables so that their impact could be controlled during analyses. Finally, this study relied heavily on parent and teacher report. Parent and teacher opinions are undoubtedly important in understanding children’s lives and experiences; however, the use of objective observation of the families in their homes and the children in their classroom could have strengthened the experimental nature of the study and improve the overall external validity.

Further Research

The current study suggests that, despite a lack of difference in the quality of parent attachments and teacher attachments, how each of these relationships related to school readiness was entirely different for the higher and lower income families. These differences are speculated to be due to differences in family educational values; however,
these values were not directly measured in the current study. Future research is needed to examine more closely what differences in parent attitude about education exist and how they relate to both parent and teacher attachment as well as school readiness. Additionally, if specific values and attitudes can be implicated in fostering school readiness, it would be interesting to see if interventions with parents without such attitudes and values can positively impact school readiness in children.

The current study also suggests that the impact of living in single family homes is very different for higher and lower income children. It is suggested that the difference may be the stability provided by nonmarital co-parents in lower income families; however, research is needed to verify this hypothesis. Additional studies are also needed to explore how and why school readiness is effected by living in single parent homes, and if training and interventions for higher income single mothers would help them to better support school readiness skills in their children.

Finally, it was found that home factors are the best predictor for school readiness for low income children, while relationships with teachers only predicted higher income children’s school readiness scores. More research is needed to see if this pattern is also seen when the children’s home environments and parent relationships are low quality. If parent attachment for the higher income children was low quality, would higher quality relationships with teachers be less likely to occur, and thus, be a less effective predictor of school readiness than seen for the current sample? Likewise, it may be the case that if home factors for lower income children are low quality, healthier teacher relationships could positively impact readiness for school.
References


comprehension, and narrative skills. *Early Education and Development, 19*(1), 27-44.


Appendix A: Fourteen Curricula Studied by the Preschool Curriculum Evaluation Research Initiative
1. *Bright Beginnings* (Charlotte-Mecklenburg Schools 2001)


4. *Curiosity Corner* (Success for All Foundation, Inc. 2003)

5. *DLM Early Childhood Express supplemented with Open Court Reading Pre-K* (SRA/McGraw-Hill 2003)


7. *Early Literacy and Learning Model* (Florida Institute of Education and the University of North Florida 2002)


13. *Project Construct* (Missouri Department of Elementary and Secondary)

Appendix B: Director/District Manager Invitation Letter
Dear Director/District Manager,

What is it about a child’s home and school environment that helps prepare them for kindergarten? This is a question I am addressing in my dissertation research at The Ohio State University. The study focuses on preschool-aged children and I am writing to invite your centers to be part of it!

With your permission, I would distribute invitation and permission slips to your 3- to 5-year-old students requesting parental permission to involve them in our study. Once parents give permission, children will work with a graduate student once between January 2010 and June 2011. During their time with the graduate student, children will answer questions about the things they are learning in preschool such as colors, numbers, and letters. The questions are aimed at learning what 3-5 year-olds understand. The testing will take place in your center at the convenience of yourself and the teacher. The session will last approximately 15-30 minutes. In addition to the testing done with the children, teachers of children enrolled in the study will be asked to complete a questionnaire about their classroom in general and their specific interactions with each participating child. We understand your teachers are very busy and as token of our appreciation for their participation, teachers who complete the questionnaire for the participating children in their classroom will be given a gift card. Parents will also be asked to complete and return a background questionnaire that asks for information about their family and its day-to-day experiences related to learning activities in the home. Parents who participate will be given the opportunity to enter in a drawing for 2 OSU football tickets for the 2010 regular session. All parents would be informed that their child’s participation in this study is voluntary, and that they are free to withdraw their consent or discontinue participation at anytime. You should also be assured that the data we collect will be kept confidential. It is also important to emphasize that when it comes time to publish any of our results from this study, we are interested in reporting only group findings and not the data from individuals.

I hope that you will be able to help me with this project and increase our understanding of children’s development! We will be calling your center to see if you are interested in participating within the next few weeks. If you have any questions or would like to let me know you would like to participate immediately, please contact us at the email address(es) or phone numbers listed below.

Thank you for your consideration.

Sincerely,

______________________________
Amy M. Boland, M.A.
School Psychology Doctoral Student

______________________________
Antoinette Miranda, PhD
Associate Professor, School Psychology
Appendix C: The Ohio State University Parental Permission For Child’s Participation in Research
**Study Title:** Environmental Factors in School Readiness  
**Researchers:** Antoinette Miranda, PhD & Amy M. Boland, M.A.

This is a parental permission form for research participation. It contains important information about this study and what to expect if you permit your child to participate.

**Your child’s participation is voluntary.** Please consider the information carefully. Feel free to discuss the study with your friends and family and to ask questions before making your decision whether or not you will participate and if you will to permit your child to participate. If you agree to participate and agree to permit your child to participate, you will be asked to sign this form and will receive a copy of the form.

**Purpose:** This study was designed to look at how a preschooler’s home and school environment relate to kindergarten readiness.

**Procedures/Tasks:** Your child will work with an OSU graduate student once during the school year. They would be asked questions about the things they are learning in preschool such as colors, numbers, and letters. The questions are aimed at learning what 3- to 5-year-olds understand. The testing will take place during your child’s preschool day (at the convenience of the teachers) and the session will last approximately 15-30 minutes. You will also be asked to complete a questionnaire about your child’s home activities and relationships, which will take approximately 15-30 minutes. Your child’s teacher would also be asked to answer questions about your child’s classroom environment and their relationship with your child.

**Duration:** Your child will participate in their preschool once for approximately 15-30 minutes. The questionnaire you will complete asks questions about your child’s home activities and relationship with you. Completing the questionnaire takes approximately 15-30 minutes. You and your child may leave the study at any time. If you or your child decides to stop participation in the study, there will be no penalty and neither you nor your child will lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.

**Risks and Benefits:** There are no foreseen risks to you or your child as a result of this study. Many children enjoy working with the graduate student.

**Confidentiality:**
Efforts will be made to keep your child’s study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your child’s participation in this study may be disclosed if required by state law. Also, your child’s records may be reviewed by the following groups (as applicable to the research):

- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;

**Incentives:**
Children will be given stickers and a certificate when finished working with the graduate student. Parents have the option of being entered into a drawing for a pair of OSU regular season football tickets for the 2010 season. Participation in the study is not required for participation in the raffle. Teachers who complete the classroom questionnaire will be given a gift card as a token of our appreciation.

**Participant Rights:** You or your child may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you or your child is a student or employee at Ohio State, your decision will not affect your grades or employment status.
If you and your child choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights your child may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Contacts and Questions:
For questions, concerns, or complaints about the study, or if you feel your child has been harmed by participation, you may contact Professor Antoinette Miranda at 614-292-5909 or graduate student Amy Boland at 323-2648.

For questions about your child’s rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

Signing the parental permission form
I have read (or someone has read to me) this form and I am aware that I am being asked to provide permission for my child to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to permit my child to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of your preschooler

Printed name of parent/guardian  Signature of parent/guardian  AM/PM

Relationship to the preschooler  Date and time

Investigator/Research Staff
I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Amy M. Boland, M.A.

Printed name of person obtaining consent  Signature of person obtaining consent  AM/PM

Date and time

PLEASE RETAIN FOR YOUR RECORDS.
I have read (or someone has read to me) this form and I am aware that I am being asked to provide permission for my child to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to permit my child to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of your preschooler

Printed name of parent/guardian  Signature of parent/guardian

Relationship to the preschooler  Date and time  AM/PM

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Amy M. Boland, M.A.  
Printed name of person obtaining consent  Signature of person obtaining consent  
_______________________________________________  AM/PM

PLEASE SIGN AND RETURN IN THE PROVIDED ENVELOPE.
Appendix D: Family Background Questionnaire
Home Environment Questionnaire

This form should be completed by the primary caregiver of the preschool-aged child.

Please indicate your relationship to the child:  
( ) Mother  ( ) Aunt  ( ) Grandmother

( ) Father  ( ) Uncle  ( ) Grandfather  ( ) Non-relative legal guardian

( ) Other: please specify______________________________________

Child’s Information

1. Date of Birth: ______/______/_______
2. Gender:  ( ) Male  ( ) Female
3. My child’s ethnicity is:
   ( ) White  ( ) Black/African American
   ( ) Hispanic/Latino  ( ) Asian/Pacific Islander
   ( ) American Indian  ( ) Indian
   ( ) African  ( ) Biracial/Multi-racial
   ( ) Other: (Please specify)_____________________________________

4. My child’s preschool class meets:
   ( ) AM  ( ) PM  ( ) All Day
5. My child attends preschool:
   ( ) 9 months a year with summers off
   ( ) 12 months a year

6. How many days a week does your child attend preschool? ____________
7. How long has your child attended preschool since turning 3 years old?
   ( ) less than 1 year (1-12 months)  ( ) 1 year (12-23 months)
   ( ) two years (24-35 months)  ( ) 3 years (36 months or more)

8. How many people are in your family that live at home with your child? ____________
   • Who does your child live with? (Please check all that apply)
     ( ) Mother  ( ) Father  ( ) Grandmother  ( ) Grandfather  ( ) Sister(s)
     ( ) Aunt  ( ) Uncle  ( ) Stepmother  ( ) Brother(s)

9. Does your family qualify for Title XX funding?  
   ( ) Yes  ( ) No
   • If yes, please indicate your family’s co-pay in dollars: $_______
     o Please circle if co-pay above is: weekly or monthly.
Mother or Primary Female Caregiver Living in the Child’s Home

1. Is there a female caregiver living in the child’s home? ( ) Yes ( ) No
   
   If yes, please complete this section:
   
   • Female Caregiver’s Birth Date: _____/_____/_____
   
   • Relationship to the child: ( ) Mother ( ) Sister ( ) Grandmother
     ( ) Friend of Family ( ) Aunt ( ) Other: __________
   
   • Highest level of education completed:
     ( ) less than high school ( ) high school diploma
     ( ) vocational school or associate’s degree ( ) bachelor’s degree
     ( ) graduate degree (for example M.A., M.S., PhD, J.D., M.D., etc)
   
   • Does this caregiver like to read to herself? ( ) Yes ( ) No
   
   • How often does she read to herself? ( ) Daily
     ( ) Several Time a Week
     ( ) Weekly or less

Father or Primary Male Caregiver Living in the Child’s Home

1. Is there a male caretaker living in the child’s home? ( ) Yes ( ) No
   
   If yes, please complete this section:
   
   • Male Caregiver’s Birth Date: _____/_____/_____
   
   • Relationship to the child: ( ) Father ( ) Brother ( ) Grandfather
     ( ) Friend of Family ( ) Uncle ( ) Other: __________
   
   • Highest level of education completed:
     ( ) less than high school ( ) high school diploma
     ( ) vocational school or associate’s degree ( ) bachelor’s degree
     ( ) graduate degree (for example M.A., M.S., PhD, J.D., M.D., etc)
   
   • Does this caregiver like to read to himself? ( ) Yes ( ) No
   
   • How often does he read to himself? ( ) Daily
     ( ) Several Time a Week
     ( ) Weekly or Less
General Information about the Home Environment

1. Does someone at home take your child to the library to borrow books? ( ) Yes ( ) No
   If “Yes” how often is it used?
   ( ) On special occasions
   ( ) Once a month
   ( ) Once every 2 weeks
   ( ) Once a week

2. Does your family subscribe to newspapers and/or magazines? ( ) Yes ( ) No
   If “Yes”:
   How many newspapers? _______
   How many adult magazines? _______
   How many child magazines? _______

3. Does your child watch TV at home? ( ) Yes ( ) No

4. How many hours per day does your child watch TV:
   Monday-Friday: ________ hours/day
   Saturday: ___________ hours/day
   Sunday: _____________ hours/day
   a. How many of the hours listed above are watching “educational” television? ________ hours.
   b. How many of the hours listed above are watching “popular” television? ___________ hours.

5. Does someone in the home read to your child? ( ) Yes ( ) No
   If “Yes”, how often is this child read to at home?
   ( ) Occasionally, less than once a week
   ( ) Once a week
   ( ) Several times a week
   ( ) Once a day
   ( ) More than once a day

6. Does your child read or look at books himself/herself? ( ) Yes ( ) No

7. Approximately how many books does your child own? ( ) Less than 10
   ( ) 10-30
   ( ) More than 30

8. Approximately how many puzzles does your child have? ( ) Less than 5
   ( ) 5-10
   ( ) More than 10
9. Do you ever teach the child a sport, dance, or physical activity?  
   ( ) Yes  ( ) No
   If “Yes”: How many times per week?
   □ less than once  □ 1 or 2 times  □ 3 times  □ 4 times  □ 5 times  □ 6 times

10. Does the child ever play with letters at home?  
    ( ) Yes  ( ) No
    If “Yes”: How many times per week?
    □ less than once  □ 1 or 2 times  □ 3 times  □ 4 times  □ 5 times  □ 6 times

11. Does someone help your child learn the ABCs or the alphabet at home?  
    ( ) Yes  ( ) No
    If “Yes”: How many times per week?
    □ less than once  □ 1 or 2 times  □ 3 times  □ 4 times  □ 5 times  □ 6 times

12. Does anyone at home ever teach the child numbers or counting?  
    ( ) Yes  ( ) No
    If “Yes”: How many times per week?
    □ less than once  □ 1 or 2 times  □ 3 times  □ 4 times  □ 5 times  □ 6 times

13. Does anyone at home ever teach the child science (i.e. nature, space, physical science)?  
    ( ) Yes  ( ) No
    If “Yes”: How many times per week?
    □ less than once  □ 1 or 2 times  □ 3 times  □ 4 times  □ 5 times  □ 6 times

14. Does anyone at home ever teach the child social studies (i.e. history, geography, citizenship)?  
    ( ) Yes  ( ) No
    If “Yes”: How many times per week?
    □ less than once  □ 1 or 2 times  □ 3 times  □ 4 times  □ 5 times  □ 6 times

15. Does anyone at home ever teach the child songs, poems, or nursery rhymes?  
    ( ) Yes  ( ) No
    If “Yes”: How many times per week?
    □ less than once  □ 1 or 2 times  □ 3 times  □ 4 times  □ 5 times  □ 6 times

16. Does your child ever paint, draw, color, or write at home?  
    ( ) Yes  ( ) No
    If “Yes”: How many times per week?
    □ less than once  □ 1 or 2 times  □ 3 times  □ 4 times  □ 5 times  □ 6 times

160
General Information About the Child's Relationships at Home

Directions: Please read each item below and circle the number that you think BEST describes how often your child behaves as described in the item. Please answer all questions and circle only one number for each item. If you make a mistake, please put an “X” through the mistake and circle the right number. Please rate your child based on his/her current behavior. This section should be completed by the primary caregiver.

<table>
<thead>
<tr>
<th></th>
<th>0 never/rarely</th>
<th>1 once in a while</th>
<th>2 occasionally</th>
<th>3 sometimes</th>
<th>4 often</th>
<th>5 usually</th>
<th>6 almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child is very clingy</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. If things don't go his/her way, my child gets very upset</td>
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<td>3. When my child gets hurt, he/she refuses to let anyone comfort him/her</td>
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<td>4. My child understands what is said to him/her</td>
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<td>6. When my child is in pain, he/she doesn't show it</td>
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<td>9. My child is very whiny</td>
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<td>10. My child talks as well as other children of the same age</td>
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<td>11. When my child is upset, he/she does not allow familiar adults to comfort him/her, but will go to strangers for comfort</td>
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<td>12. My child teases, hurts, or is cruel to other children.</td>
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<td>13. My child hoards food or has other unusual eating habits (e.g., eats paper, raw flour, paste or glue, feces, etc.)</td>
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<td>14. My child destroys or breaks his/her own things</td>
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<td>15. My child destroys or breaks things that belong to others</td>
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<td>16. My child has an easy time making and keeping friends</td>
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<td>17. My child steals things and doesn't seem to feel bad about his/her behavior</td>
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19. My child has told others that I have done or said things to or about him/her that I have not done.

20. My child plays well with other children

THANK YOU FOR PARTICIPATING!

To enter the drawing for two 2010 OSU regular season football tickets* or a $120 Kroger Gift Card, please complete the raffle ticket below. Then detach and place in the raffle box at your child's preschool.
Appendix E: Raffle Ticket

OSU Ticket/Kroger Gift Card Raffle Ticket

Parent Name:_______________________________________________________________

How would you like to be contacted if you win:  □ Phone  □ Email  □ Other

Phone, email or other:________________________________________________________________________

Which prize do you prefer?  □ OSU Football Tickets  □ Kroger Gift Card

Address to which prize should be mailed:________________________________________________________________________

*Drawing will be held at least 1 week prior to the first regular season game. Tickets will be 1 pair (2 tickets) of upgraded student tickets for the 2010 season. No ID will be required. Tickets will be provided at least 1 week prior to the game via priority USPS mail. The winner does not get to choose the game. Kroger Gift Card will be for the amount of $120.00. You do not need to participate in the study to be entered into the drawing.
### Appendix F: Home Learning Environment Measure (HLEM) Scoring

<table>
<thead>
<tr>
<th>Score</th>
<th>PRead</th>
<th>Does anyone at home/school ever read to child/students?</th>
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<tbody>
<tr>
<td>1 – Yes</td>
<td>0</td>
<td></td>
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<tr>
<td>2 – No</td>
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<thead>
<tr>
<th>Score</th>
<th>PreadOf</th>
<th>How often does someone at home/school read to child/students?</th>
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<tbody>
<tr>
<td>1 – Occasionally or less than once a week</td>
<td>1</td>
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<tr>
<td>2 – Once a week</td>
<td>2</td>
<td></td>
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<tr>
<td>3 – Several times a week</td>
<td>3</td>
<td></td>
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<tr>
<td>4 – Once a day</td>
<td>4</td>
<td></td>
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<tr>
<td>5 – More than once a day</td>
<td>5</td>
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<table>
<thead>
<tr>
<th>Score</th>
<th>Library</th>
<th>Does anyone at home/school ever take child/students to the library?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Yes</td>
<td>0</td>
<td></td>
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<tr>
<td>2 – No</td>
<td>0</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Score</th>
<th>Wlibrary</th>
<th>How often does someone at home/school take child/students to the library to borrow books?</th>
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<tbody>
<tr>
<td>1 – On special occasions</td>
<td>3</td>
<td></td>
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<tr>
<td>2 – Once a month</td>
<td>5</td>
<td></td>
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<tr>
<td>3 – Once a fortnight</td>
<td>6</td>
<td></td>
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<tr>
<td>4 – Or, once a week</td>
<td>7</td>
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<thead>
<tr>
<th>Score</th>
<th>Ptsport</th>
<th>Does anyone at home/school ever teach child/students a sport, dance or physical activities?</th>
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<tbody>
<tr>
<td>1 – Yes</td>
<td>0</td>
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<tr>
<td>2 – No</td>
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<tr>
<th>Score</th>
<th>PtsOft</th>
<th>How often does someone at home/school teach a sport, dance or physical activities?</th>
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</thead>
<tbody>
<tr>
<td>1 – Occasionally or less than once a week</td>
<td>1</td>
<td></td>
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<tr>
<td>2 – 1 or 2 days per week</td>
<td>2</td>
<td></td>
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<td>3 – 3 times a week</td>
<td>3</td>
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<td>4 – 4 times a week</td>
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<td>5 – 5 times a week</td>
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<td>6 – 6 times a week</td>
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<tr>
<td>7 – 7 times a week/constantly</td>
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<thead>
<tr>
<th>Score</th>
<th>Pnum</th>
<th>Does child/students ever play with letters at home/school?</th>
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<tbody>
<tr>
<td>1 – Yes</td>
<td>0</td>
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<td>2 – No</td>
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<tr>
<th>Score</th>
<th>PnumOft</th>
<th>How often does child/students play with letters at home/school?</th>
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<tbody>
<tr>
<td>1 – Occasionally or less than once a week</td>
<td>1</td>
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<tr>
<td>2 – 1 or 2 days per week</td>
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<td>3 – 3 times a week</td>
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<td>4 – 4 times a week</td>
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<td>5 – 5 times a week</td>
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<td>6 – 6 times a week</td>
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<tr>
<td>7 – 7 times a week/constantly</td>
<td>7</td>
<td></td>
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</tbody>
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<thead>
<tr>
<th>Score</th>
<th>ABC</th>
<th>Does anyone at home/school ever help child/students to learn the ABC or the alphabet?</th>
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</thead>
<tbody>
<tr>
<td>1 – Yes</td>
<td>0</td>
<td></td>
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<tr>
<td>2 – No</td>
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<tr>
<th>Score</th>
<th>ABCOft</th>
<th>How often does someone at home/school help child/students to learn the ABC or alphabet?</th>
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<tbody>
<tr>
<td>1 – Occasionally or less than once a week</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2 – 1 or 2 days per week</td>
<td>2</td>
<td></td>
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<tr>
<td>3 – 3 times a week</td>
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<td>4 – 4 times a week</td>
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<td>5 – 5 times a week</td>
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<td>6 – 6 times a week</td>
<td>6</td>
<td></td>
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<tr>
<td>7 – 7 times a week/constantly</td>
<td>7</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>Score</th>
<th>Math</th>
<th>Does anyone at home/school ever teach child/students numbers or counting?</th>
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</thead>
<tbody>
<tr>
<td>1 – Yes</td>
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<tr>
<td>2 – No</td>
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<tr>
<th>Score</th>
<th>MathOft</th>
<th>How often does someone at home/school try</th>
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<tr>
<td>1 – Occasionally or less than once a week</td>
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<tr>
<td></td>
<td>Does anyone at home/school ever teach child/students numbers or counting?</td>
<td>How often does someone at home/school try to teach child/students science?</td>
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<tr>
<td><strong>Science</strong></td>
<td>1 – Yes</td>
<td>1 – Occasionally or less than once a week</td>
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<td></td>
<td>2 – No</td>
<td>2 – 1 or 2 days per week</td>
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<td>3 – 3 times a week</td>
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<td>4 – 4 times a week</td>
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<td>6 – 6 times a week</td>
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<td><strong>Social Studies</strong></td>
<td><strong>ScienceOft</strong></td>
<td><strong>Social StudiesOft</strong></td>
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<td>1 – Yes</td>
<td>1 – Occasionally or less than once a week</td>
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<td></td>
<td>2 – No</td>
<td>2 – 1 or 2 days per week</td>
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<tr>
<td><strong>Paint</strong></td>
<td><strong>PaintOft</strong></td>
<td><strong>PaintOft</strong></td>
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<td>1 – Yes</td>
<td>1 – Occasionally or less than once a week</td>
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<td></td>
<td>2 – No</td>
<td>2 – 1 or 2 days per week</td>
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<tr>
<td>Overall score</td>
<td>is the sum of the 0-7 scores for each item. Total scores can range from 0 to 80 with higher scores indicating higher frequency of activities that support learning within the environment.</td>
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Appendix G: Kinship Center Attachment Questionnaire (KCAQ) Scoring

The majority of the items are worded negatively and were reverse scored so that a low score (e.g., a caregiver responds “1-Never/Rarely”) reflected more attachment difficulty and higher scores indicated more secure attachment.

Reversal Procedure: (0 = 6); (1 = 5); (2 = 4) (3 = 3) (old value = new value for reverse scoring).

Items NOT to be reversed:

4. My/This child understands what is said to him/her.

5. My/This child learns from his/her mistakes and stops a behavior when that behavior results in a negative consequence.

7. My/This child is kind and gentle with animals.

10. My/This child talks as well as other children of the same age.

16. My/This child has an easy time making and keeping friends.

20. My/This child plays well with other children.

After reversing these items, add totals for total score. Scores may range from 0-120 with higher scores indicating higher levels of secure attachment behavior.
Appendix H: Teacher Questionnaire Parts A and B
Classroom Questionnaire: FORM A
Only Complete this form ONCE.

General Information About the Classroom Environment

1. In your classroom, does anyone read to the children? ( ) Yes ( ) No
   If “Yes”: How many times per week?
   □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times

2. At school, are the students given time to read or look at books themselves? ( ) Yes ( ) No

3. Approximately how many books are in your classroom?
   □ less than 10 □ 10-30 □ more than 30

4. Approximately how many puzzles are in your classroom?
   □ less than 5 □ 5-10 □ More than 10

5. Do children have the opportunity to borrow books from a library or school? ( ) Yes ( ) No
   If “Yes”: How often can they borrow books?
   □ Once a month or less □ More than once a month □ Twice a month □ Once a week

6. Do the children watch TV in your classroom? ( ) Yes ( ) No
   If “Yes”, how many hours per day do they watch TV in your classroom? _______ hours/day.
   - How many of the hours listed above are “educational”? _______ hours.
   - How many of the hours listed above are “popular”? _______ hours.

7. Are the children taught a sport, dance, or physical activity in class? ( ) Yes ( ) No
   If “Yes”: How many times per week?
   □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times

8. Do the children ever play with letters in your class? ( ) Yes ( ) No
   If “Yes”: How many times per week?
   □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times
9. Does someone help the children learn the ABCs or the alphabet in class? ( ) Yes ( ) No
   If “Yes”: How many times per week?
   □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times

10. Does anyone teach the children numbers or counting in your classroom? ( ) Yes ( ) No
    If “Yes”: How many times per week?
    □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times

11. Does anyone in your classroom ever teach the children about science (i.e. nature, space, physical science)? ( ) Yes ( ) No
    If “Yes”: How many times per week?
    □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times

12. Does anyone in your classroom ever teach the children social studies (i.e. history, geography, citizenship)? ( ) Yes ( ) No
    If “Yes”: How many times per week?
    □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times

13. Does anyone at school ever teach the children songs, poems, or nursery rhymes? ( ) Yes ( ) No
    If “Yes”: How many times per week?
    □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times

14. Do the children in your class ever paint, draw, color, or write at school? ( ) Yes ( ) No
    If “Yes”: How many times per week?
    □ less than once □ 1 or 2 times □ 3 times □ 4 times □ 5 times □ 6 times

Thank you so much for participating!!!!

Please place the completed questionnaires and consent form in the provided envelope and place in the box in the center lobby or office.
Classroom Questionnaire: FORM B

The following questions are about how particular children act at school. Please complete this form about the child whose name is written on the attached coversheet.

Child’s Information

Your relationship to child:       (  ) Teacher       (  ) Assistant teacher
This child’s preschool class meets: (  ) AM  (  ) PM       (  ) All Day
This child’s preschool program runs: (  ) 9 months a year with summers off
                                          (  ) 12 months a year

Number of children currently enrolled in this child’s classroom: _____________

How long has this child attended your preschool classroom?

(  ) 1 to 6 months       (  ) 7 to 12 months
(  ) 13 to 18 months   (  ) 19 to 24 months
(  ) 25 to 30 months   (  ) 31 to 36 months
(  ) 37 to 42 months   (  ) 43 to 48 months

General Information About the Child’s Relationships at School

Directions: Please read each item below and circle the number that you think BEST describes how often this child behaves as described in the item. Please answer all questions and circle only one number for each item. If you make a mistake, please put an “X” through the mistake and circle the right number. Please rate your child based on his/her current behavior.

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<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td></td>
<td>never/rarely</td>
<td>once in a while</td>
<td>occasionally</td>
<td>sometimes</td>
<td>often</td>
<td>usually</td>
<td>almost always</td>
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</table>

1. This child is very clingy
2. If things don’t go his/her way, this child gets very upset
3. When this child gets hurt, he/she refuses to let anyone comfort him/her
4. This child understands what is said to him/her
5. This child learns from his/her mistakes and stops a behavior when that behavior results in a negative consequence
6. When this child is in pain, he/she doesn’t show it
7. This child is kind and gentle with toys, dolls, and stuffed animals
8. This child does not like being separated from me except on his/her terms
9. This child is very whiny
10. This child talks as well as other children of the same age
11. When upset, this child does not allow familiar adults to comfort him/her, but will go to strangers for comfort.
12. This child teases, hurts, or is cruel to other children.
13. This child hoards food or has other unusual eating habits (e.g., eats paper, raw flour, paste or glue, feces, etc.)
14. This child destroys or breaks his/her own things
15. This child destroys or breaks things that belong to others the classroom
16. This child has an easy time making and keeping friends
17. This child steals things and doesn’t seem to feel bad about his/her behavior
18. This child seems overly interested in fire, gore, and blood
19. This child plays well with other children at school.
20. This child has told others that I have done or said things to or about him/her that I have not done.

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**Thank you!!!!**
Appendix I: Sticker Sheet and Certificate of Completion

Certificate of Completion

Name:________________________________________________

Completed participation in the research study entitled:

Environmental Factors in School Readiness

Amy M. Boland, M.A.
Graduate Researcher
**Appendix J: List of Centers and Response Rates**

<table>
<thead>
<tr>
<th>Center</th>
<th>Location</th>
<th>Type of Center</th>
<th>Number of Packets Distributed</th>
<th>Number of Packets Returned</th>
<th>Response Rate</th>
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