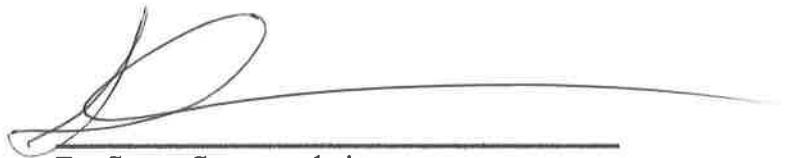


APPROVAL SHEET

Title of Thesis: Investigating the Relation Between Low-Income Parents' Educational Involvement and Classroom Variables on Children's Reading Skills

Name of Candidate: Brittany Gay
Master of Arts, 2018

Thesis and Abstract Approved:



Dr. Susan Sonnenschein
Professor
Department of Psychology

Date Approved: 8.27.18

ABSTRACT

Title of Document: INVESTIGATING THE RELATION
BETWEEN LOW-INCOME PARENTS'
EDUCATIONAL INVOLVEMENT AND
CLASSROOM VARIABLES ON
CHILDREN'S READING SKILLS

Brittany Gay, M.A, 2018

Directed By: Dr. Susan Sonnenschein, Professor, Department
of Psychology

This study examined the relation between low-income parents' educational involvement, measured as a composite of home- and school-based activities, and children's reading skills in first grade. Class size, amount of reading instruction, and teacher self-efficacy were also examined as predictors of children's reading skills as well as moderators of the relation between parents' educational involvement and children's reading skills. Parents' educational involvement predicted children's reading skills; however, none of the three classroom variables did. Although neither class size nor teacher self-efficacy moderated the relation between parents' educational involvement and children's reading skills, the amount of classroom reading instruction did. The relation between parents' educational involvement and children's reading skills was stronger for children who received fewer than 2 hours of classroom reading instruction a day. The results of this study underscore the need to consider both home and school contexts when examining the reading skills of children from low-income households.

INVESTIGATING THE RELATION BETWEEN LOW-INCOME PARENTS'
EDUCATIONAL INVOLVEMENT AND CLASSROOM VARIABLES ON
CHILDREN'S READING SKILLS

By

Brittany Gay

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, Baltimore County, in partial fulfillment
of the requirements for the degree of
Master of Arts
2018

© Copyright by
Brittany Gay
2018

Acknowledgements

First and foremost, I would like to thank my mentor, Dr. Susan Sonnenschein. This thesis would not have been possible without her patience and guidance. I would also like to thank the other members of my thesis committee, Dr. Shuyan Sun and Dr. Linda Baker. Dr. Sun's humor and statistical expertise enabled me to take on the challenge of analyzing nationally-representative data. Dr. Baker's insightful comments and grammatical assistance were also tremendously helpful. Finally, I would like to thank those who have helped me to get where I am today, including my friends, family, and former mentors.

Table of Contents

Acknowledgements	ii
Table of Contents	iii
List of Tables	iv
List of Figures	v
Introduction	1
Reading Development	4
Parents' Educational Involvement	8
Parents' Educational Involvement and Classroom Variables	16
Classroom Variables	17
Present Study	24
Specific Aims and Hypotheses	25
Method	27
Sample	27
Measures	30
Procedure	35
Results	35
Data Analysis	35
Discussion	51
Limitations and Future Directions	56
Conclusions	59
Appendices	60
References	62

List of Tables

Table 1. Demographic Information for the Sample in this Study.....	30
Table 2. Pearson Correlations between the Dependent and Independent Variables..	37
Table 3. Descriptive Statistics for Key Variables	38
Table 4. Parent Educational Involvement Predicting Children’s Reading Skills	40
Table 5. Class Size Predicting Children’s Reading Skills	42
Table 6. Amount of Reading Instruction Predicting Children’s Reading Skills.....	43
Table 7. Teacher Self-Efficacy Predicting Children’s Reading Skills.....	44
Table 8. Interaction between Class Size and Parent Educational Involvement Predicting Reading Skills.....	46
Table 9. Interaction between Amount of Reading Instruction and Parent Educational Involvement Predicting Reading Skills	48
Table 10. Conditional Effect of Parents’ Educational Involvement on Children’s Reading Skills by Amounts of Reading Instruction	49
Table 11. Interaction between Teacher Self-Efficacy and Parent Educational Involvement Predicting Reading Skills	51

List of Figures

Figure 1. Adapted version of the developmental contextual model (Lerner, 1991).	2
Figure 2. Flowchart depicting the participant exclusion process.....	29
Figure 3. Normal Q-Q plot of children's first-grade reading skills	37
Figure 4. Histogram depicting children's first-grade reading skills.	37
Figure 5. Scatterplot depicting the relation between parents' educational involvement and amount of reading instruction on children's first-grade reading skills.	50
Figure 6. Model depicting the compensatory nature of children's contexts.....	53

Introduction

About 45% of children between the ages of 6 and 11 years live in low-income households (Jiang, Ekono, & Skinner, 2016). In the United States, a household's income category (e.g., poor, near poor, low income, and above low income) is based on the federal poverty threshold. The low-income category consists of both poor (household income below 100% of the federal poverty threshold) and near poor (household income between 100% and 199% of the federal poverty threshold) households. Although the amount of income available to a near poor household can be substantially different than the income of a poor household, both poor and near poor children alike tend to score lower than higher income children on measures of academic skills (Duncan, Magnuson, Kalil, & Ziol-Guest, 2012). In fact, children from low-income households often begin school less academically prepared than their peers (Duncan, Magnuson, & Votruba-Drzal, 2014; Gershoff, Aber, Raver, & Lennon, 2007; Murnane, Sawhill, & Snow, 2012; Stipek & Ryan, 1997). For example, children from low-income households generally score about one standard deviation lower on standardized reading measures than those from higher-income households (Duncan & Murnane, 2014; Reardon, 2011; Reardon & Portilla, 2016). The income gap in children's reading scores, present at the start of school, continues or even increases as they progress through school (Duncan & Magnuson, 2011).

Although an income-based achievement gap exists, there is no single explanation as to *why* the gap exists. The bioecocultural (Bronfenbrenner & Morris, 2006) and developmental contextual (Lerner, 1991) models posit that children's development must be studied in context, as it is influenced by their interactions with

surrounding environments. The most proximal influences on the development of children are depicted in the innermost section of Figure 1. The quantity and quality of the interactions that children have with their proximal environments can vary based on macro-level influences (e.g., income), which can affect children's academic outcomes (Duncan et al., 2012; Votruba-Drzal, Miller, & Coley, 2016; Yeung, Linver, & Brooks-Gunn, 2002).

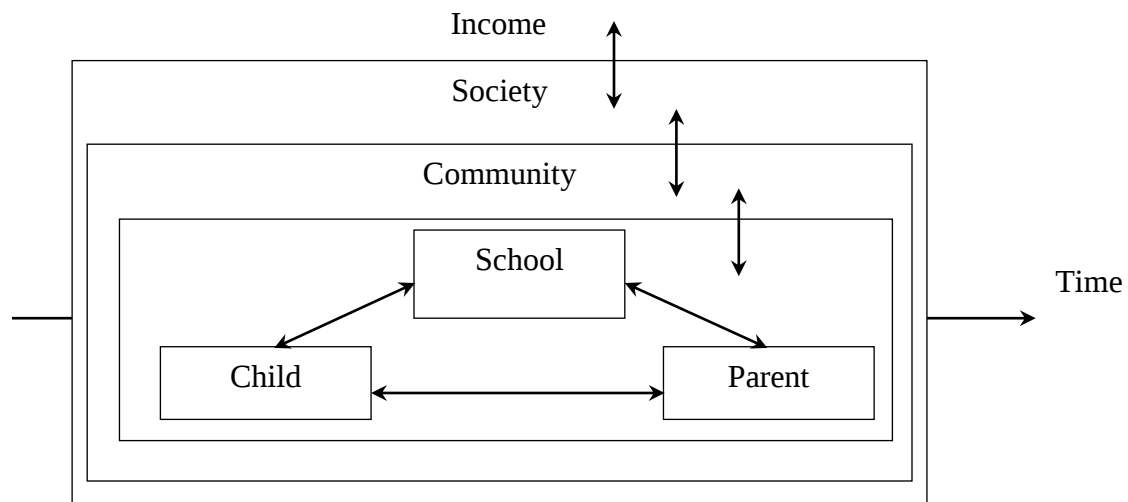


Figure 1. Adapted version of the developmental contextual model (Lerner, 1991).

One way parents can influence their children's academic outcomes is through academic socialization (Taylor, Clayton, & Rowley, 2004), that is, parents' beliefs, cognitions, and practices that can affect their children's educational development (Sonnenschein, Metzger, & Thompson, 2016; Taylor et al., 2004). Parents' academic socialization can be affected by income, which is explained by the family economic stress model and the parent investment model (Conger & Donnellan, 2007; Conger & Elder, 1994). These models support the need to consider the practices of low-income parents specifically, as opposed to the practices of all parents, due to the influence of income on parents' abilities to provide for and support their children's education.

According to the family economic stress model, economic hardship affects children's outcomes indirectly through parental psychological wellbeing and parenting practices (Conger & Elder, 1994; Conger et al., 2002; Masarik & Conger, 2017; Mistry, Vanderwater, Huston, & McLoyd, 2002). Parents experiencing economic hardships may be less able to be involved in their children's academic development due to the emotional and psychological distress associated with economic hardship. Moreover, the quality of interactions between parents and their children may be lower due to the chronic stress associated with poverty (Iruka, LaForett, & Odom, 2012; Neppl, Senia, & Donnellan, 2016). The parent investment model posits that parents with limited financial resources are often less able than more affluent parents to provide their children learning materials, such as books and educational supplies (Conger & Donnellan, 2007; Conger et al., 2002; Duncan et al., 2012; Duncan et al., 2014; Guo & Harris, 2000; Yeung et al., 2002). Taken together, the family economic stress and family investment models indicate that children from low-income households may experience smaller amounts and lower quality of academic socialization and have access to fewer educational resources, all of which can affect the degree to which children will succeed in school.

The effect of limited resources on children's academic development may be attenuated through children's attendance in high quality classrooms (Bulotsky-Shearer, Wen, Faria, Hahs-Vaughn, & Korfmacher, 2012; Wen, Bulotsky-Shearer, Hahs-Vaughn, & Korfmacher, 2012). Class size, amount of reading instruction, and teacher self-efficacy are each associated with children's reading skills (Downer & Pianta, 2006; Finn & Achilles, 1990; Zee & Koomen, 2016). As such, in the present

study, class size, amount of reading instruction, and teacher self-efficacy were examined in the spring of children's first grade year, a time when children are still developing their early reading skills. Children's early reading skills are fundamental to their success in school (Cunningham & Stanovich, 1997; Murnane et al., 2012). Although many children in the United States attend kindergarten, the first year of required formal schooling at the federal level is first grade (Workman, 2013). Accordingly, it is important that classroom characteristics which can help promote children's reading development in first grade are examined. Given that many low-income children are considered at-risk for reading difficulty (Hamre & Pianta, 2005; Snow, Burns, & Griffin, 1998), the present study examined if each of the classroom variables, class size, amount of reading instruction, and teacher self-efficacy, 1) predict children's reading skills and 2) moderate the relation between low-income parents' educational involvement and children's reading skills.

In the following sections I will review the literature on children's reading skills, parents' educational involvement, and classroom variables, as well as outline the study's methodology and results. Finally, the study's findings and limitations will be discussed.

Reading Development

Reading is defined as the "process of gaining meaning from print" (Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001, p. 34). According to the National Reading Panel (2000), there are five main components of reading, which can be classified as either skills-based or knowledge-based (Lesaux, 2012). Skills-based competencies include phonemic awareness, phonics, and word reading fluency

(Lesaux, 2012; Paris, 2005; Snow & Matthews, 2016; Stahl, 2011). These skills typically build on one another, with many children becoming proficient in skills-based competencies by the end of first grade (Morris, Bloodgood, Lomax, & Perney, 2003; Reardon, Valentino, & Shores, 2012). Knowledge-based competencies, or competencies that develop over a longer period of time, include vocabulary and reading comprehension. Although reading skills were measured as a composite in this study, it is important to acknowledge the components that make up this construct. In the following sections I will briefly review the literature on skills-based and knowledge-based reading competencies with a focus on the five reading dimensions from the National Reading Panel (2000) report which are described below.

Skills-based reading competencies. Skills-based reading competencies include phonemic awareness, phonics, and word reading fluency. Phonemic awareness is a child's ability to isolate, identify, categorize, blend, segment, and delete the smallest units of spoken language (i.e., phonemes; National Reading Panel, 2000). Phonemic awareness is necessary for children to learn to read (Yopp, 1992). Carlisle and Nomanbhoy (1993) compared the word complexity of first-grade children based on their level of phonological awareness (children who could segment words vs. children who could not segment words). The researchers found that first-grade children who could segment words were better able than their peers to form more complicated words. In addition, Wade-Woolley (2016) found that phonemic awareness was a significant predictor of fourth- and fifth-grade children's ($N = 110$) ability to decode (see also Stahl & Murray, 1994). Similar results between phonemic

awareness and children's reading skills were found in a meta-analysis conducted by Ehri and colleagues (2001).

Phonics knowledge is a child's ability to identify the relation between the sounds of words and their written representations (e.g., graphemes; Torgerson, Brooks, & Hall, 2006). Similar to phonemic awareness, there is a positive relation between phonics knowledge and children's reading skills (National Reading Panel, 2000; Torgerson et al., 2006). Phonemic awareness and phonics are part of a larger domain called the alphabetic principle. Knowledge of the alphabetic principle is the ability to connect sounds to letters and letters to words (Harn, Stoolmiller, & Chard, 2008; National Reading Panel, 2000; Rayner et al., 2001; Snow et al., 1998). For example, Foorman, Francis, Fletcher, Schatschneider, and Mehta (1998) found a significant, positive relation between instruction in the alphabetic principle and the reading skills of first- and second-grade children from low-income households ($N = 285$; see also Evans, Bell, Shaw, Moretti, & Page, 2006; Harn et al., 2008).

Children's reading fluency and comprehension could be negatively impacted should they fail to grasp the alphabetic principle, thus making them less likely to become successful readers (Snow et al., 1998).

Fluency is defined as a child's ability to accurately decode and quickly recognize text (Kuhn & Stahl, 2000). Kim, Wagner, and Lopez (2012) examined the relation between fluency and reading comprehension in a two-year longitudinal study. More specifically, the authors researched the growth of skills in word reading fluency (e.g., reading rate without context), text reading fluency (e.g., oral and silent reading of sentences or passages), and children's reading comprehension from first to second

grade ($N = 270$). Children's reading fluency at the start of first grade was predictive of their reading comprehension at the end of first grade. Children's reading fluency at the start of first grade predicted their fluency at the start of second grade, which was then associated with reading comprehension at the end of second grade (see also Wolf & Katzir-Cohen, 2001).

Knowledge-based reading competencies. Vocabulary consists of expressive and receptive vocabulary (Whitehurst & Lonigan, 1998) and can develop over the life course (Paris, 2005). Expressive vocabulary refers to the number of words a child can produce; receptive vocabulary refers to the number of words a child can recognize. Income-based differences in children's language exposure and vocabulary skills are evident prior to the start of formal schooling and are often the result of lack of exposure to vocabulary and educational resources at home (Fernald et al., 2013; Hart & Risley, 1995, 2003; Hindman, Wasik, & Snell, 2016). For instance, Hart and Risley (1995) longitudinally examined the interactions of parents and their children during early childhood, when children were between 7 months and 3 years old. They found that children ($N = 42$) from lower income households heard fewer vocabulary words than children from higher income households. Based on a follow-up study with 29 of the original participants, differences in vocabulary skills at age 3 accounted for over half of the variance in children's receptive and expressive vocabulary in third grade (Hart & Risley, 2003).

Reading comprehension is a child's ability to process and understand the meaning of text (Diamond & Gutlohn, 2006), which can be affected by the child's other reading skills and background knowledge. Children may have difficulties

comprehending written text if they do not understand that the letters on the page make words, words have meanings, and words can be combined to form meaningful statements (Diamond & Gutlohn, 2006; Ehri, 2005; National Reading Panel, 2000; Perfetti & Stafura, 2014; Rayner et al., 2001). Similarly, background knowledge is beneficial for reading comprehending as it is easier to relate to and understand information that aligns with past experiences (Maria, 1989). Children from lower income households, in particular, may be at-risk for difficulties with reading comprehension as poverty may affect children's background knowledge (Snow et al., 1998). The experiences of low-income children may not align with the information presented in children's books, which could affect how well they comprehend the text they read.

The present study focused on the reading skills of children in first grade. First grade is an important period in reading development as many children gain proficiency in skills-based competencies by the end of first grade (Mesmer & Williams, 2014; Reardon et al., 2012). In addition, children's reading skills in first grade are predictive of their reading skills in high school (Cunningham & Stanovich, 1997). Given the long-term implications of children's reading skills in first grade, it is important to investigate family and classroom characteristics that could bolster children's reading skills during this period.

Parents' Educational Involvement

Parents' involvement with their children's education is associated with children's academic success (Fan & Chen, 2001; Jeynes, 2003, 2005). Fan and Chen (2001) found a medium effect size for the relation between parent educational

involvement and children's academic skills in a meta-analysis of 25 studies. In a separate meta-analysis ($N = 21$), Jeynes (2003) found a small to medium effect size for the relation between parent educational involvement and various academic outcomes for non-White children, as well. Jeynes (2005) also found a large effect of the educational involvement of urban parents in a meta-analytic study. More specifically, the educational involvement of urban parents across 41 studies was associated with between 0.7 and 0.75 of a standard deviation in children's academic scores. The academic scores in question varied from study to study but tended to refer to either children's standardized test scores or grades. Although the populations of interest in Jeynes's (2003, 2005) meta-analyses may not be representative of all children from low-income households, both minority and urban children are more likely to live in lower income households than children from non-minority and non-urban backgrounds (Mistry et al., 2002; Votruba-Drzal et al., 2016). As such, Jeynes's (2003, 2005) findings have implications about the importance of parent involvement for children from low-income households.

Parents' educational involvement affords parents an opportunity to instruct their children and to model and reinforce behaviors that promote educational development (Hoover-Dempsey et al., 2001; Hoover-Dempsey & Sandler, 1995; Hoover-Dempsey & Sandler, 1997). Parents can emphasize the importance of education and motivate their children by being involved and interested in their children's education (Grolnick & Slowiaczek, 1994). Parents' educational involvement occurs at home and at school (Fantuzzo et al., 2013; Fantuzzo, Tighe, & Childs, 2000; Grolnick, 2016; cf. Epstein, 1995, 2010). Home-based involvement

refers to parents' provision of learning activities and opportunities and parents' interactions with their children during those activities. School-based involvement is parents' participation in educational activities in their children's schools and classrooms, such as attending parent-teacher conferences and serving as classroom volunteers (Fantuzzo et al., 2000).

Parents from lower-income households are often less involved than parents from higher income backgrounds (Grolnick, Benjet, Kurowski, & Apostoleris, 1997; Sonnenschein, Stapleton, & Metzger, 2014). Why, how, and if parents become involved in their children's education depends on a variety of variables, including how parents define their roles as parents, how efficacious they feel in helping their children, and how much time parents have to assist their children (Hoover-Dempsey & Sandler, 1995; Hoover-Dempsey & Sandler, 1997). Income itself is most likely not a direct determinant of why parents are involved, but rather may be a proxy for other variables, such as parents' time and available resources, as suggested in the family economic stress and family investment models (Conger & Donnellan, 2007; Conger & Elder, 1994; Yeung et al., 2002). In the following sections, I will briefly review the literature on home- and school-based educational involvement and their relations with children's reading skills, emphasizing research on low-income households.

Parents' home-based involvement. Parents' home-based educational involvement includes their provision of educational activities and artifacts as well as their interactions with their children during those activities. Home-based educational involvement is often positively associated with children's reading development

(Gottfried, Schlackman, Gottfried, & Boutin-Martinez, 2015; Izzo, Weissberg, Kasprow, & Fendrich, 1999; Morrison & Cooney, 2002; Sénéchal, 2006; Sénéchal & LeFevre, 2002).

Sénéchal and LeFevre (2002) studied the relations between two forms of home-based involvement (storybook exposure and parents' involvement in teaching) and children's reading skills in a sample of 168 middle-income English-speaking Canadian children ($N = 110$ kindergarteners; $N = 58$ 1st graders). Storybook exposure was measured using parent report of the number of book titles from a list parents recognized. Parents' involvement in teaching was defined as the frequency with which parents reported teaching their children to read and write. The researchers found that both higher levels of parent involvement and more exposure to books were predictive of children's reading skills. More specifically, storybook exposure (e.g., the number of book titles parents recognized) predicted children's vocabulary and listening comprehension at the beginning of first grade. Conversely, parents' involvement in teaching predicted children's reading skills at the beginning of first grade, which included measures of alphabet knowledge, decoding, and print concepts. Storybook exposure and parent involvement in teaching also had indirect long-term associations with children's reading skills. For instance, children's reading skills in first grade were positively associated with their reading skills in third grade (see also Sénéchal, 2006).

Gottfried et al. (2015) utilized data from the Fullerton Longitudinal Study to examine associations between parent home-based involvement, children's reading achievement and reading motivation, and children's educational attainment. Parents'

home-based involvement, operationalized as the time parents spent reading to children, was measured when children were 15, 39, and 60 months. Reading achievement and reading motivation were measured when children were 9 – 10 years and again when they were 13, 16, and 17 years. Children's educational attainment was measured when children were 29 years old. Gottfried et al. (2015) found that the amount of time that parents spent reading to their children during early childhood was predictive of children's reading achievement and reading motivation when they were between 9 and 10 years. Children's motivation and reading achievement at ages 9-10 years was indirectly related to educational attainment at age 29 through their reading achievement and reading motivation in adolescence. Furthermore, maternal educational attainment (an indicator of socioeconomic status) was a significant predictor of their home-based involvement and their children's educational attainment.

The income-based achievement gap in children's reading skills may be associated with a gap in access to educationally-enriching opportunities and materials, such as books and educational supplies, and interactions with parents (Gorski, 2013; Reardon, 2011). The parent investment model posits that parents with limited financial resources are often less able than other parents to invest time cultivating their children's educational endeavors and providing learning materials (Conger & Donnellan, 2007; Conger et al., 2002; Duncan et al., 2012; Duncan et al., 2014; Guo & Harris, 2000). For instance, Guo and Harris (2000) found that the relation between household poverty and children's reading skills was mediated by cognitive stimulation at home, which is one indicator of home-based involvement.

Cognitive stimulation in the home was defined as the materials (e.g., books, magazines) and activities (e.g., frequency of museum visits, frequency of reading with child) that parents provide for their children. Parents in low-income households reported owning fewer educational items and engaging in fewer educational activities with their children, which was negatively associated with children's reading (see also Sonnenschein, Baker, & Serpell, 2010). Although home-based involvement activities, such as those studied by Sénéchal and LeFevre (2002) and Sonnenschein et al. (2010), are often associated with children's academic outcomes, low-income parents may not have the means to provide materials for such activities or dedicate time to assist their children with them. As such, children from low-income households may need more outside support (e.g., from teachers and schools) than higher-income children.

Parents' school-based involvement. Involvement at school is one avenue through which parents can receive information about their children's education, increase their skills in helping their children succeed educationally, and partner with teachers to provide a consistent message about education to their children (Hill & Taylor, 2004; Sonnenschein & Schmidt, 2000; Sonnenschein et al., 2014). Similar to home-based involvement, parents' school-based involvement is associated with positive outcomes, including lower high school drop-out rates (Barnard, 2004), greater academic success (Englund, Luckner, Whaley, & Egeland, 2004; Fan & Chen, 2001; Jeynes, 2003, 2005), and higher reading scores (Dearing, Kreider, Simpkins, & Weiss, 2006; Dearing, McCartney, Weiss, Kreider, & Simpkins, 2004; Hill & Craft, 2003).

Parents' school involvement may be particularly beneficial for children from low-income households (Cooper & Crosnoe, 2007; Dearing et al., 2004; Dearing et al., 2006). For example, Cooper and Crosnoe (2007) found that parents' school involvement was predictive of children's academic orientation (e.g., children's general feelings and beliefs about school) for adolescents from low-income households but not higher-income households. Additionally, parent involvement also can mitigate against other academic risks associated with poverty, such as low maternal educational attainment. For instance, Dearing and colleagues (2006) found a positive relation between high levels of parent involvement at school and the reading skills of kindergarten children from low-income households. Moreover, parents' school-based involvement compensated for the negative effect of maternal educational attainment on children's reading skills (see also Dearing et al., 2004).

Dearing, Kreider, and Weiss (2008) collected data on parents' school involvement, children's perceptions of their academic competencies in reading and math, and children's relationships with their teachers during kindergarten, third grade, and fifth grade. Using multilevel modeling, the authors found that parents' school involvement predicted growth in children's reports of the relationship with their teachers. Parents' school involvement also predicted children's ratings of their academic competencies, but this relation was mediated by children's relationships with their teachers. Rates of parent school involvement from kindergarten to fifth grade were stable, indicating that children whose parents were not involved when their children began school tended not to become involved later.

It is important to note that parents' educational involvement is not consistently associated with positive outcomes for children. For instance, Pomerantz, Moorman, and Litwack (2007) found in a review of the literature that the association between parents' educational involvement and children's outcomes was mixed. The authors posited that how parents are involved and the rationale behind such involvement may be better predictors of children's outcomes than the quantity of parents' involvement. It also may be possible that studies either fail to test indirect models or do not collect data on possible mediators in the relation between parents' involvement and children's reading skills. For example, Daniel, Wang, and Berthelsen (2016) failed to find a direct relation between parents' school involvement in first grade and children's third grade math skills. However, they found an indirect relation between the two constructs through children's approaches to learning (as rated by teachers). That is, parents' educational involvement predicted children's approaches to learning (e.g., children's persistence, adaptability, and motivation in school), which then predicted children's math skills in third grade. Such findings emphasize the need to consider the mechanisms through which parents' educational involvement is associated with children's skills.

Although parents' school-based involvement is important, increasing the mean level of low-income parents' involvement may not be feasible (e.g., Dearing et al. 2008). Barriers to involvement may be more pronounced for low-income parents, who may not have the time or transportation necessary to increase how involved they are with their children's education (Grolnick & Slowiaczek, 1994; Hornby & Lafaele, 2011; Kim, 2009; Weiss et al., 2003). Given the inconsistent relation between

parents' educational involvement and children's skills, coupled with the tendency for low-income parents to be less involved, it is important to identify variables within children's classrooms which may aid in developing their reading skills.

Parents' Educational Involvement and Classroom Variables

Having positive home *and* classroom environments is beneficial for children (Bulotsky-Shearer et al., 2012; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Kainz & Vernon-Feagans, 2007; Wen et al., 2012). Classroom quality, one aspect of the classroom environment, is positively related to children's reading development (Bulotsky-Shearer et al., 2012; Wen et al., 2012). Bulotsky-Shearer and colleagues (2012) conducted a latent profile analysis using data from the Head Start Family and Child Experiences Survey (FACES). Profiles were based on levels of parent's home and school involvement, and the quality of children's classrooms. Classroom quality was measured using the Early Childhood Environment Rating Scale (ECERS), which included the qualities of available classroom activities and physical classroom environments. Profiles that included higher levels of parent involvement and classroom quality were associated with higher school readiness skills. For instance, children who had more involved parents and were in a high-quality classroom performed significantly better on a literacy-related assessment (Letter-Word Identification subtest of the revised Woodcock-Johnson; Woodcock & Johnson, 1989) and a vocabulary assessment (Peabody Picture Vocabulary Test; Dunn & Dunn, 1997) than children whose parents were less involved but were in a high-quality classroom.

The present study expanded current knowledge about parent involvement and classroom characteristics by investigating the relations between parent involvement, three classroom variables (class size, amount of reading instruction, and teacher self-efficacy), and children's reading skills. These three classroom variables have been shown to be independently associated with children's reading skills (Downer & Pianta, 2006; Finn & Achilles, 1990; Guo, Connor, Yang, Roehrig, & Morrison, 2012), but have received less attention as potential moderators of the relation between parent educational involvement and children's reading skills.

Classroom Variables

Class size. Small classes, typically 13-21 students (Allhusen et al., 2004; Finn & Achilles, 1990; Finn et al., 2010; Magnuson, Ruhm, & Waldfogel, 2007), are beneficial for children in the United States because children in such classes tend to receive more attention and have more interactions with their teachers than children in larger classrooms (Blatchford, 2003; Blatchford, Bassett, & Brown, 2011). In a review of the literature on class size, Finn, Pannozzo, and Achilles (2003) found that student engagement, such as attentiveness and participation in learning activities, was higher for children in small classes. Small classes may also be beneficial for teachers because they tend to be easier to manage than larger classes (Mueller, 2013; Allhusen et al., 2004). Small classes are also positively associated with children's general academic achievement and, more specifically, their reading skills (Finn & Achilles, 1990; Finn, Gerber, Achilles, & Boyd-Zaharias, 2001; Magnuson et al., 2007; Mosteller, 1995).

A large experimental study on the effect of class size on children's academic skills involved the randomization of 6,572 Tennessee students and teachers to three class size conditions (Finn & Achilles, 1990; Finn et al., 2001; Mosteller, 1995). The main project was conducted in two phases. The first phase, Project Student-Teacher Achievement Ratio (STAR), involved the random assignment of teachers and children in kindergarten through third grade to one of three class size conditions: small class size ($n = 108$ classrooms; 13 – 17 students), regular class size ($n = 101$ classrooms; 22 – 25 students), and regular class size with a teacher aide ($n = 99$ classrooms). The classes were located in inner-city ($n = 70$ classrooms), urban ($n = 41$ classrooms), suburban ($n = 62$ classrooms), and rural ($n = 158$ classrooms) schools. The schools varied in terms of students' race/ethnicities and socioeconomic status (as indexed by percentage receiving free or reduced-price lunches).

Overall, children in small classes received higher reading scores each year on the Stanford Achievement Test and the Tennessee Basic Skills First test than children in regular-sized classes, regardless of whether the regular-sized class had an aide (Finn et al., 2001). The benefits associated with small class size were more pronounced for children who remained in small classes through third grade, with reading performance increasing by about 0.12 of a standard deviation for each additional year children were in small classes (Finn et al., 2001). Relatedly, first-grade children in small classes were also significantly less likely than children in larger classes to be retained in grade (Finn, Suriani, & Achilles, 2010).

The second and third phases of the STAR project followed the children through middle and high school to evaluate the long-term effects of small class size

during early elementary school. The advantage of being in small classes during the early years of elementary school had long-term academic benefits. Children who were in small classes from kindergarten through third grade had higher test scores than students from the other class size conditions on state- administered achievement tests, including reading, in fourth, fifth, and seventh grade (Finn & Achilles, 1999; Finn et al., 2001; Finn et al., 2010). Although children who were in small classes outperformed their peers on math, science, and language assessments in sixth grade, reading was not significantly different (Finn & Achilles, 1999). In the third phase of project STAR, researchers also found that low-income children (e.g., children who received free lunch at school) and who were in small classes for at least three years during elementary school were more likely to graduate from high school than higher-income children (Finn, Gerber, & Boyd-Zaharias, 2005).

Small class size is also associated with decreasing achievement gaps between children who attended preschool and those who did not (Magnuson et al., 2007). Based on a longitudinal study of a nationally representative sample of elementary children, Magnuson et al. (2007) found that the reading score gap between children who attended preschool and those who did not was reduced when the average of children's class size during kindergarten, first, and third grades was fewer than about 20 children. Although small class sizes can be beneficial for children's reading skills, class size reductions are only one of numerous classroom components of effective educational interventions for at risk-children (Reynolds, Magnuson, & Ou, 2010). Another classroom component is the amount of reading instruction that children receive.

Amount of classroom reading instruction. “Instruction may not be effective for many children [because] they do not receive enough of it” (Morrison, Bachman, & Connor, 2005, p. 114). However, there is no consensus on what the optimal amount of instruction is and recommendations for instruction amount vary with reading curricula (Snow & Matthews, 2016). In general, the amount of reading instruction that children receive is positively associated with their reading skills (Downer & Pianta, 2006; Magnuson et al., 2007; Connor, Son, Hindman, & Morrison, 2005; Sonnenschein, Stapleton, & Benson, 2010; Taylor et al., 2000).

Downer and Pianta (2006) examined the relation between amount of reading instruction and children’s reading skills with a sample of 832 first-grade children from the NICHD Study of Early Child Care. They found that the amount of class time spent on reading was positively associated with children’s reading skills (see also Connor et al., 2005).

Magnuson et al. (2007) also used a large, nationally representative data set, the Early Childhood Longitudinal Study-Kindergarten (ECLS-K), to investigate the relation between the amount of reading instruction and children’s reading skills. They dichotomized reading instruction into amounts of instruction at or below the median of 61-90 minutes/day and above the median. On average, the advantage of preschool attendance on reading skills was eliminated by the spring of first grade for children in classrooms with high amounts of reading instruction. Similarly, Sonnenschein et al. (2010) investigated the effect of daily amounts of reading instruction using latent growth modeling with a sample of children from the ECLS-K. The amount of reading instruction that children received in first-grade classrooms

was predictive of their concurrent reading skills; surprisingly, however, greater amounts of instruction were most beneficial for children who were more advanced in reading.

Although the referenced studies found that the amount of reading instruction is related to children's reading skills, the samples were not limited to children from low-income backgrounds. Rather, household income was either controlled for in analyses (Magnuson et al., 2007) or was not a significant predictor of children's reading skills (Downer & Pianta, 2006; Sonnenschein et al., 2010). In addition, income was not a significant predictor in all of the studies but may be indirectly related to outcomes through other variables, such as exposure to enriching activities. As children from low-income households may have less educationally-involved parents (Guo & Harris, 2000; Hornby & Lafaele, 2011; Kim, 2009), there is a need to identify if greater amounts of reading instruction can compensate for low levels of parent educational involvement. As such, this study focused specifically on children from low-income households.

Teacher self-efficacy. Teacher self-efficacy is defined as the extent to which teachers perceive themselves as competent in their abilities to fulfill their duties as teachers and ensure that the students in their classrooms learn (Friedman & Kass, 2002; Martin, Sass, & Schmitt, 2012; Tschannen-Moran & Johnson, 2011; Tschannen-Moran & Woolfolk Hoy, 2001). The foundation of teacher self-efficacy lies in teachers' attributions of their students' behaviors and performances. The attributions that teachers have can be either internally-based (e.g., due to factors within the teacher or student) or externally-based (e.g., due to factors in the

environment; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Teachers' attributions can inform their future feelings of self-efficacy, thus creating a cycle (Bandura, 2006).

Teacher self-efficacy has implications for classroom practices and children's reading skills (Guo, Piasta, Justice, & Kaderavek, 2010; Guo et al., 2012; Justice, Mashburn, Hamre, & Pianta, 2008; Varghese, Garwood, Bratsch-Hines, & Vernon-Feagans, 2016; Zee & Koomen, 2016). Teachers who have higher levels of teacher self-efficacy may be better able to create classroom climates that promote children's learning by providing higher quality reading instruction than teachers with lower levels (Guo et al., 2010; Guo et al., 2012; Justice et al., 2008). Previous research has found that teacher self-efficacy is also associated with children's academic skills (see Zee & Koomen, 2016 for review) and reading skills (Guo et al., 2010; Guo et al., 2012; Varghese et al., 2016).

Guo and colleagues (2012), using data from the NICHD Study of Early Child Care, found that the self-efficacy of fifth grade teachers was positively related to students' reading skills. Teachers with higher levels of teacher self-efficacy tended to have children with higher reading skills and better classroom environments. In addition to a direct relation, teacher self-efficacy was indirectly related to children's reading skills, through teacher support for learning (composite of teacher sensitivity, control, detachment, and classroom climate).

Guo et al. (2010) investigated the relation between teacher self-efficacy and children's receptive vocabulary and print awareness with a sample of 67 preschool teachers. The print awareness construct included items on print awareness, alphabet

knowledge, and name-writing. Preschool teachers with high levels of teacher self-efficacy had classrooms with more positive classroom climates. Children whose teachers had higher levels of teacher self-efficacy displayed higher print awareness scores. An interaction between teacher self-efficacy and classroom climate on children's receptive vocabulary was also found. The relation between teacher self-efficacy and children's vocabulary skills was stronger when teachers provided more supportive classrooms. Note that Guo et al. (2010) did not investigate income in their research. As such, the present study addressed the gap in the literature by focusing on the relation between teacher self-efficacy and the reading skills displayed by first-grade children from low-income households. As teacher self-efficacy is predictive of children's reading skills and reading instruction quality (Guo et al., 2010; Guo et al., 2012; Justice et al., 2008; Varghese et al., 2016), having teachers with high levels of teacher self-efficacy may compensate for the low levels of parent educational involvement often found in low-income households.

Teacher self-efficacy and parent educational involvement. Hoover-Dempsey, Bassler, and Brissie (1987) found that teachers with higher levels of teacher self-efficacy had parents in their classrooms who were more likely to volunteer and attend parent-teacher conferences. However, both teacher self-efficacy and parent educational involvement were reported by the teachers. It is possible that teachers who felt more efficacious may have rated more highly their classroom parents' involvement. This study sought to clarify the relation between teacher self-efficacy and parents' educational involvement by using teacher-reported items for teachers' self-efficacy and parent-reported items for parents' educational

involvement. This study also addressed a gap in the literature by examining teacher self-efficacy as a moderator of the relation between low-income parents' educational involvement and children's reading skills in first grade.

Present Study

The present study is grounded in the bioecocultural, developmental contextual, family stress, and family investment models (Bronfenbrenner & Morris, 2006; Conger & Donnellan, 2007; Conger & Elder, 1994; Lerner, 1991) and focused on the reading skills of children from low-income households. The actions of parents and the characteristics of schools are influential in the development of children's reading skills (Bulotski-Shearer et al. 2012; Wen et al., 2012). Existing literature indicates that children's reading skills are associated with parent educational involvement, class size, amount of reading instruction, and teacher self-efficacy. Although parent educational involvement is often a positive predictor of reading skills (Hill & Craft, 2003; Dearing et al., 2004; Dearing et al., 2006), there are many barriers that low-income parents face that may limit their capabilities to be involved in their children's education (Hornby & Lafaele, 2011; Kim, 2009).

As children's reading skills are associated with both home and school variables (e.g., Foorman et al., 1998; Hart & Risley, 2003), the purpose of this research was to investigate the relations between parents' educational involvement, classroom characteristics, and the reading skills of children from low-income households. Although research has shown that both home and school environments are associated with children's reading skills (e.g., Bulotski-Shearer et al., 2012; Wen et al., 2012), no known research has examined if class size, amount of reading

instruction, and teacher self-efficacy moderate the relation between parent educational involvement and low-income children's first-grade reading skills. This study focused on first grade because of its importance for acquiring foundational reading skills (National Reading Panel, 2000; Reardon et al., 2012) and its association with long-term outcomes (e.g., Cunningham & Stanovich, 1997). This study focused on children from low-income households because children from low-income households are more at-risk for difficulties with reading development than children from middle-income households (Reardon, 2011; Reardon & Portilla, 2016; Reardon et al., 2012; Snow et al., 1998; Stipek & Ryan, 1997).

As some parents may be more involved in one aspect of their children's education than another (Grolnick et al., 1997; Kim, 2009; Stacer & Perrucci, 2013), the current study used a composite of home- and school-based parent educational involvement in order to maximize reports of parents' involvement. This study investigated three classroom variables (i.e., class size, amount of reading instruction, and teacher self-efficacy) as moderators of the relation between parent educational involvement and the reading skills of first-grade children from low income households. The study had three aims.

Specific Aims and Hypotheses

Aim 1. The first aim was to examine the relation between parents' educational involvement and children's reading skills.

Hypothesis 1. Parents' educational involvement will be positively associated with children's reading skills.

Aim 2. The second aim was to examine the relations between classroom variables (class size, amount of reading instruction, and teacher self-efficacy) and children's reading skills.

Hypothesis 2-1. Class size will be negatively associated with children's reading skills.

Hypothesis 2-2. The amount of reading instruction will be positively associated with children's reading skills.

Hypothesis 2-3. Teacher self-efficacy will be positively associated with children's reading skills.

Aim 3. The third aim of the study was to examine the moderating effect of classroom variables on the relation between parent educational involvement and children's reading skills.

Hypothesis 3-1. The relation between parent educational involvement and children's reading skills will vary based on classroom size. Low levels of parents' educational involvement would have a smaller effect on children's reading skills if classrooms have fewer children.

Hypothesis 3-2. The amount of reading instruction will moderate the relation between parent educational involvement and children's reading skills, such that low levels of parents' educational involvement would have less of an effect on children's reading skills when children receive greater amounts of instruction.

Hypothesis 3-3. Teacher self-efficacy will moderate the relation between parent educational involvement and children's reading skills, such that low levels of parents' educational involvement would have a weaker effect on the reading skills of

children with more self-efficacious teachers than children with less self-efficacious teachers.

Method

Sample

This study was a secondary data analysis of the public access Early Childhood Longitudinal Study – Kindergarten Cohort: 2010 – 2011 (ECLS-K: 2011). The ELCK-K: 2011 is a longitudinal, nationally representative study of the academic and social development of elementary school children in the United States that began kindergarten in 2010. The data consist of direct child assessments, parent interviews, and teacher questionnaires. The core sample of children from the ECLS-K: 2011 (N ~ 18200) was recruited in a three-stage process (Tourangeau et al., 2015). First, the United States was divided into 90 primary sampling units of non-equal size in the first stage to best represent the population densities of kindergarteners in each area. Second, public and private schools were sampled from these units using a stratified sampling design. Third, kindergarteners were randomly sampled from the selected schools. Participants who were selected to participate in kindergarten were followed longitudinally until the end of fifth grade. Participant data from the first-grade cohort (spring 2012) were examined for this study.

Participant data for the present study were limited to first-time first-grade children from low-income households (e.g., households with incomes below 200% of the federal poverty threshold). Household poverty status was determined by the ECLS-K: 2011 staff based on parents' reported income, household size, and the U.S. weighted poverty threshold for 2011. According to the U.S. weighted poverty

threshold in 2011, a household of four with an income of less than \$23, 021 was considered poor whereas an income between \$23,021 and \$46,042 was considered near poor. These categories combined (e.g., all incomes below \$46,042 for a household of four in 2011) reflect low-income households.

In addition to including only children from low-income households, children also needed to be tested in English and have completed the appropriate reading assessments to be included in the study. Only children attending public schools were included in this study because Jeynes (2012) found significant differences between the school practices of public and private schools. Figure 2 depicts how many children were excluded at each step of the process.

The final sample included 4380 participants, although the specific sample size for each analysis varied due to missing data. Children were predominantly Hispanic (39.70%), White (31.90%), or Black/African American (16.70%; see Table 2 for sample demographic information). These percentages are roughly comparable to the percentage of children between the ages of 6 and 11 years living in low-income households in 2011 (Hispanic: 34%, White: 37%, Black/African American: 19%; Addy, Engelhardt, & Skinner, 2013).

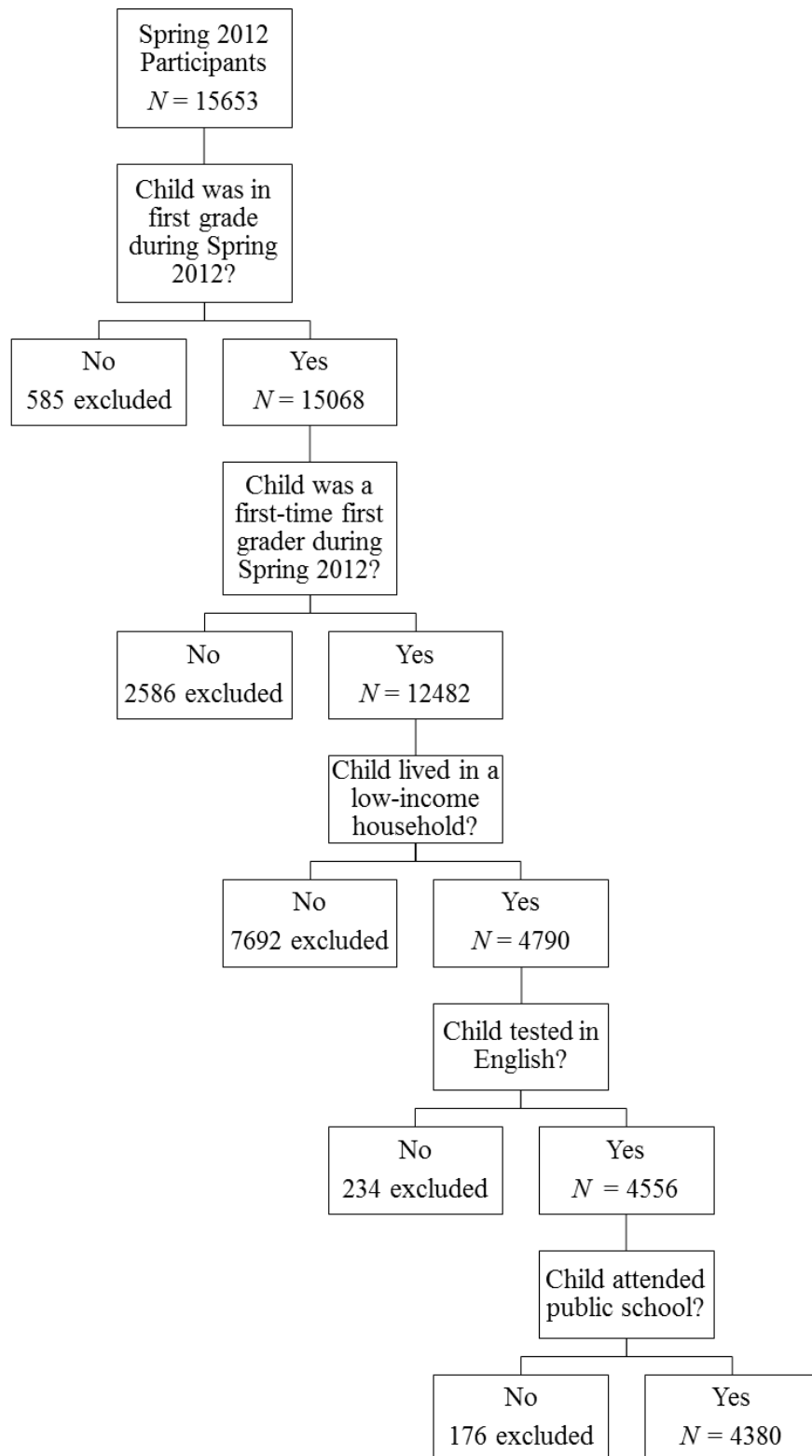


Figure 2. Flowchart depicting the participant exclusion process.

Table 1

Demographic Information for the Sample in this Study

Demographic Characteristics	<i>N</i>	Percent
Poverty level		
Poor	2424	55.30%
Near poor	1956	44.70%
Child Race/Ethnicity		
White	1399	31.90%
Black/African American	733	16.70%
Hispanic*	1741	39.70%
Asian	259	5.90%
Native Hawaiian/Pacific Islander	32	0.70%
American Indian/Alaska Native	46	1.10%
Two or more races	170	3.90%
Child gender		
Male	2200	50.20%
Female	2180	49.80%

Note. *The Hispanic category includes children with and without specified races.

Measures

Child reading skill. Child reading skill was measured using a composite formed by the ECLS-K: 2011 based on children's performance in a two-stage assessment of skills-based and knowledge-based reading skills. Basic reading skills consisted of letter recognition and beginning/ending sounds. Knowledge-based reading included vocabulary and reading comprehension skills. The first stage of the assessment served as a router which determined the difficulty level (low, middle, or high) of the second stage of items. Child reading skill in this study was measured using item response theory (IRT) scores, which are estimates of the number of items a child would have answered correctly if the entire reading assessment were administered. IRT scale scores are considered to be more accurate than number-correct scores (Bock, Thissen, & Zimowski, 1997) and are appropriate for cross-sectional analyses (Tourangeau et al., 2015). Children's reading skills were measured

at two time points: the end of kindergarten and the end of first grade. Children's first-grade reading skills were the primary focus of the present study (e.g., the dependent variable); children's kindergarten reading skills were controlled for in all analyses. Reading scores at both time points could range from 0 to 100 (Tourangeau et al., 2015), with higher scores indicating more advanced reading skills.

Parents' educational involvement. Parents' educational involvement was measured using a composite of nine parent-reported school- or home-based activities. Responses to each item were standardized and then averaged together to form a composite (see Appendix A for items and item statistics), with higher scale scores indicating higher amounts of educational involvement. Cronbach's alpha for this measure was .54. Although the reliability for the scale is low, this alpha is comparable to other studies using similar measures (e.g., Cooper & Crosnoe, 2007; Sy & Schulenberg, 2005; Yeung, 2009).

Home-based involvement. Parents reported in Spring 2012 how often they read to their children, how often they helped their children with homework, and how often their children read to themselves or others outside of school (1: *never*, 2: *once or twice a week*, 3: *three to six times a week*, 4: *every day*). Parents also responded whether they had visited a library or bookstore with their children in the past month (0 = *no*, 1 = *yes*).

School-based involvement. Parents reported in Spring 2012 whether they had attended a back to school night; a PTA, PTO, or Parent-Teacher organization meeting; a parent-teacher conference; a school or classroom event; or volunteered at

school or within their children's classrooms since the beginning of the school year (0 = no, 1 = yes).

Class size. Class size was determined using teachers' responses to the question, "*as of today's date, how many children are currently enrolled in your class?*" Similar to other research on class size (e.g., Allhusen et al., 2004; Magnuson et al., 2007), class size was dichotomized (0 = 21 students or fewer, 1 = more than 21 students).

Amount of classroom reading instruction. Teachers' responses to the question, "*how much time does the typical child in your class usually work on lessons or projects in reading and language arts,*" were used to determine the amount of classroom reading instruction. The original response options for the item were: 1) *Not applicable/never* ($N = 10$), 2) *less than ½ hour a day* ($N = 39$), 3) *½ hour to less than 1 hour* ($N = 160$), 4) *1 to less than 1 ½ hours* ($N = 396$), 5) *1 ½ to less than 2 hours* ($N = 907$), 6) *2 to less than 2 ½ hours* ($N = 1054$), 7) *2 ½ to less than 3 hours* ($N = 679$), 8) *3 hours or more* ($N = 644$). However, the item was recoded to better reflect the minimum recommended amounts of reading instruction found in classrooms (e.g., 90-minute reading block; Underwood, 2018). The recoded options were: 1) *less than 1 ½ hours* ($N = 595$), 2) *1 ½ to less than 2 hours* ($N = 907$), 3) *2 to less than 2 ½ hours* ($N = 1054$), 4) *2 ½ to less than 3 hours* ($N = 679$), and 5) *3 hours or more* ($N = 644$). "No" or "Not applicable" responses for amount of reading instruction were considered as missing data.

Teacher self-efficacy. Teacher self-efficacy was measured using a mean composite of 14 teacher-reported items related to teaching self-efficacy (see

Appendix B for items and item statistics). Items were similar to those in Gibson and Dembo's (1984) Teacher Efficacy Scale and the National Educational Longitudinal Study (Louis et al., 1996). Sample items include, *"If some students in my class are not doing well, I feel that I should change my approach to the subject"* and *"By trying a different teaching method, I can significantly affect a student's achievement."*

Response options ranged from 1 (strongly disagree) to 5 (strongly agree). Five items were reverse-coded due to the negative wording of the items. Higher composite scores indicate higher levels of teacher self-efficacy. Cronbach's alpha for this measure is .82.

Covariates. Variables were controlled at the child-, family-, and teacher-levels. The covariates were chosen because of their relations with the variables of interest in the study.

Child-level. The experiences that children have prior to formal schooling can impact their reading skills in first grade (Hahn et al., 2014; Magnuson et al., 2007; Thompson & Sonnenschein, 2016; Sonnenschein et al., 2010). Researchers have found that children's reading scores at the end of kindergarten are predictive of their later reading achievement (Sonnenschein et al., 2010), as is the type of kindergarten that they attended (e.g., full or half-day; Hahn et al., 2014; Thompson & Sonnenschein, 2016). As the focus of this study was children's first-grade reading skills, not their skills prior to first grade, kindergarten reading skills were controlled for in analyses. Similarly, researchers have found relations between children's demographic characteristics, such as gender and race/ethnicity, and either children's reading skills (Wei, Liu, & Barnard-Brak, 2015) or reports of parent educational

involvement (Grolnick et al., 1997). As such, the following were controlled in the present study: kindergarten reading skills, kindergarten type (e.g., full day or half day), gender, home language, age at time of assessment, and race/ethnicity.

Although prior research has found that children's former educational care experiences (e.g., preschool, daycare, or Head Start attendance) are associated with their reading skills during preschool (Magnuson et al., 2007), there were too many missing data points for this variable to be included as a covariate in the present study (item $N_{valid} = 883$, $N_{missing} = 3497$).

Family-level variables. Most research on children from low-income households focuses on either urban or rural populations, with very few studies encompassing both (Miller & Votruba-Drzal, 2013). Prior research has shown that there are some differences in the risks that children from different community-types face and in their educational outcomes (e.g., Miller & Votruba-Drzal, 2013; Votruba-Drzal, Miller, & Coley, 2015). Non-majority parents and parents with limited educational attainment tend to be less educationally involved than White parents and parents with more formal education (Dearing et al., 2004; Grolnick et al., 1997; Kim, 2009; Stacer & Perrucci, 2013). Married parents are also more likely to be involved than parents who are single, divorced, widowed, or separated (Fantuzzo et al., 2000). Researchers also have found that households with more children tend to exhibit lower levels of parent involvement (Manz, Fantuzzo, & Power, 2004). Although the majority of parent participants were children's biological mothers (93.4%, $N = 4091$), fathers (2.1%, $N = 92$) and others (4.5%, $N = 197$) also participated. Therefore, urbanicity, parent educational attainment, parental race/ethnicity, parental relationship

status, and number of siblings in the household (relative to the child), and the parent participant's relationship to the focal child were included as covariates.

Teacher-level variables. Researchers have found that first-grade children with less experienced teachers tend to perform more poorly in reading than children with more experienced teachers (Croninger, Rice, Rathbun, & Nishio, 2007). Furthermore, ratings of teacher self-efficacy also may vary based on teachers' years of experience teaching (Tschannen-Moran et al., 1998) and teachers' highest level of education (Shoulders & Krei, 2015). Based on these findings, teachers' years of experience teaching and highest level of educational attainment were controlled in analyses.

Procedure

ECLS-K 2011 data were collected by trained research assistants. Children were individually administered the reading skills assessment in the spring of their kindergarten and first-grade years. Parents were interviewed primarily through phone interviews using computer-assisted interview technology during the spring of children's first-grade year (Tourangeau et al., 2015). Teachers completed self-administered, hard-copied (e.g., paper and pencil) questionnaires during the spring of children's first-grade year.

Results

Data Analysis

Analyses were conducted using Statistical Program for the Social Sciences Version 23 (SPSS; IBM, 2015). As the ECLS-K: 2011 sample was not a simple random sample, the Complex Samples procedure in SPSS was utilized, which

required the creation of an analysis plan indicating that the data were collected using a stratified clustered design (stratum: W4CS4P_4TSTR; cluster: W4CS4P_4TPSU). The analysis plan also included a sample weight (weight: W4CS4P_4T0), which was necessary to provide more accurate population estimates and also account for oversampling and non-response bias (Hahs-Vaughn, 2005; Tourangeau et al., 2015). General linear model (GLM) analyses were conducted to investigate the study's aims using the Complex Sample feature in SPSS.

Preliminary data analyses. Visual evaluation of a histogram and a Q-Q plot revealed that the dependent variable (children's first-grade reading skills) was approximately normally distributed, with little skewness or kurtosis, thus fulfilling one of the assumptions needed to conduct a general linear model analysis (see Figures 3 and 4). Levene's test of equality of error variances revealed that the assumption of homogeneity of variance was also fulfilled, $p = .07$. Finally, Pearson correlations between children's first-grade reading skills, parent educational involvement, class size, amount of reading instruction, and teacher self-efficacy were analyzed to determine variable linearity (see Table 2). Although linearity between children's first-grade reading skills and two classroom variables (amount of reading instruction and class size) was not established, each variable was retained in the model for theoretical reasons.

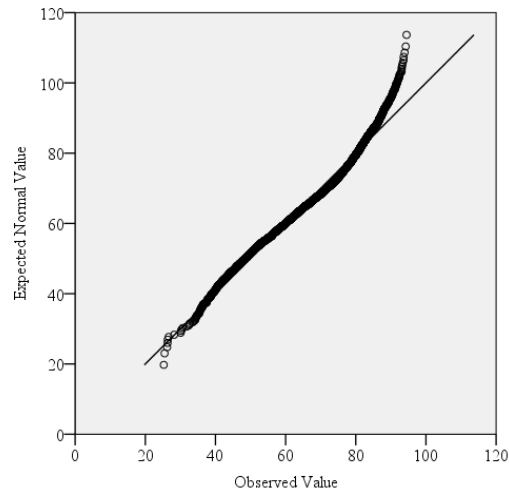


Figure 3. Normal Q-Q plot of children's first-grade reading skills

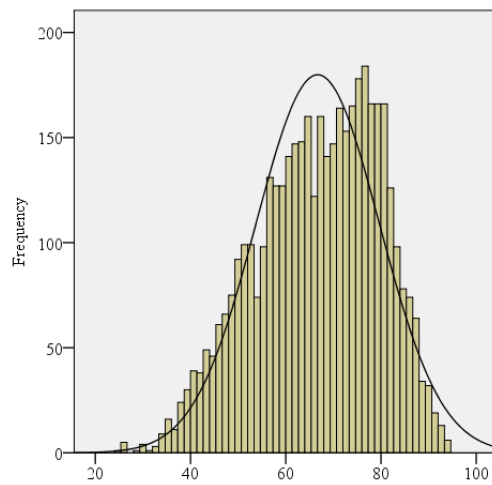


Figure 4. Histogram depicting children's first-grade reading skills.

Table 2

Pearson Correlations between the Dependent and Independent Variables

	1	2	3	4	5
1. 1 st grade reading skills	1				
2. Parents' educational involvement	.13**	1			
3. Class size	.03	-.03*	1		
4. Amt. of reading instruction	-.01	.05**	-.06**	1	
5. Teacher self-efficacy	.04*	.04*	-.01	.03	1

Note. *Significant at the .05 level (two-tailed). **Significant at the .01 level (two-tailed).

Although the sample was limited to low-income families, there could still be variability in household incomes. As monetary capital is associated with parents' educational involvement, the mean scores of poor and near poor parents' educational involvement were examined prior to running analyses. Near poor parents' educational involvement was significantly higher ($M = 1.53$, $SD = 0.30$) than that of poor parents ($M = 1.49$, $SD = 0.28$), $t(4313.25) = -6.16$, $p < .001$. Although the mean difference was small, $M_{difference} = 0.04$, poverty level (i.e., poor and near poor) was included as a covariate. Table 3 displays descriptive statistics for the independent and dependent variables in the study.

Table 3

Descriptive Statistics for Key Variables

	<i>N</i>	Min.	Max.	<i>M</i>	<i>SD</i>
First-grade reading skills	4378	25.27	94.47	66.72	12.94
Parents' educational involvement (low-income parents)	4379	0.33	2.13	1.51	0.29
Poor parents	2423	0.44	2.11	1.49	0.30
Near poor parents	1956	0.33	2.13	1.54	0.28
Class size (continuous)	3930	8	33	20.98	4.19
21 students or fewer	2261	-	-	-	-
22 students or more	1669	-	-	-	-
Amount of reading instruction	3879	1	5	2.97	1.30
Teacher self-efficacy	3879	2.57	5	4.06	0.42

Note. Parents' educational involvement scores reflect the average of parents'

responses to items on home- and school-based involvement.

Aim 1. The first aim of this study was to examine the relation between parent educational involvement and children's reading skills. To test the hypothesis that parent involvement would be positively associated with children's reading skills, a general linear model was run using Complex Samples in SPSS. Children's reading

skills, parent educational involvement, and all covariates (poverty level; child's gender, race/ethnicity, age at time of assessment, number of siblings, and home language; parents' educational attainment, relationship status, and relation to child; urbanicity; teachers' years of experience teaching and educational attainment) were entered into the model. The model was analyzed once with all covariates included and again with non-significant covariates removed for parsimony. The results reported in the following sections are from the parsimonious models.

Results indicated that when controlling for household income, parental - education, child-level variables (race/ethnicity and kindergarten reading skills), and teachers' years of experience teaching, parent educational involvement significantly predicted children's reading skills ($b = 2.15$, $t(110) = 4.16$, $p < .01$; see Table 4). The overall model significantly predicted children's first-grade reading skills ($Wald F(15, 96) = 352.22$, $p < .01$) and accounted for 60.3% of the variance in children's first-grade reading skills.

Table 4

Parent Educational Involvement Predicting Children's Reading Skills

	Model	<i>b</i>	<i>SE</i>	<i>t</i>
Parents' educational attainment	<i>Wald F</i> (5, 106) = 2.71*			
8 th grade or below		-1.47	0.81	-1.82
9 th – 12 th grade		-1.80	0.73	-2.46*
High school diploma/equivalent		-0.83	0.65	-1.26
Vocational/tech. program		0.03	0.92	0.04
Some college		-0.09	0.55	-0.17
Child race/ethnicity	<i>Wald F</i> (6, 105) = 3.55**			
American Indian/Alaska Native		1.83	1.43	1.28
Asian		0.73	0.64	1.14
Black/African American		-1.05	0.62	-1.70
Hispanic		-1.20	0.52	-2.31*
Native Hawaiian/Pacific Islander		0.90	2.03	0.44
Two or more races		-1.01	0.91	-1.11
Poverty level	<i>Wald F</i> (1, 110) = 7.22**	-0.86	0.32	-2.69**
Kindergarten reading skills	<i>Wald F</i> (1, 110) = 3516.26**	0.91	0.02	59.30**
Teachers' years of teaching experience	<i>Wald F</i> (1, 110) = 6.97**	0.04	0.02	2.64**
Parents' educational involvement	<i>Wald F</i> (1, 110) = 17.32**	2.15	0.52	4.16**

Note. *N* = 3624 *Significant at the .05 level. **Significant at the .01 level. Reference groups are as follows: parents' educational attainment = bachelor's degree or higher; child race = White; poverty level = near poor.

Aim 2. The second aim of this study was to examine the relation between each classroom variable (class size, amount of reading instruction, and teacher self-efficacy) and children's reading skills. To investigate Aim 2, general linear models in SPSS's Complex Samples were conducted. The classroom variables were examined separately in order to assess their individual impact on children's reading skills.

Although each model was initially analyzed with all covariates, the results presented

in this section are from parsimonious models in which nonsignificant covariates were removed.

Class size. In keeping with extant research, I hypothesized that there would be a negative relation between class size and children's reading skills, such that smaller class sizes would be associated with higher reading scores. When controlling for income, parental education, child race, number of siblings, kindergarten reading skills, and number of years of teaching experience, class size was not a significant predictor of children's reading skills ($b = -.13$, $t(109) = -.32$, $p = .75$; see Table 5). However, the full model did significantly predict children's first-grade reading skills ($Wald F(16, 94) = 323.59$, $p < .01$) and accounted for 60.2% of the variance in those skills.

Table 5

Class Size Predicting Children's Reading Skills

	Model	<i>b</i>	<i>SE</i>	<i>t</i>
Parents' educational attainment	<i>Wald F</i> (5, 105) = 2.93*			
8 th grade or below		-1.69	0.80	-2.12*
9 th – 12 th grade		-2.07	0.72	-2.87**
High school diploma/equivalent		-1.17	0.65	-1.81
Vocational/tech. program		-0.25	0.91	-0.28
Some college		-0.28	0.55	-0.52
Child race/ethnicity	<i>Wald F</i> (6, 104) = 3.46**			
American Indian/Alaska Native		2.06	1.27	1.62
Asian		0.51	0.71	0.73
Black/African American		-0.96	0.62	-1.55
Hispanic		-1.18	0.52	-2.26*
Native Hawaiian/Pacific Islander		1.28	2.06	0.62
Two or more races		-0.97	0.92	-1.05
Number of siblings	<i>Wald F</i> (1, 109) = 4.62*	-0.32	0.15	-2.15*
Poverty level	<i>Wald F</i> (1, 109) = 8.39**	-0.93	0.32	-2.90**
Kindergarten reading skills	<i>Wald F</i> (1, 109) = 3338.82**	0.91	0.02	57.78**
Teachers' years of teaching experience	<i>Wald F</i> (1, 109) = 10.57**	0.05	0.02	3.25**
Class size	<i>Wald F</i> (1, 109) = 0.10	-0.13	0.41	-0.32

Note. *N* = 3601 *Significant at the .05 level. **Significant at the .01 level. Reference

groups are as follows: parents' educational attainment = bachelor's degree or higher;

child race = White; poverty level = near poor; class size = more than 21 students.

Amount of reading instruction. Greater amounts of reading instruction were expected to be positively associated with children's reading skills. As such, an amount of 1.5 hours or less of instruction per day was chosen as the reference variable. The amount of instruction did not predict children's first-grade reading skills when controlling for other variables in the model (see Table 6). The model

accounted for 60.2% of the variance in children's reading skills (*Wald F* (20, 89) = 265.49, $p < .01$).

Table 6

Amount of Reading Instruction Predicting Children's Reading Skills

	Model	<i>b</i>	<i>SE</i>	<i>t</i>
Parents' educational attainment	<i>Wald F</i> (5, 104) = 2.94*			
8 th grade or below		-1.83	0.82	-2.23*
9 th – 12 th grade		-2.13	0.74	-2.86**
High school diploma/equivalent		-1.23	0.65	-1.92
Vocational/tech. program		-0.33	0.91	-0.37
Some college		-0.27	0.55	-0.49
Child gender	<i>Wald F</i> (1, 108) = 5.42*	-0.82	0.35	-2.33*
Child race/ethnicity	<i>Wald F</i> (6, 103) = 3.67**			
American Indian/Alaska Native		1.80	1.26	1.43
Asian		0.59	0.68	0.86
Black/African American		-0.93	0.63	-1.47
Hispanic		-1.19	0.54	-2.21*
Native Hawaiian/Pacific Islander		1.33	2.05	0.65
Two or more races		-1.14	0.90	-1.26
Number of siblings	<i>Wald F</i> (1, 108) = 4.71*	-0.33	0.15	-2.17*
Poverty level	<i>Wald F</i> (1, 108) = 8.11**	-0.90	0.32	-2.85**
Kindergarten reading skills	<i>Wald F</i> (1, 108) = 3442.41**	0.91	0.02	58.67**
Teachers' years of teaching experience	<i>Wald F</i> (1, 108) = 7.56**	0.04	0.02	2.75**
Amount of reading instruction				
1.5 to less than 2 hours	<i>Wald F</i> (1, 108) = 0.79	0.43	0.49	0.89
2 to less than 2.5 hours	<i>Wald F</i> (1, 108) = 0.06	0.15	0.60	0.25
2.5 to less than 3 hours	<i>Wald F</i> (1, 108) = 0.46	0.40	0.58	0.68
3 hours or more	<i>Wald F</i> (1, 108) = 0.07	-0.13	0.49	-0.27

Note. $N = 3559$ *Significant at the .05 level. **Significant at the .01 level. Reference

groups are as follows: parents' educational attainment = bachelor's degree or higher;

child gender = female; child race = White; poverty level = near poor; amount of

reading instruction = less than 1.5 hours of instruction.

Teacher self-efficacy. I hypothesized a positive relation between teacher self-efficacy and children's reading skills. Results indicated that teacher self-efficacy did not predict children's reading skills when controlling for income, parents' education, child's race, number of siblings, kindergarten reading skills, and teachers' number of years teaching ($b = -0.24$, $t(109) = -0.64$, $p = .53$; see Table 7). The model significantly predicted children's first-grade reading skills ($Wald F(16, 94) = 314.15$, $p < .01$) and accounted for 60.2% of the variance).

Table 7

Teacher Self-Efficacy Predicting Children's Reading Skills

	Model	<i>b</i>	<i>SE</i>	<i>t</i>
Parents' educational attainment	$Wald F(5, 105) = 3.07^{**}$			
8 th grade or below		-1.75	0.81	-2.16*
9 th – 12 th grade		-2.10	0.73	-2.88**
High school diploma/equivalent		-1.14	0.66	-1.73
Vocational/tech. program		-0.24	0.91	-0.26
Some college		-0.19	0.55	-0.35
Child race/ethnicity	$Wald F(6, 104) = 3.73^{**}$			
American Indian/Alaska Native		2.07	1.27	1.64
Asian		0.51	0.71	0.73
Black/African American		-0.92	0.62	-1.48
Hispanic Native Hawaiian/Pacific Islander		-1.16	0.52	-2.23*
Two or more races		1.89	2.13	0.89
Number of siblings	$Wald F(1, 109) = 4.22^*$	-1.04	0.90	-1.15
Poverty level	$Wald F(1, 109) = 8.40^{**}$	-0.31	0.15	-2.05*
Kindergarten reading skills	$Wald F(1, 109) = 3327.67^{**}$	-0.90	0.31	-2.90**
Teachers' years of teaching experience	$Wald F(1, 109) = 7.99^{**}$	0.91	0.02	57.69*
Teacher self-efficacy	$Wald F(1, 109) = 0.41$	0.04	0.02	2.83**
		-0.24	0.38	-0.64

Note. $N = 3570$ *Significant at the .05 level. **Significant at the .01 level. Reference groups are as follows: parents' educational attainment = bachelor's degree or higher; child race = White; poverty level = near poor.

Aim 3. The third, and final, aim of this study was to investigate if the relation between parent educational involvement and children's reading skills was moderated by the three classroom variables. Continuous independent variables (e.g., parents' educational involvement and teacher self-efficacy) were mean centered prior to running analyses to aid in the interpretation of interaction effects. Three separate models were analyzed, one model for each interaction.

Class size. Table 8 displays the results of the interaction between parent educational involvement and class size. The interaction was not significant, indicating that the relation between parent educational involvement and children's first-grade reading scores was not dependent on the number of students in a child's classroom. This finding also indicates that class size did not buffer the impact of low levels of involvement for children. Although the interaction was not significant, the overall model significantly predicted children's first-grade reading skills ($Wald F (13, 97) = 380.07, p < .01$) and accounted for 60.2% of the variance in reading skills.

Table 8

*Interaction between Class Size and Parent Educational Involvement Predicting**Reading Skills*

	Model	<i>b</i>	<i>SE</i>	<i>t</i>
Child race/ethnicity	<i>Wald F</i> (6, 104) = 3.84**			
American Indian/Alaska Native		1.77	1.36	1.30
Asian		0.48	0.69	0.70
Black/African American		-1.05	0.62	-1.71
Hispanic		-1.47	0.47	-3.12**
Native Hawaiian/Pacific Islander		1.39	2.13	0.65
Two or more races		-0.79	0.93	-0.85
Number of siblings	<i>Wald F</i> (1, 109) = 4.57*	-0.31	0.15	-2.14*
Poverty level	<i>Wald F</i> (1, 109) = 11.10**	-1.09	0.31	-3.46**
Kindergarten reading skills	<i>Wald F</i> (1, 109) = 3418.07**	0.92	0.02	58.46**
Teachers' years of teaching experience	<i>Wald F</i> (1, 109) = 9.58**	0.05	0.02	3.10**
Parents' educational involvement (PEI)	<i>Wald F</i> (1, 109) = 19.06**	2.53	0.61	4.13**
Class size	<i>Wald F</i> (1, 109) = 0.11	-0.13	0.40	-0.33
PEI x class size	<i>Wald F</i> (1, 109) = 0.22	-0.46	0.10	-0.47

Note. *N* = 3612 *Significant at the .05 level. **Significant at the .01 level. Reference

groups are as follows: child race = White; poverty level = near poor; class size = more than 21 students.

Amount of reading instruction. Greater amounts of reading instruction were hypothesized to buffer the impact of low parent educational involvement on children's first-grade reading skills. The overall model accounted for 60.2% of the variance in children's reading skills. An interaction between parents' educational involvement and amount of reading instruction was present for three categories of amount of instruction: 2 hours to less than 2.5 hours of instruction; 2.5 hours to less than 3 hours of instruction; and 3 or more hours of instruction (controlling for child's

race/ethnicity, number of siblings, and kindergarten reading skills; poverty level; teachers' years of teaching experience; see Table 9). This indicates that the slopes for the three categories of amount of instruction differ significantly from the reference group (less than 1.5 hours of instruction) but does not offer more specific information about the nature of the difference between the groups. As such, a supplemental analysis was required.

To probe the interaction between parents' educational involvement and amount of reading instruction, simple slopes were tested using PROCESS in SPSS (template model 1; Hayes, 2017) with the same covariates that were used in the Complex Samples GLM analysis (listed in Table 9). Due to constraints with the PROCESS software, the complex sampling methods used to collect the ECLS-K: 2011 data (e.g., strata, clusters, and oversampling) could not be taken into consideration in the analysis. As such, results from this analysis should be interpreted cautiously. Simple slopes were tested at each amount of reading instruction (see Figure 5 for plots of simple slopes). Simple slopes test the strength of the relation between the predictor (parents' educational involvement) and the outcome (children's reading skills) at different levels of the moderator (amount of reading instruction; Robinson, Tomek, & Schumacker, 2013).

Table 9

*Interaction between Amount of Reading Instruction and Parent Educational**Involvement Predicting Reading Skills*

	Model	<i>b</i>	<i>SE</i>	<i>t</i>
Child race/ethnicity	<i>Wald F</i> (6, 103) = 4.40**			
American Indian/Alaska Native		1.64	1.21	1.35
Asian		0.66	0.65	1.03
Black/African American		-1.08	0.61	-1.76
Hispanic		-1.50	0.48	-3.12**
Native Hawaiian/Pacific Islander		1.19	1.12	0.56
Two or more races		-0.10	0.89	-1.12
Number of siblings	<i>Wald F</i> (1, 108) = 4.63*	-0.32	0.15	-2.15*
Poverty level	<i>Wald F</i> (1, 108) = 11.98**	-1.08	0.31	-3.46**
Kindergarten reading skills	<i>Wald F</i> (1, 108) = 3627.59**	0.91	0.02	60.23**
Teachers' years of teaching experience	<i>Wald F</i> (1, 108) = 7.73**	0.04	0.02	2.78**
Parents' educational involvement (PEI)	<i>Wald F</i> (1, 108) = 0.93	5.24	1.32	3.96**
Amount of reading instruction				
1.5 to less than 2 hours	<i>Wald F</i> (1, 108) = 0.77	0.41	0.47	0.88
2 to less than 2.5 hours	<i>Wald F</i> (1, 108) = 0.04	0.12	0.60	0.02
2.5 to less than 3 hours	<i>Wald F</i> (1, 108) = 0.28	0.30	0.57	0.53
3 hours or more	<i>Wald F</i> (1, 108) = 0.25	-0.23	0.46	-0.50
PEI x amount of reading instruction				
PEI x 1.5 to less than 2 hours	<i>Wald F</i> (1, 108) = 0.60	-1.34	1.74	-0.77
PEI x 2 to less than 2.5 hours	<i>Wald F</i> (1, 108) = 5.34*	-3.78	1.64	-2.31*
PEI x 2.5 to less than 3 hours	<i>Wald F</i> (1, 108) = 4.50*	-3.71	1.75	-2.12*
PEI x 3 hours or more	<i>Wald F</i> (1, 108) = 5.52*	-4.77	2.03	-2.35*

Note. $N = 3570$ *Significant at the .05 level. **Significant at the .01 level. Reference groups are as follows: child race = White; poverty level = near poor; amount of reading instruction = less than 1.5 hours of instruction.

Results indicated that for children who received 2 or more hours of instruction, parents' educational involvement did not predict reading skills (see Table 10). The lack of interaction between parents' educational involvement and amount of reading instruction may suggest that having at least 2 hours of instruction may be beneficial for children with less involved parents (see Figure 4). For children who received less than 2 hours of instruction, the relation between parents' educational involvement and reading skills was stronger. More specifically, at less than 1.5 hours of instruction, the slope was $b = 4.16$, $t(3785) = 3.61$, $p < .01$, and at 1.5 to less than 2 hours of instruction, the slope was $b = 2.91$, $t(3785) = 3.19$, $p < .01$. These results indicate that parents' educational involvement may be most beneficial for children receiving less than 2 hours of reading instruction at school.

Table 10

*Conditional Effect of Parents' Educational Involvement on Children's Reading Skills
by Amounts of Reading Instruction*

	<i>b</i>	<i>SE</i>	<i>t</i>
Less than 1.5 hours	4.16	1.15	3.61**
1.5 to less than 2 hours	2.91	0.91	3.19**
2 to less than 2.5 hours	1.25	0.89	1.40
2.5 to less than 3 hours	1.51	1.11	1.36
3 hours or more	1.92	1.09	1.76

Note. $N = 3805$ **Significant at the .01 level.

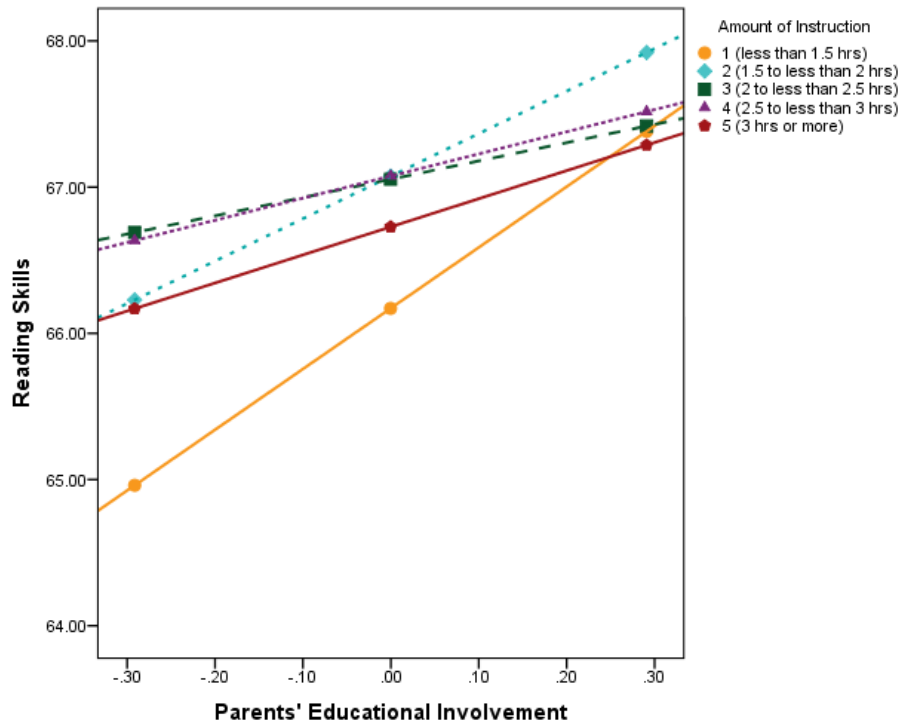


Figure 5. Scatterplot depicting the relation between parents' educational involvement and amount of reading instruction on children's first-grade reading skills.

Teacher self-efficacy. The interaction between parent educational involvement and teacher self-efficacy was not significant. When controlling for demographic characteristics (see Table 11) and children's kindergarten reading skills, neither the interaction between parent educational involvement and teacher self-efficacy nor the individual predictors were significantly related to children's reading skills in first grade. In addition, although the whole model was significant ($R^2 = .60$, $Wald F(13, 97) = 381.73, p < .01$), only the covariates provided a significant contribution to it.

Table 11

*Interaction between Teacher Self-Efficacy and Parent Educational Involvement**Predicting Reading Skills*

	Model	<i>b</i>	<i>SE</i>	<i>t</i>
Child race/ethnicity	<i>Wald F</i> (6, 104) = 4.22**			
American		1.74	1.34	1.30
Indian/Alaska Native				
Asian		0.42	0.68	0.62
Black/African		-1.02	0.61	-1.68
American				
Hispanic		-1.50	0.47	-3.21**
Native		2.05	2.17	0.94
Hawaiian/Pacific				
Islander				
Two or more races		-0.88	0.92	-0.96
Number of siblings	<i>Wald F</i> (1, 109) = 4.29*	-0.31	0.15	-2.07*
Poverty level	<i>Wald F</i> (1, 109) = 12.69**	-1.07	0.30	-3.56**
Kindergarten reading skills	<i>Wald F</i> (1, 109) = 3381.19**	0.92	0.02	58.15**
Teachers' years of teaching experience	<i>Wald F</i> (1, 109) = 7.45**	0.04	0.02	2.73**
Parents' educational involvement (PEI)	<i>Wald F</i> (1, 109) = 21.20**	2.33	0.51	4.60**
Teacher self-efficacy	<i>Wald F</i> (1, 109) = 0.60	-0.29	0.38	-0.78
PEI x teacher self-efficacy	<i>Wald F</i> (1, 109) = 1.42	1.54	1.29	1.19

Note. *N* = 3581 *Significant at the .05 level. **Significant at the .01 level. Reference

groups are as follows: child race = two or more races; poverty level = near poor.

Discussion

The present study examined the relations between low-income parents' educational involvement, classroom characteristics (class size, amount of reading instruction, and teacher self-efficacy), and the reading skills of first graders. Three specific aims were examined. First, we investigated the relation between parents' educational involvement and children's reading skills. Second, we investigated if each of three classroom characteristics (class size, amount of reading instruction, and

teacher self-efficacy) predicted children's reading skills. Third, we examined if the relation between parents' educational involvement and children's reading skills was moderated by each of the three classroom characteristics of interest. There were three noteworthy findings.

First, in keeping with prior research (Fan & Chen, 2001; Jeynes, 2003, 2005), we found that parents' educational involvement was predictive of children's reading skills, such that children with more involved parents tended to have higher reading scores. When parents are involved in their children's education, they show their children that reading and, more broadly, schooling are important and worth investing time in (Hill & Taylor, 2004; Hoover-Dempsey & Sandler, 1995). Depending on the specific activities that parents engage in with their children, they also may model behaviors, such as reading books or visiting the library, to their children that promote the development of reading skills.

Second, we found that the amount of reading instruction moderated the relation between parent educational involvement and children's reading skills. More specifically, the relation between parents' educational involvement and children's reading skills was stronger for children who received less than 2 hours of instruction per day at school. There was no interaction, however, at greater amounts of reading instruction. Based on these findings, parents' educational involvement may be more important if their children do not receive much reading instruction at school. These results underscore the importance of considering both the home and school contexts of children from low-income households, as the impact of what occurs in one context may be more or less effective based on what occurs in the other. Our results suggest

that if the strength of relations between children and their schools (e.g., the amount of classroom reading instruction that they receive) is weak, as depicted below by a dashed line, then the relations occurring between children and other contexts may grow stronger.

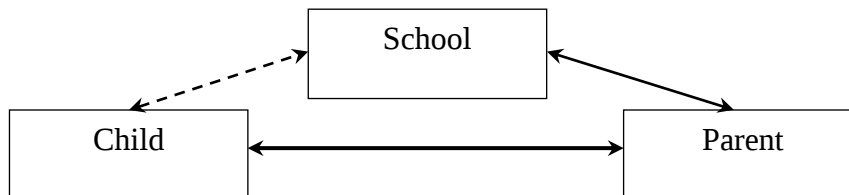


Figure 6. Model depicting the compensatory nature of children’s contexts.

Third, we found that the level of household poverty was a significant predictor of children’s reading skills in each of the analyses that were conducted, even though the sample was limited to low-income households. Children from near poor households tended to have higher reading scores than their counterparts from poor households. One possible explanation of this finding is the robust effect of family economic capital on children’s reading skills (e.g., Yeung et al., 2002). As relayed in the family stress (Conger & Elder, 1994; Masarik & Conger, 2017) and family investment models (Conger & Donnellan, 2007; Duncan et al., 2012), parents experiencing financial strain, may be less able to provide resources or engage in activities that promote children’s reading skills. It is plausible for poor parents to be under a greater amount of financial strain than near poor parents because of the differences in income. Although this area of inquiry was beyond the scope of the present study, future research would benefit from using more refined indicators of household income (e.g., cost-of-living combined with income-to-needs ratios; Chien

& Mistry, 2013), as opposed to more global and commonly used measures (e.g., federal poverty thresholds).

Contrary to the hypotheses, none of the classroom characteristics examined in this study predicted the reading skills of children from low-income households. In addition, neither class size nor teacher self-efficacy moderated the relation between parents' educational involvement and children's reading skills.

Although the amount of reading instruction moderated the relation between parents' educational involvement and children's reading skills, the amount of reading instruction did not directly predict children's reading skills. This finding is counter to extant research (e.g., Downer & Pianta, 2006; Sonnenschein et al., 2010). One possible reason for the discrepancy between this study's findings and that of other research is the year the data were collected. Both Downer and Pianta's (2006) and Sonnenschein et al.'s (2010) data were collected prior to widespread interest in 90-minute reading blocks, whereas the data from this study were collected afterwards (Underwood, 2018). In the present study, 61% of children had teachers who reported engaging in at least 2 hours of reading instruction a day. Exposure to reading instruction is important; however, the quality and individualization of the instruction that is being given may explain the lack of direct relation in this study (Conner et al., 2005; Conner et al., 2009). Small amounts of high quality instruction may be comparable to large amounts of lower quality instruction. For instance, Connor and colleagues (2009) found that first-grade children who received a greater amount of individualized reading instruction in high quality classroom environments had higher, on average, reading skills assessment scores than their peers. Differences in the

quality of instruction, which could not be assessed in this study, could explain why the hypothesis was not supported.

The lack of direct relation between class size and children's reading scores differs from what others have found (Finn et al., 2003; Finn et al., 2005; Magnuson et al., 2007; Mosteller, 1995). It is possible that the effects of class size can only be seen in very small classes, or if children are in small classes for more than one year (e.g., kindergarten and first grade). For instance, small classes in the Tennessee STAR study consisted of 13 students. In contrast, small classes in the present study ranged from 8 to 21 students and only 121 children (3%) were in classes of 13 or fewer. It is possible that other aspects of the classroom, such as the amount and quality of reading instruction, are more important for the development of reading skills in a first-grade context. Hattie (2005) posited that teachers may use the same methods in the classes they teach regardless of how many students they are instructing. Small class sizes may not be effective in promoting children's reading skills if teachers do not modify large class practices (e.g., whole class instruction) to accommodate fewer students.

Similar to class size, teacher self-efficacy neither predicted children's reading skill nor moderated the relation between parents' educational involvement and children's reading skills. It is possible that the relation between teacher self-efficacy and children's reading skills may be best explored indirectly, such as through mediation analyses or latent modeling. For instance, Guo et al. (2012) found that teacher self-efficacy was associated with several classroom practices including what the authors termed teacher support for learning (e.g., teacher warmth and classroom

climate), which in turn predicted children's fifth grade reading skills. In addition, past studies on teacher self-efficacy and children's reading skills also did not examine the role of income in the relation between the two constructs. It is possible that the manifestation of self-efficacy for teachers who teach low-income students somehow differs from those who teach higher-income students. For instance, McCoach and Colbert (2010) examined the relations between school socioeconomic status, collective teacher efficacy (defined as the "degree to which teachers believe that their collective efforts contribute to students' academic success;" p. 31), and students' performance on state achievement tests. They found that school socioeconomic status was strongly correlated with one component of collective teacher efficacy (task), but not the other (competence).

Limitations and Future Directions

There are a few limitations to this study that should be considered. This study was not an experiment; therefore, causality between the variables cannot be determined. Relatedly, because much of the data were collected at the same time point, directionality between the variables of interest also cannot be established. For instance, parents may alter the amount of involvement if they think their children are doing well in school.

The second limitation of this research is that the scope of the measures is limited by the items and response options included in the original dataset. Developers of the ECLS-K: 2011 focused on breadth of measurement, rather than depth (Tourangeau et al., 2015). One example of measurement breadth is apparent in how the amount of reading instruction was assessed. Teachers responded to the question

“How much time does the typical child in your class usually work on lessons or projects in reading and language arts,” which may reflect the amount of time a child spends doing reading activities within the classroom and not necessarily the amount of direct instruction that is offered. Another example of lack of depth is evidenced in the reading skills measure. For instance, Paris (2005) noted that the aggregated reading variable in the ECLS-K does not allow researchers to evaluate differences in reading component skills (e.g., alphabets, fluency, and comprehension). Although Paris (2005) was referring to the reading composite used in the 1998 version of the ECLS-K, the reading composite in the ECLS-K: 2011 is similar. Despite this limitation, measurement breadth is important, especially when examining general trends and relations between variables.

Due to limitations with the data that were collected, this study could not examine parents’ rationales behind their involvement and relied on a composite of both home- and school-based practices. Parents’ rationales for becoming involved in their children’s education may affect the relation between parents’ educational involvement and children’s reading skills (Hoover-Dempsey et al., 2005; Pomerantz et al., 2007). In order to avoid underestimating parents’ educational involvement, both parents’ home- and school-based activities were included in the composite used in this study,. It should be noted that researchers have found that some parents become more involved at home, but less involved at school, when their children have academic difficulties (Hoglund, Brown, Jones, & Aber, 2015). It is also possible that activities that parents engage in, either at home or at school, were simply not captured by the items used in this study.

Relatedly, racial/ethnic differences were not examined in the present study. Although parents' and children's races/ethnicities were controlled for in analyses, it is possible that there are meaningful differences in the frequency of educational involvement between the various racial/ethnic groups who participated in the ECLS-K: 2011. For instance, researchers have found that non-White parents tend to be less involved at school than White parents (Cheadle & Amato, 2011; Griffith, 1998; Hill & Taylor, 2004), which could be the result of barriers to involvement above and beyond those associated with income. However, the items used to measure parents' educational involvement may not be culturally sensitive enough to warrant racial/ethnic comparisons.

Despite the aforementioned limitations, this study has the potential to make a contribution to the literature on low-income children's reading skills. Results indicate that what is occurring in the classroom, in this case the amount of daily reading instruction, can interact with parents' educational involvement to impact children's reading skills. Future research should address the limitations in this study and further investigate the interaction between parents' educational involvement and amount of reading instruction. One possible area of inquiry is to examine if the practices of either parents or teachers differ based on the amount of reading instruction that is provided in the classroom. It may be possible that teachers who offer smaller amounts of classroom reading instruction send reading activities home for parents to work on with their children. Conversely, parents may have beliefs about the optimal amount of reading instruction and purposefully become involved in their children's education if their children are offered less instruction than what they consider

optimal. Findings from such an investigation could have implications on how to improve home-school partnerships to best promote children's reading skills.

Conclusions

Children from low-income households generally perform more poorly on reading assessments than more affluent children (Duncan et al., 2014; Duncan & Murnane, 2014; Gershoff et al., 2007; Murnane et al., 2012; Stipek & Ryan, 1997). The current study examined the relations between low-income parents' educational involvement, classroom variables (class size, amount of reading instruction, and teacher self-efficacy), and children's reading skills. As low-income parents tend to encounter more barriers to being involved in the education of their children (Hornby & Lafaele, 2011), the classroom variables investigated in this study were expected to buffer the relation between low levels of educational involvement and children's reading skills. Our findings support prior research showing that parents' educational involvement predicts low-income children's reading scores, even when controlling for various demographic characteristics. Parents' educational involvement is especially beneficial for low-income children if less than 2 hours of reading instruction is provided in their classrooms. This study highlights the importance of considering both home and school contexts when investigating the reading skills of children from low-income households.

Appendices

Appendix A

Parent Educational Involvement Scale Items and Descriptive Statistics

	Item	<i>N</i>	<i>M</i>	<i>SD</i>
PIQ130	Since the beginning of this school year, have you or other adults in your household attended an open house or a back-to-school night?	4370	0.78	0.41
PIQ140	Since the beginning of this school year, have you or other adults in your household attended a meeting of a PTA, PTO, or Parent-Teacher Organization?	4367	0.42	0.49
PIQ150	Since the beginning of this school year, have you or other adults in your household gone to a regularly-scheduled parent-teacher conference with {child's} teacher or meeting with {child's} teacher?	4378	0.91	0.29
PIQ160	Since the beginning of this school year, have you or the other adults in your household attended a school or class event, such as a play, sports event, or science fair?	4374	0.74	0.44
PIQ170	Since the beginning of this school year, have you or the other adults in your household served as a volunteer in {child's} classroom or elsewhere in the school?	4377	0.39	0.49
PIQ520	During this school year, how often did you or someone else help {him/her} with {his/her} homework?	4311	3.93	0.94
HEQ210	In the past week, how often did {child} read to {himself/herself} or to others outside of school?	4294	3.05	0.89
HEQ030	In a typical week, how often do you or any other family members read books to {child}?	4316	2.89	0.92
HEQ105	In the past month, that is since {month} {day}, has anyone in your family visited a library or bookstore with {child}?	4293	0.59	0.49

Appendix B

Teacher Self-Efficacy Scale Items

	Item	<i>N</i>	<i>M</i>	<i>SD</i>
G3A	If I try really hard, I can get through even to the most difficult or unmotivated students.	3868	3.87	0.84
G3B	If some students in my class are not doing well, I feel that I should change my approach to the subject.	3878	4.25	0.56
G3C	By trying a different teaching method, I can significantly affect a student's achievement.	3874	4.21	0.61
G3D	There is really very little I can do to ensure that most of my students achieve at a high level. (Reverse)	3876	4.32	0.69
G3E	I work to create lessons so my students will enjoy learning and become independent thinkers.	3874	4.41	0.60
G3F	I feel sometimes it is a waste of my time to try to do my best as a teacher. (Reverse)	3878	4.49	0.82
G3G	The attitudes and habits students bring to my class greatly reduce their chances for academic success. (Reverse)	3858	3.21	1.07
G3H	My success or failure in teaching is due primarily to factors beyond my control rather than to my own effort or ability. (Reverse)	3851	3.53	1.04
G3I	The amount a student can learn is primarily related to family background. (Reverse)	3860	3.69	0.92
G3J	If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson.	3863	3.77	0.72
G3K	If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him/her quickly.	3780	4.18	0.60
G3L	I really enjoy my present teaching job.	3859	4.28	0.79
G3M	I am certain I am making a difference in the lives of the children I teach.	3862	4.44	0.61
G3N	If I could start over, I would choose teaching again as my career.	3861	4.11	0.99

References

- Addy, S., Engelhardt, W., & Skinner, C. (2013). *Basic facts about low-income children: Children aged 6 through 11 years, 2011*. New York: National Center for Children in Poverty, Columbia University Mailman School of Public Health.
- Allhusen, V., Belsky, J., Booth-LaForce, C. L., Bradley, R., Brownell, C. A., Burchinal, M., ... Weinraub, M. (2004). Does class size in first grade relate to children's academic and social performance or observed classroom processes? *Developmental Psychology*, 40, 651-664. doi: 10.1037/0012-1649.40.5.651
- Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.). *Self-efficacy beliefs of adolescents*, Vol. 5 (307-337). Greenwich, CT: Information Age Publishing.
- Barnard, W. M. (2004). Parent involvement in elementary school and educational attainment. *Children and Youth Services Review*, 26, 39-62. doi: 10.1016/j.chilyouth.2003.11.002
- Blatchford, P. (2003). A systematic observational study of teachers' and pupils' behavior in large and small classes. *Learning and Instruction*, 13, 569-595. doi: :10.1016/S0959-4752(02)00043-9
- Blatchford, P., Bassett, P., & Brown, P. (2011). Examining the effect of class size on classroom engagement and teacher-pupil interaction: Differences in relation to pupil prior attachment and primary vs. secondary schools. *Learning and Instruction*, 21, 715-730. doi: 10.1016/j.learninstruc.2011.04.001

- Bock, R. D., Thissen, D., & Zimowski, M. F. (1997). IRT estimation of domain scores. *Journal of Educational Measurement*, 34, 197-211. doi: 10.1111/j.1745-3984.1997.tb00515.x
- Bronfenbrenner, U., & Morris, P. (2006). The bioecological model of human development. (6th ed.). In R. M. Lerner and W. Damon (Eds.), *Handbook of child psychology: Theoretical models of human development*, Vol. 1 (pp. 793-828). Hoboken, NJ: John Wiley & Sons.
- Bulotsky-Shearer, R. J., Wen, X., Faria, A. M., Hahs-Vaughn, & Korfmacher, J. (2012). National profiles of classroom quality and family involvement: A multilevel examination of proximal influences on Head Start children's school readiness. *Early Childhood Research Quarterly*, 27, 627-639. doi: 10.1016/j.ecresq.2012.02.001
- Burchinal, M. R., Peisner-Feinberg, E., Pianta, R., & Howes, C. (2002). Development of academic skills from preschool through second grade: Family and classroom predictors of developmental trajectories. *Journal of School Psychology*, 40, 415-436. doi: 10.1016/S0022-4405(02)00107-3
- Carlisle, J. F., & Nomanbhoy, D. M. (1993). Phonological and morphological awareness in first graders. *Applied Psycholinguistics*, 14, 177-195.
- Cheadle, J. E., & Amato, P. R. (2011). A quantitative assessment of Lareau's qualitative conclusions about class, race, and parenting. *Journal of Family Issues*, 32, 679-706. doi: 10.1177/0192513X10386305

- Chien, N., & Mistry, R. S. (2013). Geographic variations in cost of living: Associations with family and child well-being. *Child Development, 84*, 209-225. doi: 10.1111/j.1467-8624.2012.01846.x
- Conger, R. D., & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology, 58*, 175-199. doi: 10.1146/annurev.psych.58.110405.085551
- Conger, R. D. & Elder, G. J. (1994). *Families in troubled times: Adapting to change in rural America*. Hillsdale, NJ: Aldine.
- Conger, R. D., Wallace, L. E., Sun, Y., Simons, R. L., McLoyd, V. C., & Brody, G. H. (2002). Economic pressure in African American families: A replication and extension of the family stress model. *Developmental Psychology, 38*, 179-193.
- Conner, C. M., Piasta, S. B., Fishman, B., Glasney, S., Schatschneider, C., Crowe, E., Underwood, P., & Morrison, F. J. (2009). Individualizing student instruction precisely: Effects of child x instruction interactions on first graders' literacy development. *Child Development, 80*, 77-100. doi: 10.1111/j.1467-8624.2008.01247.x
- Connor, C. M., Son, S.-H., Hindman, A. H., & Morrison, F. J. (2005). Teacher qualifications, classroom practices, family characteristics, and preschool experience: Complex effects on first graders' vocabulary and early reading outcomes. *Journal of School Psychology, 43*, 343-375. doi: 10.1016/j.jsp.2005.06.001

- Cooper, C. E., & Crosnoe, R. (2007). The engagement in schooling of economically disadvantaged parents and children. *Youth & Society*, 38, 372-391. doi: 10.1177/0044118X06289999
- Croninger, R. G., Rice, J. K., Rathbun, A. & Nishio, M. (2007). Teacher qualifications and early learning: Effects of certification, degree, and experience on first-grade student achievement. *Economics of Education Review*, 26, 312-324. doi: 10.1016/j.econedurev.2005.05.008
- Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*, 33, 934-945.
- Daniel, G. R., Wang, C., & Berthelsen, D. (2016). Early school-based parent involvement, children's self-regulated learning and academic achievement: An Australian longitudinal study. *Early Childhood Research Quarterly*, 36, 168-177. <http://dx.doi.org/10.1016/j.ecresq.2015.12.016>
- Dearing, E., Kreider, H., Simpkins, S., & Weiss, H. B. (2006). Family involvement in school and low-income children's literacy: Longitudinal associations between and within families. *Journal of Educational Psychology*, 98, 653-664. doi: 10.1037/0022-0663.98.4.653
- Dearing, E., Kreider, H., & Weiss, H. B. (2008). Increased family involvement in school predicts improved child teacher relationships and feelings about school for low-income children. *Marriage & Family Review*, 43, 226 – 254.
- Dearing, E., McCartney, K., Weiss, H. B., Kreider, H., & Simpkins, S. (2004). The promotive effects of family educational involvement for low-income

- children's literacy. *Journal of School Psychology*, 42, 445-460. doi: 10.1016/j.jsp.2004.07.002
- Diamond, L., & Gutlohn, L. (2006). *Vocabulary Handbook*. Berkeley, CA: CORE.
- Downer, J. T., & Pianta, R. C. (2006). Academic and cognitive functioning in first grade: Associations with earlier home and child care predictors and with concurrent home and classroom experiences. *School Psychology Review*, 35, 11-30. doi: 10.1046/j.1467-8624.2003.00629.x
- Duncan, G. J., & Magnuson, K. (2011). The nature and impact of early achievement skills, attention skills, and behavior problems. In G. J. Duncan & R. J. Murnane (Eds.), *Whither opportunity?: Rising inequality, schools, and children's life chances* (pp. 47-69). New York, NY: Russell Sage Foundation.
- Duncan, G. J., Magnuson, K., Kalil, A., & Ziol-Guest, K. (2012). The importance of early childhood poverty. *Social Indicators Research*, 108, 87-98. doi: 10.1007/s11205-011-9867-9
- Duncan, G. J., Magnuson, K., & Votruba-Drzal, E. (2014). Boosting family income to promote child development. *The Future of Children*, 24, 99-120. doi: 10.1353/foc.2014.0008
- Duncan, G. J., & Murnane, R. J. (2014). *Restoring opportunity: The crisis of inequality and the challenge for American education*. New York, NY: Russell Sage Foundation.
- Dunn, L. M., & Dunn, L. M. (1997). Peabody Picture Vocabulary Test. Third Edition. Examiner's manual and norms booklet. Circle Pines, MN: American Guidance Service.

- Ehri, L. C. (2005). Learning to read words: Theory, findings, and issues. *Scientific Studies of Reading*, 9, 167-188.
- Ehri, L. C., Nunes, S. R., Willows, D. M., Shuster, B. V., Yaghoub-Zadeh, Z., & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from National Reading Panel's meta-analysis. *Reading Research Quarterly*, 36, 250-287.
- Englund, M. M., Luckner, A. E., Whaley, G. J. L., & Egeland, B. (2004). Children's achievement in early elementary school: Longitudinal effects of parental involvement, expectations, and quality of assistance. *Journal of Educational Psychology*, 96, 723-730. doi: 10.1037/0022-0663.96.4.723
- Epstein, J. L. (1995). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan*, 76, 701-712.
- Epstein, J. L. (2010). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan*, 92(3), 81-96.
- Evans, M. A., Bell, M., Shaw, D., Moretti, S., & Page, J. (2006). Letter names, letter sounds and phonological awareness: An examination of kindergarten children across letters and of letters across children. *Reading and Writing*, 19, 959-989. doi: 10.1007/s11145-006-9026-x
- Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, 13, 1-22. doi: 1040-726X/01/0300-0
- Fantuzzo, J., Gadsden, V., Li, F., Sproul, F., McDermott, P., Hightower, D., & Minney, A. (2013). Multiple dimensions of family engagement in early

- childhood education: Evidence for a short form of the Family Involvement Questionnaire. *Early Childhood Research Quarterly*, 28, 734-742. doi: 10.1016/j.ecresq.2013.07.001
- Fantuzzo, J., Tighe, E., & Childs, S. (2000). Family Involvement Questionnaire: A multivariate assessment of family participation in early childhood education. *Journal of Educational Psychology*, 92, 367-376. doi: 10.1037//0022-0663.92.2.367
- Fernald, A., Marchman, V. A., & Weisleder, A. (2013). SES differences in language processing skill and vocabulary are evident at 18 months. *Developmental Science*, 16, 234-248. doi: 10.1111/desc.12019
- Finn, J. D., & Achilles, C. M. (1990). Answers and questions about class size: A statewide experiment. *American Educational Research Journal*, 27, 557-577.
- Finn, J. D., & Achilles, C. M. (1999). Tennessee's class size study: Findings, implications, misconceptions. *Educational Evaluation and Policy Analysis*, 21, 97-109. doi: 10.3102/01623737021002097
- Finn, J. D., Gerber, S. B., & Boyd-Zaharias, J. (2005). Small classes in the early grades, academic achievement, and graduating from high school. *Journal of Educational Psychology*, 97, 214-223. doi: 10.1037/0022-0663.97.2.214
- Finn, J. D., Gerber, S. B., Achilles, C. M., & Boyd-Zaharias, J. (2001). The enduring effects of small classes. *Teachers College Record*, 103, 145-183. doi: 10.1111/0161-4681.00112

- Finn, J. D., Pannozzo, G. M., & Achilles, C. M. (2003). The “why’s” of class size: Student behavior in small classes. *Review of Educational Research*, 73, 321-368. doi: 10.3102/00346543073003321
- Finn, J. D., Suriani, A. E., & Achilles, C. M. (2010). Small classes in the early grades: One policy, multiple outcomes. In A.J. Reynolds, A. J. Rolnick, M. M. Englund, & J. A. Temple (Eds.), *Childhood programs and practices in the first decade of life: A human capital integration* (pp. 287-308). Cambridge, UK: Cambridge University Press.
- Foorman, B. R., Francis, D. J., Fletcher, J. M., Schatschneider, C., & Mehta, P. (1998). The role of instruction in learning to read: Preventing failure in at-risk children. *Journal of Educational Psychology*, 90, 37-55.
- Friedman, I. A., & Kass, E. (2002). Teacher self-efficacy: A classroom-organization conceptualization. *Teaching and Teacher Education*, 18, 675-686. doi: 10.1016/S0742-051X(02)00027-6
- Gershoff, E. T., Aber, J. L., Raver, C. C., & Lennon, M. C. (2007). Income is not enough: Incorporating material hardship into models of income associations with parenting and child development. *Child Development*, 78, 70-95. doi: 10.1111/j.1467-8624.2007.00986.xFguo
- Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, 76, 569–582.
- Gorski, P. C. (2013). *Reaching and teaching students in poverty: Strategies for erasing the opportunity gap*. New York, NY: Teachers College Press.

- Gottfried, A. W., Schlackman, J., Gottfried, A. E., Boutin-Martinez, A. S. (2015). Parental provision of early literacy environment as related to reading and educational outcomes across the academic lifespan. *Parenting: Science and Practice, 15*, 24-38. doi: 10.1080/15295192.2015.992736
- Griffith, J. (1998). The relation of school structure and social environment to parent involvement in elementary schools. *The Elementary School Journal, 99*, 53-80. <https://www.jstor.org/stable/1002225>
- Grolnick, W. S. (2016). Parental involvement and children's academic motivation and achievement. In C. K. J. Wang, W.-C. Liu, & R. M. Ryan (Eds.), *Building Autonomous Learners: Perspectives from research and practice using Self-Determination Theory* (169-183). New York, NY: Springer.
- Grolnick, W. S., Benjet, C., Kurowski, C. O., & Apostoleris, N. H. (1997). Predictors of parent involvement in children's schooling. *Journal of Educational Psychology, 89*, 538-548.
- Grolnick, W. S., & Slowiaczek, M. L. (1994). Parents' involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development, 65*, 237-252.
- Guo, G., & Harris, K. M. (2000). The mechanisms mediating the effects of poverty on children's intellectual development. *Demography, 37*, 431-447. doi: 10.1353/dem.2000.0005
- Guo, Y., Connor, C. M., Yang, Y., Roehrig, A. D., Morrison, F. J. (2012). The effects of teacher qualification, teacher self-efficacy, and classroom practices on fifth

- graders' literacy outcomes. *The Elementary School Journal*, 113, 3-24. doi: 10.1086/665816
- Guo, Y., Piasta, S. B., Justice, L. M., & Kaderavek, J. N. (2010). Relations among preschool teachers' self-efficacy, classroom quality, and children's language and literacy gains. *Teaching and Teacher Education*, 26, 1094-1103. doi: 10.1016/j.tate.2009.11.005
- Hahn, R. A., Rammohan, V., Truman, B. I., Milstein, B., Johnson, R. L., Muntañer, C., Jones, C. P., Fullilove, M. T., Chattopadhyay, S. K., Hunt, P. C., Abraido-Lanza, A. F., & Community Preventive Services Task Force (2014). Effects of full-day kindergarten on the long-term health prospects of children in low-income and racial/ethnic minority populations: A community guide systematic review. *American Journal of Preventive Medicine*, 46, 312-323. doi: 10.1016/j.amepre.2013.12.003
- Hahs-Vaughn, D. L. (2005). A primer for using and understanding weights with national datasets. *The Journal of Experimental Education*, 73, 221-248. <http://dx.doi.org/10.3200/JEXE.73.3.221-248>
- Hamre, B. K., & Pianta, R. C. (2005). Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure? *Child Development*, 76, 949-967.
- Harn, B. A., Stoolmiller, M., & Chard, D. J. (2008). Measuring the dimensions of alphabetic principle on the reading development of first graders: The role of automaticity and unitization. *Journal of Learning Disabilities*, 41, 143-157. doi: 10.1177/0022219407313585

- Hart, B., & Risley, T. R. (2003). The early catastrophe: The 30 million word gap by age 3. *American Educator*, 27, 4-9.
- Hart, B., & Risley, T. R. (1995). *Meaningful differences in the lives of children*. Baltimore, MD: Brookes.
- Hattie, J. (2005). The paradox of reducing class size and improving learning outcomes. *International Journal of Educational Research*, 43(6), 387-425. doi: 10.1016/j.ijer.2006.07.002
- Hayes, A. F. (2017). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach (2nd ed.). New York, NY: Guilford Press.
- Hill, N. E., & Craft, S. A. (2003). Parent-school involvement and school performance: Mediated pathways among socioeconomically comparable African American and Euro-American families. *Journal of Educational Psychology*, 95, 74-93. doi: 10.1037/0022-0663.95.1.74
- Hill, N., & Taylor, L. (2004). Parental school involvement and children's academic achievement: Pragmatics and issues. *Current Directions in Psychological Science*, 13, 161-164. doi: 10.1111/j.0963-7214.2004.00298.x
- Hindman, A. H., Wasik, B. A., & Snell, E. K. (2016). Closing the 30 million word gap: Next steps in designing research to inform practice. *Child Development Perspectives*, 10, 134-139. doi: 10.1111/cdep.12177
- Hoglund, W. L. G., Brown, J. L., Jones, S. M., & Aber, J. L. (2015). The evocative influence of child academic and social-emotional adjustment on parent

- involvement in inner-city schools. *Journal of Educational Psychology*, 107, 517-532. doi: 10.1037/a0037266
- Hoover-Dempsey, K. V., Bassler, O. C., & Brissie, J. S. (1987). Parent involvement: Contributions of teacher efficacy, school socioeconomic status, and other school characteristics. *American Educational Research Journal*, 24, 417-435.
- Hoover-Dempsey, K. V., Battiato, A. C., Walker, J. M. T., Reed, R. P., DeJong, J. M., & Jones, K. P. (2001). Parental involvement in homework. *Educational Psychologist*, 36, 195-209.
- Hoover-Dempsey, K. V., & Sandler, H. M. (1995). Parental involvement in children's education: Why does it make a difference? *Teachers College Record*, 97, 310-331.
- Hoover-Dempsey, K. V., & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of Educational Research*, 67, 3-42. doi: 10.3102/00346543067001003
- Hoover-Dempsey, K. V., Walker, J. M. T., Sandler, H. M., Whetsel, D., Green, C. L., Wilkins, A. S. & Closson, K. (2005). Why do parents become involved? Research findings and implications. *The Elementary School Journal*, 106, 105-130. doi: 0013-5984/2005/10602-0003
- Hornby, G., & Lafaele, R. (2011). Barriers to parental involvement in education: An explanatory model. *Educational Review*, 63, 37-52. doi: 10.1080/00131911.2010.488049
- IBM Corp. (2015). IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

- Iruka, I. U., LaForett, D. R., & Odom, E. C. (2012). Examining the validity of the family investment and stress models and relationship to children's school readiness across five cultural groups. *Journal of Family Psychology*, 26, 359-370. doi: 10.1037/a0028290
- Izzo, C. V., Weissberg, R. P., Kasprow, W. J., & Fendrich, M. (1999). A longitudinal assessment of teacher perceptions of parent involvement in children's education and school performance. *American Journal of Community Psychology*, 27, 817-839. <https://doi.org/10.1023/A:1022262625984>
- Jeynes, W. H. (2003). A meta-analysis: The effects of parental involvement on minority children's academic achievement. *Education and Urban Society*, 35, 202-218. doi: 10.1177/0013124502239392
- Jeynes, W. H. (2005). A meta-analysis of the relation of parental involvement to urban elementary school student academic achievement. *Urban Education*, 40, 237-269. doi: 10.1177/0042085905274540
- Jeynes, W. H. (2012). A meta-analysis on the effects and contributions of public, public charter, and religious schools on student outcomes. *Peabody Journal of Education*, 87, 305-335. doi: 10.1080/0161956X.2012.679542
- Jiang, Y., Ekono, M., & Skinner, C. (2016). *Basic facts about low-income children: Children under 18 years, 2014*. New York: National Center for Children in Poverty, Columbia University Mailman School of Public Health.
- Justice, L. M., Mashburn, A. J., Hamre, B. K., & Pianta, R. C. (2008). Quality of language and literacy instruction in preschool classrooms serving at-risk

- pupils. *Early Childhood Research Quarterly*, 23, 51-68.
doi:10.1016/j.ecresq.2007.09.004
- Kainz, K. & Vernon-Feagans, L. (2007). The ecology of early reading development for children in poverty. *The Elementary School Journal*, 107, 407-427.
<http://www.jstor.org/stable/10.1086/518621>
- Kim, Y. (2009). Minority parental involvement and school barriers: Moving the focus away from deficiencies of parents. *Educational Research Review*, 4, 80-102.
doi: 10.1016/j.edurev.2009.02.003
- Kim, Y.-S., Wagner, R. K., & Lopez, D. (2012). Developmental relations between reading fluency and reading comprehension: A longitudinal study from grade 1 to grade 2. *Journal of Experimental Child Psychology*, 113, 93-111. doi: 10.1016/j.jecp.2012.03.002
- Kuhn, M.R. & Stahl, S.A. (2000). *Fluency: A review of developmental and remedial practices* (CIERA Report #2-008). Washington, DC: US Department of Education.
- Lerner, R. M. (1991). Changing organism-context relations as the basic process of development: A developmental contextual perspective. *Developmental Psychology*, 27, 27-32. doi: 10.1037/0012-1649.27.1.27
- Lesaux, N. K. (2012). Reading and reading instruction for children from low-income and non-English-speaking households. *The Future of Children*, 22(2), 73-88.
- Louis, K. S., Marks, H. M., & Kruse, S. (1996). Teachers' professional community in restructuring schools. *American Educational Research Journal*, 33, 757-798.

- Magnuson, K. A., Ruhm, C. & Waldfogel, J. (2007). The persistence of preschool effects: Do subsequent classroom experiences matter? *Early Childhood Research Quarterly*, 22, 18-38. doi: 10.1016/j.ecresq.2006.10.002
- Manz, P. H., Fantuzzo, J. W., & Power, T. J. (2004). Multidimensional assessment of family involvement among urban elementary students. *Journal of School Psychology*, 42, 461-475. doi: 10.1016/j.jsp.2004.08.002
- Maria, K. (1989). Developing disadvantaged children's background knowledge interactively. *The Reading Teacher*, 42(4), 296-300.
<http://www.jstor.org/stable/20200114>
- Martin, N. K., Sass, D. A., & Schmitt, T. A. (2012). Teacher efficacy in student engagement, instructional management, student stressors, and burnout: A theoretical model using in-class variables to predict teachers' intent-to-leave. *Teaching and Teacher Education*, 28, 546-559. doi: 10.1016/j.tate.2011.12.003
- Masarik, A. S., & Conger, R. D. (2017). Stress and child development: A review of the Family Stress Model. *Current Opinion in Psychology*, 13, 85-90. doi: <http://dx.doi.org/10.1016/j.copsyc.2016.05.008>
- McCoach, D. B., & Colbert, R. D. (2010). Factors underlying the Collective Teacher Efficacy Scale and their mediating role in the effect of socioeconomic status on academic achievement at the school level. *Measurement and Evaluation in Counseling and Development*, 43, 31-47. doi: 10.1177/0748175610362368

- Mesmer, H. A. E., & Williams, T. O. (2014). Modeling first grade reading development. *Reading Psychology, 35*, 468-495. doi: 10.1080/02702711.2012.743494
- Miller, P. & Votruba-Drzal, E. (2013). Early academic skills and childhood experiences across the urban-rural continuum. *Early Childhood Research Quarterly, 28*, 234-248. doi: 10.1016/j.ecresq.2012.12.005
- Mistry, R. S., Vanderwater, E. A., Huston, A. C., & McLoyd, V. C. (2002). Economic well-being and children's social adjustment: The role of family process in an ethnically diverse low-income sample. *Child Development, 73*, 935-951.
- Morris, D., Bloodgood, J. W., Lomax, R. G., & Perney, J. (2003). Developmental steps in learning to read: A longitudinal study in kindergarten and first grade. *Reading Research Quarterly, 38*, 302-328. doi: 10.1598/RRQ.38.3.1
- Morrison, F., Bachman, H., & Connor, C. (2005). The classroom: Teaching and learning. In *Improving Literacy in America: Guidelines from Research* (pp. 111-135). Yale University Press.
- Morrison, F. J., & Cooney, R. R. (2002). Parenting and academic achievement: Multiple paths to early literacy. In J. G. Borkowski (Ed.), *Parenting and the child's world: Influences on academic, intellectual, and social-emotional development* (pp. 141-160). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *The Future of Children, 5*(2), 113-127. doi: 10.2307/1602360

- Mueller, S. (2013). Teacher experience and the class size effect – Experimental evidence. *Journal of Public Economics*, 98, 44-52. doi: 10.1016/j.jpubeco.2012.12.001
- Murnane, R., Sawhill, I., & Snow, C. (2012). Literacy challenges for the twenty-first century: Introducing the issue. *The Future of Children*, 22(2), 3-15. doi: 10.1353/foc.2012.0013
- National Reading Panel (2000). *Teaching children to read: An evidence-based assessment of the scientific research and literature on reading and its implications for reading instruction: Reports of the subgroups* (NIH Publication No. 00-4754). Washington, DC: National Institute of Child Health and Development.
- Neppl, T. K., Senia, J. M., & Donnellan, M. B. (2016). Effects of economic hardship: Testing the family stress model over time. *Journal of Family Psychology*, 30, 12-21. doi: 10.1598/RRQ.40.2.3
- Paris, S. G. (2005). Reinterpreting the development of reading skills. *Reading Research Quarterly*, 40, 184-202. doi: 10.1598/RRQ.40.2.3
- Perfetti, C., & Stafura, J. (2014). Word knowledge in a theory of reading comprehension. *Scientific Studies of Reading*, 18, 22-37. doi: 10.1080/10888438.2013.827687
- Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). The how, whom, and why of parents' involvement in children's academic lives: More is not always better. *Review of Educational Research*, 77, 373-410. doi: 10.3102/003465430305567

- Rayner, K., Foorman, B. R., Perfetti, C. A., Pesetsky, D., & Seidenberg, M. S. (2001). How psychological science informs the teaching of reading. *Psychological Science in the Public Interest*, 2(2), 31-74. doi: 10.1111/1529-1006.00004
- Reardon, S. F. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. In G. J. Duncan & R. J. Murnane (Eds.), *Whither opportunity?: Rising inequality, schools, and children's life chances* (91-116). New York, NY: Russell Sage Foundation.
- Reardon, S. F., & Portilla, X. A. (2016). Recent trends in income, racial, and ethnic school readiness gaps at kindergarten entry. *AERA Open*, 2(3), 1-18. doi: 10.1177/2332858416657343
- Reardon, S. F., Valentino, R. A., & Shores, K. A. (2012). Patterns of literacy among U.S. students. *The Future of Children*, 22(2), 17-37. doi: 10.1353/foc.2012.0015
- Reynolds, A. J., Magnuson, K. A., & Ou, S. (2010). Preschool-to-third grade programs and practices: A review of the research. *Children and Youth Services Review*, 32, 1121-1131. doi:10.1016/j.childyouth.2009.10.017
- Robinson, C. D., Tomek, S., & Schumacker, R. E. (2013). Tests of moderation effects: Difference in simple slopes versus the interaction term. *Multiple Linear Regression Viewpoints*, 39, 16-24.
- Sénéchal, M. (2006). Testing the Home Literacy Model: Parent involvement in kindergarten is differentially related to grade 4 reading comprehension, fluency, spelling, and reading for pleasure. *Scientific Studies of Reading*, 10, 59-87. doi: 10.1207/s1532799xssr1001_4

- Sénéchal, M., & LeFevre, J. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development*, 73, 445-460. doi: 10.1111/1467-8624.00417
- Shoulders, T. L., & Krei, M. S. (2015). Rural high school teachers' self-efficacy in student engagement, instructional strategies, and classroom management. *American Secondary Education*, 44, 50-62.
- Snow, C. E., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children*. Washington, D.C.: National Academy Press.
- Snow, C. E., & Matthews, T. J. (2016). Reading and language in the early grades. *The Future of Children*, 26(2), 57-74.
- Sonnenschein, S., Baker, L., & Serpell, R. (2010). The Early Childhood Project: A 5-year longitudinal investigation of children's literacy development in sociocultural context. In D. Aram, & O. Korat (Eds.), *Literacy: Development and enhancement across orthographies and cultures* (pp. 85-96). NY: Springer.
- Sonnenschein, S., Metzger, S. R., & Thompson, J. A. (2016). Low-income parents' socialization of their preschoolers' early reading and math skills. *Research in Human Development*, 13, 207-224. doi: 10.1080/15427609.2016.1194707
- Sonnenschein, S. & Schmidt, D. (2000). Fostering home and community connections to support children's reading development. In L. Baker, M.J. Dreher, & J.T. Guthrie (Eds.), *Engaging young readers: Promoting achievement and motivation* (pp. 264-284). NY: Guilford

- Sonnenschein, S., Stapleton, L. M., & Benson, A. (2010). The relation between the type and amount of instruction and growth in children's reading comprehension. *American Educational Research Journal*, 47, 358-389.
- Sonnenschein, S., Stapleton, L. M., & Metzger, S. R. (2014). What parents know about how well their children are doing in school. *The Journal of Educational Research*, 107, 152-162. doi: 10.1080/00220671.2013.788987
- Stacer, M. J., & Perrucci, R. (2013). Parental involvement with children at school, home, and community. *Journal of Family Economic Issues*, 34, 340-354. doi: 10.1007/s10834-012-9335-y
- Stahl, K. A. D. (2011). Applying new visions of reading development in today's classrooms. *The Reading Teacher*, 65, 52-56. doi: 10.1598/RT.65.1.7
- Stahl, S. A., & Murray, B. A. (1994). Defining phonological awareness and its relationship to early reading. *Journal of Educational Psychology*, 86, 221-234.
- Stipek, D. J., & Ryan, R. H. (1997). Economically disadvantaged preschoolers: Ready to learn but further to go. *Developmental Psychology*, 33, 711-723. doi: 10.1037/0012-1649.33.4.711
- Sy, S. R., & Schulenberg, J. E. (2005). Parent beliefs and children's achievement trajectories during the transition to school in Asian American and European American families. *International Journal of Behavioral Development*, 29, 505-515. doi: 10.1080/01650250500147329
- Taylor, B. M., Pearson, P. D., Clark, K., & Walpole, S. (2000). Effective schools and accomplished teachers: Lessons about primary-grade reading instruction in low-income schools. *The Elementary School Journal*, 101, 121-165.

- Taylor, L. C., Clayton, J. D., & Rowley, S. J. (2004). Academic socialization: Understanding parental influences on children's school-related development in the early years. *Review of General Psychology*, 8, 163-178.
- Thompson, J. A., & Sonnenschein, S. (2016). Full-day kindergarten and children's later reading: The role of early word reading. *Journal of Applied Developmental Psychology*, 42, 58-70. doi: 10.1016/j.appdev.2015.11.005
- Torgerson, C., Brooks, G., & Hall, J. (2006). A systematic review of the research literature on the use of phonics in the teaching of reading and spelling. (Research Report No. 711). London, England: Department of Education and Skills.
- Tourangeau, K., Nord, C., Lê, T., Wallner-Allen, K., Hagedorn, M.C., Leggitt, J., & Najarian, M. (2015). *Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K:2011), user's manual for the ECLS-K:2011 Kindergarten – first grade data file and electronic codebook, public version* (NCES 2015-078). U.S. Department of Education. Washington, DC: National Center for Education Statistics.
- Tschannen-Moran, M., & Johnson, D. (2011). Exploring literacy teachers' self-efficacy beliefs: Potential sources at play. *Teaching and Teacher Education*, 27, 751-761. doi: 10.1016/j.tate.2010.12.005
- Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, 17, 783-805. doi: 10.1016/S0742-051X(01)00036-1

- Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68, 202-248. doi: 10.3102/00346543068002202
- Underwood, S. (2018, January). *What is the evidence for an uninterrupted, 90-minute literacy instruction block?* Retrieved from <http://educationnorthwest.org/resources/what-evidence-uninterrupted-90-minute-literacy-instruction-block>
- Varghese, C., Garwood, J. D., Bratsch-Hines, M., & Vernon-Feagans, L. (2016). Exploring magnitude of change in teacher efficacy and implications for students' literacy growth. *Teaching and Teacher Education*, 55, 228-239. doi: 10.1016/j.tate.2016.01.011
- Votruba-Drzal, E., Miller, P., & Coley, R. L. (2015). Poverty, urbanicity, and children's development of early academic skills. *Child Development Perspectives*, 10, 3-9. doi: 10.1111/cdep.12152
- Wade-Woolley, L. (2016). Prosodic and phonemic awareness in children's reading of long and short words. *Reading and Writing*, 29, 371-382. doi: 10.1007/s11145-015-9600-1
- Wei, T., Liu, X., & Barnard-Brak, L. (2015). Gender differences in mathematics and reading trajectories among children from kindergarten to eighth grade. *Research in Education*, 93, 77-89. <http://dx.doi.org/10.7227/RIE.0015>
- Weiss, H. B., Mayer, E., Kreider, H., Vaughan, M., Dearing, E., Hencke, R., & Pinto, K. (2003). Making it work: Low-income working mothers' involvement in

- their children's education. *American Educational Research Journal*, 40, 879-901. <https://doi.org/10.3102%2F00028312040004879>
- Wen, X., Bulotsky-Shearer, R. J., Hahs-Vaughn, D. L., & Korfmacher, J. (2012). Head Start program quality: Examination of classroom quality and parent involvement in predicting children's vocabulary, literacy, and mathematics achievement trajectories. *Early Childhood Research Quarterly*, 27, 640-653. doi: 10.1016/j.ecresq.2012.01.004
- Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development*, 69, 848-872.
- Wolf, M., Katzir-Cohen, T. (2001). Reading fluency and its intervention. *Scientific Studies of Reading*, 5(3), 211-239. http://dx.doi.org/10.1207/S1532799XSSR0503_2
- Woodcock, R. W., & Johnson, M. B. (1989). Woodcock-Johnson Revised Tests of Achievement. Itasca, IL: Riverside
- Workman, E. (2013). *Inequalities at the starting line: State kindergarten policies*. Denver, CO: Education Commission of the States.
- Yeung, R. (2009). Are school uniforms a good fit?: Results from the ECLS-K and the NELS. *Educational Policy*, 23, 847-874. doi: 10.1177/0895904808330170
- Yeung, W. J., Linver, M. R., & Brooks-Gunn, J. (2002). How money matters for young children's development: Parental investment and family processes. *Child Development*, 73, 1861-1879.
- Yopp, H. K. (1992). Developing phonemic awareness in young children. *The Reading Teacher*, 45, 696-703.

Zee, M., & Koomen, H. Y. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research. *Review of Educational Research*, 86, 981-1015. doi: 10.3102/0034654315626801

