FORMAL AND INFORMAL PARENTAL INVOLVEMENT
AND CHILDREN’S ACADEMIC
ACHIEVEMENT

A Thesis
Presented to the
Faculty of
California State University, Fullerton

In Partial Fulfillment
of the Requirements for the Degree
Master of (Science)
in
Clinical Psychology

By
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Spring, 2018
ABSTRACT

Researchers have found that parental involvement plays an important role in children’s learning and development. Students generally score higher on educational achievement tests, have better attendance at school, and are more likely to continue their postsecondary education when parents are actively involved in their schooling (Martinez, 2004). However, parental involvement requires the investment of time, and some parents are unable to be present at the school to attend PTA meetings or volunteer during a class. Parents who are busy during the day may only be involved with the child at home by helping with homework, discussing important academic concepts, and reading to the child. This study examines the relationship between children’s academic achievement and two types of parental involvement: in-school (formal) and at-home (informal). This study used data from the national Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K), which included a sample of approximately 18,200 kindergarteners and their parents. This study examined whether both formal and informal parental involvement were positively related to students’ academic outcomes in math, reading, and science. Results of the study partially supported hypotheses. In addition, the current study examined whether parental involvement in both contexts, formal and informal, was better for students’ academic achievement than if the parent was only involved in one context. Results of the study did not support this hypothesis.
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ACKNOWLEDGMENTS

I would like to express my sincere gratitude to my thesis advisor Dr. Susan R. Sy for her continuous support, contribution of time, professionalism, encouragement, and motivation during the process of writing this thesis. It has been a long venture for me and Dr. Sy has been always there ready to provide assistance and expertise that I needed during this journey’s ups and downs.

In addition, I would like to thank the members of my thesis committee: Dr. Mitchell Okada and Dr. Lisa Mori for their insightful feedback, valuable suggestions, and guidance. I know that without your help, dedication of time, and support this thesis would not have been possible.

Finally, a very special gratitude goes to all members of my family, especially my husband Henry, my mother Ramilya, and my daughter Ita, who have supported and motivated me along this venture. You are the most important people in my life and I dedicate this thesis to you.
CHAPTER 1
INTRODUCTION

Previous Literature

Parental involvement plays an important role in children’s learning and development (Epstein, 2009; Stewart, 2008). Over the past decades, many school districts worked on increasing parental involvement as a result of the national legislation program No Child Left Behind (NCLB), which states that parents share accountability for students’ achievements in school (NCLB, 2004). NCLB emphasized that parental involvement is an important factor in students’ grades, and it encouraged schools to create an action plan for how to help parents become more active in school (NCLB, 2004).

Existing research on parental involvement primarily suggests a positive relationship with student academic outcomes. Students generally score higher on educational achievement tests, have better attendance at school, and are more likely to continue their postsecondary education when parents are actively involved in students’ academic lives (Martinez, 2004). Responsive parental behaviors, such as involvement, closeness, or participation in children’s activities, predict higher grade point average among secondary school students (Bogenschneider & Pallok, 2008), and when parents show interest in their children’s academic career, high school students have higher academic achievement (Sepra, Wentzel, & Matto, 2009). Additional research suggests that parental academic support is a positive predictor of educational success for children.
in kindergarten, middle school, high school, and college (Barnard, 2004; DeGarmo & Martinez, 2006).

Researchers continue to acknowledge the benefits of parental involvement for academic achievement and recognize that it is most beneficial during the elementary school years. Rimm-Kaufmann and Pianta (2001) suggest that children’s home and school are the most fundamental environments that influence their learning habits. According to Cotton and Wikeland (2001), the earlier parental involvement begins in a child’s education, the more powerful are the benefits. Young children construct their identity as students in the early years of school, and how well they perform in the early grades may shape their later academic experiences (Farkas & Beron, 2004; Rouse, Brooks-Gann, & McLanahan, 2005).

Although there is an abundance of research on parental involvement, the definition of this construct often varies among educators, parents, and researchers. For instance, when teachers talk about parental involvement, they are usually referring to formal or observable participation in the school that may include attending PTA meetings, going with the child’s class on field trips, or volunteering in a classroom (LeFevre & Shaw, 2012). However, teachers may not be aware of parents’ informal participation at home, and it is typical for teachers to assume that working parents are less involved than other parents (Jackson & Remillard, 2005). Researchers, however, have recognized the importance of parental involvement at home. One recent study examined the relationship between two types of parental involvement at home (academic instruction and academic socialization) and children’s reading achievement (Sy, Gottfried, & Gottfried, 2013). Both types of parental home involvement positively
predicted children’s emergent reading skills in preschool and kindergarten (Sy et al., 2013). Even though there is extensive research on parental involvement, investigators have not yet compared the relative importance of both formal and informal parental involvement for children’s academic outcomes. This study will examine whether parental involvement in only one context provides the same benefits for children’s scholarly achievement as does parental involvement in both contexts.

**Theoretical Framework**

Research indicates that the family and the school are the two most important contexts for shaping children’s academic outcomes because children spend the majority of time in these settings. Epstein’s (1992) model of overlapping spheres of influence is helpful in understanding the influence of these important contexts. This model emphasizes the influences of family, community, and school systems on children’s development and growth, and is one of the most widely referenced frameworks in the parental involvement literature (Bower & Griffin, 2011). Although the family, community, and school settings function as separate spheres of influence, sometimes they interact, creating an overlap (Epstein, 1992). For instance, when a teacher assigns homework at school, the parent helps the child with the completion of this homework at home. Within these three contexts, Epstein (1996) defines six types of parental involvement behaviors: (1) creating positive home conditions (basic safety and health needs), (2) communication (school-home communication about student’s progress), (3) involvement at school (volunteering), (4) engaging in home learning activities (reading at home, playing educational games), (5) shared decision making with the school (parents’ participation in school structure), and (6) community partnerships (collaboration between
family, school, and the community) (Epstein et al., 2009). This framework suggests that involvement in both the formal and informal contexts is related to the student’s overall academic experience.

Although Epstein’s model emphasizes involvement in multiple contexts, the existing research has not been consistent with operational definitions of parental involvement. Researchers have defined parental involvement as participation in school activities (Coleman & McNeese, 2009), parental aspirations, hopes, and expectations for their children (Hill et al., 2004), engagement in schoolwork within the home (Hoover-Dempsey et al., 2005), and home-school-community partnerships (Comer & Haynes, 1991). Parental involvement may also involve making sure that children do not miss school, bringing the child to school on time, and providing essential support for what the teacher is doing when the student is at home (Bernstein, 2012). Because there is no consensus on the definition of parental involvement, this study will define it as academic-related activities that parents use to interact with their children in the school and at home (Bower, 2011).

**Informal (Home) Involvement**

Although parental involvement is an important factor influencing children’s early development and learning, it is also essential to recognize that parental involvement requires investments of time from parents (Bower, 2001). Work schedules may prevent many parents from being physically present at the school, so they are unable to attend PTA meetings, volunteer during a class, or participate in activities at the school site (Hill & Tailor, 2004). Therefore, the parents who are working during the day can only be
involved with the child at home after work by reading to the child, helping with his or her homework, or discussing important academic concepts.

Informal parental involvement is defined as academic-related activities and educational support that happen at home or outside of the school environment (LeFevre & Shaw, 2012). It may also include going to libraries, museums, historical sites, and reading to the child to improve his or her learning experience (Grolnick & Slowiaczek, 1994; Gutman & McLoyd, 2000). Some other ways that parents can informally participate in their children’s education may include helping with homework, providing the child comfortable and quiet settings for completing homework, arriving at school on time, monitoring the child’s attendance, and providing emotional support (Auerbach, 2007; Zarate, 2007). One study suggests that informal parental involvement may also include spoken and unspoken messages about the significance of education and school (De Gaetano, 2007; Stewart, 2008). LeFevre and Shaw (2012) suggest that parents can be informally involved by eliminating possible distractions, such as babysitting younger siblings, so they can fully dedicate their time to school work at home. Additionally, Wilder (2014) explains that informal parental involvement may include monitoring the child’s time spent doing homework and watching television, and making sure that child comes home after school.

Existing research on informal parental involvement shows that there is a positive association between academic achievement and parental participation at home. Clark (1990) states that approximately seventy percent of children’s waking hours are spent outside of school settings and it is important that parents use this time to be involved with the child’s education. Erion (2006) conducted a meta-analysis of 37 studies focusing on
informal parental involvement, specifically learning activities at home, to determine the
relationship between parent tutoring and students’ academic achievement. Results
showed that parental involvement at home positively related to students’ academic
outcomes. Parent activities with children at home such as reading or playing educational
games can strengthen parent–child emotional bonds, expand parental influence, and
strengthen academic achievement (Benson & Mokhtari, 2011).

Although the research to date on the relationship between informal parental
involvement and children’s academic outcomes is mainly positive, some suggest that
when children advance in age, more involvement is not always better. Hill and Tyson
(2009) found that parental help with homework during the middle school years is
negatively related to students’ achievement. The author suggests this negative correlation
is a function of parental interference with students’ autonomy or excessive parental
pressure during the adolescence years. Sy et al. (2013) also indicate that when children
are doing poorly in school, their parents may increase their academic involvement at
home in response to students’ school performance. A meta-analysis by Fan and Chen
(2001) examined multiple measures of informal parental involvement across middle and
high school students and found that parental involvement in learning activities at home
has the weakest relationship with students’ academic achievement. Pomerantz at el.
(2007) also found that informal parental involvement is beneficial for children if it is
supportive and positive; however, it becomes ineffective if it is controlling and negative.

Overall, the research indicates that children in the earlier years of schooling
would greatly benefit from having informal parental support. Elementary school students
need this parental support and perform better academically when their parents are informally involved with them at home.

**Formal (School) Involvement**

Formal parental involvement includes the behaviors, activities, and support that take place in the schools. These behaviors include attending PTA meetings, and parent-teacher conferences, volunteering in the classroom, and participating in fundraisers or school events (Valencia & Black, 2002). Formal parental involvement activities may also include helping with field trips and keeping in contact with teachers about the student’s academic progress, behavioral issues, and upcoming school events (Barnard, 2004; Sheldon & Epstein, 2006). Thus, formal parental involvement includes any activities that require parents to be present in school settings or have any type of a communication with the school (LeFevre & Shaw, 2012).

When parents are in close contact with the school and collaborate with the teacher about their children’s progress, students’ academic performance seems to improve. When parents are in contact with their child’s teacher, students feel that their parents and teacher care about their academics and overall wellbeing (Epstein & Sanders, 2002; Stewart, 2008). In turn, students’ feelings about being in school may influence their learning and development (Shields, 1991).

When parents are in their children’s school, they also have a chance to meet other parents and gain insights about schooling practices, how to handle difficult situations, and extracurricular activities. Formally involved parents develop more complex and advanced strategies, such as being aware of their child’s friends, knowing their child’s teacher, other teachers, and parents, or talking with other parents about solutions to hypothetical
academic problems to promote their child’s education (Baker & Stevenson, 1986). Moreover, formally involved parents can establish relationships with school personnel, which helps them understand the school’s expectations about educational projects and homework. According to Crace, Ronco, and Hossler (2013), parent-to-parent collaboration in school provides the knowledge, information, and experience the parents need to support their children academically and emotionally. Thus, formal parental involvement may increase parental skills so they become better equipped to assist their children with academics and overall development.

**Formal Versus Informal Parental Involvement**

Existing research on parental involvement suggests that both contexts, formal and informal, are significant predictors of students’ academic outcomes during early elementary school years. Although parental involvement is an important factor influencing academic achievement, children of busy and working parents may be at disadvantage. Parents who cannot attend school activities may not fully understand what teachers expect in their class for students to do well, how the school operates, and what programs or activities are available for students (Bogenschneider & Johnson, 2004). On the other hand, formally involved parents have a chance to spend more time with their child and have a better understanding of the school system and expectations in terms of education (Bogenschneider & Johnson). Thus, there may be unique benefits for children whose parents are involved in both contexts, formal and informal, compared to children whose parents are involved in only the informal context.

There are a few reasons why it is important to investigate parental involvement in both contexts versus parental involvement only in one context and its relationship to
academic outcomes during the early elementary years. First, many working parents cannot leave their jobs to participate in formal school activities during the day, so it is important to examine whether children of less formally involved parents have the same educational benefits as other children whose parents are involved in both contexts. Second, if children whose parents cannot be involved in both formal and informal contexts are at disadvantage, then it is important to consider how schools can offer additional support for those children. Third, if being involved only in one context is not enough to promote optimum academic performance, then researchers and practitioners need to consider how to promote parent-teacher collaboration in order to support children whose parents are unavailable during the day. Some ways to promote parent-teacher collaboration would be offering training for parents on effective communication tools, surveying parents to determine needs, and ensuring parents have easy access to information about the child’s academic progress (Van Roekel, 2008).

**Hypotheses**

This study examined whether parental involvement in both formal and informal contexts is better for students’ academic achievement than if the parent is only involved in one context.

The hypotheses examined in this study are the following:

*H1:* There will be a significant positive relationship between formal parental involvement and students’ math, reading, and science achievement.

*H2:* There will be a significant positive relationship between informal parental involvement and students’ math, reading, and science achievement.
$H3$: Students whose parents are involved in both formal and informal contexts will have higher academic achievement than students whose parents are involved only in one context.
CHAPTER 2

METHODOLOGY

Participants

Data for this study were drawn from the nationally representative Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K:2011). The data are sponsored by the US Department of Education and National Center for Education Statistics and provide information on students who attended kindergarten in the United States in the 2010-2011 school year. The ECLS-K:2011 is a longitudinal study that follows a representative sample of students from their kindergarten year to the spring of 2016, when most of them were in fifth grade. The ECLS-K:2011 data collection began in the fall of 2010 and includes approximately 18,200 kindergarten children enrolled in 970 schools. The children came from diverse socioeconomic and racial/ethnic backgrounds. Information was collected in the fall and the spring of kindergarten (2010-11), the fall and spring of first grade (2011-12), the fall and spring of second grade (2012-13), the spring of third grade (2014), the spring of fourth grade (2015), and the spring of fifth grade (2016).

The ECLS-K:2011 provides information on children’s cognitive, social, emotional, and physical development. Information was also collected on children’s home educational activities, home and school environment, parental involvement, classroom curriculum, and teacher qualifications. The ECLS-K:2011 data were collected using
direct child assessments, parent interviews, teacher and school administrator questionnaires, students’ records, and school facility checklists. The majority of parent interviews were conducted by telephone or in person. Item response theory (IRT) scores were calculated to measure children’s academic achievement.

This study used the second-grade spring 2013 data. The spring second-grade direct child assessments were conducted from March through June of 2013. The total sample of this wave is 18,174 children. The racial distribution of children was identified as white, non-Hispanic (46.7%, n = 8,495), Hispanic, Race Specified (22.4%, n = 4,068), Hispanic, No Race Specified (2.8%, n = 517), Black, African-American (13.2%, n = 2,396), Asian (8.5%, n = 1,542), Native Hawaiian, Pacific Islander (0.6%, n = 117), American Indian, Alaskan Native (0.9%, n = 168), two or more races, non-Hispanic (4.5%, n = 825), and refuse to specify (0.3%, n = 46). The children were identified as male (51.1%, n = 9,288), female (48.7%, n = 8,847), and refuse to identify (0.3%, n = 39). This wave was selected because it is the latest data from ECLS-K:2011 that became publicly available in February of 2017 and children have been in school long enough for parents to establish consistent parental involvement practices. After listwise deletion, a total of 8,565 out of 18,174 cases were used in the analysis.

Measures

Parent involvement factors were assessed using data from parent interviews. Academic achievement was assessed using data from direct child assessments.

Formal Parental Involvement

Five items examining formal parental involvement were included in the spring second grade interview. Parents were asked if, since the beginning of this school year,
they or another adult member of the household attended an open house or back-to-school night, attended a PTA meeting, attended a regularly-scheduled parent-teacher conference, attended a school event, and volunteered in the child’s classroom. Responses were coded “yes” (1) or “no” (0). The five items were summed together to create a single variable to represent formal parental involvement with scores ranging from 0 to 5. Higher scores reflect higher overall formal parental involvement participation.

**Informal Parental Involvement**

Informal parental involvement was assessed using six questions in the spring second grade interview. Parents were asked how often they or another member of the household do several activities with their child, including tell stories, help do arts and crafts, play educational games or do puzzles, talk about nature or science projects, practice reading, writing or working with numbers, and read books. Responses were coded “not at all” (1); “once or twice a week” (2); “3-6 times a week” (3); or “every day” (4). One additional question asked how often they or another member of the household help with child’s homework. Response were coded “never” (1); “less than once a week” (2); “1 to 2 times a week” (3); “3 to 4 times a week” (4); “5 or more times a week” (5). In order to stay consistent with a four-point Likert scale the last item was recoded to “never” and “less than once a week” (1); “1 to 2 times a week” (2); “3 to 4 times a week” (3); “5 or more times a week” (4).

The seven questions were summed together as indicators of a single variable to represent informal parental involvement. Higher scores reflect higher informal parental involvement.
Academic Achievement

Academic achievement was assessed using item response theory (IRT) scores that were calculated from children’s responses. For the current study, the IRT scaled scores for reading, math, and science were included as three separate variables.

Parental Education

Parental education was included in order to control for the relationship between socio-economic status, parental involvement, and academic achievement. Parental education was measured with two composite items: one for mother and one for father. The two items were averaged to create a single parental education variable.

Household Income

Household income was included in order to control for the relationship between socio-economic status, parental involvement, and academic achievement. Household income was a composite variable that was calculated by using detailed income range information collected in the parent interview.

Analysis

First, to examine hypothesis 1, a multiple regression was conducted to test the relationship between formal parental involvement and students’ academic outcomes in math, reading, and science while controlling for parental education and household income. The independent variables were parental education, household income, and formal parental involvement. The dependent variable was academic achievement. The multiple regression was run three separate times for each academic IRT score (math, reading, and science).
Second, to examine hypothesis 2, the data were analyzed using a multiple regression to examine the relationship between informal parental involvement and students’ academic achievements in math, reading, and science while controlling for parental education and household income. The independent variables were parental education, household income, and informal parental involvement. The dependent variable was academic achievement. The multiple regression was run three times for each academic subject separately.

Third, in order to test hypothesis 3 which compares parental involvement (PI) in both formal and informal contexts with PI only on one type, three groups were created. One group represented parents who scored high on both types of PI, the second group represented parents who scored high on only one type of PI, and the third group represented parents who scored low on both types of PI. In order to create these three groups, a median split was conducted on each involvement variable to create categorical measures of PI scores. Any PI scores below the median were classified as low PI, and those PI scores that were above the median as high PI. Low PI were coded as “0” and high PI were coded as “1”. A new variable was created that indicated that parents who were coded as “1” on both types of PI were grouped together (high formal and high informal). Parents who were coded as “0” on one type of PI and “1” on another type of PI were grouped together (high involvement in only one context). Parents who were coded as “0” on both types of PI were grouped together (low formal and low informal).

Finally, the data were analyzed using a one-way ANOVA test comparing students’ achievement scores between students with high parental involvement in both contexts (Group 1) and students with high parental involvement in only one context.
(Group 2) and students with low parental involvement in both contexts (Group 3). The one-way ANOVA test was run three separate times for each academic subject. A post-hoc Tukey pairwise comparison test was conducted to determine the difference between the three groups.
CHAPTER 3

RESULTS

Assumptions

There was a slight kurtosis for reading IRT score (kurtosis = 1.47; see Table 1), math IRT score (kurtosis = 2.55), science IRT score (kurtosis = 1.42), household income (kurtosis = -1.25), and for the 3-group parental involvement variable (kurtosis = -1.16). Skewness was present in reading IRT score (skewness = -1.14), math IRT score (skewness = -1.28), and science IRT score (skewness = -1.17).

Table 1. Summary Descriptive Statistics Key Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading IRT score</td>
<td>98.09</td>
<td>11.52</td>
<td>49.23</td>
<td>116.38</td>
<td>-1.14</td>
<td>1.47</td>
</tr>
<tr>
<td>Math IRT score</td>
<td>83.37</td>
<td>12.77</td>
<td>14.78</td>
<td>112.74</td>
<td>-1.28</td>
<td>2.55</td>
</tr>
<tr>
<td>Science IRT score</td>
<td>44.55</td>
<td>8.14</td>
<td>9.45</td>
<td>58.99</td>
<td>-1.17</td>
<td>1.42</td>
</tr>
<tr>
<td>Household income</td>
<td>11.90</td>
<td>5.27</td>
<td>1.00</td>
<td>18.00</td>
<td>-.49</td>
<td>-1.25</td>
</tr>
<tr>
<td>Parental education</td>
<td>4.77</td>
<td>1.80</td>
<td>1.00</td>
<td>8.00</td>
<td>-.09</td>
<td>-.78</td>
</tr>
<tr>
<td>Formal PI</td>
<td>3.68</td>
<td>1.13</td>
<td>.00</td>
<td>5.00</td>
<td>-.72</td>
<td>.12</td>
</tr>
<tr>
<td>Informal PI</td>
<td>16.62</td>
<td>3.21</td>
<td>7.00</td>
<td>26.00</td>
<td>.12</td>
<td>-.21</td>
</tr>
<tr>
<td>3-Group PI variable</td>
<td>2.10</td>
<td>.74</td>
<td>1.00</td>
<td>3.00</td>
<td>-.17</td>
<td>-1.16</td>
</tr>
</tbody>
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Multiple Regression Analysis:
Formal Involvement

Reading

A multiple regression analysis was conducted to investigate the relationship between formal parental involvement and reading academic outcomes. The results
indicated that each of the predictor variables had a significant \((p < .001)\) zero-order correlation with reading IRT scores. There was a weak positive correlation between formal parental involvement and reading outcomes \((r = .19, p < .05; \text{see Table 2})\), indicating that formal parental involvement was positively related to children’s reading scores.

After controlling for household income and parental education, the regression model accounted for 18.9\% of the variance in reading achievement scores, \(R^2 = .189, F(3, 8564) = 666.34, p < .001\) (see Table 3). When formal parental involvement was added to the model, there was a significant change in \(R^2, \Delta R^2 = .003, p < .001\), (see Table 3); however, formal PI only explained 0.3\% of the variance in reading achievement scores.

Formal parental involvement significantly predicted reading scores, \(\beta = .06, t(8564) = 5.62, p < .001\); however, the estimated beta size suggests a weak effect of formal parental involvement on reading achievement scores.

**Math**

A multiple regression analysis was conducted to investigate the relationship between formal parental involvement and math academic outcomes. The results indicated that each of the predictor variables had a significant \((p < .001)\) zero-order correlation with math IRT scores. There was a weak positive correlation between formal parental involvement and math outcomes \((r = .17, p < .05; \text{see Table 2})\), indicating that formal parental involvement was positively related to children’s math scores.

After controlling for household income and parental education, the regression model accounted for 17.0 \% of the variance in math achievement scores, \(R^2 = .170, F(3, 8564) = 666.34, p < .001\).
\[ F(3, 8564) = 584.65, p < .001, \] (see Table 3). When formal parental involvement was added to the model, there was a significant change in \( R^2, \Delta R^2 = .001, p < .001, \) (see Table 3); however, formal PI only explained 0.1% of the variance in math scores.

Formal parental involvement significantly predicted math scores, \( \beta = .04, t(8564) = 3.86, p < .001; \) however, the estimated beta size suggests a weak effect of formal parental involvement on math achievement scores.

**Science**

A multiple regression analysis was conducted to investigate the relationship between formal parental involvement and science academic outcomes. The results indicated that each of the predictor variables had a significant \( (p < .001) \) zero-order correlation with science IRT scores. There was a weak positive correlation between formal parental involvement and science outcomes \( (r = .18, p < .05; \) see Table 2), indicating that formal parental involvement was positively related to children’s science scores.

After controlling for household income and parental education, the regression model accounted for 19.5 % of the variance in science achievement scores, \( R^2 = .195, F(3, 8564) = 691.70, p < .001, \) (see Table 3). When formal parental involvement was added to the model, there was a significant change in \( R^2, \Delta R^2 = .001, p < .001, \) (see Table 3); however, formal PI only explained 0.1% of the variance in science scores.

Formal parental involvement significantly predicted science scores, \( \beta = .04, t(8564) = 3.78, p < .001; \) however, the estimated beta size suggests a weak effect of formal parental involvement on science achievement scores.
Table 2. Correlation Matrix Key Variables

<table>
<thead>
<tr>
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<td>.38**</td>
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<td>.03**</td>
<td>.16**</td>
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* p < .05, ** p < .001

Table 3. Summary of Multiple Regression for Formal PI

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<td>$F$ value</td>
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</table>

* p < .001.

**Multiple Regression Analysis: Informal Involvement**

**Reading**

A multiple regression analysis was conducted to investigate the relationship between informal parental involvement and reading academic outcomes. The results
indicated that each of the predictor variables had a significant \((p < .001)\) zero-order correlation with reading IRT scores. There was a weak negative correlation between informal parental involvement and reading outcomes \((r = -.09, p < .05;\) see Table 2), indicating that informal parental involvement was negatively related to children’s reading scores.

After controlling for household income and parental education, the regression model accounted for 19.4 % of the variance in reading achievement scores, \(R^2 = .194, F(3, 8564) = 689.16, p < .001,\) (see Table 4). When informal parental involvement was added to the model, there was a significant change in \(R^2, \Delta R^2 = .008, p < .001,\) (see Table 4); however, informal PI only explained 0.8% of the variance in reading scores.

Informal parental involvement significantly predicted reading scores, \(\beta = -.09, t(8564) = -9.34, p < .001;\) however, the estimated beta size suggests a weak negative effect of informal parental involvement on reading achievement scores.

Math

A multiple regression analysis was conducted to investigate the relationship between informal parental involvement and math academic outcomes. The results indicated that each of the predictor variables had a significant \((p < .001)\) zero-order correlation with math IRT scores. There was a weak negative correlation between informal parental involvement and math outcomes \((r = -.10, p < .05;\) see Table 2), indicating that informal parental involvement was negatively related to children’s math scores.

After controlling for household income and parental education, the regression model accounted for 17.9% of the variance in math achievement scores, \(R^2 = .179,\)
$F(3, 8564) = 625.29, p < .001$, (see Table 4). When informal parental involvement was added to the model, there was a significant change in $R^2, \Delta R^2 = .011, p < .001$, (see Table 4); however, informal PI only explained 1.1% of the variance in math scores.

Informal parental involvement significantly predicted math scores, $\beta = -.11$, $t(8564) = -10.78, p < .001$; however, the estimated beta size suggests a weak negative effect of informal parental involvement on math achievement scores.

**Science**

A multiple regression analysis was conducted to investigate the relationship between informal parental involvement and science academic outcomes. The results indicated that each of the predictor variables had a significant ($p < .001$) zero-order correlation with science IRT scores. There was a weak negative correlation between informal parental involvement and science outcomes ($r = -.03, p < .05$; see Table 2), indicating that informal parental involvement was negatively related to children’s science scores.

After controlling for household income and parental education, the regression model accounted for 19.5% of the variance in reading achievement scores, $R^2 = .195$, $F(3, 8564) = 691.42, p < .001$, (see Table 4). When informal parental involvement was added to the model, there was a significant change in $R^2, \Delta R^2 = .001, p < .001$, (see Table 4); however, informal PI only explained 0.1% of the variance in science scores.

Informal parental involvement significantly predicted science scores, $\beta = -.04$, $t(8564) = -3.68, p < .001$; however, the estimated beta size suggests a weak negative effect of informal parental involvement on science achievement scores.
Table 4. Summary of Multiple Regression for Informal PI

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<tr>
<td>Model 1</td>
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<tr>
<td>Household income</td>
<td>.42</td>
<td>.03</td>
<td>.19</td>
</tr>
<tr>
<td>Parental education</td>
<td>1.80</td>
<td>.08</td>
<td>.28</td>
</tr>
<tr>
<td>$Adjusted R^2$</td>
<td>.186</td>
<td></td>
<td>.168</td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>.186</td>
<td></td>
<td>.168</td>
</tr>
<tr>
<td>$F$ value</td>
<td>980.19*</td>
<td></td>
<td>868.12*</td>
</tr>
</tbody>
</table>

| Model 2           |         |      |         |         |      |         |         |      |         |
| Household income  | .40     | .03  | .18     | .47     | .03  | .19     | .30     | .02  | .19     |
| Parental education| 1.85    | .08  | .29     | 1.84    | .09  | .26     | 1.31    | .06  | .29     |
| Informal PI       | -.33    | .04  | -.09    | -.42    | .04  | -.11    | -.09    | .03  | -.04    |
| $Adjusted R^2$    | .194    |      | .179    | .195    |      |         |         |      |         |
| $\Delta R^2$     | .008    |      | .011    | .001    |      |         |         |      |         |
| $F$ value         | 689.16* |      | 625.29* | 691.42*|      |         |         |      |         |

*p < .001.

One-way ANOVA Analysis

Reading

A one-way ANOVA was conducted to compare students’ reading achievement scores between students with high parental involvement in both contexts ($N = 2836$), students with high parental involvement in only one context ($N = 3790$), and students with low parental involvement in both contexts ($N = 1939$). The three parental involvement groups significantly differed on reading achievement scores, $F(2, 8565) = 27.24$, $\eta^2 = .01$, $p < .001$ (see Table 5). Post hoc comparison using the Tukey HSD test indicated that the mean score for students with low parental involvement in both contexts ($M = 96.40$, $SD = 12.20$, see Table 6) was significantly lower than the mean scores for students with high parental involvement in only one context ($M = 98.62$, $SD = 11.24$) and students with high parental involvement in both contexts ($M = 98.54$, $SD = 11.32$).
However, there was no significant difference between students with high parental involvement in only one context and students with high parental involvement in both contexts. This indicates that students performed better in reading when parents were involved in either both contexts or at least one context rather than low or no parental involvement at all.

**Math**

A one-way ANOVA was conducted to compare students’ math achievement scores between students with high parental involvement in both contexts \((N = 2836)\), students with high parental involvement in only one context \((N = 3790)\), and students with low parental involvement in both contexts \((N = 1939)\). There three parental involvement groups significantly differed on math achievement scores, \(F(2, 8565) = 14.98, \eta^2 = .01, p < .001\) (see Table 5). Post hoc comparison using the Tukey HSD test indicated that the mean score for students with low parental involvement in both contexts \((M = 82.05, SD = 13.25, \text{see Table 6})\) was significantly lower than the mean scores for students with high parental involvement in only one context \((M = 83.99, SD = 12.44)\) and students with high parental involvement in both contexts \((M = 83.46, SD = 12.83)\). However, there was no significant difference between students with high parental involvement in only one context and students with high parental involvement in both contexts. This indicates that students performed better in math when parents were involved in either both contexts or at least one context rather than low or no parental involvement.
Science

A one-way ANOVA was conducted to compare students’ science achievement scores between students with high parental involvement in both contexts \( (N = 2836) \), students with high parental involvement in only one context \( (N = 3790) \), and students with low parental involvement in both contexts \( (N = 1939) \). The three parental involvement groups significantly differed on science achievement scores, \( F(2, 8565) = 37.60, \eta^2 = .01, p < .001 \), (see Table 5). Post hoc comparison using the Tukey HSD test indicated that the mean score for students with low parental involvement in both contexts \( (M = 43.19, SD = 8.64, \text{see Table 6}) \) was significantly lower than the mean scores for students with high parental involvement in only one context \( (M = 44.77, SD = 8.01) \) and students with high parental involvement in both contexts \( (M = 45.20, SD = 7.86) \). However, there was no significant difference between students with high parental involvement in only one context and students with high parental involvement in both contexts. This indicates that students performed better in science when parents were involved in either both contexts or at least one context rather than low or no parental involvement at all.
Table 5. One-way Analysis of Variances of IRT scores

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Table 6. ANOVA Comparisons of IRT Scores Between Groups

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<tr>
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<td>98.54</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>82.05</td>
<td>13.25</td>
<td>&lt; .001</td>
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<td>83.99</td>
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<tr>
<td>1.Both low</td>
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<td>3.Both high</td>
<td>2836</td>
<td>45.20</td>
<td>7.86</td>
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CHAPTER 4
DISCUSSION

The goal of the current study was to examine whether students’ academic achievement was higher when their parents were involved in both formal and informal contexts compared to students whose parents were only involved in one context. This study also examined the relationship between both formal and informal parental involvement and students’ academic outcomes in math, reading, and science.

**Formal Parental Involvement and Academic Achievement**

Results supported the first hypothesis suggesting that formal parental involvement is positively related to children’s academic scores in reading, math, and science. This indicates that increased parental involvement in school is significantly related to increased academic performance in all three academic subjects. These findings were consistent with previous research on formal parental involvement indicating that formal involvement is positively linked to children’s math skills, literacy, and overall social-emotional development during early elementary grades (Epstein, 1996; Van Voorhis, et.al., 2013). Thus, parents who already are formally involved should continue their practices because it benefits their children academically and developmentally. Schools may also promote formal parental engagement by sending a message to currently uninvolved parents emphasizing the link between parental involvement and children’s academic success. However, it is important to acknowledge that even though formal
parental involvement was a statistically significant predictor of students’ academic achievement in this study, the contribution of just formal parental involvement was quite weak. It may be that working parents, who are not able to leave their jobs to be present at school, should not feel obligated to be formally involved because the benefits to children’s’ academic achievement may be outweighed by the cost of lost wages and financial hardships for families.

**Informal Parental Involvement and Academic Achievement**

The second hypothesis, which stated there would be a positive relationship between informal involvement and children’s academic achievement, was not supported in this study. Rather, results indicated that there was a negative correlation between informal parental involvement and student’s academic achievement in all three subjects. This finding is inconsistent with previous studies that found a positive relationship between informal parental involvement and children’s academic achievement during the elementary school years (Epstein, 2009; McWayne et al., 2004). McWayne et al. found that kindergarten children demonstrated positive interactions with their peers and better academic skills when parents were actively involved at home. The current study focused on academic outcomes among second-grade children. It may be that the relationship between home activities and achievement depends on the age of the child and there is something different about the types of home activities parents engage in as their children get older. For instance, one of the questions this study had was how often they or another member of the household practice reading with their child. When children are in kindergarten, parents may practice reading with their child at home. However, it is possible that parents would stop this practice by the time the child is in second grade.
because by this age the majority of children are able to read on their own without parental help. In addition, when children are in preschool or kindergarten, parents may not have as much information from the school about children’s academic achievement to determine if they need to adjust their home involvement strategies. However, when children get older, parents may start receiving messages from the school that their child is struggling in some academic areas. Perhaps a negative relationship between informal parental involvement and academic achievement in second grade reflects parental reaction to children’s academic struggles at school (Pomerantz et.al, 2007; Siu-Chu & Willms, 1996). In other words, when parents have information from the school that their children have low academic performance, they increase their involvement at home in order to help their children do better in school. For example, when second-grade children perform well in math, they may not need parental help with this subject, so parents may be less involved at home. However, if children struggle with math at school, parents may become increasingly involved at home to practice math with their children.

Additionally, it is possible that a negative relationship between informal parental involvement and academic achievement may be related to the style in which parents provide their support at home (Kikas, 2016; Pomerantz & Eaton, 2011). Pomerantz and Eaton identified two approaches to informal involvement, which include supportive and guiding or controlling and intrusive. Some studies found that guiding and supportive activities that match with children’s learning styles and knowledge may influence children’s academic achievement in a positive way (Hoover-Dempsey et al., 2001; Pomerantz et al., 2007). However, when parents see that their child is struggling in school, they could become worried and may increase their support practices by adopting
a more controlling and intrusive type of informal involvement (Grolnick et al., 2009; Hoover-Dempsey et al., 2001; Pomerantz & Eaton, 2011; Sy et al., 2013). This type of parental support was found to relate to students’ negative self-perceptions, feelings of incompetence, and lower academic performance (Gonida & Cortina, 2014; Grolnick et al., 1991; Pomerantz & Eaton, 2011). In the current study, unfortunately, variables to distinguish these two parental approaches were not available in the data set.

**Formal and Informal Involvement and Academic Achievement**

The third hypothesis, which stated that children whose parents were involved in both contexts would have higher achievement than would children whose parents were involved in only one context, also was not supported. There was no significant difference between the two groups. Perhaps the reason for the lack of significant difference has to do with the fact that involvement at home was negatively related to academic achievement. Thus, children whose parents are involved in both contexts are benefitting from formal involvement. Interestingly, children whose parents were involved in neither context had lower academic achievement than children whose parents were involved in one or both contexts. This finding indicates that children are benefitting academically from partnership with their parents more than when parents are not involved at all.

**Strengths, Limitations, and Future Directions**

One of the strengths of this study is the large national data set with a sample that is racially and demographically representative of the larger population.

A limitation of this study is that the data set did not include information that may explain some of the findings about informal parental involvement; therefore, it was difficult to account for several variables that may influence children’s academic
achievement. For instance, it was not possible to assess whether or not parents who engaged in informal activities did so in a supporting and guiding way or in a controlling and intrusive way.

This study indicates that parental involvement plays an important role in children’s academic outcomes and overall development, and it appears that the formal context is positively related to children’s achievement in the second grade. This is consistent with previous research on formal parental involvement and student’s achievements with third and fifth graders indicating that parental involvement is a positive predictor of academic success (Lee & Bowen, 2006). Moreover, this study’s findings add to the literature by indicating that involvement in either one or both contexts of home and school is better for students’ academic achievement than no parental involvement at all. However, the negative relationship between informal parental involvement and students’ academic achievement needs further exploration. Being involved at home either in a controlling and intrusive way or not at all may not be beneficial for children’s academic achievement. It may be that a developmentally appropriate level of parental involvement is most beneficial to academic achievement, and the more aiding, supporting, and guiding the parent-student partnership is, the higher the student’s academic performance (Henderson et al., 1994). If parents become controlling and intrusive within the informal context, children may take less responsibility for themselves and learn to rely on others to manage their time, homework, and other important tasks (Shadach, 2013). Thus, future research should examine the relationship between approaches to parental involvement (controlling and intrusive versus guiding and supportive) and students’ academic achievement during the
elementary school years. It is also important to note that the relationship between parental approaches and students’ academic achievement is reciprocal; therefore, future research should also examine how children may react to parental involvement strategies.
REFERENCES


No Child Left Behind (NCLB), Parent involvement: Title 1, Part a (2004). Who is a parent for the purpose of Title 1, Part A. Retrieved from http://www.ed.gov/programs/titleiparta/parentinvguid.doc


