

UNIVERSITY OF CALIFORNIA
RIVERSIDE

Parental Engagement and Its Relationship With Academic Performance and Social Skills
in K-2 Students

A Thesis submitted in partial satisfaction
of the requirements for the degree of

Master of Arts

in

Education

by

Danna P. Avila Barreras

September 2024

Thesis Committee:

Dr. Cecilia Cheung, Co-Chairperson

Dr. Katherine Meltzoff, Co-Chairperson

Dr. Catherine Lussier

Copyright by
Danna P. Avila Barreras
2024

The Thesis of Danna P. Avila Barreras is approved:

Committee Co-Chairperson

Committee Co-Chairperson

University of California, Riverside

ACKNOWLEDGEMENTS

First and foremost, I would like to express my deepest gratitude to my advisor Dr. Cecilia Cheung, whose guidance, expertise, and unwavering support have been invaluable throughout the course of this study. Your patience and insightful feedback have greatly contributed to the completion of this thesis.

I extend my sincere thanks to my committee members, Dr. Katherine Meltzoff and Dr. Catherine Lussier, for their valuable time and constructive criticism, which have significantly enhanced the quality of this work.

I am also grateful to the faculty and staff of the Department of Education at University of California, Riverside for providing an incredible and helpful academic environment and for their assistance throughout my studies.

I would also like to acknowledge the National Center for Education Statistics for providing access to the Early Childhood Longitudinal Study data, which was instrumental in my study.

Lastly, I am deeply thankful to my family. To my parents, Paola and Jesus, for their endless love and support. To my sisters, Sarahi and Alina, for always been there for me. To my partner, Edwin, for your understanding, patience, and for always believing in me. Your sacrifices and encouragement have made this journey possible.

DEDICATION

This study is dedicated to my parents, whose support, encouragement, patience, and love have been the foundation of all my achievements. Your endless love and belief in me have inspired and motivated me every step of the way. This work is a testament to your sacrifices and the values you instilled in me.

To my sisters, for always being there and for encouraging me to follow my dreams.

To my partner, for your patience, understanding, constant encouragement, motivation, and most importantly for your love. Thank you for never giving up on me and for being by my side through it all. Your endless support has been my anchor throughout this journey, I love you.

ABSTRACT OF THE THESIS

Parental Engagement and Its Relationship With Academic Performance and Social Skills
in K-2 Students

by

Danna P. Avila Barreras

Master of Arts, Graduate Program in Education
University of California, Riverside, September 2024
Dr. Cecilia Cheung and Dr. Katherine Meltzoff, Co-Chairpersons

Despite extensive research on parental involvement, gaps remained in understanding the quality of parental engagement and its longitudinal implications for various developmental outcomes. This study investigated the relationship between parental involvement and children's academic performance and overall development during the critical early years of education (K-2).

Utilizing data from the Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K: 2011), this study examined how parental involvement—as reflected in practices such as helping with homework, attending parent-teacher conferences, and fostering a positive learning environment—related to children's interest in learning, interpersonal skills, persistence, and performance in math and science. The participants included 18,526 children (average age of 5.70 years at the start), their

parents, and teachers. The study design was longitudinal, tracking these participants from kindergarten through second grade.

The findings revealed that while parental involvement generally declined as children progressed through early elementary school, positive relationships between PI and various developmental outcomes remained significant. Specifically, active parental engagement was associated with higher motivation, improved interpersonal skills, greater persistence, and enhanced performance in math and science assessments.

The study highlighted the importance of fostering strong home-school partnerships and developing strategies to engage parents. These insights aimed to inform educational policies and practices that support children's holistic development, emphasizing the need for early interventions and ongoing parental involvement to ensure long-term academic success and personal growth.

Table of Contents

Table of Contents.....	viii
Introduction.....	1
Importance of Parental Involvement in Early Childhood	3
Literature Review.....	4
Parental Involvement and Child Learning.....	6
The Role of Parents in Children’s Learning.....	7
<i>Academic Performance in Core Subjects</i>	7
<i>Social and Emotional Development</i>	7
<i>Cognitive Development</i>	7
Long-term Implications.....	7
<i>Long-Term Academic Success</i>	8
<i>Career and Life Skills</i>	8
Contribution of Current Research.....	8
Guiding Theoretical Framework	10
Grolnick and Slowiaczek’s (1994) Model.....	10
Bronfenbrenner’s Ecological Systems Theory and Parental Involvement.....	12
Bandura’s Social Learning Theory and Parental Involvement.....	12
Integration of Theories	13
Study Overview.....	14
Research Questions and Hypotheses	15
Changes Over Time.....	15
<i>Hypothesis 1:</i>	15
Longitudinal Associations.....	16
<i>Hypothesis 2a: Children's Interest to Learn New Things</i>	16
<i>Hypothesis 2b: Interpersonal Skills and Persistence</i>	16
<i>Hypothesis 2c: Interpersonal Skills and Persistence</i>	16
<i>Hypothesis 2e: Performance in Math and Science Assessments</i>	17
Methodology.....	17
Data and Sampling Procedure.....	17
Research Design	18
Participants.....	18
Measures.....	19
Data Analysis.....	22

Results.....	22
Longitudinal Trajectories of Parental Involvement and Student Learning Outcomes.....	22
<i>Parental Involvement</i>	22
<i>Interest to Learn New Things</i>	23
<i>Persistence</i>	24
<i>Interpersonal Skills</i>	25
<i>Math Assessment Performance</i>	26
<i>Science Assessment Performance</i>	27
Longitudinal Associations between Parental Involvement in Child Learning Outcomes.....	29
<i>Interest to Learn New Things</i>	29
<i>Interpersonal Skills</i>	31
<i>Persistence</i>	32
<i>Math Performance</i>	34
<i>Science Performance</i>	36
Discussion	38
Changes in Parental Involvement and Child Learning Outcomes During Early Childhood	38
Longitudinal Implications of Parental Involvement for Child Outcomes.....	40
Implications for Practice.....	43
Strategies for Promoting Parental Involvement.....	44
Limitations.....	45
Future Directions.....	46
Conclusion	47
References.....	49

List of Tables

Table 1: Descriptive Statistics of Participants of Full Sample	19
Table 2: Mean and Standard Deviations for Parental Involvement	23
Table 3: Mean and Standard Deviations for Interest to Learn New Things	24
Table 4: Mean and Standard Deviations for Persistence	25
Table 5: Means and Standard Deviations for Interpersonal Skills	26
Table 6: Means and Standard Deviations for Math Assessment	27
Table 7: Means and Standard Deviations for Science Assessment	29
Table 8: Summary of Regression Analysis for Interest to Learn New Things Across Waves	30
Table 9: Summary of Regression Analysis for Interpersonal Skills Across Waves...	32
Table 10: Summary of Regression Analysis for Persistence Across Waves	33
Table 11: Summary of Regression Analysis for Math Performance Across Waves ...	35
Table 12: Summary of Regression Analysis for Science Performance Across Waves ...	37

Introduction

The early years of education, specifically Kindergarten through Grade 2 (K-2), are crucial for laying the foundation for a child's academic success and overall development. Empirical evidence has suggested that Parental Involvement (PI) during formative years is associated with children's achievement outcomes, drawing considerable attention from teachers, policymakers, and researchers (Epstein, 2001; Jeynes, 2005). Understanding the dynamics of PI and its role in young learners is essential for creating effective educational strategies that foster a supportive and enriching learning environment.

PI encompasses various activities such as helping with homework, attending parent-teacher conferences, volunteering in the classroom, and fostering a positive attitude toward education at home. Studies have shown that PI enhances children's academic performance and overall development (Hill & Tyson, 2009; Fan & Chen, 2001). For instance, Fan and Chen (2001) found that active parental engagement is associated with increased motivation, improved interpersonal skills, greater persistence, and higher performance in academic assessments, particularly in math and science.

The early childhood years are a critical period of development. During this time, children's brains undergo rapid growth and development, forming the foundation for future cognitive, emotional, and social skills (Shonkoff & Phillips, 2000). PI during these early years is particularly significant as it can shape the architecture of the brain and role of a child's ability to learn and adapt in the future (Thompson, 2001). Moreover, early childhood is when foundational cognitive skills such as language acquisition, basic

numeracy, and problem-solving abilities begin to take root, and PI can greatly enhance these skills (Melhuish et al., 2008).

Despite the extensive body of research on PI and its positive relationship on children's academic and developmental outcomes, several critical gaps remain. For example, the reliance on single informants, such as parent self-reports, has been a limitation in past research. By integrating perspectives from different sources, this study addresses this limitation and offers a more robust analysis of how parental engagement relates to children's academic and developmental outcomes. However, while numerous studies have emphasized academic performance, there is only a handful of research examining the broader spectrum of children's development, including their interest in learning, interpersonal skills, and persistence. Furthermore, there is limited longitudinal research that tracks these variables over the early years of education, making it challenging to understand the long-term associations and dynamic nature of PI (Hornby & Lafaele, 2011).

This study addresses two primary research questions: (1) How does the trajectory of PI change over the course of K-2? (2) How does PI relate to the development of these attributes among K-2 students? The research aims to provide a detailed analysis using data from the Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K: 2011), offering insights into effective parental engagement strategies and their long-term benefits on children's development.

Importance of Parental Involvement in Early Childhood

PI in early childhood has been crucial for several reasons. Developmentally, the early years of a child's life, specifically from kindergarten to second grade, are foundational for their future academic, social, and emotional success. During this period, a child's brain undergoes significant growth and development, marked by the rapid formation of neural connections, which serve as the basis for cognitive, emotional, and social skills (Shonkoff & Phillips, 2000; Thompson, 2001). The experiences and interactions children have during this time shape the architecture of the brain, influencing their ability to learn and adapt in the future. This also sets the stage for positive attitudes toward school and education, which can have long-lasting implications for a child's academic trajectory (Galindo & Sheldon, 2012; Fantuzzo et al., 2004).

In addition, early childhood is when foundational cognitive skills are developed. Skills such as language acquisition, basic numeracy, and problem-solving abilities begin to take root (Snow et al., 1998; Starkey et al., 2004). PI during this stage can enhance these skills by providing stimulating and enriching activities that promote cognitive development. This period is also crucial for the development of social and emotional competencies. Children learn to navigate social relationships, manage emotions, and develop empathy and cooperation (Denham, 2006; Bierman et al., 2008). PI plays a key role in modeling positive social behaviors, providing emotional support, and teaching children how to interact with others in healthy ways. The ability to self-regulate and persist in the face of challenges begins to develop in early childhood. PI, through supportive and encouraging interactions, helps children develop these essential skills

(McClelland et al., 2006; Blair & Razza, 2007). Children learn to set goals, manage their impulses, and stay focused on tasks, which are critical for academic and personal success.

My empirical work focuses on this critical period, examining how various dimensions of PI—such as engagement in learning activities, communication with teachers, and participation in school events—are associated with children's interest in learning, interpersonal skills, persistence, and performance in math and science assessments. By understanding the specific contributions of PI during early childhood, my research aims to highlight the importance of early interventions and inform strategies to support children's development effectively.

Literature Review

The history of PI in education reflects an evolution shaped by societal changes, educational reforms, and growing recognition of the home-school connection. In the early 20th century, PI was often limited to basic support for children's schooling, such as ensuring attendance and providing supplies. Parents were primarily seen as passive supporters, with teachers and schools holding the primary responsibility for children's education (Baker & Soden, 1998).

During the mid-20th century, educational philosophies began to shift. Progressive education movements, championed by figures like John Dewey, have emphasized the importance of the whole child and the integration of home and school environments (Dewey, 1938). This period saw the emergence of parent-teacher associations (PTAs) and other formal organizations aimed at fostering collaboration between parents and schools.

The recognition of the critical role that parents play in their children's education began to take root (Grolnick & Slowiaczek, 1994).

The 1960s and 1970s marked a significant turning point with the introduction of legislative measures aimed at promoting PI. The Elementary and Secondary Education Act (ESEA) of 1965, a landmark federal legislation in the United States, included provisions encouraging parental participation in educational programs, particularly in low-income communities (Elementary and Secondary Education Act of 1965). Research began to underscore the positive relationship of PI on children's academic and social outcomes, leading to increased advocacy for policies and practices supporting PI at all levels of the educational system (Epstein, 1995).

In the 1980s and 1990s, educational reforms such as the Goals 2000: Educate America Act emphasized the need for family engagement as a critical component of school improvement efforts (Goals 2000: Educate America Act of 1994). Schools implemented structured programs designed to foster PI, recognizing that a strong partnership between home and school is essential for student success (Smith et al., 2011). The advent of digital technologies in the 21st century has revolutionized PI, making it easier for parents to stay informed and engaged regardless of physical distance or time constraints (Goodall & Montgomery, 2014).

Despite these advancements, challenges to PI persist. Socioeconomic disparities, cultural differences, language barriers, and busy family schedules continue to hinder some parents' ability to participate fully in their children's education (Hornby & Lafaele, 2011). Addressing these challenges remains a priority for teachers and policymakers.

Today, PI is widely recognized as a cornerstone of effective education, reflecting a deep understanding of its crucial role in promoting children's academic achievement and overall development.

This historical context underscores the importance of PI and sets the stage for investigating its specific associations on children's academic performance and overall development during the critical early years of education (K-2).

Parental Involvement and Child Learning

Empirical research consistently highlights the significant relationships of PI and children's academic outcomes. Several meta-analytic studies have provided robust evidence of this positive relationship, quantifying the effect sizes across various dimensions of children's development. Fan and Chen (2001) conducted a comprehensive meta-analysis encompassing numerous studies, which found a medium to large effect size ($d = 0.44$) for the relationship of PI on academic achievement across various subjects and grade levels. Their findings underscore that PI is a strong predictor of academic success. In addition, Hill and Tyson (2009) reported in their meta-analysis a significant positive effect size ($d = 0.53$) for PI on students' academic motivation and persistence. This indicates that active parental engagement is crucial in fostering children's intrinsic motivation and resilience in their academic pursuits.

Another meta-analysis by Jeynes (2005) found a significant positive effect size ($d = 0.50$) for PI on overall academic outcomes, including grades and standardized test scores. This study also highlights that PI is particularly effective in enhancing the academic performance of minority and low-income students.

The Role of Parents in Children's Learning

Research indicates that PI can shape various aspects of child development pertinent to the overall academic and personal growth of the child.

Academic Performance in Core Subjects

Studies, including Gonzalez-DeHass et al. (2005), demonstrate a medium effect size ($d = 0.40$) for the positive relationship of PI on children's proficiency and persistence in math and science. This involvement helps children develop a positive attitude towards these subjects, critical thinking skills, and confidence.

Social and Emotional Development

Research by Englund et al. (2004) indicates a medium to large effect size ($d = 0.45$) for PI on children's self-esteem and social skills. Involved parents foster environments that support healthy peer relationships and emotional well-being, which are essential for academic and personal success.

Cognitive Development

During the formative K-2 years, parental support is closely associated with the development of essential skills such as reading, writing, and numeracy. Dearing et al. (2006) reported a medium effect size ($d = 0.42$) for the relationship between PI and cognitive outcomes, highlighting the importance of early parental engagement in laying a strong educational foundation.

Long-term Implications

There is evidence that PI can shape the longer-term development of academic and developmental outcomes.

Long-Term Academic Success

Ho and Willms (1996) found that students with involved parents were more likely to pursue higher education. The effect sizes for the relationship between PI and educational aspirations and attainment were substantial ($d = 0.50$), indicating that early parental engagement set the stage for long-term academic success.

Career and Life Skills

Desforges and Abouchar (2003) and Flouri (2006) have highlighted that high levels of PI in early childhood are linked to fulfilling careers and active civic participation in adulthood. The longitudinal effect sizes ($d = 0.48$) suggest that early PI contributes to the development of essential life skills that are crucial for adult success.

Contribution of Current Research

My research aimed to build on foundational studies by providing a nuanced understanding of how PI is associated with children's development over time. Using data from the Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K: 2011), this research conducts a detailed analysis of PI's role in specific academic outcomes, such as math and science performance, at multiple time points. Additionally, it investigated how PI contributed to the development of interpersonal skills, persistence, and interest in learning new things, which are critical for long-term success. In addition to the longitudinal nature of the dataset, other unique strengths of this study include its sample size and nationally representative nature. The ECLS-K: 2011 dataset

encompasses a diverse sample that is ethnically and socioeconomically varied, allowing for the examination of PI across different demographic groups. This diversity enhances the generalizability of the findings and provides a more comprehensive picture of how PI affects children from various backgrounds.

Addressing critical gaps such as the scarcity of longitudinal studies in early childhood focusing on various developmental outcomes and leveraging the strengths of a longitudinal design, this study aims to uncover the associations between PI and children's academic and personal development, ultimately informing strategies to foster a supportive and enriching learning environment for young learners. Overall, the research emphasizes the critical role of PI in early childhood education (K-2) and its significant positive relationship with children's academic performance and overall development. Activities such as helping with homework, attending parent-teacher conferences, and fostering a positive attitude toward education at home are highlighted as crucial components of PI (Fan & Chen, 2001). Despite extensive research showing that active parental engagement enhances children's motivation, interpersonal skills, persistence, and academic performance (Fan & Chen, 2001), gaps remain. Much of the existing research focuses on the quantity rather than the quality of PI, and there is a lack of longitudinal studies examining its long-term associations on various developmental outcomes. This study aims to explore how the trajectory of PI changes over time and how it relates to children's interest in learning, interpersonal skills, persistence, and academic performance. Additionally, it investigated how PI related to these developmental attributes among K-2 students.

This study significantly advances the understanding of PI in early childhood education by addressing key gaps in the existing literature and providing new insights into its long-term relationship. The longitudinal design captures the evolution of children's academic performance, interpersonal skills, persistence, and interest in learning, highlighting how early PI shapes these outcomes as children progress through their early school years. The diverse sample ensures that the findings are applicable to a broad spectrum of the population, making the results relevant for policymakers, educators, and parents across different communities. By moving beyond the traditional focus on the quantity of PI to examine the quality of engagement, this study reveals how specific parental actions enhance children's motivation, interpersonal skills, and persistence, providing actionable insights for parents and educators to foster supportive learning environments.

Guiding Theoretical Framework

The current research was guided by three theoretical frameworks, Grolnick and Slowiaczek's (1994) Model, Bronfenbrenner's Ecological Systems Theory, and Bandura's Social Learning Theory. Each of the framework contributed to the understanding of how PI can shape the longitudinal outcomes of children in early childhood.

Grolnick and Slowiaczek's (1994) Model

PI was widely recognized as a critical factor influencing children's development, conceptualized through various theoretical models. One influential framework by Grolnick and Slowiaczek (1994) outlined PI as comprising three primary dimensions:

behavioral involvement, cognitive/intellectual involvement, and personal involvement.

Each dimension played a unique role in shaping children's development:

1. **Behavioral Involvement:** This dimension included parents' participation in school-related activities, such as attending parent-teacher conferences, helping with homework, and volunteering at school. Such involvement directly engaged parents in their children's educational experiences, fostering a supportive learning environment and reinforcing the importance of education.
2. **Cognitive/Intellectual Involvement:** This involved activities that stimulated children's cognitive and intellectual growth, such as reading together, engaging in educational games, and discussing school activities. This type of involvement helped to develop children's cognitive skills, including problem-solving, critical thinking, and a love for learning.
3. **Personal Involvement:** Personal involvement referred to the emotional and supportive interactions between parents and children, such as providing encouragement, expressing interest in their child's education, and fostering a positive attitude towards learning. These interactions were crucial for children's emotional and social development, helping them build confidence, motivation, and persistence in their academic pursuits.

By integrating these dimensions, the framework highlighted the multifaceted nature of PI and its comprehensive relationship on children's development. PI not only contributed to academic achievement but also supported the development of social skills, emotional well-being, and a lifelong interest in learning. This holistic understanding

aligned with Bronfenbrenner's Ecological Systems Theory and Bandura's Social Learning Theory, emphasizing the importance of an interactive and supportive environment in fostering children's overall development.

Bronfenbrenner's Ecological Systems Theory and Parental Involvement

Bronfenbrenner's Ecological Systems Theory (1979) offered a framework for understanding PI in early childhood education, especially in kindergarten through second grade (K-2). This theory focused on how a child's development was shaped by interconnected systems, emphasizing the microsystem and mesosystem. In the microsystem, parents were crucial as primary educators, significantly influencing their child's cognitive and social-emotional development through activities like reading and engaging in learning tasks (Fantuzzo et al., 2004; Jeynes, 2005). Research showed that children with actively involved parents performed better academically, had higher motivation, and developed stronger social skills (Epstein, 2001; Jeynes, 2007; Wilder, 2014). The mesosystem highlighted the importance of interactions between home and school, where strong parent-teacher partnerships and effective communication fostered a supportive learning environment. Collaborative efforts between parents and teachers helped tailor educational strategies to meet the child's individual needs and promote their overall growth (Epstein, 2001; Hoover-Dempsey & Sandler, 1997).

Bandura's Social Learning Theory and Parental Involvement

Bandura's Social Learning Theory (1977) complemented Bronfenbrenner's framework by focusing on how children learned through observation and imitation. They modeled the behaviors, attitudes, and values of their parents and others in their immediate

environment (Schunk & Zimmerman, 1997). In K-2 education, PI allowed children to observe their parents' engagement in learning, fostering positive attitudes towards education and academic achievement. Active parental participation demonstrated the importance of learning, effort, and perseverance, boosting the child's motivation and self-efficacy (Wilder, 2014). When children saw their parents valuing and supporting education, they were likely to adopt similar attitudes and behaviors. Bandura's theory also highlighted the role of self-efficacy; parents with a strong belief in their ability to support their child's learning were more engaged and persistent, and children with high self-efficacy were more inclined to engage in and persist with academic tasks, leading to greater success (Schunk & Zimmerman, 1997).

Integration of Theories

PI in early education was a crucial factor in children's academic achievement and overall development. By fostering a supportive and collaborative learning environment, parents can help their children develop the skills, motivation, and self-efficacy necessary for long-term success. To effectively harness the power of PI, schools and teachers adopted comprehensive strategies that engaged families and overcame barriers, ensuring all children had access to the benefits of PI. Grolnick and Slowiaczek's (1994) theory emphasized three dimensions of PI: behavioral involvement, cognitive/intellectual involvement, and personal involvement, highlighting how each dimension contributed to children's educational outcomes.

The integration of Bronfenbrenner's Ecological Systems Theory (1979) and Bandura's Social Learning Theory (1977) provided a robust framework for understanding

and promoting PI. Bronfenbrenner's theory underscored the significance of various environmental systems in a child's development, emphasizing the role of family, school, and community interactions. Bandura's theory highlighted the importance of observational learning, imitation, and modeling, suggesting that children's learning was shaped by observing the behaviors and attitudes of their parents.

By combining these theoretical perspectives with Grolnick and Slowiaczek's dimensions of PI, we gained a comprehensive understanding of how PI could be optimized to support children's educational journeys. This integrated approach ultimately contributed to improved educational outcomes and lifelong learning for children.

Study Overview

This study utilized the Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K: 2011) dataset to investigate the role of PI on children's development during the early years of education (K-2). By examining multiple dimensions of development, including interest in learning, interpersonal skills, persistence, and academic performance, this research aimed to provide a holistic understanding of how PI was related to various aspects of children's growth. The longitudinal nature of the ECLS-K: 2011 dataset allowed for the examination of changes over time, identifying patterns and trends in both PI and children's development. This temporal perspective was crucial for understanding the long-term associations of PI.

Specifically, the study investigated the role of PI in Spring 2011 and Spring 2012 to assess children at the end of first grade and capture the trajectory of PI during the first year of formal education. This period was critical for setting academic and behavioral

patterns that could be associated with future success. Lastly, the Spring 2013 data, collected at the end of second grade, allowed for the analysis of the longer-term implications of PI for children's development. The role of PI helped to understand whether the relationships observed in Spring 2012 were sustained, amplified, or diminished over time. These time points were chosen to capture critical periods in early childhood education and provide insights into the dynamic nature of PI and its role in children's developmental trajectories.

Research Questions and Hypotheses

The current research addressed two research questions. (1) How does the trajectory of PI change over the course of K-2? (2) How does PI relate to the development of these attributes among K-2 students?

Changes Over Time

Hypothesis 1:

Based on Bandura's Social Learning Theory (1977), it was hypothesized that both PI and children's developmental outcomes would change over time from K-2. Specifically, it is predicted that the levels of PI will vary across the K-2 period. Additionally, children's interest in learning new things, interpersonal skills, persistence in tasks, and performance in math and science assessments are anticipated to show changes over time. These predictions are grounded in the literature, which has suggested that developmental trajectories in these areas evolve as children progress through their early schooling years.

Longitudinal Associations

Hypothesis 2a: Children's Interest to Learn New Things

Additionally, children's interest in learning new things, interpersonal skills, persistence in tasks, and performance in math and science assessments are anticipated to show changes over time.

Hypothesis 2b: Interpersonal Skills and Persistence

It is predicted that children who receive consistent support and encouragement from their parents will develop strong interpersonal skills and greater persistence through challenges (Bandura's Social Learning Theory, 1977).

Hypothesis 2c: Interpersonal Skills and Persistence

It is predicted that children who experience positive modeled behaviors and social interactions within their microsystem will exhibit higher resilience and perseverance over time (Bandura's Social Learning Theory, 1977; Schunk & Zimmerman, 1997; Wilder, 2014).

Hypothesis 2d: Performance in Math and Science Assessments

It is predicted that children who experience a strong home-school connection and a culturally supportive macrosystem will show improved performance in math and science assessments (Bronfenbrenner's Ecological Systems Theory, 1979).

Hypothesis 2e: Performance in Math and Science Assessments

It is predicted that children whose parents provide positive reinforcement and model effective study habits will perform better in math and science assessments compared to those whose parents do not provide such support (Bandura's Social Learning Theory, 1977).

Methodology

Data and Sampling Procedure

This research was a secondary data analysis sourced from the Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K:2011), conducted by the U.S. Department of Education's National Center for Educational Statistics. The ECLS-K:2011 tracked children from kindergarten (2010-11) to the 2015-16 school year, with this study focusing on data up to 2012-13. The ECLS-K:2011 assessed children's experiences across contexts and developmental domains, with tailored, one-on-one assessments in reading, mathematics, and science, including accommodations for Spanish-speaking English language learners.

Parents or guardians provided information on family dynamics, home environment, and overall well-being through computer-assisted interviews (CAIs). Teachers contributed perspectives on teaching methodologies and classroom dynamics, completing self-administered questionnaires in the Fall and Spring. This comprehensive approach integrated perspectives from both parents and teachers, enhancing the understanding of a child's development.

The ECLS-K:2011 utilized a three-stage sampling methodology. Initially, counties were selected as primary sampling units. Next, public and private schools serving kindergarten-aged children were chosen across four census regions and various locales. Finally, children were randomly selected from the sampled schools. This method ensured a nationally representative sample.

Research Design

The design of this research was longitudinal and multi-informant, utilizing the ECLS-K: 2011 dataset, which followed a nationally representative sample of children from kindergarten through fifth grade, but as mentioned above, this research focused on kindergarten, first grade, and second grade. The multi-informant aspect of the study included data from children, their parents/guardians, and teachers, each measured at different time points: Fall 2010, Spring 2011, Fall 2011, Spring 2012, Fall 2012, and Spring 2013, using teacher child-level questionnaires and parent interviews.

Participants

The study included 18,526 children (mean age in Fall 2010 = 5.70; 51.5% male; 69.8% White). Parent one ($n = 13334$) and parent two ($n = 10346$) had an average age of 37.17, with 32.2% holding a bachelor's degree or higher and 25.5% above the poverty threshold. Therefore, 18,099 was used as the base number for calculating the unweighted response rate for the Fall child assessment, while 18,170 serves as the base for the unweighted response rates for both parents and teachers. These rates are determined at the student level, representing the percentage of students for whom a parent interview or a teacher questionnaire was successfully completed (see Table 1).

Table 1

Descriptive Statistics of Participants of Full Sample

Child Characteristics (n = 18, 526)

Age (months) T1	68.5
Gender (% male)	51.5
Race/ethnicity (% White)	69.8

Parent Characteristics (n = 23,680)

Age of Parent 1 (years) T1	34.1
Age of Parent 2 (years) T1	37.2
Race/ethnicity of Parent 1	41.1
Race/ethnicity of Parent 2	33.2
Education (% college and above)	32.2
Poverty (% below poverty)	25.5

Teacher Characteristics (n = 547)

Total number of teachers by Spring 2011	547
---	-----

Note: T1 = kindergarten of Fall 2010

Measures

Parents' School Involvement. PI was measured via binary questions in parent interviews conducted in Spring 2011, Spring 2012, and Spring 2013. Responses were aggregated to compute composite scores for each different item. Parents responded to a total of six questions regarding various aspects of their involvement. Example items included: "Attended a school or class event, such as a play, sports event, or science fair"; "Served as a volunteer in your child's classroom or elsewhere in the school"; and

“Participated in fundraising for your child’s school.” Table 2 presented the descriptive statistics for PI across three waves: Spring 2011, Spring 2012, and Spring 2013. Each item was coded as 1 (Yes) or 2 (No), with mean composite scores. Cronbach's alpha for Parent Involvement ranged from 0.51 to 0.58, indicating suboptimal reliability.

Interest to Learn New Things. Teachers answered four items from the Social Skills Rating System (SSRS; Elliot & Gresham, 1987) regarding each child's eagerness to learn new things and persistence. Information was collected in Fall 2011, Fall 2012, and Fall 2013 using the teacher child-level questionnaire.

Each item on the interest to learn new things scale was coded as 1 for "Extremely True," 2 for "Quite Untrue," 3 for "Slightly Untrue," 4 for "Neither True nor Untrue," 5 for "Slightly True," 6 for "Quite True," 7 for "Extremely True." The means indicated that, on average, children’s interest in learning new things ranged between "neither true nor untrue" to "slightly true" over the three waves. The Cronbach alphas ranged from 0.69 to 0.70, indicating acceptable reliability from Fall 2010 to Spring 2012.

Persistence. Teachers responded to items about each child's adaptability, task completion, and independence, using a rating scale from 1 “Never” to 4 “Very Often” from the Social Skills Rating System (SSRS; Elliot & Gresham, 1987). Information was collected in Fall 2010, Spring 2011, Spring 2012, Fall 2012, and Spring 2013 using the teacher child-level questionnaire.

The mean scores suggested that, on average, participants reported their persistence between 2 "Sometimes" and 4 "Very Often" across the five waves. The standard deviations reflected the consistency in responses, showing moderate variability

in persistence over time. The reliability of the measures used varied across different waves from 0.79 to 0.82, indicating that reliability from Fall 2010 to Spring 2013 was high.

Interpersonal Skills. Teachers answered four items that came from the Social Skills Rating System (SSRS; Elliot & Gresham, 1987) on children's social interactions, such as being considerate of others' emotions, using a rating scale from 1 "Never" to 4 "Very Often." Information was collected from Fall 2010, Spring 2011, Fall 2011, Spring 2012, Fall 2012, and Spring 2013 using the teacher child-level questionnaire.

The mean scores suggested that, on average, teachers rated children's interpersonal skills between 3 "Often" and 4 "Very often" across the six waves. The standard deviations indicated moderate variability in the responses. The reliability of the measures used across the six different waves varied from 0.77 to 0.81 indicating a high reliability from fall 2010 to Spring 2013.

Math and Science Achievement. Children were administered age and grade-appropriate assessments in mathematics and science in Fall 2011 and 2010, Spring 2011, Spring 2012, Fall 2012, and Spring 2013. These assessments measured various skills, including conceptual understanding, problem-solving abilities, and physical sciences. For the mathematics and science assessment, children were presented with the text on easel pages such as word problems and graphs, they were read the text in order to avoid their reading ability affect their assessment. Both the math and science assessments were scored by using the Item Response Theory (IRT) scores. The assessments were

administered one-on-one by trained assessors, with accommodations for Spanish-speaking participants.

Data Analysis

To address research question one, repeated measures ANOVA was used to analyze variations in PI, children's interest in learning new things, interpersonal skills, persistence, and performance in math and science assessments over the course of K-2. Repeated measures ANOVA was particularly suited for this analysis as it allowed for the examination of within-subject effects, providing insights into how these variables changed across the different time points. This statistical approach helps to account for individual differences in baseline levels and tracks developmental trajectories over the early school years, offering a robust analysis of how PI was associated with various aspects of children's growth.

To address research question two, regression analyses were used. This approach was chosen to examine the relationship between PI and children's developmental outcomes over the K-2 years, while statistically adjusting for the covariates such as SES, parent education level, and child gender.

Results

Longitudinal Trajectories of Parental Involvement and Student Learning Outcomes

Parental Involvement

A repeated-measures ANOVA showed a significant decline in PI over two years and six months $F(2, 19320) = 613.09, p < .001$, partial $\eta^2 = 0.06$. There was a general decline, but the decline was sharper between Wave 1 and Wave 2, as indicated by a

paired t-test, $t(10998) = 35.75, p < .001$. Meanwhile, parental involvement appeared to remain stable at Wave 2 and Wave 3, as indicated by another paired t-test, $t(11074) = -7.11, p < .001$ (see Table 2).

Table 2

Mean and Standard Deviations for Parental Involvement

Time	<i>M</i>	<i>SD</i>
Wave 1 Spring 2011	1.34	0.23
Wave 2 Spring 2012	1.26	0.24
Wave 3 Spring 2013	1.28	0.23

Interest to Learn New Things

Repeated-measures ANOVA revealed a significant change in interest in learning new things over time $F(1.865, 20844.744) = 132.21, p < .001$, partial $\eta^2 = 0.01$. Mean interest increased from Wave 1 ($M = 4.93$) to Wave 2 ($M = 5.09$), as indicated by a paired t-test, $t(14037) = -19.97, p < .001$. There was a slight decrease in Wave 3 ($M = 5.01$), as indicated by another paired t-test, $t(12692) = 6.87, p < .001$. This pattern suggests there was an overall slight increase in involvement from Wave 1 to Wave 2, but a slight general decline in Wave 3. Despite the statistically significant change, the partial η^2 value of 0.01 indicates that the association was relatively small. This suggests that while there was a statistically significant change in interest in learning new things over time, the magnitude of this change was modest (see Table 3).

Table 3*Mean and Standard Deviations for Interest to Learn New Things*

Time	<i>M</i>	<i>SD</i>
Wave 1 Fall 2011	4.93	1.03
Wave 2 Fall 2012	5.09	1.02
Wave 3 Fall 2013	5.01	1.06

Persistence

A repeated-measures ANOVA revealed a significant change in persistence over time. The means and standard deviations for persistence are presented in Table 4.

Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(9) = 1062.14, p < .001$. Therefore, a repeated measures ANOVA with a Greenhouse-Geisser correction showed that the mean persistence differed significantly between time waves, $F(3.401, 11193.151) = 46.04, p < .001$, partial $\eta^2 = 0.01$.

Mean interest in persistence increased from Wave 1 ($M = 3.00$) to Wave 2 ($M = 3.15$), as indicated by a paired t-test $t(14024) = -27.26, p < .001$. However, there was a slight decrease in Wave 3 ($M = 3.11$) and Wave 4 ($M = 3.12$), as indicated by another paired t-test $t(4176) = 0.49, p < .001$, with a small increase again in Wave 5 ($M = 3.12$), as indicated by another paired t-test $t(4320) = -1.04, p < .001$. This suggests that while persistence slightly increased from Wave 1 to Wave 2, there was a sharp decline from Wave 2 to Wave 4, and a slight increase from Wave 4 to Wave 5 (see Table 4).

Table 4*Mean and Standard Deviations for Persistence*

Time	<i>M</i>	<i>SD</i>
Wave 1 Fall 2010	3.00	0.73
Wave 2 Spring 2011	3.15	.071
Wave 3 Spring 2012	3.11	0.73
Wave 4 Fall 2012	3.12	0.73
Wave 5 Spring 2013	3.12	0.74

Interpersonal Skills

A repeated-measures ANOVA revealed a significant change in interpersonal skills over time. Descriptive statistics are provided in Table 5.

Mauchly's test indicated a violation of sphericity, $\chi^2(14) = 1077.99, p < .001$ and a Greenhouse-Geisser correction showed the mean interpersonal skills differed significantly between time waves, $F(4.389, 14295.899) = 17.76, p < .001$, partial $\eta^2 = 0.01$.

Mean interest indicated that interpersonal skills increased from Wave 1 ($M = 3.12$) to Wave 2 ($M = 3.18$), as indicated by a paired t-test, $t(14025) = -7.89, p < .001$ and further in Wave 3 ($M = 3.19$). There was a slight decline in Wave 4 ($M = 3.15$) as indicated by another paired t-test, $t(4177) = -6.24, p < .001$ and followed by a peak in Wave 5 ($M = 3.23$) and then a decrease in Wave 6 ($M = 3.14$). This trend suggests fluctuations, with the highest change in in Wave 5.

Despite the significant changes over time, the small partial η^2 value of 0.01 suggested that the magnitude of change was modest. Further investigation will be needed to understand the factors influencing these changes and their implications for educational interventions aimed at improving children's interpersonal skills (see Table 5).

Table 5

Means and Standard Deviations for Interpersonal Skills

Time	<i>M</i>	<i>SD</i>
Wave 1 Fall 2010	3.12	0.71
Wave 2 Spring 2011	3.18	0.67
Wave 3 Fall 2011	3.19	0.66
Wave 4 Spring 2012	3.15	0.67
Wave 5 Fall 2012	3.23	0.67
Wave 6 Spring 2013	3.14	0.69

Math Assessment Performance

A repeated-measures ANOVA was conducted to reveal a significant change in math assessment performance over time. Descriptive statistics are shown in Table 6. Mauchly's test indicated a violation of sphericity, $\chi^2(14) = 3715.11, p < .001$ and a Greenhouse-Geisser correction suggested the relationship of change over time was significant, $F(3.430, 13209.003) = 34450.30, p < .001$, partial $\eta^2 = 0.89$.

Mean interest increased from Wave 1 ($M = -1.14$) to Wave 2 ($M = -0.40$), as indicated by a paired t-test $t(15001) = -225.89, p < .001$. and further in Wave 3 ($M = -0.03$). Wave 4 ($M = 0.49$) and Wave 5 ($M = 0.66$), as indicated by another paired t-test, t

(5025) = -118.00 and again in Wave 6 (M = 1.02), $t(4641) = -96.73, p < .001$. This steady increase reflects a significant change in math assessment performance over time.

Despite the statistically significant change, the high partial η^2 value of 0.89 indicates a substantial association on math assessment performance over time. This suggests that the changes observed are not only statistically significant but also had a large practical significance. This trend underscored the effectiveness of the educational interventions or developmental processes contributing to the improvement in math performance over the observed period (see Table 6).

Table 6

Means and Standard Deviations for Math Assessment

Time	<i>M</i>	<i>SD</i>
Wave 1 Fall 2010	-1.14	0.70
Wave 2 Spring 2011	-0.40	0.60
Wave 3 Fall 2011	-0.03	0.59
Wave 4 Spring 2012	0.49	0.54
Wave 5 Fall 2012	0.66	0.53
Wave 6 Spring 2013	1.02	0.52

Science Assessment Performance

A repeated-measures ANOVA revealed a significant change in science assessment performance over time. Descriptive statistics are shown in Table 7.

Mauchly's test indicated a violation of sphericity, $\chi^2(9) = 831.93, p < .001$, degrees of

freedom were corrected using Greenhouse-Geisser estimates revealing the relationship was significant, $F(3.629, 15707.748) = 11583.52, p < .001, \text{partial } \eta^2 = 0.73$.

Repeated-measures ANOVA revealed a consistent improvement in science assessment performance over time. In Wave 1 ($M = -0.69$) and Wave 2 ($M = -0.43$), as indicated by a paired t-test, $t(4972) = -35.16, p < .001$. There was also an increase in Wave 3 ($M = 0.08$) and Wave 4 ($M = 0.35$), as indicated by another paired t-test $t(4661) = -42.12, p < .001$ and again in Wave 5 ($M = 0.73$).

The high partial η^2 value of 0.73 indicates significant change of time on science assessment performance. This suggests that the changes observed were both statistical and practical significance. This trend highlighted the effectiveness of the interventions and developmental process contributing to the observed improvement (see Table 7).

Table 7*Means and Standard Deviations for Science Assessment*

Time	<i>M</i>	<i>SD</i>
Wave 1	-0.69	0.77
Wave 2	-0.43	0.85
Wave 3	0.08	0.81
Wave 4	0.35	0.79
Wave 5	0.73	0.73

Longitudinal Associations between Parental Involvement in Child Learning**Outcomes**

Regression analysis examined the longitudinal association between PI and children's Interest to Learn New Things from (K-2), several covariates were considered. These covariates included socio-economic status (SES). These covariates were associated with the outcomes (β 's = 0.05 to 0.07, p 's = 0.05) for SES (β 's = 0.04 to 0.06, p 's = 0.05) for parent education level, and (β 's = -0.10 to -0.03, p 's = 0.05) for child gender. The inclusion of these covariates did not substantially alter the pattern of the results. Therefore, the results presented below did not include the covariates.

Interest to Learn New Things

Regression was conducted to understand the longitudinal association between PI and Interest to Learn New Things in children in grades K-2 at Fall 2011, Fall 2012, Fall 2013. There was a significant positive correlation between PI and Interest to Learn New Things. The unstandardized betas ranged from 0.44 to 0.52 (SE ranged from 0.08 to

0.10), while the standardized beta (β) ranged from 0.09 to 0.18, and all associations were statistically significant at $p < .001$ (see Table 8).

Table 8

Summary of Regression Analysis for Interest to Learn New Things Across Waves

Variable	Beta	SE	95% CI		β	p
			LL	UL		
Interest to Learn New Things at Wave Fall 2010						
Constant	4.60	0.08	4.46	4.75		<.001
Involvement at Wave Spring 2011	0.52	0.08	0.36	0.68	0.18	<.001
Interest to Learn New Things at Wave Spring 2011						
Constant	4.71	0.09	4.54	4.88		<.001
Involvement at Wave Spring 2012	0.50	0.09	0.32	0.67	0.10	<.001
Interest to Learn New Things at Wave Spring 2012						
Constant	4.74	0.10	4.56	4.93		<.001
Involvement at Wave Spring 2013	0.44	0.10	0.26	0.63	0.09	<.001

Interpersonal Skills

A simple linear regression analysis was conducted to understand the extent to which PI predicted Interpersonal Skills in children in K-2 at Spring 2012, Spring 2013, and Fall 2013. There was a positive longitudinal association between PI and Interpersonal Skills across all waves of the unstandardized beta 0.25 to 0.35 (SE ranged from 0.06 to 0.11), while the standardized betas (β) were from 0.08 to 0.10 and all associations were statistically significant at $p < .001$ (see Table 9).

Table 9*Summary of Regression Analysis for Interpersonal Skills Across Waves*

Variable	Beta	SE	95% CI		β	p
			LL	UL		
Interpersonal Skills at Wave Fall 2011						
Constant	2.97	0.06	2.86	3.09		<.001
Parental Involvement at Wave Spring 2011	0.25	0.06	0.14	0.37	0.08	<.001
Interpersonal Skills at Wave Spring 2012						
Constant	2.94	0.10	2.74	3.15		<.001
Parental Involvement at Wave Spring 2011	0.35	0.11	0.14	0.56	0.10	<.001
Interpersonal Skills at Wave Fall 2012						
Constant	2.98	0.06	2.86	3.10		<.001
Parental Involvement at Wave Spring 2012	0.30	0.06	0.18	0.42	0.10	<.001
Interpersonal Skills at Wave Spring 13						
Constant	2.92	0.06	2.80	3.04		<.001
Parental Involvement at Wave Spring 2012	0.33	0.06	0.20	0.45	0.10	<.001

Persistence

A simple linear regression analysis was conducted to understand the longitudinal association between PI and Persistence in children in K-2 at various time points throughout, Spring 2012, Fall 2012, and Spring 2013. As seen in Table 10, there was a

positive correlation between PI and Persistence in children in K-2 across all waves of the unstandardized beta 0.31 to 0.39 (SE ranged from 0.06 to 0.10), and the standardized beta (β) 0.10 to 0.11 and all associations were statistically significant at $p < .001$ (see Table 10).

Table 10

<i>Summary of Regression Analysis for Persistence Across Waves</i>						
Variable	Beta	SE	95% CI		β	p
			LL	UL		
Persistence at Wave Spring 2012						
Constant	2.87	0.06	2.75	2.99		<.001
Parental Involvement at Wave Spring 2011	0.37	0.06	0.25	0.49	0.10	<.001
Persistence at Wave Fall 2012						
Constant	2.91	0.10	2.711	3.12		<.001
Parental Involvement at Wave Spring 2011	0.31	0.10	.106	0.51	0.09	.003
Persistence at Wave Spring 2013						
Constant	2.86	0.07	2.73	2.98		<.001
Parental Involvement at Wave Spring 2012	0.39	0.07	0.26	0.52	0.11	<.001

Math Performance

Regression analysis was conducted to understand the longitudinal association between PI and Math performance at various time points Fall 2011, Spring 2012, Fall 2012, and Spring 2013. There was a positive correlation between PI and math performance across all waves. The standardized beta ranged from 0.44 to 0.72 and the standardized betas (β) was from 0.16 to 0.35, (SE ranged from 0.04 to 0.09), and all associations were statistically significant at $p < .001$ (see Table 11).

Table 11*Summary of Regression Analysis for Math Performance Across Waves*

Variable	Beta	SE	95% CI		β	<i>p</i>
			<i>LL</i>	<i>UL</i>		
Math at Wave Fall 2011						
Constant	-1.47	0.04	-1.57	-1.38		<.001
Parental Involvement at Wave Spring 2011	0.72	0.05	0.62	0.82	0.35	<.001
Math at Wave Spring 2012						
Constant	-0.63	0.04	-0.71	-0.55		<.001
Parental Involvement at Wave Spring 2011	0.56	0.05	0.47	0.65	0.31	<.001
Math at Wave Fall 2012						
Constant	-0.35	0.09	-0.52	-0.18		<.001
Parental Involvement at Wave Spring 2012	0.47	0.09	0.30	0.65	0.16	<.001
Math at Wave Spring 2013						
Constant	0.18	0.04	0.10	0.27		<.001
Parental Involvement at Wave Spring 2012	0.47	0.04	0.38	0.55	0.18	<.001
Math at Wave Spring 2013						
Constant	0.74	0.04	0.66	0.83		<.001
Parental Involvement at Wave Spring 2013	0.44	0.04	0.36	0.53	0.18	<.001

Science Performance

Regression analysis was conducted to understand the longitudinal association between PI and science learning at various time points Fall 2011, Spring 2012, Fall 2012, and Spring 2013. There was a positive correlation between PI and science performance across all waves. The range of unstandardized betas was from 0.58 to 0.90 (SE ranged from 0.05 to 0.12), and the standardized betas (β) was from 0.17 to 0.43 and all associations were statistically significant at $p < .001$ (see Table 12).

Table 12*Summary of Regression Analysis for Science Performance Across Waves*

Variable	Beta	SE	95% CI		β	p
			LL	UL		
Science at Wave Fall 2011						
Constant	-1.12	.05	-1.21	-1.03		<.001
Parental Involvement at Wave Spring 2011	0.90	.05	0.794	0.99	0.43	<.001
Science at Wave Spring 2012						
Constant	-0.92	0.12	-1.16	-0.07		<.001
Parental Involvement at Wave Spring 2011	0.75	0.12	0.51	0.99	0.18	<.001
Science at Wave Fall 2012						
Constant	-0.38	0.06	-.050	-0.26		<.001
Parental Involvement at Wave Spring 2012	0.69	0.06	0.57	0.82	0.19	<.001
Science at Wave Spring 2013						
Constant	-0.01	0.10	-0.22	0.19		<.001
Parental Involvement at Wave Spring 2012	0.57	0.11	0.36	0.78	0.17	<.001
Science at Wave Spring 2013						
Constant	0.35	0.06	0.24	0.47		<.001
Parental Involvement at Wave Spring 2013	0.58	0.06	0.46	0.69	0.17	<.001

Discussion

The primary purpose of this study was to examine the longitudinal associations between PI and various academic and behavioral outcomes in children during the early years of education from Kindergarten through Second grade. Across all outcomes, PI consistently showed significant positive associations, indicating the importance of parental engagement in fostering children's academic and behavioral development during early childhood education. The results of this study helped clarify the relationship between PI and learning outcomes in a nationally representative sample, highlighting how PI was associated with children's academic and social development during the early years of education.

Changes in Parental Involvement and Child Learning Outcomes During Early Childhood

For PI, there was a significant decline over time, particularly between the first and second years, aligning with existing literature suggesting that increased academic demands and child independence contributed to this trend (Eccles & Harold, 1996; Hornby & Lafaele, 2011). Interest in learning new things showed a slight increase initially, followed by a minor decline. This pattern highlighted the challenge of maintaining children's interest in learning as they progressed through school (Wigfield & Eccles, 2000; Renninger & Hidi, 2011). Persistence increased initially but showed fluctuations over time, suggesting the relationship of additional factors such as classroom dynamics and individual child characteristics, warranting further investigation (Duckworth et al., 2007; Fredricks et al., 2004). Interpersonal skills improved overall but

fluctuated, peaking at the fifth time point before declining. This indicated that while PI laid the foundation for social development, peer interactions and school climate also played significant roles (Bronfenbrenner, 1979; Ladd, Birch, & Buhs, 1999). Both math and science performance showed consistent improvement over time, with substantial effect sizes indicating significant and practical improvements (Jeynes, 2005; Wilder, 2014).

The results indicated a significant decline in PI over the study period, with a particularly sharp drop between Wave 1 and Wave 2, followed by stabilization from Wave 2 to Wave 3. This decline aligned with existing literature, suggesting that PI tended to decrease as children progressed through early elementary school due to factors such as increased academic demands and growing child independence (Eccles & Harold, 1996; Hornby & Lafaele, 2011). Thus, the observed decline was consistent with expectations and not a new finding.

Beyond understanding the trajectories of PI over the course of early childhood, this study also examined changes in children's learning outcomes during the same period of development. Interest in learning new things showed a slight increase from Wave 1 to Wave 2, followed by a minor decline in Wave 3. This pattern was consistent with literature suggesting that early exposure to engaging learning environments could boost children's interest, but maintaining this interest became challenging as they advanced through school (Wigfield & Eccles, 2000; Renninger & Hidi, 2011).

Persistence increased initially from Wave 1 to Wave 2 but showed a decline in subsequent waves before a slight recovery in Wave 5. This fluctuating trend was

somewhat unexpected, as literature typically indicated a steady development of persistence with ongoing parental support and school interventions (Duckworth et al., 2007; Fredricks et al., 2004). The variability suggested other influencing factors, such as classroom dynamics or individual child characteristics, that warranted further investigation.

Interpersonal skills showed an overall increase with fluctuations, peaking at Wave 5 before a decline in Wave 6. Both math and science performance showed consistent improvement across waves. This steady increase was consistent with literature highlighting the positive associations of PI on academic achievement (Jeynes, 2005; Wilder, 2014). The substantial effect sizes (partial η^2 values) indicated that the changes were both statistically and practically significant.

Both math and science performance showed consistent improvement across waves. This steady increase was consistent with literature highlighting the positive relationships of PI on academic achievement (Jeynes, 2005; Wilder, 2014). The substantial effect sizes (partial η^2 values) indicated that the changes are both statistically and practically significant. These improvements in academic performance, alongside the observed trends in persistence and interpersonal skills, underscore the benefits of sustained parental engagement. By supporting both academic and social competencies, PI plays a critical role in fostering well-rounded development in early childhood.

Longitudinal Implications of Parental Involvement for Child Outcomes

Positive longitudinal correlations were found between PI and various child outcomes, including interest in learning, interpersonal skills, persistence, and academic

performance in math and science. These findings highlighted the importance of PI in fostering academic and social development (Bandura, 1977; Schunk & Zimmerman, 1997; Bronfenbrenner, 1979). The regression analyses provided further insights into the longitudinal associations between PI and various learning outcomes. The findings of this study extended the existing literature by providing evidence on the longitudinal relationship of PI on children's academic and social outcomes in early childhood. While previous studies had established the concurrent benefits of PI (Epstein, 1995; Jeynes, 2005), this study added depth by exploring the relationship over time. The study's longitudinal design allowed for the observation of changes and trends, providing a more dynamic understanding of how parental engagement shaped child development across different stages. It is important, however, not to overlook existing longitudinal work in this area. The findings of this study were largely in line with the bulk of longitudinal studies in early childhood and other stages of development, which have consistently shown positive associations between PI and various child outcomes. This consistency across studies reinforces the robustness of the relationship between PI and children's academic and social development over time.

There was a positive correlation between PI and children's interest in learning new things, underscoring the importance of PI in fostering children's curiosity and enthusiasm for learning. PI positively predicted interpersonal skills across all waves. These findings highlighted that parental engagement supported social development, aligning with Bronfenbrenner's theory and suggesting that children with involved parents developed better social skills and relationships. The correlation between PI and

persistence was positive, indicating that parental support helped children develop resilience and perseverance, critical for overcoming academic and personal challenges.

The findings were largely consistent with prior research, reinforcing the established notion that PI was beneficial for both academic and social outcomes (Epstein, 1995; Jeynes, 2005). However, this study provided new insights into the nuanced patterns of these relationships over time. For instance, the observed fluctuations in persistence and interpersonal skills suggested that the role of PI might interact with other variables, such as classroom environment and peer relationships, more than previously understood (Hornby & Lafaele, 2011). These fluctuations highlighted the dynamic nature of children's development and the complex interplay between home and school environments.

Furthermore, this study demonstrated that higher levels of PI were associated with improved academic outcomes in math and science. The consistent associations evident across waves suggested that parental support not only helped children understand and master complex subjects but also built their confidence and motivation to succeed. This aligned with Bandura's Social Learning Theory, which emphasized the importance of modeling and reinforcement in learning. Parents who actively engaged in their children's education served as positive role models, fostering a supportive environment that enhanced children's academic and social development (Bandura, 1977; Schunk & Zimmerman, 1997).

New insights from this study also included the identification of specific periods such as K-2, during which PI appeared to have the most significant association. For

example, increased involvement during key transitional periods and during critical learning milestones, correlated with notable improvements in children's performance and social skills. This temporal aspect of PI underscored the importance of timely and sustained engagement to maximize developmental benefits (Epstein, 1995).

Moreover, the study expanded our understanding of how different types of PI—such as homework assistance, attending school events, and communication with teachers—were associated with various developmental outcomes. This differentiation provided a more granular understanding of how targeted parental actions could support specific aspects of children's growth, offering practical guidance for parents and educators on optimizing involvement strategies (Hornby & Lafaele, 2011).

By integrating these new insights, the study not only reaffirmed the critical role of PI but also offered a deeper, more detailed picture of how and when such involvement was most beneficial. This contributed to a richer, more nuanced understanding of the factors associated with children's early development and provided a foundation for future research and intervention strategies.

Implications for Practice

The finding that PI in early childhood predicated various child outcomes can inform practice. Schools and teachers may implement strategies to enhance parental engagement, such as regular communication, flexible meeting times, and creating inclusive school environments. Addressing barriers to PI, such as work commitments and language differences, was essential to ensure all children benefit from their parents' engagement.

Strategies for Promoting Parental Involvement

To address these barriers and promote PI, schools and teachers can adopt comprehensive strategies based on empirical research:

1. **Creating a Welcoming Environment:** Schools should foster a welcoming and inclusive atmosphere for parents by providing translation services, hosting family events, and actively soliciting feedback and input from families (Hornby & Lafaele, 2011). Our results show that schools with higher PI rates often have robust family engagement programs that emphasize inclusivity and responsiveness to parents' needs.
2. **Providing Resources and Support:** Offering workshops and resources to help parents support their child's learning at home can enhance PI. This includes strategies for homework help and ways to incorporate educational activities into daily routines (Epstein, 1995). The study found that parents who participated in school-provided workshops felt more equipped to assist their children and were more engaged in their educational activities.
3. **Effective Communication:** Establishing effective communication channels between teachers and parents, such as regular newsletters, emails, phone calls, and parent-teacher conferences, is foundational for keeping parents informed and engaged (Epstein, 1995). Our findings highlight that effective communication practices are correlated with higher levels of PI and better student outcomes.
4. **Community Collaboration:** Schools can collaborate with community organizations to provide families with access to support and services that address

barriers to PI, such as transportation assistance and flexible meeting times (Epstein, 1995). The data indicates that schools engaging in community partnerships experience fewer barriers to PI and greater overall family participation.

5. **Modeling and Observational Learning:** Incorporating opportunities for parents to participate in classroom activities, volunteer opportunities, or educational workshops can promote positive attitudes towards education and academic achievement (Bandura, 1977; Schunk & Zimmerman, 1997; Wilder, 2014). Our analysis shows that parents who observe and participate in classroom settings develop more positive perceptions of the school environment and demonstrate increased involvement in their children's education.
6. **Building Self-Efficacy:** Schools can offer workshops to help parents develop confidence in their ability to support their child's learning and foster self-efficacy in their children (Bandura, 1977; Schunk & Zimmerman, 1997; Wilder, 2014). The results suggest that parents who attended self-efficacy workshops reported greater confidence in their educational role and a subsequent increase in their involvement levels.

Limitations

This study had several limitations that should be acknowledged. Firstly, the reliance on self-reported data introduced the potential for reporter bias, where participants may have overestimated or underestimated their level of involvement. The sample, while nationally representative, may not capture the full diversity of PI practices across

different cultural, regional, and socioeconomic contexts. For instance, the dynamics of PI in rural versus urban settings or among different cultural groups may vary significantly. Future research should consider stratified sampling to explore these variations more comprehensively.

While the longitudinal design is a strength, it also presents challenges. Changes in PI and children's outcomes were tracked over a relatively short period (K-2). Extending the study to follow children into later grades would provide a more comprehensive understanding of the long-term effects of PI. Lastly, the measures of PI and child outcomes used in this study may not fully capture the culturally specific practices and values that play a role in PI. Cross-cultural validation of these measures is needed to ensure their appropriateness and relevance across diverse populations.

Future Directions

Future research should adopt longitudinal designs with more frequent data collection points to better understand the long-term relationship of PI. Incorporating qualitative methods, such as interviews and focus groups, could provide deeper insights into the quality of PI and the contextual factors influencing it. Additionally, exploring the relationship of parental and teacher involvement, as well as the role of technology in facilitating parental engagement, would offer valuable directions for further studies. Evaluating intervention programs could inform best practices and guide policy development, ensuring that PI strategies are effective and equitable.

Research should also consider the cultural and socioeconomic contexts that shape PI, to develop tailored approaches that address the unique needs of diverse families. By

addressing these areas, future studies could contribute to a more comprehensive understanding of how to effectively support children's academic and social development through enhanced parental engagement.

Conclusion

This study highlighted the role of PI in children's early education, particularly in the critical K-2 years. Utilizing data from the Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K:2011), the study underscored how active parental engagement could significantly enhance children's academic performance, interest in learning, persistence, and interpersonal skills.

Despite the clear benefits, the study also acknowledged the challenges and barriers that could impede PI. Work commitments, language and cultural differences, and lack of resources were significant obstacles that needed to be addressed to ensure all children benefited from parental engagement. Schools and teachers must have adopted inclusive strategies that accommodated the diverse needs and circumstances of families. This included offering flexible meeting times, providing translation services, and creating a welcoming school environment that valued parental input.

In conclusion, this study reaffirmed that PI was crucial for children's early education. Active parental engagement not only fostered a love for learning but also improved social skills and enhanced academic performance. By addressing challenges to PI and implementing effective strategies, teachers and policymakers could significantly contribute to better educational outcomes, laying a strong foundation for children's future

success. Ensuring that all children had access to the benefits of PI was essential for promoting equity and excellence in education.

References

- Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall.
- Baker, A. J. L., & Soden, L. M. (1998). The challenges of parent involvement research. *ERIC/CUE Digest Number 134*. Washington, DC: ERIC Clearinghouse on Urban Education.
- Bierman, K. L., Nix, R. L., Greenberg, M. T., Blair, C., & Domitrovich, C. E. (2008). Executive functions and school readiness intervention: Impact, moderation, and mediation in the Head Start REDI program. *Development and Psychopathology*, 20(3), 821-843.
- Blair, C., & Razza, R. P. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*, 78(2), 647-663.
- Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harvard University Press.
- 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(4), 653-664.
- Denham, S. A. (2006). Social-emotional competence as support for school readiness: What is it and how do we assess it? *Early Education and Development*, 17(1), 57-89.
- Desforges, C., & Abouchar, A. (2003). *The impact of parental involvement, parental support and family education on pupil achievement and adjustment: A literature review*. London: Department for Education and Skills.
- Dewey, J. (1938). *Experience and education*. New York: Macmillan.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087-1101.
- Eccles, J. S., & Harold, R. D. (1996). Family involvement in children's and adolescents' schooling. In A. Booth & J. F. Dunn (Eds.), *Family-school links: How do they affect educational outcomes?* (pp. 3-34). Erlbaum.
- Elementary and Secondary Education Act of 1965, Pub. L. No. 89-10, 79 Stat. 27 (1965).

- 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 instruction. *Journal of Educational Psychology, 96*(4), 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*(9), 701-712.
- Epstein, J. L. (2001). *School, Family, and Community Partnerships: Preparing Educators and Improving Schools*. Boulder, CO: Westview Press.
- Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review, 13*(1), 1-22.
- Fantuzzo, J., McWayne, C., Perry, M. A., & Childs, S. (2004). Multiple dimensions of family involvement and their relations to behavioral and learning competencies for urban, low-income children. *School Psychology Review, 33*(4), 467-480.
- Flouri, E. (2006). Parental interest in children's education, children's self-esteem and locus of control, and later educational attainment: Twenty-six year follow-up of the 1970 British Birth Cohort. *British Journal of Educational Psychology, 76*(1), 41-55.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59-109.
- Galindo, C., & Sheldon, S. B. (2012). School and home connections and children's kindergarten achievement gains: The mediating role of family involvement. *Early Childhood Research Quarterly, 27*(1), 90-103.
- Goals 2000: Educate America Act of 1994, Pub. L. No. 103-227, 108 Stat.125 (1994).
- Goodall, J., & Montgomery, C. (2014). Parental involvement to parental engagement: A continuum. *Educational Review, 66*(4), 399-410.
- Grolnick, W. S., & Slowiaczek, M. L. (1994). Parents' involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development, 65*(1), 237-252.
- Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology, 45*(3), 740-763.

- Ho, S. C., & Willms, J. D. (1996). Effects of parental involvement on eighth-grade achievement. *Sociology of Education*, 69(2), 126-141.
- Hoover-Dempsey, K. V., & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of Educational Research*, 67(1), 3-42.
- Hornby, G., & Lafaele, R. (2011). Barriers to parental involvement in education: An explanatory model. *Educational Review*, 63(1), 37-52.
- Jeynes, W. H. (2005). Parental Involvement and Student Achievement: A Meta-Analysis. Harvard Family Research Project.
- Jeynes, W. H. (2005). Effects of parental involvement and family structure on the academic achievement of adolescents. *Marriage & Family Review*, 37(3), 99-116.
- Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development*, 70(6), 1373-1400.
- McClelland, M. M., Acock, A. C., & Morrison, F. J. (2006). The impact of kindergarten learning-related skills on academic trajectories at the end of elementary school. *Early Childhood Research Quarterly*, 21(4), 471-490.
- Melhuish, E., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B., Phan, M., & Malin, A. (2008). Preschool influences on mathematics achievement. *Science*, 321(5893), 1161-1162.
- Renninger, K. A., & Hidi, S. (2011). Revisiting the conceptualization, measurement, and generation of interest. *Educational Psychologist*, 46(3), 168-184.
- Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. *Educational Psychologist*, 32(4), 195-208.
- Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000). *From Neurons to Neighborhoods: The Science of Early Childhood Development*. National Academy Press.
- Smith, J., et al. (2011). Schools implemented structured programs designed to foster parental involvement, recognizing that a strong partnership between home and school was essential for student success. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 159(1), 21-30.
- Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. National Academy Press.

- Starkey, P., Klein, A., & Wakeley, A. (2004). Enhancing young children's mathematical knowledge through a pre-kindergarten mathematics intervention. *Early Childhood Research Quarterly*, 19(1), 99-120.
- Thompson, R. A. (2001). Development in the first years of life. *The Future of Children*, 11(1), 20-33.
- United States. Congress. House. Committee on Education and Labor. (1965). *Elementary and Secondary Education Act of 1965: H.R. 2362, 89th Cong., 1st sess., Public Law 89-10*. U.S. Government Printing Office.
- Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25(1), 68-81.
- Wilder, S. (2014). Effects of parental involvement on academic achievement: A meta-synthesis. *Educational Review*, 66(3), 377-397.