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How Much Do Parents Matter?

Testing the Reciprocal Association between Parental Involvement and Children's Educational
Trajectories among Native and Immigrant Families

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Education

by

Connie S. Tan

2012

ABSTRACT OF THE DISSERTATION

How Much Do Parents Matter?

Testing the Reciprocal Association between Parental Involvement and Children's Educational Trajectories among Native and Immigrant Families

by

Connie S. Tan

Doctor of Philosophy in Education

University of California, Los Angeles, 2012

Professor Rashmita S. Mistry, Chair

That parental involvement makes a positive impact on children's educational outcomes is well established (Fan & Chen, 2001). However, several gaps remain in when and how parental involvement influences children's educational progress: (1) parental involvement is mainly studied at particular points in the life course, but not across the developmental continuum, (2) the parental involvement-achievement link is generally modeled as a unidirectional relationship as compared with a transactional process, (3) the parental involvement-achievement link has mainly been examined among native families but less is known about how these associations apply to immigrant families in the U.S. To address these limitations, the current study tested the reciprocal associations between parental involvement and academic achievement across the elementary and middle school years for children from native and immigrant families. Data came

from the Early Childhood Longitudinal Study-Kindergarten Cohort. A subsample of 7,100 families was used, for whom longitudinal data from first to eighth grade and nativity status information was available. All analyses were conducted within a structural equation modeling framework using Mplus v.5.1.

Continuous time cross-lagged panel analyses showed the mutual influence between parental involvement and reading and math achievement across the elementary and middle school years. Early involvement was observed to positively predict children's future reading and math achievement. In addition, prior reading and math achievement was observed to influence future levels of parental involvement. As children did better in school, parents became less involved during the transition from fifth to eighth grade and vice versa. The patterns of associations were similar among native and immigrant families.

Findings shed light into the dynamic relationship between parental involvement and children's academic achievement across the school years, and for children from diverse backgrounds. Future studies should consider how the parental involvement-achievement link varies by other family background characteristics. It is important to consider children's role in shaping parental involvement and to understand the factors that influence why parents become involved. Educational implications include rethinking family interventions that are just geared towards changing parents' involvement strategies but consider programs to increase parental education and income or to improve communication between families and schools.

The dissertation of Connie S. Tan is approved.

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INTRODUCTION

Improving the educational system and promoting the positive development of children in the United States are critical issues on the national agenda. Education reform efforts are targeted towards closing achievement gaps and ensuring all children are on track towards higher education and will be career-ready in the future (U.S. Department of Education, 2012). But schools are facing many challenges and barriers as they attempt to address these issues. One such challenge is the complexity behind school efforts to meet the needs of all students to ensure that everyone receives a quality education and will become informed and productive citizens in society. As schools become increasingly diverse, it is important to focus on strategies to promote the educational success and positive development of all children.

Children from immigrant families, having at least one foreign-born parent, directly contribute to the growing diversity in our schools. Currently, one in four children in the U.S. are from immigrant families and as such they constitute the largest growth in the school-based population (Hernandez, Denton, & Macartney, 2008). In addition, immigration is the main driving force behind future U.S. population growth, leading to a new U.S. majority and transforming the race-ethnic composition of our country (Pew Research Center, 2008). Acknowledging that the immigrant population is diverse with respect to migration history, country of origin, cultural background, language, and socioeconomic status is a key consideration for schools to meet the needs of diverse students. However, there are persistent educational disparities between children from native and immigrant families (Crosnoe, 2009). On average, children from immigrant families often attend lower-resourced and more segregated schools (Orfield & Lee, 2005; Schwartz & Gershberg, 2001) and are more likely to live in poverty (Raphael & Smolensky, 2009) as compared with children from native families. These

disparities begin in early childhood and persist throughout the educational pipeline. Such educational conditions have far reaching consequences for children's future educational outcomes. It is crucial to focus on the educational outcomes of children from immigrant families given the implications for the future economy as they will become the largest proportion of the future workforce and will need to be well-prepared for a competitive labor market (Hernandez, Denton, & Macartney, 2008).

Traditionally, schools have played a critical role in assisting children from immigrant families successfully integrate into U.S. society (Fuligni & Fuligni, 2007). Parents are also important influences in fostering their children's educational success and economic and social mobility in the future. Schools and families share a common goal for children to succeed and reach their potential, but less is known about the best strategies to foster collaboration between schools and families in order to support children's academic achievement (Hill & Chao, 2009).

A starting point for intervention is to focus on family-based strategies such as parental involvement (e.g., providing educational resources and support) in children's education. Focusing on the family context is important because parents are strong socialization agents in children's lives (Parke & Buriel, 2006) and are the most proximate influences in children's development (Bronfenbrenner & Morris, 1998). Promoting family-school partnerships such as parental involvement is a feasible entry point for policy change and a way to decrease achievement gaps (Crosnoe, 2009, Dearing, Kreider, Simpkins, & Weiss, 2006). The No Child Left Behind Act (NCLB) requires schools to establish and encourage parental involvement activities (NCLB, 2004), acknowledging that the value of education needs to be reinforced in the home and school contexts. Research suggests that when parents are involved, children do better in school (Eccles & Harold, 1993; Epstein, 1990; Fan & Chen, 2001; Jeynes, 2005). But these

parental involvement strategies can vary as a function of families' social, economic, and cultural context. There is a need for better understanding of what parental involvement means across diverse families. Therefore, this dissertation examines how parental involvement influences children's academic outcomes among native and immigrant families.

Understanding what parental involvement means throughout children's educational pipeline is key to identifying strategies that best promote children's academic success. It is important to acknowledge that parental involvement is a multidimensional and dynamic construct that changes depending on children's developmental and educational needs. There is consensus in the literature that parental involvement includes activities such as participating in school activities, communicating with teachers, and reinforcing the curriculum at home (Eccles & Harold, 1993; Epstein, 1990). However, prior studies have mainly focused on a particular point in the life course (i.e. early transition into schooling, elementary school years, or middle school years) (Bradley et al., 1989; Fan & Chen, 2001; Hill & Tyson, 2009). Lacking is a developmental perspective examining how parental involvement influences children across the school years. Parents' understanding of how to navigate the school system depends on where children are in the educational pipeline. Developmental and curricula shifts occur as children progress to higher levels of schooling. Thus, parental involvement strategies that make an impact on children's achievement during elementary school become less influential during middle school (Seginer, 2006). This dissertation examines parental involvement across children's schooling.

The first goal of this dissertation is to longitudinally examine the relationship between parental involvement and academic achievement. Child development research has focused on the transactional interplay between children and their environment, suggesting that development and

learning occurs as children and their environment mutually influence one another over time (Bell 1968; Sameroff, 2009). The transactional model has been most often utilized in understanding parent-child relationships (Bell, 1968; Maccoby & Marton, 1983; Patterson, 1982) and only recently has this model been applied to parents and children in an educational setting (Englund, Luckner, Whaley, & Egeland, 2004; Gershoff, Aber, & Clements, 2009; Goldenberg, Gallimore, Reese, & Garnier; 2001; Grolnick, 2009; Mistry, White, Benner, & Huynh, 2009). Findings suggest that not only do parents influence children's school performance, but children's academic progress also influences parents' support and expectations for their children. In contrast, a majority of prior research has focused primarily on a unidirectional relationship (i.e. parents' effect on children) between parental involvement and academic achievement. There is no doubt that parents play an important role in fostering children's educational success. However, it is important to acknowledge that children's level of achievement and motivation also dictate how much and in what way parents are involved in their schooling. Therefore, this dissertation incorporates a transactional framework in its examination of the reciprocal relationship between parental involvement and children's academic achievement over time.

The second goal of this dissertation is to test whether the patterns of associations between parental involvement and academic achievement differ by family nativity status. It is increasingly important to understand how diverse families in the U.S. navigate the American school system and foster the educational success of their children. It is meaningful to focus on nativity status as an important factor in understanding the relationship between parental involvement and academic achievement. If the relationship between parental involvement and academic achievement is similar among native and immigrant families, we can generalize that these are "common pathways" that apply across diverse families. This contributes to the current

literature about normative processes of child development. If the relationship is found to differ among native and immigrant families, we can say that there are “unique pathways” that are distinct to different family forms. In this case, it is important to understand the variation in parental involvement manifestations and tailor strategies that meet the needs of diverse families. However, much of the research on parental involvement (e.g., attending school events or joining a parent-teacher organization) is informed by research on native and middle-class U.S. families (Grolnick & Slowiaczek, 1994; Hampton, Mumford, & Bond; 1998; Lareau, 2011). Although immigrant families heavily emphasize the importance of education, they are much less likely to engage in direct forms of participation in schools due to multiple barriers (Suarez-Orozco & Suarez-Orozco, 2001). Immigrant families are more likely to transmit their value for education and concern to their children through home-based parental involvement strategies, such as maintaining high expectations (Fuligni, 1997) and having regular discussions about the importance of education with their children (Lopez, 2001). Therefore, this dissertation explores what parental involvement looks like across diverse families and tests the relationship between parental involvement and academic achievement among a population that has been underrepresented in the literature but constitutes a growing presence in the U.S.

LITERATURE REVIEW

THE IMPORTANCE OF PARENTAL INVOLVEMENT IN EDUCATION

There is general consensus that when parents are involved, children do better in school (Eccles & Harold, 1993; Epstein, 1990; Fan & Chen, 2001; Jeynes, 2005). However, researchers have only examined the relationship between parental involvement and academic achievement at distinct periods during the life course (i.e. transition into early schooling, during elementary or middle school). During the early years, findings suggest that parental involvement is positively

associated with children's school readiness skills (Bradley et al., 1989; Galindo & Sheldon, 2012; Senechal & Le-Fevre, 2002). Parental involvement during the early childhood years emphasizes hands-on interaction with children to promote academic skill development. Bradley et al. (1989) found that parent responsiveness to their children's needs and the provision of toys and learning materials were positively associated with cognitive outcomes during children's first three years of life. Senechal and Le-Fevre (2002) found that home literacy activities and direct reading and writing instruction were related to emergent literacy and reading skills. In addition, the early childhood years are an important time for parents to get to know their children's school. Galindo and Sheldon (2012) found that parents' involvement in school activities was positively related to children's achievement during kindergarten. Parental involvement during children's early childhood years emphasizes the provision of enriching educational activities, direct instruction, and familiarity with the school system to foster children's success in transitioning to formal schooling.

Meta-analyses indicate moderate associations between parental involvement and academic achievement throughout the elementary school years (Fan & Chen, 2001; Jeynes, 2005). Parental involvement during the elementary school years emphasizes helping children with schoolwork and participating in school events. Parents' communication and relationship with the school staff had positive associations with children's achievement during the elementary school years (Englund et al., 2004) but also had far-reaching implications for their high school outcomes (Barnard, 2004). As children progress throughout elementary school, the focus on academics become increasingly important as the curriculum becomes more formalized, focused on academics and increasingly standardized testing. Although school participation is still an

important component of parental involvement, parents move away from direct educational assistance but continue to provide educational guidance to their children.

Meta-analyses also indicate moderate associations between parental involvement and academic achievement during the middle school years (Hill & Tyson, 2009). The goal of parental involvement during middle school is to better prepare children for the future by ensuring that they are academically competitive and eligible for higher education. Hill & Tyson (2009) found that school participation continues to play an important role in children's achievement but home environments that foster educational values and frequent discussions about school had the strongest influence on children's academic outcomes. Thus, as children progress into higher levels of schooling, parents adjust their parental involvement strategies to better fit their children's educational needs and goals.

The current study focuses on the influence of parental involvement on two specific areas of achievement: reading and math. Sheldon and Epstein (2005) argue that parental involvement strategies are most effective when targeted towards domain-specific outcomes. Reading and math are separate core foundational skill sets necessary for school readiness and future success. Although early reading and math skills are essential for achievement, they are differentially related to future academic performance, such that math skills at school entry are more strongly associated with higher school performance in later grades than reading skills (Duncan, et al., 2007). Therefore, it is important to examine how parental involvement influences children's reading and math achievement across the school years.

THE CHANGING NATURE OF PARENTAL INVOLVEMENT ACROSS CHILDREN'S SCHOOLING

Most of the existing research recognizes that there are two different domains in which parents foster their children's educational success: at school and at home (Green, Walker, Hoover-Dempsey, & Sandler, 2007; Grolnick & Slowiaczek, 1994; Grolnick, Benjet, Kurowski, & Apostoleris, 1997; Hoover-Dempsey, Bassler, & Brissie, 1987; Waanders, Mendez, & Downer, 2007). *School-based parental involvement* is traditionally characterized by parents' direct interaction with their child's school such as attending parent-teacher conferences, communicating with teachers, and volunteering at school (Epstein, 1990; Hill & Tyson, 2009). These are the types of parental involvement strategies that schools often value because they imply parental concern, support, and participation on behalf of children's learning according to teachers and school administrators. Schools uphold a standard view of expected parental roles in the educational system. More specifically, schools expect parents to establish open communication with teachers and attend school events as a way of valuing their children's education (Lareau, 1987; Lareau, 2011). In addition, even federal policies uphold the idea "that parents are encouraged to be actively involved in their child's education at school" (NCLB, 2004), through open communication and collaboration with teachers and schools. School-based parental involvement strategies are heavily emphasized during the elementary school years as a way for parents to show their value for education and present an opportunity to advocate on behalf of their children.

Home-based parental involvement is characterized by the provision of a learning environment for children at home such as assisting with homework, maintaining a work space, having family discussions about school, and purchasing supplemental academic materials (Hill &

Tyson, 2009). During children's early schooling, there is an emphasis on providing learning opportunities and literacy activities to foster school readiness skills (Bradley, Corwyn, McAdoo, & Garcia-Coll, 2001b). As children progress into middle school and academic material becomes more challenging, some parents may not be as well equipped with the skill sets to assist their children in their schoolwork as compared with other parents. Economic (i.e. making investments in their children's education), educational (i.e. parents' own educational experiences), and language barriers come into play when parents try to engage in home-based parental involvement strategies that require direct parental assistance (e.g., homework help or participating in educational activities) but parents can still create a supportive educational environment for their children in the home context. Home-based parental involvement strategies continue to play a significant role in shaping children's school success, but the nature of activities change as children progress to higher levels of schooling. Hill and Tyson (2009) recognized children's needs for educational guidance and reinforcement from their parents and introduced the concept of academic socialization as a parental involvement strategy that may be particularly salient during middle school. *Academic socialization* is characterized by communicating educational expectations and making plans for the future. Although all forms of parental involvement decrease as children progress to higher grade levels (Chao & Tseng, 2002; Green et al., 2007), Hill and Tyson's (2009) findings reaffirm the idea that parental involvement, especially home-based strategies, continues to matter for children's academic adjustment during middle school.

In addition, parental involvement strategies that were originally developed for the elementary school context may not be easily carried forward to the middle school context. Structural changes during middle school such as larger schools and classes, multiple teachers, more challenging academic material, and a more competitive educational atmosphere make it

more difficult for parents to navigate the school system and to identify how best to support their children. School-based and home-based parental involvement strategies that require direct participation and assistance may be easier for parents to implement during the elementary school years but be less feasible during the middle school years.

The transition to middle school also coincides with developmental changes such that children have enhanced cognitive capacities to make educational decisions on their own as well as with their parents. Parents' influence on early adolescent behavior becomes more indirect and children begin to renegotiate roles and question parental authority (Hill & Tyson, 2009). It may be more challenging for parents to participate in their child's school during middle school because children attempt to make their own educational choices and may not inform their parents about what is going on at school. Early adolescents have an increased self-efficacy to make decisions regarding their course selections and understand the impact of educational activities on future academic goals. However, parents still play an important role in shaping their children's educational outcomes. Therefore, there may be less of a need to directly participate at school activities or provide academic instruction at home (Seginer, 2006). In this case, communication, guidance, and reinforcement of educational expectations and values may be more helpful and salient during the middle school years.

MUTUAL INFLUENCE BETWEEN PARENTAL INVOLVEMENT AND CHILDREN'S ACHIEVEMENT

In a seminal article, Bell (1968) argued that child development research should move away from emphasizing a unidirectional relationship between parents and children, whereby parents' effect on children is the dominant focus. He reported that parents exerted a strong influence on children's behaviors but that children also influenced parenting behaviors. He noted

that parenting repertoires are not only influenced by social forces but also through reinforcement and responsiveness from the child. In order to better understand parent-child relationships, Bell emphasized examining the transactional processes between parents and children. A transactional model of development posits that development occurs as a result of the mutual and bidirectional influence between children and their social contexts over time (Sameroff, 2009). A majority of the research utilizing a transactional model explores the relationship between parenting and children's behaviors. Maccoby & Martin (1983) found that positive and mutually responsive interactions between parents and children indicate reciprocity in the parent-child relationship. On the other hand, Patterson (1982) found that coercive parenting practices influence more negative child behavior, which in turn perpetuates a cycle of undesirable parenting environment. Thus, transactional processes help to shed light into the ways in which parents and children positively and negatively influence one another over time.

More recent work has focused on the bidirectional relationship between parents and children in an educational setting (Englund et al., 2004; Gershoff et al., 2009; Goldenberg et al.; 2001; Grolnick, 2009; Mistry et al., 2009). In a study of Latino immigrant families, Goldenberg et al., (2001) examined the reciprocal association between parents' educational expectations and children's school performance from kindergarten through middle school. To better understand the directionality of effects, two models were tested: (1) an "expectations-driven" model that assessed the influence of parents' educational expectations on children's school performance, and (2) a "performance-driven" model that assessed the influence of children's school performance on parents' educational expectations. Parents' expectations did not predict children's school performance; rather it was children's school performance that influenced parents' expectations over time. Parents' expectations fluctuated over time, depending upon how

well children were doing in school. Similarly, Mistry et al., (2009) found evidence for a performance-driven model in which changes in children's academic achievement across a three year period positively influenced teachers' and parents' expectations, and in turn, predicted children's current school performance among a multi-ethnic, low-income sample. As these studies suggest, adult expectations are dynamic and change in response to how well children are doing in school.

Although it is well documented that parental involvement positively impacts children's achievement (Fan & Chen, 2001; Hill & Chao, 2009), less is known about how children's academic progress influences parents' level of involvement, or how this shifts across time. The current study utilizes a transactional model for understanding the dynamic relationship between parental involvement and children's academic outcomes, which has rarely been explored in prior research (exceptions, Englund et al., 2004; Gershoff et al., 2009). Englund et al., (2004) found that prior levels of academic achievement positively influenced future expectations, levels of parental involvement, and academic achievement. When children were doing well at first grade, parents had higher expectations and engaged in more parental involvement activities, which then led to higher academic achievement by third grade. Similarly, Gershoff and colleagues (2009) found that changes in parents' support for learning was mutually influenced by changes in children's reading ability. When parents engaged in more learning support activities, children displayed higher gains in reading ability over time. Simultaneously, as children's reading abilities improved, parents scaled back on learning support activities over time. Parents can be very proactive in implementing educational activities to improve their children's academic performance. On the other hand, children's lack of academic progress or challenges can trigger parents to react and implement parental involvement strategies more intensely. A transactional

model provides a comprehensive understanding of how and why parents become involved in their children's schooling over time. Therefore, this dissertation examines the reciprocal relationship between parental involvement and children's reading and math achievement from elementary to middle school and tests how these relationships operate among diverse families (See Figure 1).

VARIATIONS IN PARENTAL INVOLVEMENT STRATEGIES AMONG IMMIGRANT FAMILIES

Much of the research on parental involvement has been conducted with samples of predominately native, middle-class, White and African-American families in the U.S.; less research has examined these processes among immigrant families. The meaning of parental involvement along with its association with academic outcomes may differ by nativity status. It is important to uncover whether the relationship between parental involvement and academic achievement is similar or different across native and immigrant families. Paths of associations that are similar across groups would indicate that there are "common pathways" in understanding the influence between parental involvement and academic achievement that can be applied across diverse families. Paths of associations that differ across groups would indicate that there are "unique pathways" in understanding the influence between parental involvement and academic achievement that vary by family background.

Although it is well-established that immigrant families have a strong value for education and have high educational expectations for their children (Chao & Tseng, 2002; Fuligni, 1997; Fuligni & Yoshikawa, 2003; Kao, 1995; Garcia-Coll et al., 2002), we need a better understanding of how values and beliefs translate into specific parental involvement strategies. Immigrant families are less likely to engage in school-based parental involvement strategies as

compared with native families (Brown, 2012; Mau, 1997; Suarez-Orozco & Suarez-Orozco, 2001). Lee and Bowen (2006) found differences in school-based parental involvement strategies such that White parents more frequently reported attending parent-teacher conferences and volunteering at school as compared with Latino parents. In focus groups, White parents more often expressed the importance of building relationships with schools in order to gain information about their children's educational environment as compared with Latino immigrant parents (Hill, Tyson, & Bromell, 2009). Similarly, Mau (1997) found that Asian immigrant parents were less likely to participate in school activities compared to White parents. School-based parental involvement strategies may be less salient for Asian parents because they do not provide the type of assistance that children need to do well in school. As noted by Chao & Tseng (2002), Asian families foster academic success through guidance and expectations at home rather than through more direct interactions with their child's school. The process of navigating the school system and tailoring parental involvement strategies to meet children's educational needs may be especially difficult for immigrant, low-income families. These families may be unfamiliar with the American school system, lack the educational skills to assist with their children's schoolwork, have limited resources to provide supplemental academic books and courses, and have time constraints due to multiple job demands (Suarez-Orozco & Suarez-Orozco, 2001). In addition, some parents may mistrust their child's teacher (Lareau, 1987; McKay, Atkins, Hawkins, Brown & Lynn, 2003) or view teachers as the sole authority figure when it comes to the education of their children (Lareau, 2011; Suarez-Orozco & Suarez-Orozco, 2001).

On the other hand, immigrant families are much more likely to engage in home-based parental involvement strategies to foster the value of education. In a study with low-income

Mexican immigrant families, Delgado-Gaitan (1992) found that parents demonstrated support for their children's education by maintaining a homework space, monitoring bedtime, and rewarding children for their academic success. Lopez's (2001) qualitative study of one Mexican migrant farm-worker family showed that parents motivated their children towards educational success through instilling a strong work ethic to prove the value of education. Brown (2012) found that Mexican immigrant parents' involvement strategies centered around buying school supplies, being involved in daily activities, maintaining high expectations, monitoring school progress, and placing a high value on education. The value of education, both in the form of implicit and explicit messages about the importance of education, was the strongest predictor of children's academic indicators. Similarly, Tan (2009) found that low-income Chinese immigrant parents were frequently engaged in keeping track of their child's progress in school, telling them to work hard, maintaining high expectations, and instilling the value of education. Parental involvement strategies that included instilling the value of education (i.e., discussions about the lack of educational opportunities and how hard parents work in their jobs) were positively related to children's academic motivation. Immigrant parents' constant communication about the value of education is internalized by their children, which in turn, is related to higher academic outcomes (Fuligni & Fuligni, 2007; Plunkett, Behnke, Sands, & Choi, 2009).

As discussed by Chao and Tseng (2002), Chinese immigrant parents engage in more direct educational instruction at home during children's early school years but change to school planning and preparation for college as children transition to middle and high school. Chao et al. (2009) found that East Asian immigrant families engaged in two types of home-based parental involvement strategies: managerial and structural activities. Managerial activities focused on checking and helping with homework while structural activities focused on providing extra

homework assignments. East Asian immigrant families were less involved in managerial activities but more involved in structural activities during children's high school years as compared with native White families. Asian families reported more investment in educational resources at home by enrolling children in supplemental academic courses than did White (Kao, 1995; Peng & Wright, 1994), African-American, Latino, and Native American families (Peng & Wright, 1994), even after controlling for family income. It is evident that native and immigrant families engage in a variety of parental involvement strategies depending on their educational belief systems and socioeconomic circumstances. In addition, there is some evidence to suggest that there are differential associations between parental involvement and academic achievement among native and immigrant families. This dissertation tests whether the relationship between parental involvement and reading and math achievement differs by nativity status.

THE CURRENT STUDY

The current study utilizes a contemporary and nationally representative sample of children in the U.S. to: (1) determine the extent to which there is a reciprocal relationship between parental involvement and children's reading and math achievement, and (2) test whether the patterns of relationships differ by nativity status.

METHOD

DATA SOURCE

Data came from the Early Childhood Longitudinal Study-Kindergarten Cohort of 1998-1999 (ECLS-K) dataset which includes a contemporary and nationally representative sample of over 20,000 children who began kindergarten in the fall of 1998 and were followed through to eighth grade in the spring of 2007. The ECLS-K used a multistage probability sample design consisting of 100 primary sampling units (i.e., counties), from which 1,000 schools were

selected, from which over 21,000 children were selected. ECLS-K's longitudinal sample started with over 17,000 children at kindergarten, but by eighth grade, only slightly more than 8,000 children remained in the study. Analyses for the present study are based on a subset of approximately 7,100 families for whom longitudinal data and parents' nativity status was available. This included 5,800 native families (i.e., both parents were native U.S. born) and 1,300 immigrant families (i.e., at least one parent was foreign born). Data was collected at first, third, fifth, and eighth grade. All reported sampled sizes are rounded to the nearest 50 for data security purposes, as required by National Center for Education Statistics (NCES).

MEASURES

PARENTAL INVOLVEMENT. Eight parental involvement indicators across first, third, fifth, and eighth grades were included. Different measures were assessed at each grade level because it was theoretically informed by children's developmental age. Composite scores of parental involvement were created for each grade level. First and third grade parental involvement composites included cognitive stimulation, numbers of books, extracurricular activities, and school participation. Fifth grade parental involvement composite included number of books, extracurricular activities, and school participation. Eighth grade parental involvement composite included school participation, parent-child activities, and school discussions. (See Table 1 for information about when each indicator was measured).

COGNITIVE STIMULATION. Parents provision of cognitive stimulation was based on the H.O.M.E. measure (Caldwell & Bradley, 1984) consisting of ten items, assessing how often parents told stories, sang songs, and practiced numbers with their children, and was rated on a scale ranging from 1 (*not at all*) to 4 (*everyday*). All items were averaged in which higher values

reflected more provision of cognitive stimulation. Cognitive stimulation was measured at the first ($\alpha_{\text{Full}}=.74$, $\alpha_{\text{Native}}=.73$, $\alpha_{\text{Immigrant}}=.75$) and third ($\alpha_{\text{F}}=.72$, $\alpha_{\text{N}}=.72$, $\alpha_{\text{I}}=.72$) grade time points.

NUMBER OF BOOKS IN THE HOME. Number of books in the home consisted of a single item in which parents reported the total number of books in their home and was measured at the first, third, and fifth grade time points. This item was log transformed to reduce skewness and kurtosis.

EXTRACURRICULAR ACTIVITIES. Children's participation in extracurricular activities consisted of six items, assessing if parents enrolled their children in dance lessons, music lessons, organized sports, and was rated on a scale from 0 (*no*) to 1 (*yes*). All items were summed to create a total score where higher values reflected more participation in extracurricular activities. Extracurricular activities were measured at the first, third, and fifth grade time points.

SCHOOL PARTICIPATION. Parents' school participation consisted of six items, assessing if parents ever participated in school activities since the beginning of the school year, such as attending open house, PTA meetings, and volunteering, and was rated on a scale from 0 (*no*) to 1 (*yes*). All items were summed to create a total score where higher values reflected more participation in school activities. School participation was measured at the first, third, fifth, and eighth grade time points.

PARENT-CHILD ACTIVITIES. Parent-child activities consisted of 13 items, assessing how frequently parents and children attended school events, family functions, and took day trips together, and was rated on a scale ranging from 1 (*never*) to 4 (*frequently*). All items were averaged in which higher values reflected higher frequency of parent-child activities. Parent-child activities were measured only at the eighth grade time point ($\alpha_{\text{F}}=.73$, $\alpha_{\text{N}}=.70$, $\alpha_{\text{I}}=.77$).

SCHOOL DISCUSSIONS. Five items assessing how often parents discussed their children's school grades and future prospects with them, and was rated on a scale ranging from 1 (*not at all*) to 4 (*everyday*). All items were averaged such that higher values reflected higher frequency of school discussions. School discussions were only measured at the eighth grade time point ($\alpha_F=.73$, $\alpha_N=.72$, $\alpha_I=.77$).

ACADEMIC ACHIEVEMENT. Children's achievement outcomes were assessed through direct child assessments of reading and math at the first, third, fifth, and eighth grade time points. At the kindergarten and first grade assessments, children who were non-native English speakers were given an English screening exam (i.e., English Oral Language Development Scale, OLDS) before the administration of the direct assessments. However, the English screening exam was discontinued after the first grade time point because all children demonstrated English proficiency. These direct child assessments were specifically developed for the ECLS-K. For each assessment, all children received a 10-item routing test. Based on their performance on the initial routing items, children were then given assessments of low, medium, or high difficulty levels. Item response theory (IRT) was used to create scale scores in order to compare different children's achievement and/or also to compare one child's achievement across time. The reading assessment included items such as letter recognition, word comprehension, literal inference, and text evaluation. The math assessment included items such as number sense, geometry, and spatial sense. The reading and math assessments reliabilities for the low, medium, and difficulty tests ranged from 0.62 to 0.82. Some reliabilities are lower because of the restricted range of children's ability levels on the tests.

COVARIATES. The majority of covariates were measured at the kindergarten time point. Covariates include gender, child's race/ethnicity, whether the child changed schools from

kindergarten to first grade, kindergarten direct child assessments in reading and math, parents' level of education, parents' employment status, income-to-needs ratio (INR), parents' marital status, home language (i.e., English or non-English), parents' age at migration (for immigrant families only), parental involvement barriers (e.g., lack of transportation, lack of child care, work schedule conflicts), and urbanicity (i.e., rural, suburb, or large city).

ANALYTIC STRATEGY

FIT INDICES

All analyses were conducted using Mplus v.5.1 (Muthen & Muthen, 1998-2006). Goodness-of-fit indices were used to examine how adequate the models fit the data covariance structure. Since different fit indices operate on various assumptions, it is important to include multiple fit indices for a comprehensive evaluation of the model fit (Hoyle & Panter, 1995).

Multiple goodness-of-fit indices, such as the comparative fit index (CFI; Bentler, 1990, 1995) and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993) were used. The CFI ranges from 0 to 1, with values above .90 indicating a reasonably good fit (Hu & Bentler, 1999) while the RMSEA requires values below .08 for a reasonably good fit (Kline, 2005).

MISSING DATA

Full Information Maximum Likelihood (FIML) method was used to deal with missing data (FIML; Arbuckle, 1996). FIML preserves the use of the available data and allows the generalization of results to the population. FIML fits the tested model directly onto the non-missing data for each participant rather than estimating values for the missing data. In addition, FIML retains reasonable residual variances and lack of model fit to the data.

COMPLEX SURVEY DESIGN

ECLS-K utilized a complex sample survey design in which children were clustered within schools and the schools were clustered within primary sampling units. If this nested structure is unaccounted for, there would be inaccurately small estimates of standard errors (Bryk & Raudenbush, 1992). To make the proper adjustments for standard errors, I used an estimation procedure in Mplus (i.e., TYPE=COMPLEX function) that accounts for ECLS-K's multi-stage clustering (Muthen & Satorra, 1995). Special weight (C2_7FP0), stratification (C27FPSTR), and cluster (C27FPPSU) variables were also applied to all analyses to deal with ECLS-K's complex survey design.

To determine the extent to which there is a reciprocal relationship between parental involvement and children's academic achievement across the elementary to middle school years, continuous time cross-lagged panel analysis were conducted within a structural equation modeling framework. Cross-lagged analyses provide a way to understand temporal and transactional relationships between constructs while autoregressive techniques are an index for stability (Singer & Willet, 2003). To determine whether relationships differed by nativity status, I ran separate models based on native families versus immigrant families.

RESULTS

MEAN-LEVEL DIFFERENCES ACROSS NATIVITY STATUS

Table 2 provides descriptive information for the analysis variables by nativity status. All descriptive statistics were conducted using Stata v.10 (StataCorp, 2007), which accommodated the application of sample weights, stratification, and clustering due to ECLS-K's complex survey design. *T*-tests and chi-square tests of association were used to examine differences by nativity status. *T*-tests were conducted instead of analysis of variance (ANOVA) because Stata v.10's

complex survey command does not accommodate ANOVA tests. A Bonferroni correction was applied to control for Type I error, due to the large sample size and the number of tests, such that .05 was divided by the number of tests, yielding a new adjusted α level of .0009.

As shown in Table 2, parent reports of parental involvement strategies differed among native and immigrant families, such that native families reported higher levels of cognitive stimulation, numbers of books, extracurricular activities, and school participation across all grade levels. No differences in eighth grade levels of school participation and school discussions were observed between native and immigrant families.

There were also differences in children's academic scores by nativity status, such that children from native families consistently scored higher on reading and math assessments than did children from immigrant families across first and third grade. At fifth and eighth grades, children from native families continued to score higher on reading than did children from immigrant families, but no differences were evident in children's math scores.

In addition, there were marked socioeconomic and sociodemographic differences between native and immigrant families. Native families reported higher levels of income, parental education level, and English fluency as compared with immigrant families. Immigrant families were more likely to be Latino or Asian and to be married. Immigrant families also reported more barriers to parental involvement as compared with native families (Refer to Table 2).

RECIPROCAL ASSOCIATION BETWEEN PARENTAL INVOLVEMENT AND ACADEMIC ACHIEVEMENT

To test the reciprocal association between parental involvement and reading and math achievement across the elementary to middle school years, continuous time cross-lagged panel

analyses were conducted with the full sample and separately by nativity status. I tested three model specifications to examine the association between parental involvement and reading and math achievement: (1) a bidirectional model between parental involvement and reading and math achievement (Figure 1), (2) a parental involvement model (i.e., the effect of parental involvement on reading and math) (Figure 2), and (3) an achievement model (the effect of reading and math on parental involvement) (Figure 3).

First, I tested a parsimonious model in which I specified the bidirectional relationship between parental involvement and reading and math achievement in order to better capture transactional processes. However, this model specification did not converge. I then tested two alternate model specifications. Informed by previous research, I tested parental involvement models in which I specified the direction of effect from parental involvement to reading and math achievement, separately. In addition, informed by the work of Goldenberg et al. (2001), I tested achievement models in which I specified the direction of effect from reading and math achievement to parental involvement. The parental involvement model and achievement model fit the data well. Therefore, for all subsequent analyses both models were used. Model fit indices are shown in Figures 4-15. Model fit was adequate for all models. Covariates were modeled on first grade parental involvement and academic achievement for all models.

PARENTAL INVOLVEMENT AND READING ACHIEVEMENT. For the parental involvement model among the full sample (Figure 4: $\chi^2(142) = 829.363$; CFI = 0.956; RMSEA = 0.026), autoregressive paths indicated a high degree of stability in parental involvement and reading achievement from first through eighth grade. As shown in Table 3, different sets of covariates emerged as important predictors of parental involvement and reading achievement at first grade. In general, the patterns of results confirm prior research of parental involvement

during the transition to school. In terms of child covariates, children's kindergarten reading scores were positively associated with parental involvement, such that parents of children with higher scores were more likely to be involved. Family characteristics such as maternal education, marital status, and income were all positively associated with parental involvement, such that parents with more resources were more likely to be involved. In addition, parents who perceived barriers to parental involvement were less likely to be involved. Prior kindergarten reading, maternal and paternal education, and marital status were positively associated with reading achievement at first grade.

Within time, there were consistent positive associations between parental involvement and reading achievement at first ($\beta = .04, p < .01$), third ($\beta = .07, p < .001$), and fifth ($\beta = .07, p < .001$) grade but not for eighth grade. Higher levels of parental involvement predicted higher levels of reading achievement, such that parents who were more involved had children who scored higher on reading. Across time, cross-lagged paths showed reciprocal effects of prior parental involvement influencing future reading achievement, and vice versa. First grade parental involvement was positively associated with changes in reading achievement across first to third grade ($\beta = .10, p < .001$). Similarly, fifth grade parental involvement was positively associated with changes in reading achievement from fifth to eighth grade ($\beta = .08, p < .001$). When parents were involved early on, children had better reading scores at later grades. In addition, third grade reading achievement was positively associated with changes in parental involvement between third and fifth grade ($\beta = .13, p < .001$). Children who did well in reading at third grade had parents who increased their level of involvement over time. On the other hand, fifth grade reading achievement was negatively associated with changes in parental involvement between fifth and eighth grade ($\beta = -.17, p < .001$). Children who did well in reading at fifth grade had parents who

decreased their level of involvement over time. Conversely, children who did less well in reading at fifth grade had parents who increased their level of involvement over time.

For the achievement model among the full sample (Figure 5: $\chi^2 (142) = 829.734$; CFI = 0.956; RMSEA = 0.026), autoregressive paths showed similar associations and a similar set of covariates predicted parental involvement and reading achievement at first grade as the parental involvement model for reading achievement. Within time, there were consistent positive associations between reading achievement and parental involvement at first ($\beta = .07, p < .01$), third ($\beta = .07, p < .001$), and fifth ($\beta = .12, p < .001$) grade but not for eighth grade. Higher levels of reading achievement predicted higher levels of parental involvement, such that children who scored higher on reading had parents who were more involved. Across time, patterns of reciprocal associations between parental involvement and reading achievement were similar to the parental involvement model. The key difference emerged between third and fifth grade. Unlike the parental involvement model, third grade reading achievement was not associated with parental involvement at fifth grade. However, third grade parental involvement was positively associated with changes in reading from third to fifth grade ($\beta = .04, p < .001$). When parents were involved in third grade, children had better reading scores by fifth grade.

PARENTAL INVOLVEMENT AND MATH ACHIEVEMENT. For the parental involvement model among the full sample (Figure 6: $\chi^2 (142) = 1068.858$; CFI = 0.945; RMSEA = 0.030), autoregressive paths showed similar associations and a similar set of covariates predicted parental involvement and math achievement at first grade as the parental involvement model for reading achievement. Within time, positive associations between parental involvement and math achievement emerged only at fifth ($\beta = .05, p = .001$) and eighth ($\beta = .03, p < .05$) grade. Higher levels of parental involvement predicted higher levels of math achievement, such that

parents who were more involved had children who scored higher in math. Across time, patterns of reciprocal associations between parental involvement and math achievement were similar to the parental involvement model for reading achievement. The key difference emerged between first and third grade. First grade math achievement was positively associated with changes in parental involvement between first and third grade ($\beta = .03, p < .05$). Children who did well in math at first grade had parents who increased their level of involvement over time.

For the achievement model among the full sample, (Figure 7: $\chi^2(142) = 1070.030$; CFI = 0.945; RMSEA = 0.030), autoregressive paths and covariates predicting parental involvement and math achievement were similar to previous models. Within time, positive associations between math achievement and parental involvement emerged only at fifth grade ($\beta = .12, p < .001$). Across time, paths of associations between parental involvement and math achievement were similar to the achievement model for reading.

To summarize, parents' level of involvement in their children's education was highly stable across the elementary to middle school years. Kindergarten assessments of family resources and perceived barriers to parental involvement predicted parents' level of involvement and reading and math achievement at first grade. Results from the within time associations indicated that parents' level of involvement and children's academic achievement were reciprocally related. Parents who were more involved had children who scored higher in reading and math. Simultaneously, children who did well in reading and math had parents who were more likely to be involved. Results from the cross-lagged associations suggested that prior parental involvement influenced children's future reading and math achievement. When parents were involved early on, children experienced greater increases in reading and math scores over time. In addition, prior reading and math achievement influenced future levels of involvement.

Parents' involvement was informed by their children's prior reading and math abilities, which led parents to either increase or decrease their level of involvement. This demonstrates that parents can make a positive difference in their children's education and at the same time are responsive to their children's prior level of achievement and can adjust their involvement strategies when necessary.

RECIPROCAL ASSOCIATION BETWEEN PARENTAL INVOLVEMENT AND ACADEMIC ACHIEVEMENT: DIFFERENCES BY NATIVITY STATUS

To determine whether the associations between parental involvement and academic achievement differed by nativity status, separate analyses were conducted for native and immigrant families to see how well the parental involvement and achievement models fit for these two groups (Refer to Figures 8-15).

For native families, paths of associations for the parental involvement and achievement models for both reading and math achievement were mostly similar to the full sample. Differences with the full sample emerged with the achievement model for reading achievement and parental involvement model for math achievement. For the achievement model for reading achievement, within time associations suggest that eighth grade reading achievement was negatively associated with parental involvement at eighth grade. Children who did well in reading had parents who were less likely to be involved. Conversely, children who were struggling with reading had parents who were more likely to be involved. For the parental involvement model for math achievement, the within time association between eighth grade parental involvement and eighth grade math achievement was no longer significant. Across time, the cross-lagged association between first grade math achievement and third grade parental

involvement was also no longer significant. Although non-significant, the strength and direction of associations were similar to the full sample.

For immigrant families, there were more differences in the paths of associations for the parental involvement and achievement models for reading and math achievement when compared to the full sample. More non-significant paths of associations emerged in the association between parental involvement and reading and math achievement within time and across time for all models when compared to full sample. However, the strength and direction of associations were similar to full sample.

In summary, the parental involvement and achievement models for reading and math achievement fit well for native and immigrant families. Evidence of reciprocal associations between parental involvement and reading and math achievement were also similar among native and immigrant families.

DISCUSSION

As the U.S. population continues to become increasingly diverse, improving the educational prospects and positive development of children from diverse family backgrounds is a key educational issue. Focusing on family-based strategies, such as parental involvement in children's schooling, is a viable starting point to foster the educational success of all children. It is well-established that when parents are involved, children do better in school (Eccles & Harold, 1993; Epstein, 1990; Fan & Chen, 2001; Jeynes, 2005). However, several gaps remain in the parental involvement literature. First, most researchers have only studied parental involvement at particular points in the life course but not longitudinally to reflect children's educational process. Second, the parental involvement-achievement link is generally modeled as a unidirectional relationship (i.e. parents' effect on children) but there is reason to believe that the relationship

between parental involvement and academic achievement is more transactional in nature. Third, the relationship between parental involvement and academic achievement has mostly been examined among native families but less is known about how these associations apply to diverse families in the U.S.

Therefore, this dissertation examined whether there is a reciprocal relationship between parental involvement and reading and math achievement over time and tested if the patterns of association differed by nativity status (i.e. native families and immigrant families). I found that parental involvement influenced academic achievement and simultaneously children's academic achievement drove parents' level of involvement. In addition, associations between parental involvement and academic achievement were similar among native and immigrant families.

PARENTAL INVOLVEMENT ACROSS ELEMENTARY TO MIDDLE SCHOOL

Based on mean level differences, native and immigrant families were engaged in different levels of parental involvement. Native families reported engaging in more tangible activities such as fostering a cognitively stimulating home environment, investing in educational materials, participating in school activities, and enrolling children in extracurricular activities than immigrant families. This may be explained by families' socioeconomic status and ability to invest in their children's schooling. In the current sample, native families reported significantly higher levels of human capital (e.g., income and education) than did immigrant families, which leads to more opportunities to invest in educational resources for their children. In addition, immigrant families also reported encountering more barriers to parental involvement at school, which may deter families from directly participating in school events. From prior research, we know that many immigrant families encounter multiple barriers to school-based parental involvement (Brown, 2012; Suarez-Orozco & Suarez-Orozco, 2001). Schools may mistakenly

view the lack of school-based parental involvement as a sign that parents do not care about their children's education (Brown, 2012) and may fail to recognize that immigrant families engage in more home-based parental involvement strategies.

Much of the prior research has used traditional approaches in measuring parental involvement such as frequency of school participation and provision of books in the home (Eccles & Harold, 1993; Epstein, 1990) but this does not accurately reflect the specific educational and developmental needs of children. Parental involvement strategies that are prominently used in the elementary school context may not carry over into the middle school context. It is important to consider the inclusion of additional parental involvement strategies that reflect the specific needs of children at various grade levels.

THE RECIPROCAL INFLUENCE OF PARENTAL INVOLVEMENT AND CHILDREN'S ACHIEVEMENT

The current study examined whether there is a reciprocal relationship between parental involvement and reading and math achievement across children's elementary to middle school years. I tested three model specifications to examine the direction of influence between parental involvement and academic achievement: (1) a bidirectional model between parental involvement and academic achievement, (2) a parental involvement model (i.e., the effect of parental involvement on achievement), and (3) an achievement model (the effect of achievement on parental involvement). The bidirectional model did not converge and may be explained by the complexity of model. The parental involvement model and achievement model proved to be the best fit for the data. Results indicated that parental involvement was stable over time. Once parents were involved in their children's education in the early years, they continued to stay involved as their children progressed into higher levels of schooling. The parental involvement

model confirms prior research that parental involvement is positively associated with children's achievement (Fan & Chen, 2001; Hill & Tyson, 2009). Within time, when parents were involved, children did well in reading and math. Notably, the current study shows that when parents were involved early on, children did better in reading and math at later grades. This is in line with the work of Englund et al. (2004) which demonstrated that early involvement makes a difference for children's later achievement. On the other hand, the achievement model has rarely been tested in the parental involvement literature but the current study results are in line with the work of Goldenberg et al. (2001). Although Goldenberg et al. (2001) specifically focused on parents' educational expectations, the current study extends this by showing that children's academic achievement informed parents' overall level of involvement. Parents were using their children's academic progress as a gauge to determine whether to increase or scale back their level of involvement.

In the achievement model, when children were doing well in school, parents were more likely to increase their involvement. Dauber and Epstein (1993) found that parents of high-performing elementary and middle school children reported more school-based parental involvement than parents of low-performing children. In addition, Goldenberg et al. (2001) argued that parents' educational expectations were informed not only by their children's academic progress but also by their children's interest in school. Perhaps, when children are doing well in school and show a strong interest for school, parents are motivated to be more involved to cultivate their children's educational success. Across time, findings suggested that prior academic achievement influenced future levels of parental involvement. As children gained and demonstrated greater academic competency, parents became less involved across the transition from fifth to eighth grade. This is in line with the work of Gershoff and colleagues

(2009). They found that as children improved their reading abilities, parents scaled back their learning support for reading. Over time, when children continue to do well in school, parents have to do less scaffolding to support their children's learning. On the other hand, when children struggle in school, parents need to remain involved or become more involved and implement specific strategies that will improve their children's learning.

Parents' level of involvement fluctuated as a result of their children's academic progress. It may be particularly salient during the transition to middle school because schooling becomes more important as children prepare for the prospects of higher education. In addition, children also rely on their peers for academic assistance as compared with their parents (Hill & Chao, 2009). Parents may be in tuned to the fact that academic performance and educational decisions during middle school have consequences for future educational trajectories.

THE RECIPROCAL INFLUENCE OF PARENTAL INVOLVEMENT AND CHILDREN'S ACHIEVEMENT BY NATIVITY STATUS

The parental involvement model and achievement model appeared to fit well for native and immigrant families, suggesting the mutual influence between parental involvement and children's reading and math achievement across time and among both native and immigrant families. Native and immigrant families were consistently involved with their children's education from elementary to middle school. The main difference that emerged between native and immigrant families is that more paths of associations were non-significant for immigrant families. However, the general strength and direction of the paths were similar across native and immigrant families. This may be explained by a power issue in which there are overwhelmingly more native families in the current study than immigrant families.

LIMITATIONS

There are a few limitations to be acknowledged for the current study. Most of the parental involvement measures in the ECLS-K are proactive activities that promote and support children's achievement. Reactive strategies in response to when children are not doing well in school, such as providing supplemental learning materials and enrolling children in tutorial programs are not assessed in the ECLS-K. In addition, it is important to include involvement strategies that may not be visible to the school system such as having high educational expectations, instilling the value of hard work, and setting aside space and time for schoolwork. For immigrant families, having high educational expectations is a prominent way in which parents transmit the value of education and the belief that education is a pathway towards social and economic mobility (Fuligni & Yoshikawa, 2003). These implicit activities may be more of indicative of parental involvement among less well-resourced and perhaps newcomer immigrant families in particular (Brown, 2012; Delgado-Gaitan, 1992; Lopez, 2001).

It is also important to consider additional covariates (i.e., school and neighborhood characteristics) that influence parental involvement and children's academic achievement, which are not modeled in the current study. There is a growing body of literature that suggests school and neighborhood context variables play a role in determining parents' involvement in their children's schooling and contribute to differences in the associations between parental involvement and achievement. School climate and structure can influence how parents are involved and if they feel welcomed by the school staff (Hoover-Dempsey, Ice, & Whitaker, 2009, Smith et al., 1997). In addition, neighborhood safety and climate determines the way in which parents are involved outside the home context (Smith et al., 1997). Parents who live in high-risk and under-resourced neighborhoods may have socialization goals emphasizing safety

and protection of their children rather than focusing on educational involvement strategies (Eccles & Harold, 1993). Selection bias is an important consideration to note because it limits the ability to draw causal inferences. There may be unobserved parent and child characteristics that influence the study findings. However, my model does attempt to control for measures of parental involvement and academic achievement at earlier time points to rule out unobserved time invariant characteristics (Duncan, Magnuson, & Ludwig, 2004).

Researchers should acknowledge the heterogeneity of different subgroups of the native and immigrant population. For the current analyses, my native sample mainly consisted of White, African American, and Latino families but these groups have different social, cultural, and economic histories that influence parents' level of involvement and children's educational experiences. Similarly, the immigrant population in the U.S is diverse with respect to race/ethnicity, migration history, country of origin, cultural background, language, and socioeconomic status. For future studies, I plan to run multiple group analyses by race/ethnicity and nativity status (e.g., White native families, Black native families, Latino native families, Latino immigrant families).

KEY STUDY STRENGTHS AND FUTURE DIRECTIONS

The current study highlights the importance of moving away from traditional measures of parental involvement because asking questions about how often parents are involved in school events is not enough. School participation is an important component of parental involvement across children's elementary to middle school years, but parents are engaged in a wide array of strategies that are also indicative of parental involvement. The current study included measures of school-based and home-based parental involvement strategies. It is important that researchers ask the appropriate parental involvement measures at different grade levels. The majority of

extant research has examined unidirectional effects of parental involvement on children's academic achievement (Fan & Chen, 2001). However, parents and children mutually influence one another, and in turn, these transactional processes impact development over time (Bell, 1968; Sameroff, 2009). Rarely have researchers explored how children's academic achievement influences parents' level of involvement and utilized a transactional approach to understand how parents and children mutually influence one another (exception, Englund et al, 2004; Gershoff, Clements, & Aber, 2009; Mistry et al., 2009). A transactional perspective to understanding the relationship between parental involvement and academic achievement is instructive because parents can be proactive in fostering positive involvement strategies to enhance their children's educational outcomes but simultaneously children's academic progress will dictate the types of educational supports that parents need to implement. The current study showed that parental involvement made a difference for children's reading and math achievement and simultaneously children's academic progress drove parents' level of involvement. Parents can be proactive in implementing various strategies to help their children in school. It is important for parents to be involved early on in their children's education because it can influence their future academic progress. In addition, parents also respond to children's needs and tailor their involvement strategies to help cultivate children's educational progress. Especially during the transition to middle school, parents learn to adjust their strategies more appropriately. When children are doing well in school, parents are less involved and scale back their involvement strategies. When children are struggling in school, parents become more responsive and implement specific involvement strategies more intensely. Parents can make a difference in fostering their children's educational success but children are also a major influence in shaping parental behaviors and this

should inform how we model the relationship between parental involvement and academic outcomes in future studies.

It is increasingly important that current research reflect diversity of the U.S. population and incorporate research on ethnic minority and immigrant children (Garcia-Coll et al., 1996; Quintana et al., 2006). However, much of the prior research on parental involvement has mainly used native, middle-class families. The current study highlighted that immigrant parents were involved in their children's education in myriad ways. The current study also showed that the patterns of association between parental involvement and academic achievement can be applied to immigrant families, suggesting that there may be "common pathways" to our understanding of how parental involvement affects children's development across diverse families. It is important to acknowledge the multitude of ways families are engaged in their children's education and to capitalize on the strengths of diverse families.

For future research, it is necessary to take an in-depth examination of what parental involvement means across diverse families, such as variations by socioeconomic status and race/ethnicity, to inform how schools and families can foster culturally and developmentally appropriate strategies to enhance children's educational outcomes. It is also important to acknowledge variations within subgroups of the immigrant population as cultural and socioeconomic differences among immigrant families can inform their support and encouragement of children's schooling (Schwartz & Stiefel, 2011). In addition, future research needs to focus on other strategies that will promote children's educational prospects. Furstenburg (2011) suggests rethinking family interventions that attempt to promote children's educational success. Although early involvement is crucial for children's academic development, Furstenburg argues that interventions solely geared towards changing parents' socialization

practices are not enough. As evidenced by the current study, the covariates that were most predictive of parents' level of involvement were family resources. Higher levels of human capital were associated with higher levels of parental involvement. In addition, barriers to parental involvement (e.g., lack of transportation, lack of child care, work schedule conflicts) were associated with lower levels of parental involvement. Schools and family intervention programs should focus less on telling parents how to be involved but target family resources and reduce barriers that prevent parents from being engaged in their children's schooling. Educational policies should consider strategies to increase parental education and income, improve communication between families and schools, ensure that parents feel welcomed at school, and immerse parents and children in intensive programs to build school skills.

APPENDICES

Table 1. Datapoints and Parental Involvement Measures

| | First Grade | Third Grade | Fifth Grade | Eighth Grade |
|----------------------------|-------------|-------------|-------------|--------------|
| Cognitive Stimulation | ✓ | ✓ | | |
| Number of Books | ✓ | ✓ | ✓ | |
| Extracurricular Activities | ✓ | ✓ | ✓ | |
| School Participation | ✓ | ✓ | ✓ | ✓ |
| Parent-Child Activities | | | | ✓ |
| School Discussions | | | | ✓ |

Table 2. Sample Descriptives

| | Full Sample N=7200 | | Native Families n=5000 | | Immigrant Families n=1200 | |
|-----------------------------|-----------------------|------|---------------------------|------|------------------------------|------|
| | Mean or % | SE | Mean or % | SE | Mean or % | SE |
| Parental Involvement | | | | | | |
| First Grade | | | | | | |
| Cognitive Stimulation | 0.02 | 0.02 | 0.11 ^a | 0.02 | -0.42 ^b | 0.03 |
| Number of Books | 2.73 | 0.01 | 2.75 ^a | 0.01 | 2.60 ^b | 0.02 |
| Extracurricular Activities | 102.69 | 3.08 | 112.91 ^a | 3.43 | 53.52 ^b | 3.14 |
| School Participation | 1.52 | 0.03 | 1.63 ^a | 0.04 | 0.96 ^b | 0.05 |
| Third Grade | | | | | | |
| Cognitive Stimulation | 4.08 | 0.05 | 4.21 ^a | 0.05 | 3.51 ^b | 0.07 |
| Number of Books | -0.01 | 0.02 | 0.05 ^a | 0.02 | -0.34 ^b | 0.03 |
| Extracurricular Activities | 2.61 | 0.01 | 2.63 ^a | 0.01 | 2.52 ^b | 0.02 |
| School Participation | 121.98 | 4.41 | 133.61 ^a | 5.14 | 66.93 ^b | 3.78 |
| Fifth Grade | | | | | | |
| Number of Books | 1.61 | 0.03 | 1.68 ^a | 0.03 | 1.29 ^b | 0.04 |
| Extracurricular Activities | 4.18 | 0.05 | 4.25 ^a | 0.05 | 3.82 ^b | 0.06 |
| School Participation | -0.02 | 0.03 | 0.04 ^a | 0.03 | -0.29 ^b | 0.04 |
| Eighth Grade | | | | | | |
| Number of Books | 108.14 | 3.61 | 116.39 ^a | 4.07 | 68.68 ^b | 4.34 |
| Extracurricular Activities | 1.70 | 0.03 | 1.73 ^a | 0.04 | 1.52 ^b | 0.05 |
| School Participation | 4.06 | 0.05 | 4.12 ^a | 0.06 | 3.73 ^b | 0.06 |
| Parent-Child Activities | -0.02 | 0.02 | 0.02 ^a | 0.02 | -0.18 ^b | 0.04 |
| School Discussions | 2.52 | 0.04 | 2.55 | 0.04 | 2.40 | 0.07 |
| | 3.32 | 0.01 | 3.35 ^a | 0.01 | 3.18 ^b | 0.02 |
| | 3.36 | 0.01 | 3.37 | 0.01 | 3.34 | 0.02 |

Note. Different subscripts refer to differences significant to $p < .0009$. N's rounded to 50. All reported means and percentages are weighted. Standard errors are linearized.

Table 2. Sample Descriptives (continued)

| | Full Sample N=7200 | | Native Families n=5000 | | Immigrant Families n=1200 | |
|------------------------------------|-----------------------|------|---------------------------|------|------------------------------|------|
| | Mean or % | SE | Mean or % | SE | Mean or % | SE |
| Achievement Outcomes | | | | | | |
| First Grade | | | | | | |
| Direct Child Assessment of Reading | 78.07 | 0.60 | 78.81 ^a | 0.67 | 74.26 ^b | 1.00 |
| Direct Child Assessment of Math | 61.88 | 0.47 | 62.89 ^a | 0.55 | 57.18 ^b | 0.70 |
| Third Grade | | | | | | |
| Direct Child Assessment of Reading | 128.01 | 0.81 | 129.64 ^a | 0.93 | 120.68 ^b | 1.19 |
| Direct Child Assessment of Math | 99.83 | 0.77 | 100.80 ^a | 0.91 | 95.47 ^b | 1.07 |
| Fifth Grade | | | | | | |
| Direct Child Assessment of Reading | 150.30 | 0.80 | 151.75 ^a | 0.92 | 144.04 ^b | 1.20 |
| Direct Child Assessment of Math | 123.92 | 0.86 | 124.56 | 1.02 | 121.15 | 1.18 |
| Eighth Grade | | | | | | |
| Direct Child Assessment of Reading | 168.91 | 0.95 | 169.92 ^a | 1.11 | 164.12 ^b | 1.22 |
| Direct Child Assessment of Math | 140.66 | 0.72 | 141.19 | 0.84 | 138.11 | 1.10 |

Note. Different subscripts refer to differences significant to $p < .0009$. N's rounded to 50. All reported means and percentages are weighted. Standard errors are linearized.

Table 2. Sample Descriptives (continued)

| | Full Sample N=7200 | | Native Families n=5000 | | Immigrant Families n=1200 | |
|--|-----------------------|------|---------------------------|------|------------------------------|------|
| | Mean or % | SE | Mean or % | SE | Mean or % | SE |
| Covariates | | | | | | |
| Child Gender (1=male) | 52% | -- | 52% | -- | 51% | -- |
| Child Race: White (1=yes) | 58% | -- | 67% ^a | -- | 15% ^b | -- |
| Child Race: African-American/Black (1=yes) | 16% | -- | 18% ^a | -- | 8% ^b | -- |
| Child Race: Hispanic/Latino (1=yes) | 18% | -- | 10% ^a | -- | 59% ^b | -- |
| Child Race: Asian (1=yes) | 3% | -- | 1% ^a | -- | 14% ^b | -- |
| Child Race: Other/Multiracial (1=yes) | 4% | -- | 4% | -- | 4% | -- |
| Child Changed Schools from K-1st grade (1=yes) | 14% | -- | 15% | -- | 12% | -- |
| Direct Child Assessment of Math (K grade) | 36.68 | 0.44 | 37.44 ^a | 0.37 | 33.01 ^b | 0.50 |
| Direct Child Assessment of Reading (K grade) | 46.89 | 0.68 | 47.02 | 0.40 | 46.10 | 0.76 |
| Direct Child Assessment of General Knowledge/Science (K grade) | 27.62 | 0.38 | 28.23 ^a | 0.24 | 23.86 ^b | 0.37 |
| Mother's Education (K grade) | 4.36 | 0.05 | 4.54 ^a | 0.05 | 3.48 ^b | 0.09 |
| Father's Education (K grade) | 4.46 | 0.06 | 4.63 ^a | 0.06 | 3.68 ^b | 0.11 |
| Mother's Employment- Full Time (1=yes, K grade) | 46% | -- | 47% ^a | -- | 39% ^b | -- |
| Mother's Employment- Part Time (1=yes, K grade) | 23% | -- | 24% | -- | 17% | -- |
| Mother's Employment- Not Employed (1=yes, K grade) | 31% | -- | 29% ^a | -- | 44% ^b | -- |
| Father's Employment- Full Time (1=yes, K grade) | 92% | -- | 93% | -- | 88% | -- |
| Father's Employment- Part Time (1=yes, K grade) | 3% | -- | 3% | -- | 5% | -- |
| Father's Employment- Not Employed (1=yes, K grade) | 5% | -- | 4% | -- | 7% | -- |
| Income (K grade) | 3.01 | 0.10 | 3.18 ^a | 0.09 | 2.25 ^b | 0.10 |
| Married (1=yes, K grade) | 72% | -- | 70% ^a | -- | 78% ^b | -- |
| Mother's Age at Migration | 3.21 | 0.50 | -- | -- | 19.18 | 0.41 |
| Father's Age at Migration | 19.70 | 0.39 | -- | -- | 22.34 | 0.43 |
| Home Language (1=English, K grade) | 88% | -- | 98% ^a | -- | 38% ^b | -- |
| Parental Involvement Barriers (K grade) | 1.39 | 0.07 | 1.32 ^a | 0.03 | 1.76 ^b | 0.07 |
| Urbanicity- Small Town (K grade) | 21% | -- | 24% ^a | -- | 8% ^b | -- |
| Urbanicity- Suburb (K grade) | 42% | -- | 44% | -- | 37% | -- |
| Urbanicity- Large City (K grade) | 37% | -- | 33% ^a | -- | 55% ^b | -- |

Note. Different subscripts refer to differences significant to $p < .0009$. N's rounded to 50. All reported means and percentages are weighted. Standard errors are linearized.

Table 3. Covariates Predicting First Grade Parental Involvement and Reading Achievement (Full Sample)

| Covariates | Parental Involvement | | Academic Achievement | |
|--|----------------------|------|----------------------|------|
| | β | SE | β | SE |
| Child Gender (1=male) | -0.09*** | 0.01 | -0.02 | 0.01 |
| Child Race: African-American/Black (1=yes) | -0.11*** | 0.02 | -0.04* | 0.02 |
| Child Race: Hispanic/Latino (1=yes) | -0.07** | 0.02 | 0.01 | 0.02 |
| Child Race: Asian (1=yes) | -0.06*** | 0.01 | 0.04** | 0.01 |
| Child Race: Other/Multiracial (1=yes) | 0.00 | 0.02 | 0.01 | 0.01 |
| Child Changed Schools from K-1st grade (1=yes) | -0.02 | 0.02 | 0.04 | 0.02 |
| Direct Child Assessment of Reading (K grade) | 0.02 | 0.02 | 0.70*** | 0.01 |
| Mother's Education (K grade) | 0.19*** | 0.02 | 0.06*** | 0.02 |
| Father's Education (K grade) | 0.14*** | 0.03 | 0.07*** | 0.02 |
| Mother's Employment- Part Time (1=yes, K grade) | 0.05* | 0.02 | 0.01 | 0.01 |
| Mother's Employment- Not Employed (1=yes, K grade) | 0.01 | 0.02 | 0.01 | 0.01 |
| Father's Employment- Part Time (1=yes, K grade) | 0.01 | 0.02 | 0.01 | 0.01 |
| Father's Employment- Not Employed (1=yes, K grade) | -0.03 | 0.02 | -0.01 | 0.01 |
| Income (K grade) | 0.09*** | 0.02 | 0.01 | 0.02 |
| Married (1=yes, K grade) | 0.10*** | 0.02 | 0.04** | 0.02 |
| Immigrant Status (1=yes) | -0.06* | 0.03 | -0.01 | 0.02 |
| Mother's Age at Migration | -0.01 | 0.04 | 0.00 | 0.03 |
| Father's Age at Migration | -0.11** | 0.03 | -0.05 | 0.03 |
| Home Language (1=English, K grade) | 0.08** | 0.03 | 0.03 | 0.02 |
| Parental Involvement Barriers (K grade) | -0.08*** | 0.02 | -0.02* | 0.01 |
| Urbanicity- Small Town (K grade) | -0.02 | 0.02 | 0.00 | 0.02 |
| Urbanicity- Suburb (K grade) | -0.04* | 0.02 | -0.03 | 0.02 |

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 4. Covariates Predicting First Grade Parental Involvement and Reading Achievement (Native Sample)

| Covariates | Parental Involvement | | Academic Achievement | |
|--|----------------------|------|----------------------|------|
| | β | SE | β | SE |
| Child Gender (1=male) | -0.10*** | 0.02 | 0.00 | 0.01 |
| Child Race: African-American/Black (1=yes) | -0.13*** | 0.02 | -0.03 | 0.02 |
| Child Race: Hispanic/Latino (1=yes) | -0.04 | 0.02 | 0.01 | 0.01 |
| Child Race: Asian (1=yes) | -0.02* | 0.01 | 0.01 | 0.01 |
| Child Race: Other/Multiracial (1=yes) | 0.00 | 0.02 | -0.01 | 0.01 |
| Child Changed Schools from K-1st grade (1=yes) | 0.00 | 0.02 | 0.04 | 0.02 |
| Direct Child Assessment of Reading (K grade) | 0.08*** | 0.02 | 0.70*** | 0.01 |
| Mother's Education (K grade) | 0.17*** | 0.03 | 0.05** | 0.02 |
| Father's Education (K grade) | 0.15*** | 0.03 | 0.07*** | 0.02 |
| Mother's Employment- Part Time (1=yes, K grade) | 0.06** | 0.02 | 0.01 | 0.01 |
| Mother's Employment- Not Employed (1=yes, K grade) | 0.03 | 0.02 | 0.02 | 0.02 |
| Father's Employment- Part Time (1=yes, K grade) | 0.02 | 0.02 | 0.01 | 0.01 |
| Father's Employment- Not Employed (1=yes, K grade) | 0.00 | 0.03 | -0.01 | 0.01 |
| Income (K grade) | 0.08*** | 0.02 | 0.00 | 0.01 |
| Married (1=yes, K grade) | 0.12*** | 0.03 | 0.04* | 0.02 |
| Home Language (1=English, K grade) | 0.04 | 0.03 | 0.02 | 0.01 |
| Parental Involvement Barriers (K grade) | -0.08*** | 0.02 | -0.02 | 0.01 |
| Urbanicity- Small Town (K grade) | -0.06* | 0.03 | -0.01 | 0.02 |
| Urbanicity- Suburb (K grade) | -0.04 | 0.03 | 0.01 | 0.02 |

Note. *p<.05; **p<.01; ***p<.001

Table 5. Covariates Predicting First Grade Parental Involvement and Reading Achievement (Immigrant Sample)

| Covariates | Parental Involvement | | Academic Achievement | |
|--|----------------------|------|----------------------|------|
| | β | SE | β | SE |
| Child Gender (1=male) | -0.07* | 0.03 | -0.05* | 0.02 |
| Child Race: African-American/Black (1=yes) | -0.12* | 0.05 | -0.05 | 0.04 |
| Child Race: Hispanic/Latino (1=yes) | -0.17** | 0.06 | 0.00 | 0.05 |
| Child Race: Asian (1=yes) | -0.16*** | 0.04 | 0.09** | 0.04 |
| Child Race: Other/Multiracial (1=yes) | -0.01 | 0.03 | 0.04 | 0.02 |
| Child Changed Schools from K-1st grade (1=yes) | -0.02 | 0.03 | 0.05 | 0.03 |
| Direct Child Assessment of Reading (K grade) | 0.04 | 0.04 | 0.66*** | 0.03 |
| Mother's Education (K grade) | 0.26*** | 0.05 | 0.08* | 0.04 |
| Father's Education (K grade) | 0.09* | 0.05 | 0.08 | 0.05 |
| Mother's Employment- Part Time (1=yes, K grade) | 0.02 | 0.03 | -0.02 | 0.03 |
| Mother's Employment- Not Employed (1=yes, K grade) | -0.04 | 0.04 | -0.03 | 0.03 |
| Father's Employment- Part Time (1=yes, K grade) | -0.03 | 0.04 | 0.00 | 0.03 |
| Father's Employment- Not Employed (1=yes, K grade) | -0.13** | 0.04 | 0.00 | 0.03 |
| Income (K grade) | 0.07* | 0.03 | -0.02 | 0.03 |
| Married (1=yes, K grade) | 0.03 | 0.03 | 0.03 | 0.02 |
| Mother's Age at Migration | 0.01 | 0.05 | 0.01 | 0.04 |
| Father's Age at Migration | -0.09* | 0.03 | -0.06 | 0.04 |
| Home Language (1=English, K grade) | 0.13** | 0.04 | 0.05 | 0.04 |
| Parental Involvement Barriers (K grade) | -0.07* | 0.03 | -0.04 | 0.02 |
| Urbanicity- Small Town (K grade) | 0.02 | 0.03 | -0.02 | 0.04 |
| Urbanicity- Suburb (K grade) | 0.05 | 0.04 | -0.06 | 0.03 |

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Figure 1. Conceptual Model

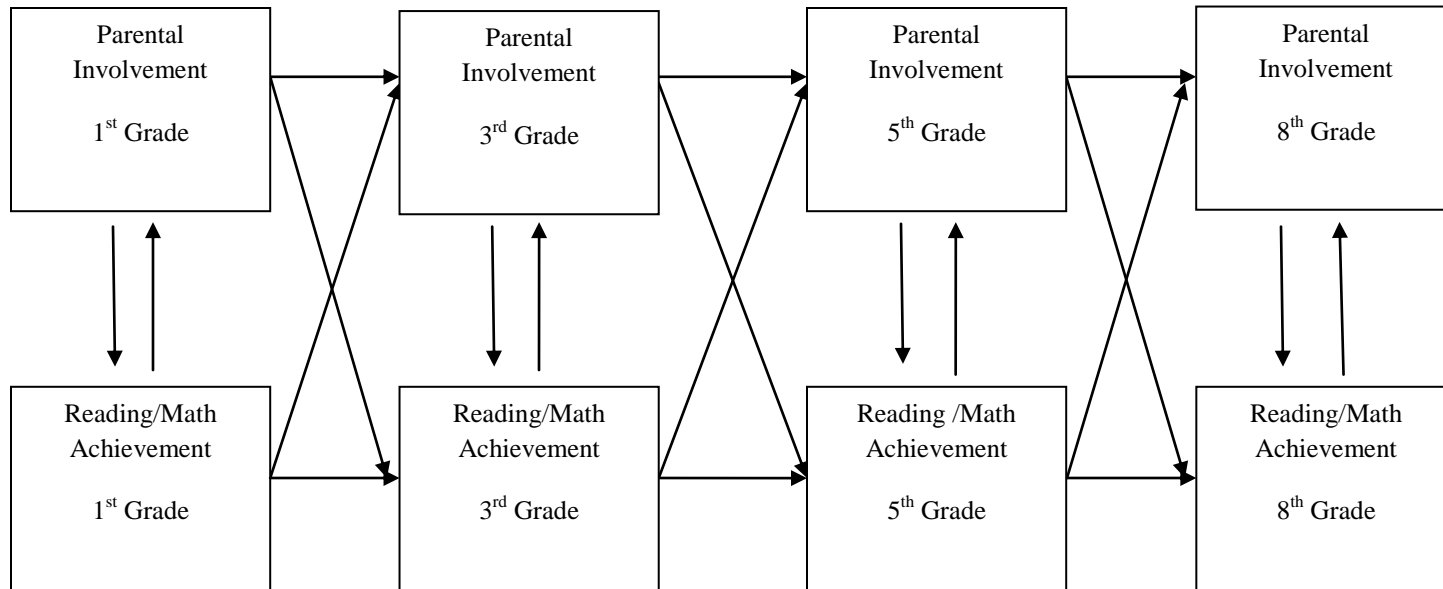


Figure 2. Parental Involvement Model

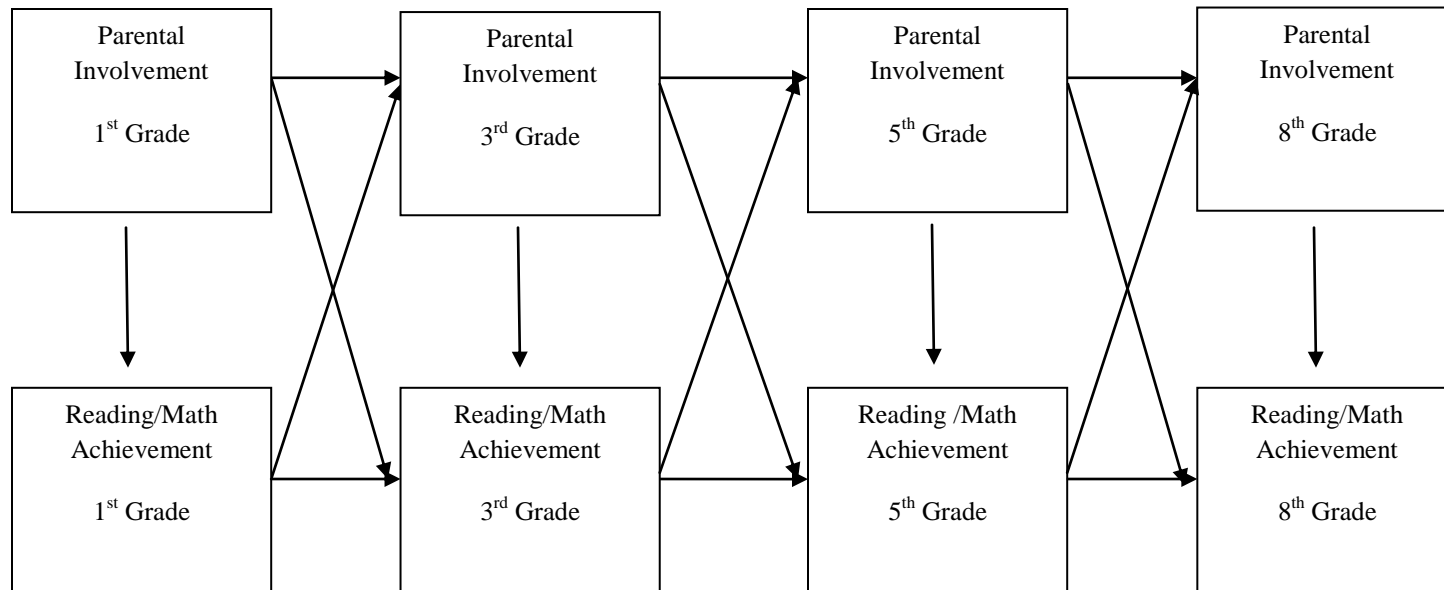


Figure 3. Achievement Model

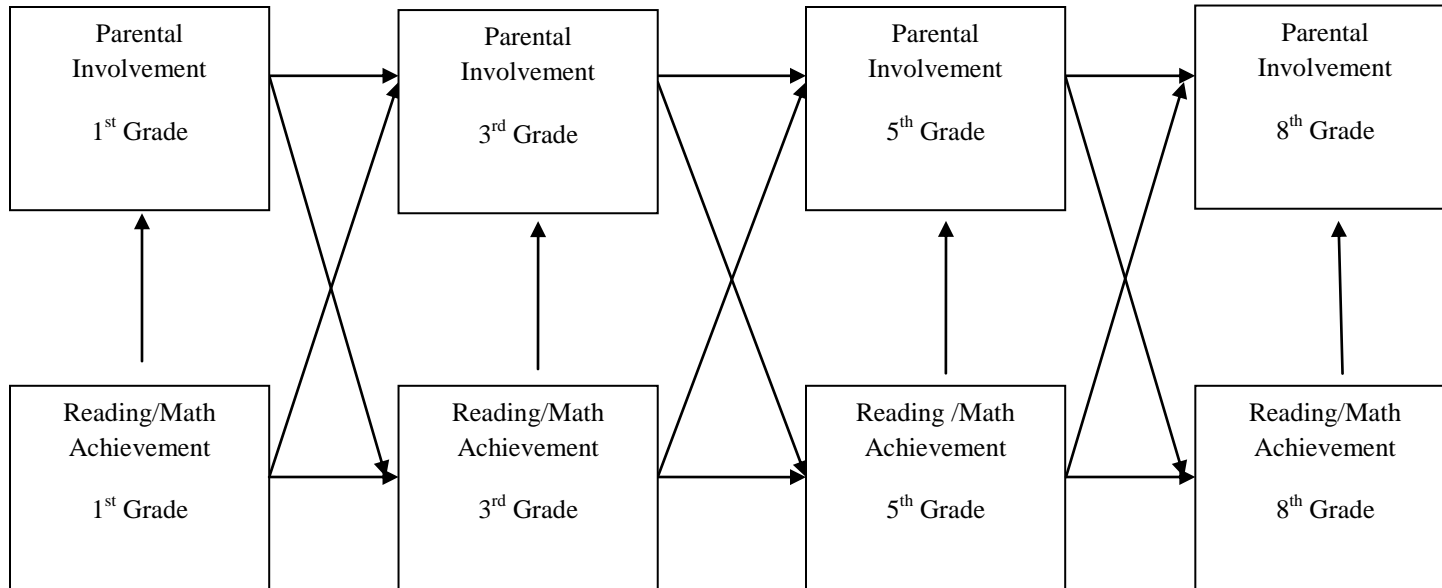
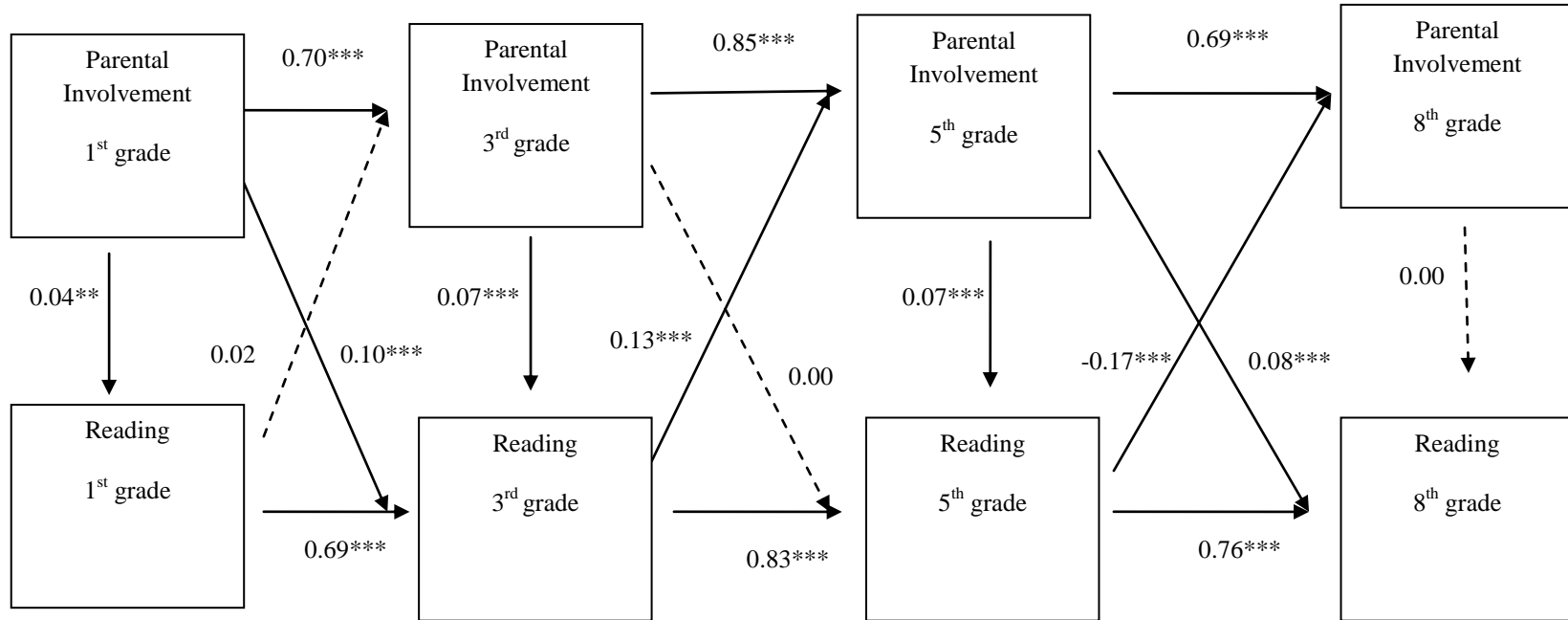


Figure 4. Parental Involvement Model for Reading Achievement, Full Sample (N=7,100)

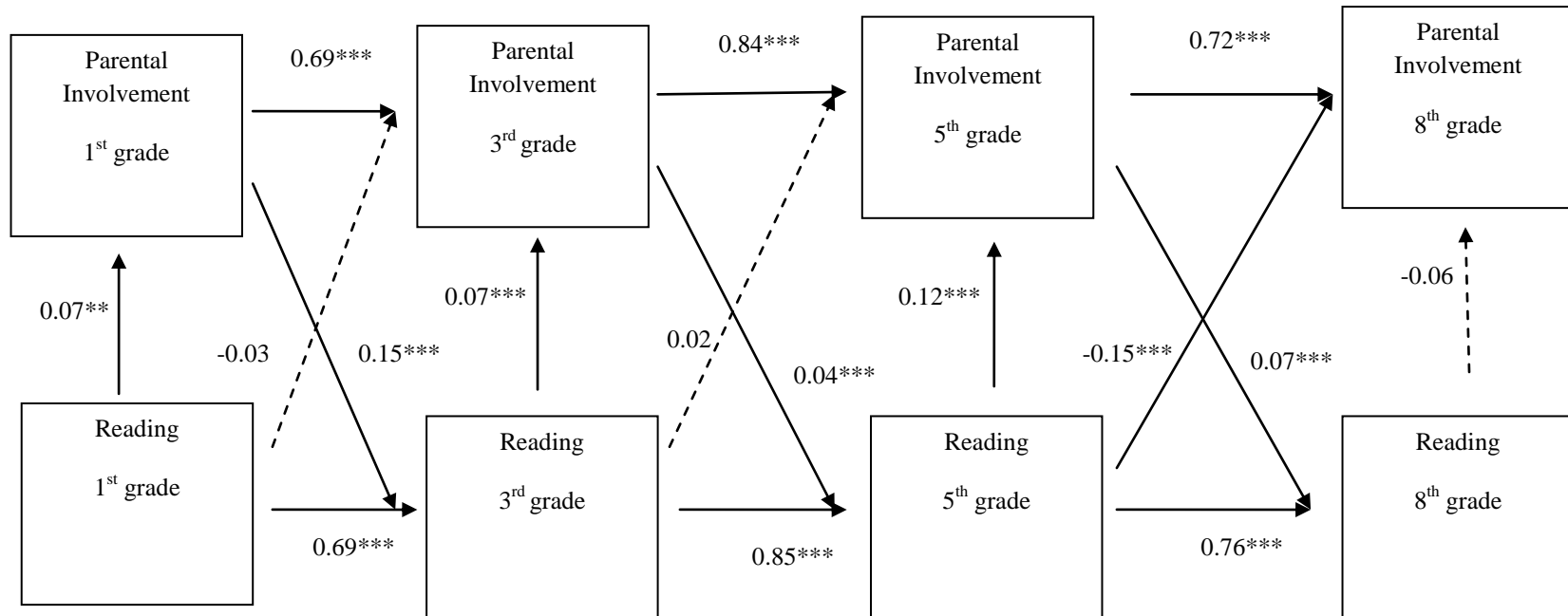


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and reading: gender, child's race/ethnicity, changed schools, K grade reading achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, immigrant status, mom/dad age at migration, parental involvement barriers, urbanicity

χ^2 (142) = 829.363; CFI = 0.956; RMSEA = 0.026

Figure 5. Achievement Model for Reading Achievement, Full Sample (N=7,100)

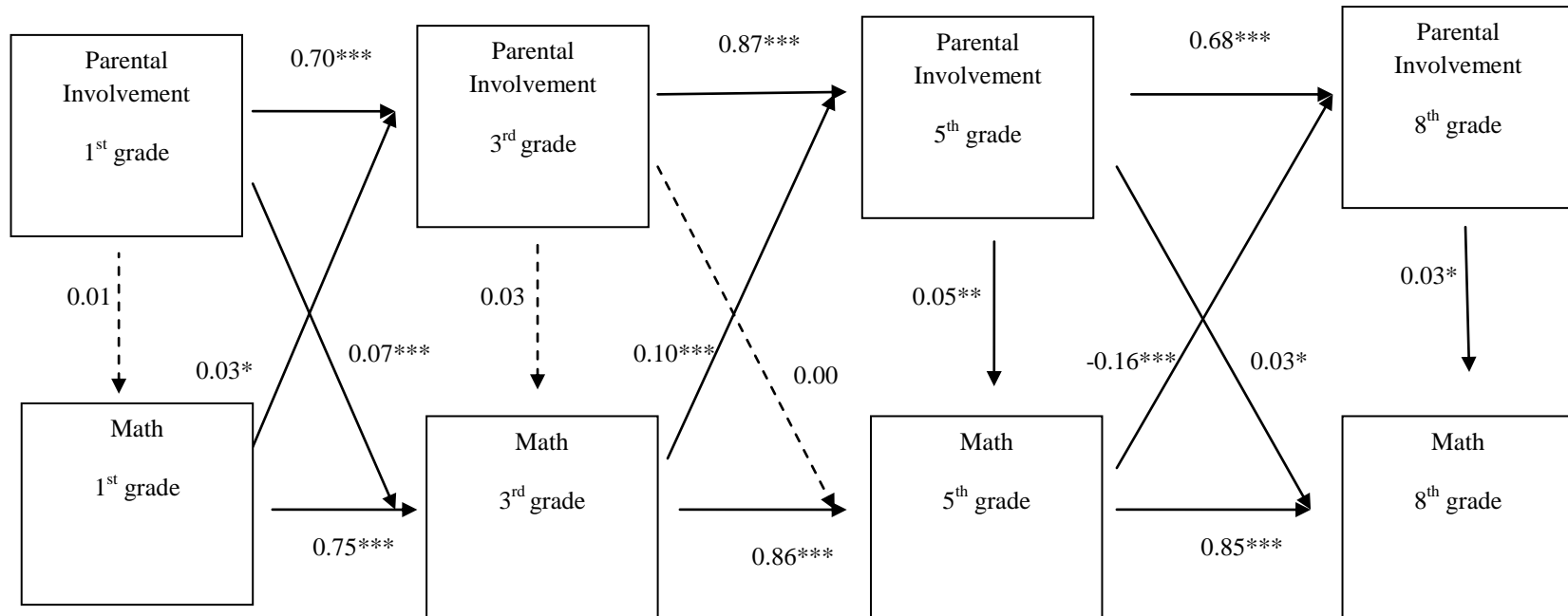


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and reading: gender, child's race/ethnicity, changed schools, K grade reading achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, immigrant status, mom/dad age at migration, parental involvement barriers, urbanicity

$\chi^2 (142) = 829.734$; CFI = 0.956; RMSEA = 0.026

Figure 6. Parental Involvement Model for Math Achievement, Full Sample (N=7,100)

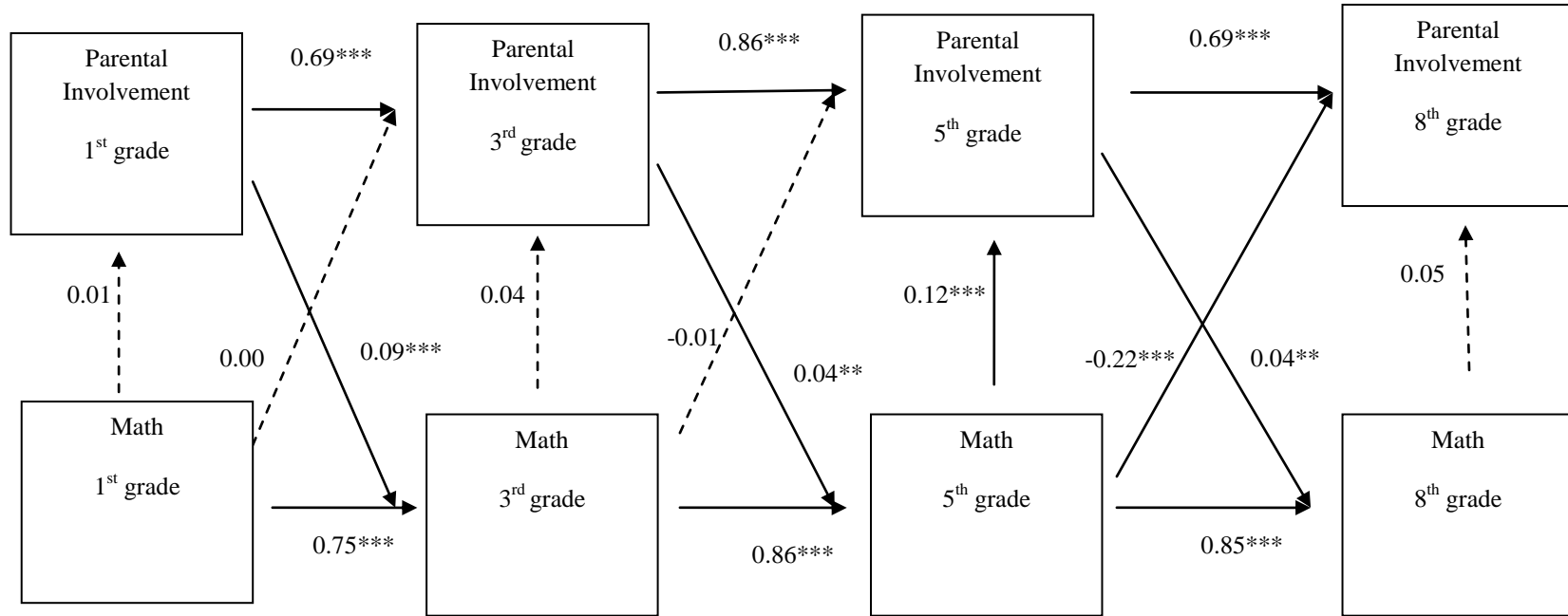


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and math: gender, child's race/ethnicity, changed schools, K grade math achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, immigrant status, mom/dad age at migration, parental involvement barriers, urbanicity

χ^2 (142) = 1068.858; CFI = 0.945; RMSEA = 0.030

Figure 7. Achievement Model for Math Achievement, Full Sample (N=7,100)

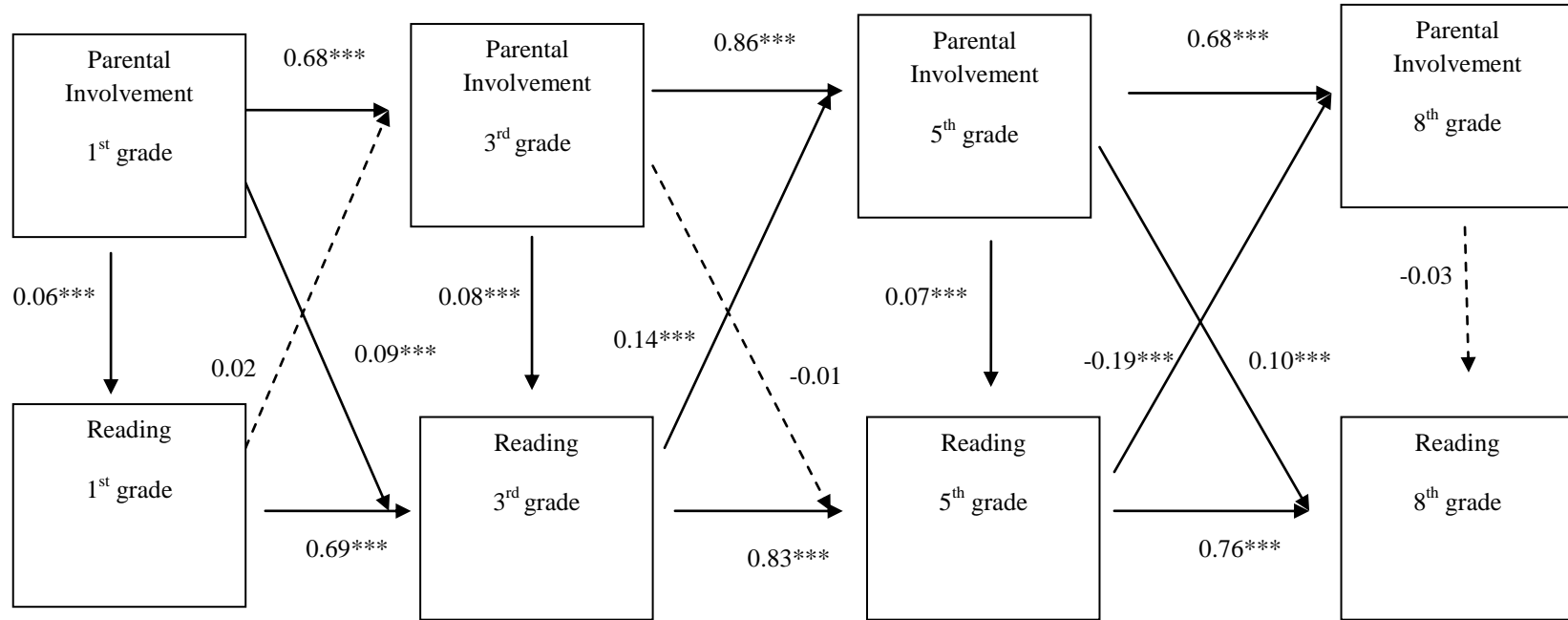


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and math: gender, child's race/ethnicity, changed schools, K grade math achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, immigrant status, mom/dad age at migration, parental involvement barriers, urbanicity

χ^2 (142) = 1070.030; CFI = 0.945; RMSEA = 0.030

Figure 8. Parental Involvement Model for Reading Achievement, Native Sample (N=5,800)

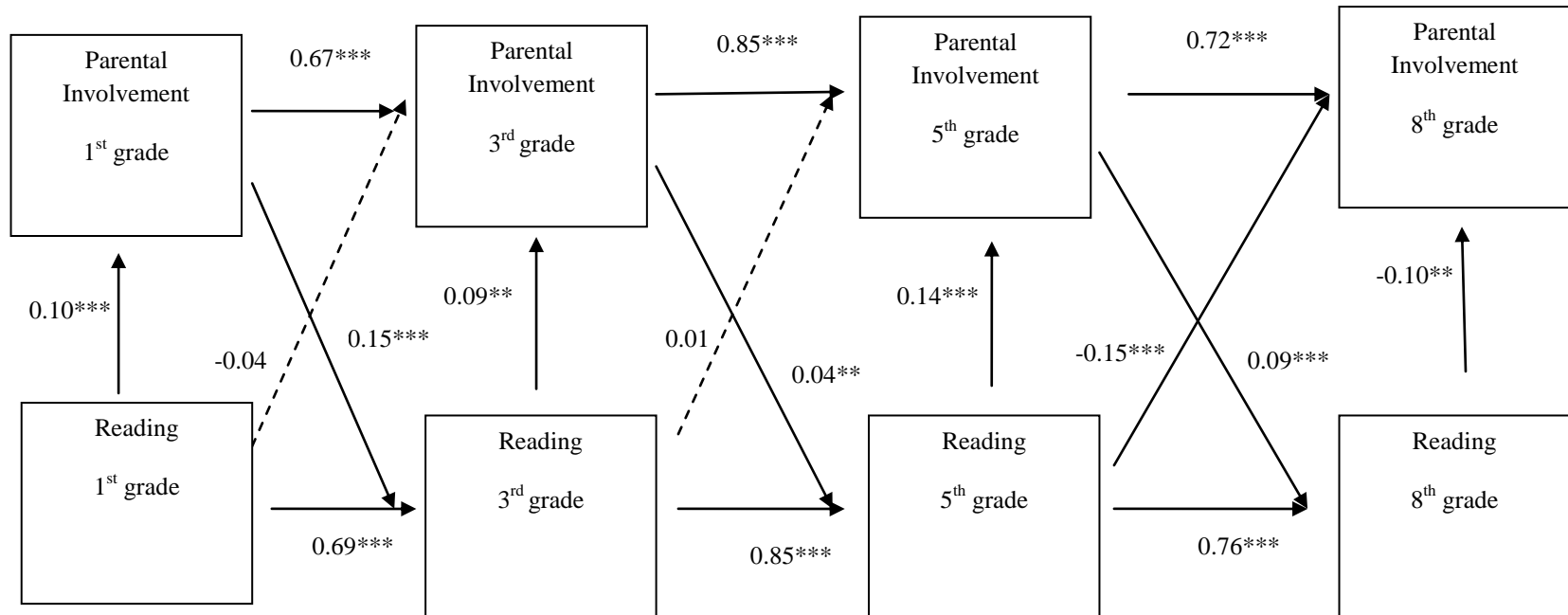


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and reading: gender, child’s race/ethnicity, changed schools, K grade reading achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, parental involvement barriers, urbanicity

χ^2 (124) = 644.532; CFI = 0.955; RMSEA = 0.027

Figure 9. Achievement Model for Reading Achievement, Native Sample (N=5,800)

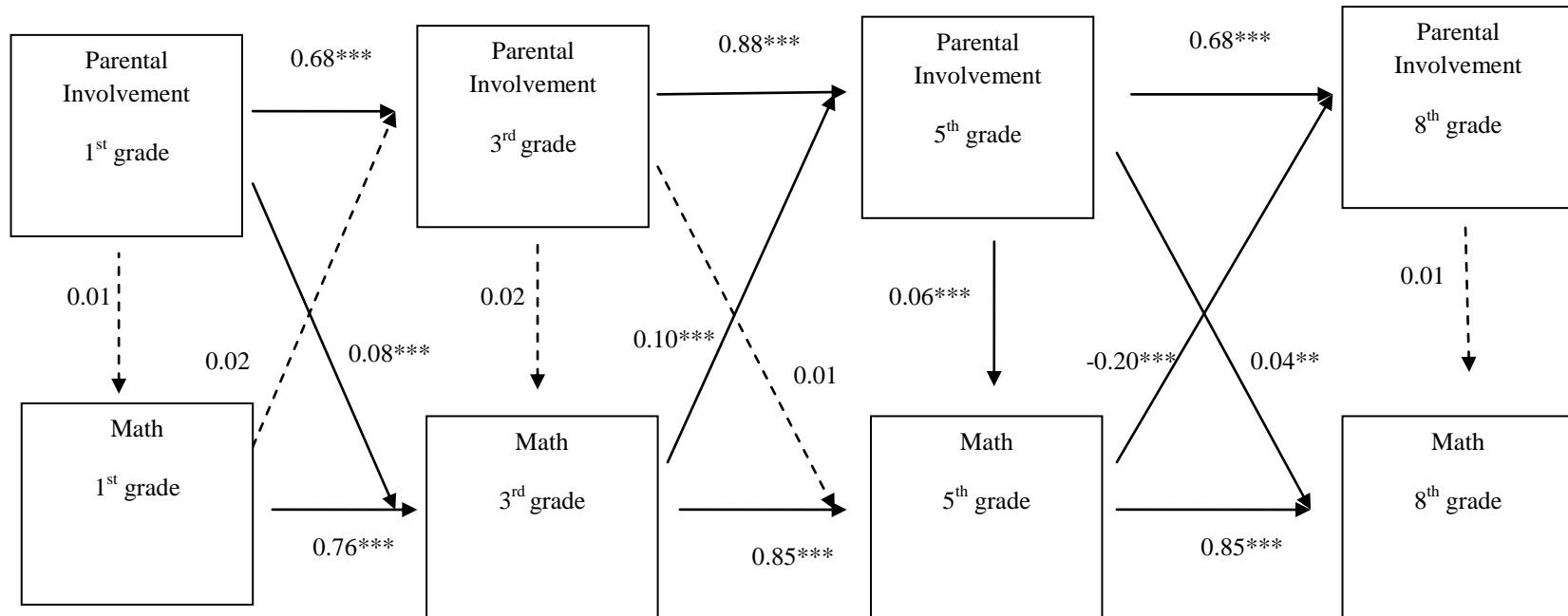


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and reading: gender, child's race/ethnicity, changed schools, K grade reading achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, parental involvement barriers, urbanicity

χ^2 (124) = 644.301; CFI = 0.955; RMSEA = 0.027

Figure 10. Parental Involvement Model for Math Achievement, Native Sample (N=5,800)

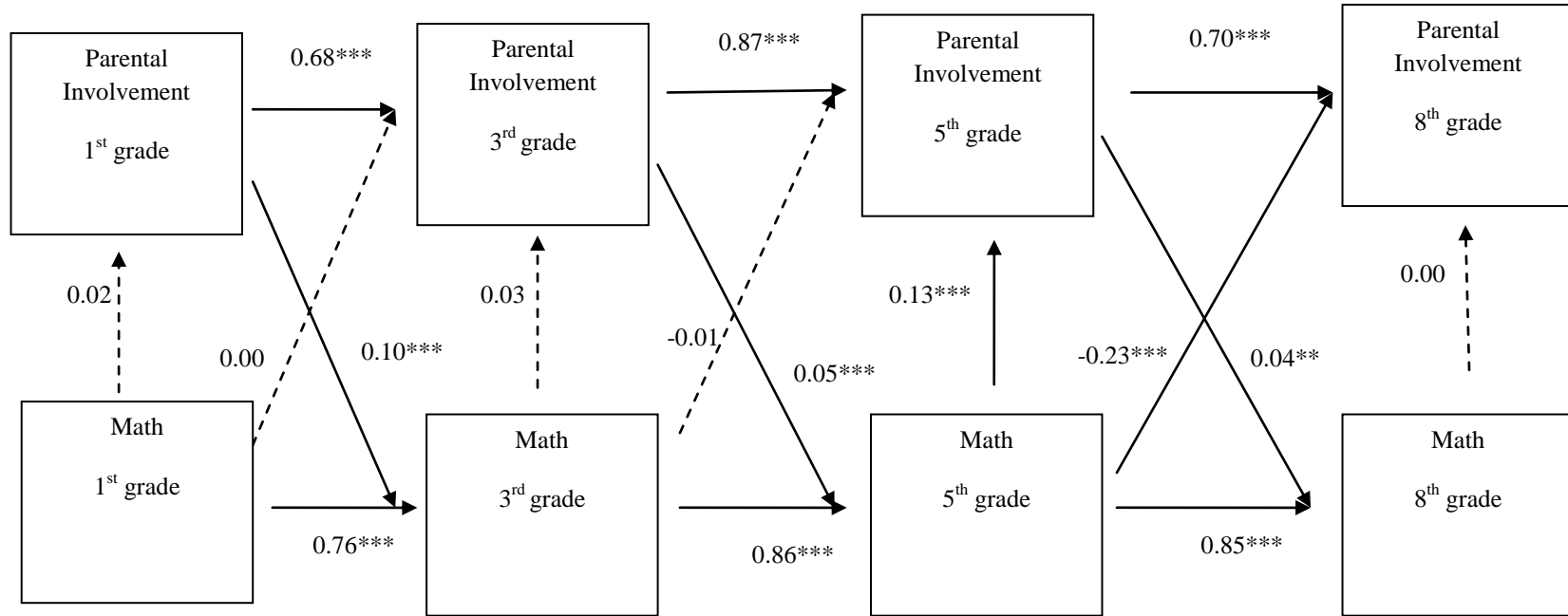


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and math: gender, child's race/ethnicity, changed schools, K grade math achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, parental involvement barriers, urbanicity

χ^2 (124) = 819.646; CFI = 0.946; RMSEA = 0.031

Figure 11. Achievement Model for Math Achievement, Native Sample (N=5,800)

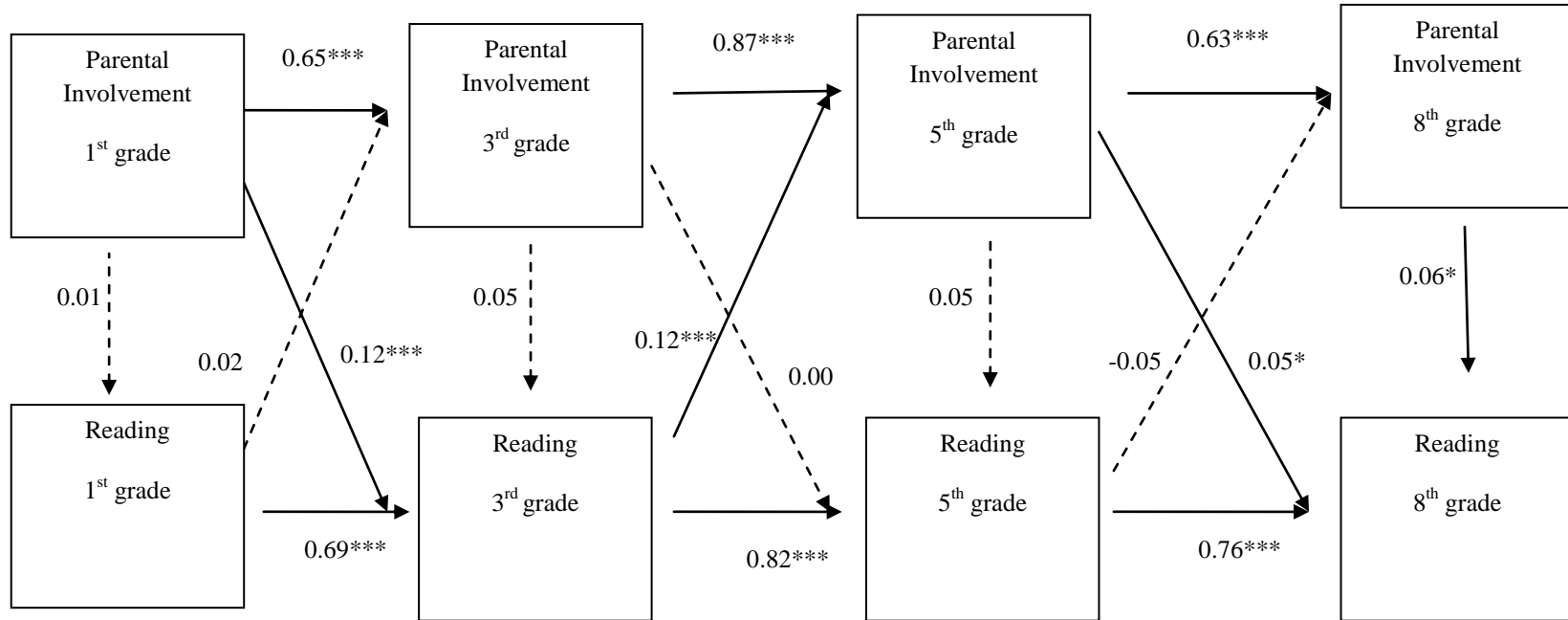


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and math: gender, child's race/ethnicity, changed schools, K grade math achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, parental involvement barriers, urbanicity

$\chi^2 (124) = 822.353$; CFI = 0.946; RMSEA = 0.031

Figure 12. Parental Involvement Model for Reading Achievement, Immigrant Sample (N=1,300)

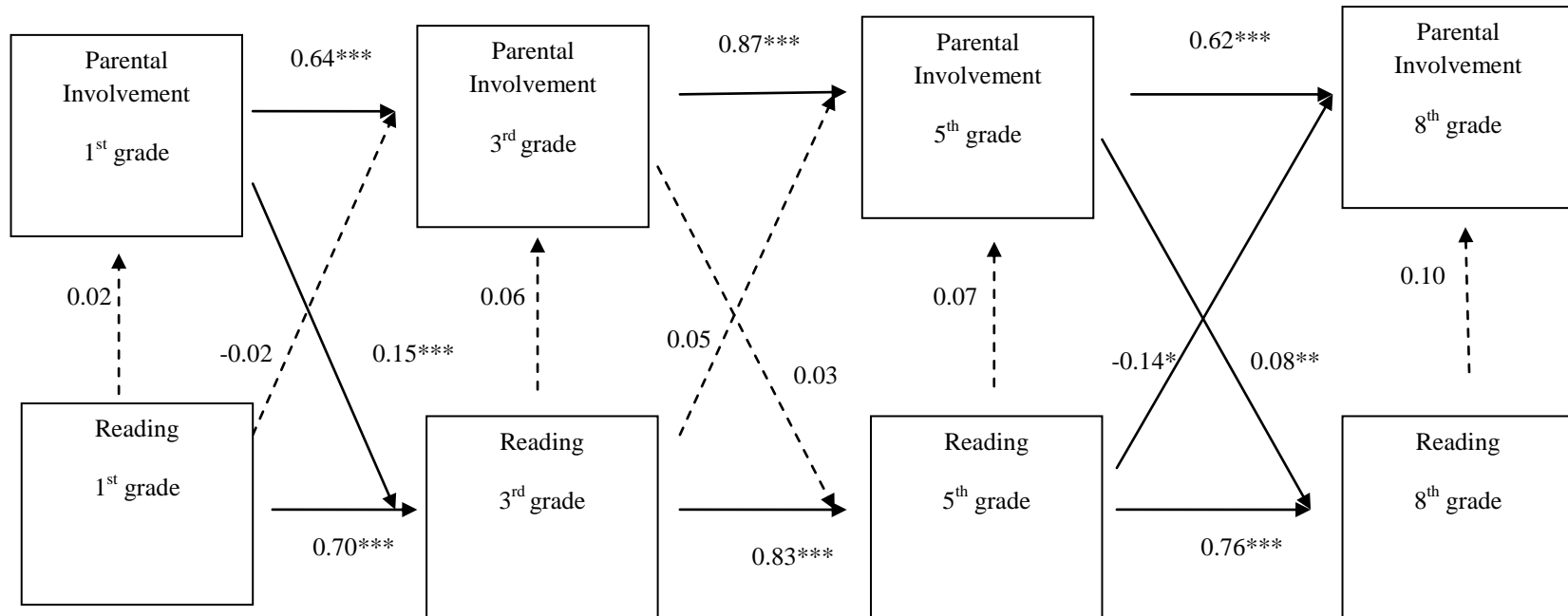


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and reading: gender, child's race/ethnicity, changed schools, K grade reading achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, mom/dad age at migration, parental involvement barriers, urbanicity

χ^2 (136) = 392.969; CFI = 0.937; RMSEA = 0.039

Figure 13. Achievement Model for Reading Achievement, Immigrant Sample (N=1,300)

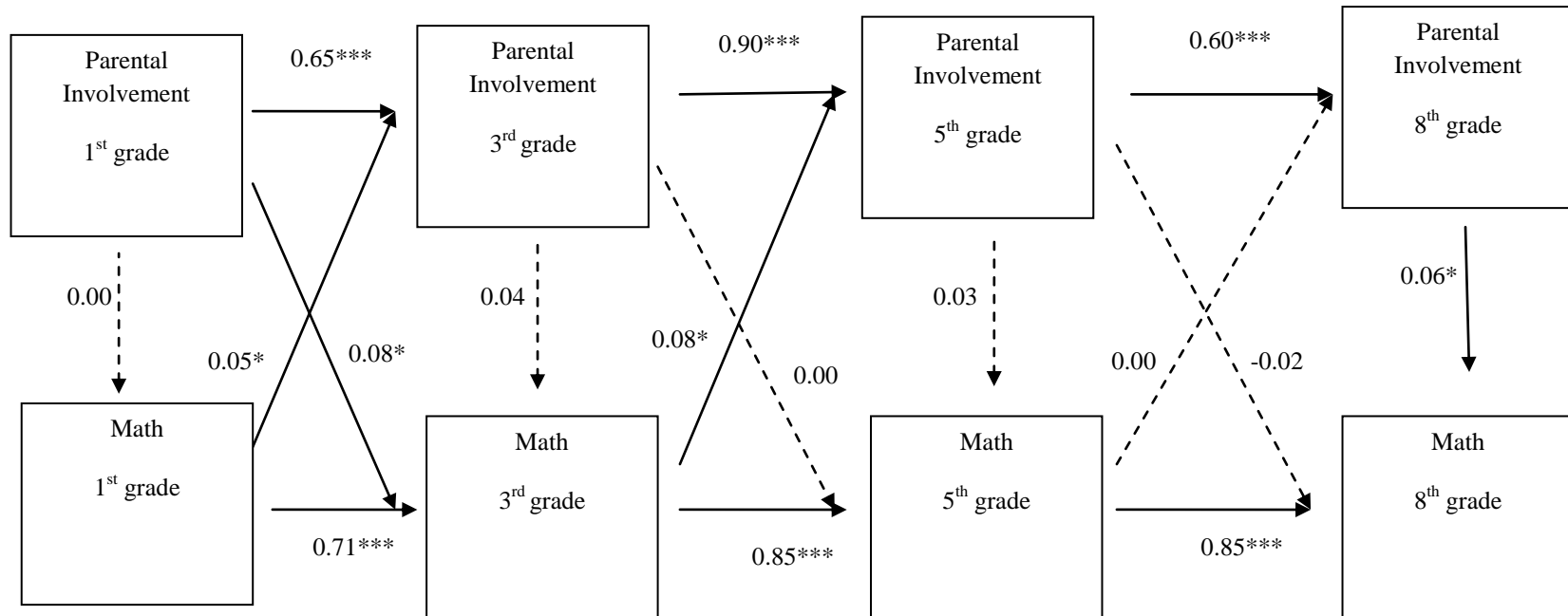


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and reading: gender, child's race/ethnicity, changed schools, K grade reading achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, mom/dad age at migration, parental involvement barriers, urbanicity

χ^2 (136) = 397.713; CFI = 0.936; RMSEA = 0.039

Figure 14. Parental Involvement Model for Math Achievement, Immigrant Sample (N=1,300)

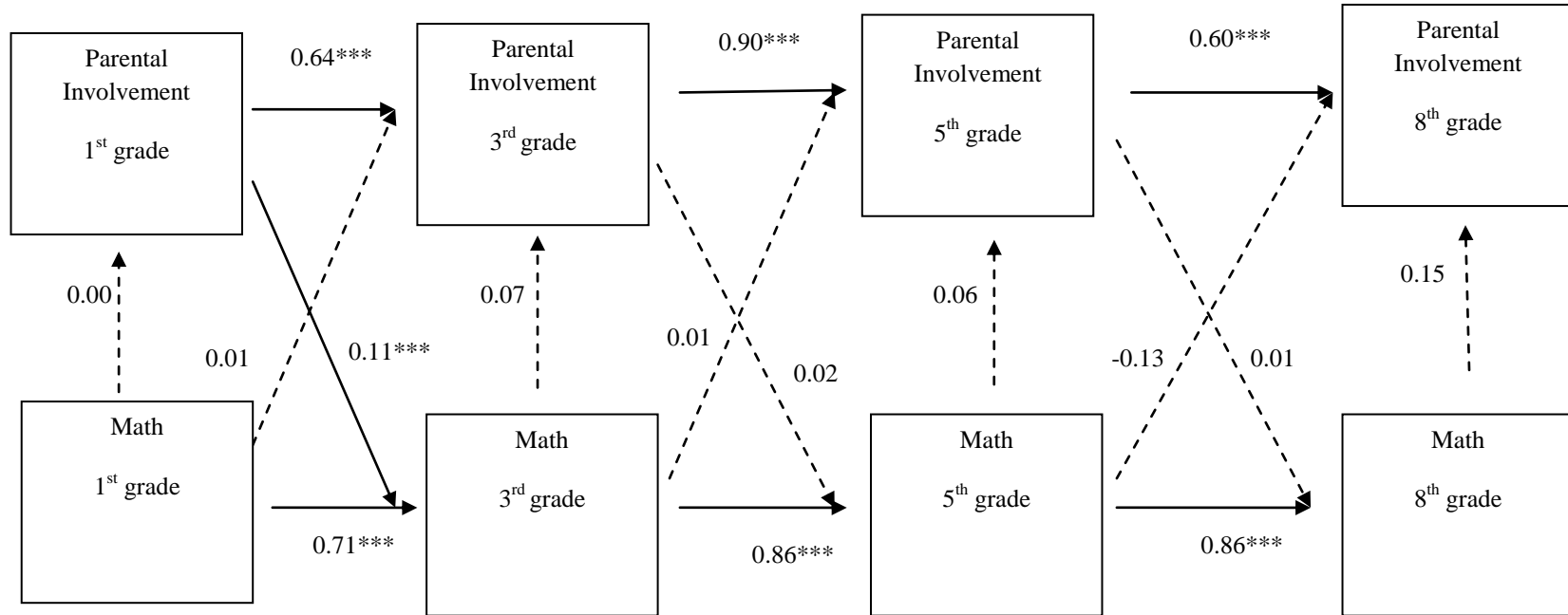


Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and math: gender, child's race/ethnicity, changed schools, K grade math achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, immigrant status, mom/dad age at migration, parental involvement barriers, urbanicity

χ^2 (136) = 484.092; CFI = 0.920; RMSEA = 0.045

Figure 15. Achievement Model for Math Achievement, Immigrant Sample (N=1,300)



Note: Dashed lines represent non-significance. *p<.05, **p<.01, ***p<.001.

Covariates on first grade parental involvement and math: gender, child's race/ethnicity, changed schools, K grade math achievement, mom/dad education, mom/dad employment status, INR, marital status, home language, mom/dad age at migration, parental involvement barriers, urbanicity

χ^2 (136) = 486.716; CFI = 0.920; RMSEA = 0.04

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