



# Parental involvement, child effort, and the development of immigrant boys' and girls' reading and mathematics skills: A latent difference score growth model<sup>☆</sup>



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## ABSTRACT

Gender differences in elementary school performance among immigrant children have not yet been well documented. This study examined how differences in parental involvement, child effort, and family characteristics and resources contribute to immigrant boys' and girls' academic achievement from kindergarten through 5th-grade. The sample was drawn from the Early Childhood Longitudinal Study-Kindergarten cohort. Using a latent score growth model, this study found that parents' involvement at home benefited boys' reading and mathematics skills throughout all early elementary school years, but did not have the same benefit for girls. For both boys and girls, child effort in reading appears to be strongly linked to better reading and mathematics skills at kindergarten and to subsequent improvement between grades. The positive associations of parental involvement and child's effort with test scores were greater during earlier years than during later years for boys, whereas there was no difference in the association over time for girls.

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## 1. Introduction

Gender differences in academic performance have been consistently observed in U.S. children. Girls perform better in reading, and boys do better in mathematics (Kenney-Benson, Pomerantz, Ryan, & Patrick, 2006). Research is just beginning to move beyond a focus on levels to examine what experiences are linked to improvements in mathematics and reading over the early elementary school years for typical American children. Furthermore, in spite of the presence of 41 million immigrants and the fact that children with at least one immigrant parent represent 25% of U.S. school-age children (Nwosu, Batalova, & Auclair, 2014), the existence of gender differences in academic achievement among children of immigrants is unknown. Although research has examined trajectories for immigrant children overall (Han, 2008), how immigrant parents' characteristics, family background, and the child's own behaviors differentially influence boys' and girls' later successes is yet unknown. Gender differences in academic performance are linked to differences in later educational attainment and potential future mobility. Because of characteristics unique to immigrant families, such as language barriers, cultural conflicts, and a high probability of low socioeconomic status, it is possible that gender differences among children of immigrant parents

could be larger and have more serious consequences. Or it may be the case that, despite their disadvantaged circumstances, children of immigrants do not exhibit significant differences in achievement by gender.

## 2. Literature review

### 2.1. Child gender and academic achievement

A recent study found that a small gender difference in mathematics favoring boys observed at kindergarten widened during the elementary school years, whereas a larger gender difference in reading achievement favoring girls narrowed afterward (Robinson & Lubienski, 2011). Because observed differences are apparent as early as kindergarten, it is unlikely that the school environment explains the initial differences. Although scientists may ultimately identify contributions of other physical subsystems, so far the neurological study of language development has not identified sources of gender differences in mathematics (Dehaene, 1997). Socialization is likely to play a large role. Thus, researchers have focused on what happens in the home. Girls read for enjoyment more often and tended to have a greater number of books than did boys (Davis-Kean, 2005). Children often choose sex-typed activities, even when the same tool (e.g., a computer) is used. For example, girls are significantly more likely to do school work and communicate with others on the computer, whereas boys are more likely to use the computer to play games that engage their spatial and numeric skills (Hofferth, 2010; Louie, 2003). Parents were more likely to believe that

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mathematics/science-related subjects were less interesting and more difficult for girls than boys, and such parental beliefs and expectations influenced girls' perceptions of their ability and self-efficacy in mathematics/science subjects (Bleeker & Jacobs, 2004; Gunderson, Ramirez, Levine, & Beilock, 2012; Tomasetto, Alparone, & Cadinu, 2011).

Gender gaps are also found among immigrant children; immigrant girls have consistently been reported to exhibit higher test scores, educational attainment, and future educational aspirations than boys (Dumka, Gonzales, Bonds, & Millsap, 2009; Suarez-Orozco & Qin, 2006; Updegraff, McHale, Whiteman, Thayer, & Crouter, 2006). Lopez (2003) even contended that the gender gaps in academic performance among children from immigrant families were larger than those in the non-immigrant population. Different cultural values and practices unique to the immigrant population could contribute to these gender gaps. For example, it is quite common in Latino- and Asian-origin families to give girls more household responsibilities than boys, and this was associated with greater competence in schooling and academic domains (Suarez-Orozco & Qin, 2006). Immigrant parents practice stricter control over their daughters than their sons, which may have the unintended consequence of providing girls with more time at home studying or doing homework (Feliciano, 2012; Zhou & Bankston, 2001). Few studies have focused on gender differences in academic performance, however, and research on a younger population is needed to understand when the divergence started and to identify possible long-term influences.

## 2.2. Parental involvement and children's academic achievement

Children develop skills in the presence of educational materials and in interactions with their parents, who not only make reading materials available, but also demonstrate how to use them (Britto & Brooks-Gunn, 2001). Parents' use of printed materials in interactions with their child is more likely than direct skill instruction to lead to a positive attitude toward reading and to better reading skills. Interactions with parents through written materials and verbal contact influence children's oral language development, phonological skills, and print awareness (Burgess, Hecht, & Lonigan, 2002; Senechal, Lefevre, Hudson, & Lawson, 1996). Parents' direct involvement in, and encouragement of, literacy-related activities at home was associated with Latino children's better receptive vocabulary scores (Farver, Xu, Eppe, & Lonigan, 2006).

Children's mathematical skills have also been found to be affected by parental involvement in children's activities (Lin, 2003), particularly in the case of number-related activities that enhance children's mathematical skills. Some examples of number-related activities include turning pages, counting animals/persons or events in a book or conversation, counting scores for games, and remembering past events. Involvement does not need to be numerical in nature. The quality of the relations between parents and their children, along with the number of stimulating toys in the home, also had a significant association with children's mathematics test scores (Crosnoe, Leventhal, Wirth, Pierce, & Pianta, 2010).

## 2.3. Long-term influence of parental involvement

There is a gap in our understanding of both concurrent and lagged influences of parent involvement in home literacy-related activities as the child ages. Research consistently shows influences from early childhood on later achievement (Senechal & Lefevre, 2002). Although the links were not as strong for older children as for younger children, there were still significant effects of home-based, parent-involved activities and direct verbal interaction with parents on increased vocabulary/verbal knowledge, word recognition, and pronunciation ability for children in middle childhood (Han, Leventhal, & Linver, 2004). Few studies have examined the longer-term influences of early literacy activities with parents on later achievement, however. A recent study found that the effects of home literacy environment did not diminish; reading activities with parents at kindergarten continued to influence the

reading and mathematics test scores of third-grade children (Davis-Kean & Sexton, 2009). Thus, home literacy activities with parents are expected to have both concurrent and long-term influences over the course of middle childhood.

## 3. The current study

This study examines the contribution of parental involvement to differences between boys and girls from immigrant families in levels of achievement in reading and mathematics from kindergarten through 5th grade. Although parents have a good deal of influence, children themselves contribute to determining their reading and mathematics trajectories; therefore, the child's own reading behavior (hereafter called "child's effort") is distinguished from other daily activities at home. Given that extant literature has reported gender differences in parental expectations, parent-child interactions, children's activity preferences, and immigrant parents' values/beliefs, we explored whether parental involvement and the child's own effort in reading would differentially influence the development of boys' and girls' reading and math skills. Finally, to augment previous research on the long-term effects of home literacy-related activities, we examined whether parental involvement in children's activities and children's effort in reading continue to influence achievement from the early elementary school years to the later elementary school years, and whether these associations differ over time.

We also have expectations about the influence of our control variables. Family socioeconomic status, which we used as a proxy measure for parental education and the resources provided at home, was hypothesized to have a critical impact on children's test scores (Aikens & Barbarin, 2008; Orr, 2003). Its influence was expected to be similar for boys and girls, since parental education and access to books and other material goods in the home are unlikely to be differentially allocated among children according to gender. We expected that the presence of two parents in the home would be associated with higher test scores. The presence of the father was expected to be more related to test scores for boys than for girls because of the critical additional attention boys receive from their father in two-parent families (Mammen, 2011; Yeung, Sandberg, Davis-Kean, & Hofferth, 2001). In larger families, each child receives less attention, so having more siblings should depress achievement for both boys and girls (Downey, 2001). And we expected that parents' English proficiency would be linked to children's achievement on test scores, regardless of other variables (Bleakley & Chin, 2008).

## 4. Method

### 4.1. Data and sample

This study uses data from the Early Childhood Longitudinal Study Kindergarten Class of 1998–99 (ECLS-K), sponsored by the National Center for Education Statistics of the U.S. Department of Education. The ECLS-K sampled 21,260 kindergarten children from over 1000 schools, and had tracked the early school experiences of these children through eighth grade by 2007. Of the six data waves available, this study uses four: fall kindergarten,<sup>1</sup> spring first grade, spring third grade, and spring fifth grade. Due to the larger influence of peer and school context beyond elementary school, eighth graders were not included. The current sample is limited to 2613 children from immigrant families, in which at least one of the parents was born somewhere other than the U.S. or a U.S. territory. Cases with missing data for the variables of interest were included using full information maximum likelihood

<sup>1</sup> About 5% of children who participated in the fall of the kindergarten year did not participate in the spring of kindergarten (ECLS-K User's Guide, [http://nces.ed.gov/pubs2001/2001029rev\\_5\\_8.pdf](http://nces.ed.gov/pubs2001/2001029rev_5_8.pdf)). We allowed latent difference score models to adjust for unequal intervals.

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