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Parental involvement, child effort, and the development of immigrant boys' and girls' reading and mathematics skills: A latent difference score growth model

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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.

Keywords: academic achievement, gender differences, immigrant children, parent involvement, longitudinal study

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 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 1,000 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[1], 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 2,613 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 estimation. After applying a base-year weight, data represent the population of U.S. children who began kindergarten in 1998-99 (Tourangeau, Nord, Le, Pollack & Atkins-Burnett, 2006).

4.2. Measures

4.2.1. Reading and mathematics test scores

Direct cognitive assessments were individually administered at all survey waves. ECLS-K used Item Response Theory (IRT) to create a common scale of ability estimates across time (Tourangeau et al., 2006). IRT scoring makes it possible to measure gain longitudinally even though the assessments administered are not identical. By using the overall pattern of right and wrong responses and the characteristics of each item to estimate ability, IRT adjusts for the

[1] About 5 percent 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). We allowed latent difference score models to adjust for unequal intervals.

possibility of a low-ability student guessing several hard items correctly. The scale had high internal item-consistency reliability, .92-.96 at each round.

The reading assessment measures basic literacy skills, such as print familiarity, letter recognition, and passage comprehension. The mathematics assessment measures children's ability to recognize/perform the following: number and shape, relative size, ordinality and sequence, addition/subtraction, multiplication/division, place value, rate/measurement, fractions, and area/volume.

4.2.2. Parent involvement

Interactions with parents were defined as activities mostly driven by parents that occurred at home. Four items focused on parents' direct verbal interactions with the child, such as frequency per week of telling stories to the child. Five items focused on parent-child interaction in the form of play and daily living activities, such as frequency per week of helping child with arts/crafts and playing games or puzzles with child. The response range was from 1=never to 4=every day. A composite variable was created as a sum of the 9 items for each wave. The reliability of the composite variable was .73, .72, and .70, at kindergarten, 1st grade, and 3rd grade, respectively.

4.2.3. Child's effort

Children's reading for pleasure has been shown to be one of the important predictors of academic success that takes place at home (Cunningham, 2005; Hofferth, 2010; Krashen, 1995). Parents were asked how often their child read to himself/herself or to others outside of school at each wave. The response range on this item was from 1=never to 4=every day.

4.2.4. Family SES & family structure

A standardized composite measure of family SES, with a mean of 0 and standard deviation of 1, was provided by the ECLS-K. The composite was constructed using five components: father's and mother's education; father's and mother's occupation; and household income. Family structure was coded as 0 for one parent and 1 for two parents in the household. The number of siblings in the household ranged from 0 to 11. Whether children reside in an urban or rural area could affect their achievement. Parents in small towns or rural areas are less likely to access community education amenities and tend to engage in fewer extracurricular activities compared to those in larger towns (Froiland, 2011). The locale of the family residence was assigned to one of three categories: large/mid-size city, suburbs/large town, and small town/rural.

4.2.5. Immigrant background

A parental English proficiency scale was created using the sum of each parent's speaking, reading, and writing skills. Parents rated these skills on a 4-point scale: 1=very well to 4=not well at all. After reverse coding, a higher value means better English proficiency. Parents' length of stay in the U.S. was calculated using information on age at immigration and age at which they were interviewed. The mother's length of stay in the U.S. was used in data analyses except in the case of single father families or families with a U.S.-born mother and a foreign-born father, in which case the father's length of stay was used. We controlled for country of origin. There is a significant difference in children's educational outcomes across immigrant groups (Portes & Rumbaut, 2001). The diverging outcomes observed among immigrant children may be better explained by parents' origin than by children's immigrant generational status (Glick & Hohmann-Marriott, 2007). Therefore, immigrant groups were categorized based on mother's country of origin: South American, Mexican-origin, Central American/Caribbean, East Asian,

Southeast Asian, “other countries”, and families with a U.S.-born mother and a foreign-born father.

4.3. Analysis plan

Using Mplus (Muthen & Muthen, 1998-2010), children’s test scores were fitted into a latent difference score model (McArdle, 2008). Latent intercept variables represent children’s reading and mathematics test scores at kindergarten, and latent change variables represent changes between each pair of adjacent points (Figure 1). We used each latent change variable as a dependent variable in the conditional model (Cabrera, Hofferth & Hancock, 2014; Hancock & Lawrence, 2006) to examine the effects of covariates at specific time points on outcomes during specific time periods. This time-sensitive model can take into account individual instances of growth and decline. The unconditional model contains joint associations between reading and math scores (Shin, Davison, Long, Chan & Heistad, 2013), and residuals of all latent variables were allowed to covary above and beyond the effects of covariates.

(Figure 1 about here)

Latent intercept factors and difference factors were regressed on the variables of parent involvement and child’s effort at kindergarten, 1st grade, and 3rd grade, controlling for family background (Figure 2). Time-variant covariates, such as family SES, were included in the same order as the main independent variables of parent involvement and child’s effort in the analyses. Parents’ length of stay in the U.S. was treated as a time-invariant variable because the change across time is consistent. Parents’ English proficiency level was treated as a time-invariant variable because information was available at only one time point.

(Figure 2 about here)

To examine differences in the parameters between genders, the difference in unstandardized estimates of two parameters was divided by the square root of the sum of each standard error squared (Mann, Rutstein & Hancock, 2009).

$$|Z_{diff}| = \frac{\widehat{b_1} - \widehat{b_2}}{\sqrt{SE_{b1}^2 + SE_{b2}^2}}$$

To examine differences in the parameters over time within the group, an asymptotic covariance matrix was used.

$$|Z_{diff}| = \frac{\widehat{b_1} - \widehat{b_2}}{\sqrt{SE_{b1}^2 + SE_{b2}^2 - 2(SE_{b1}SE_{b2}r_{b1b2})}}$$

$$= \frac{\widehat{b_1} - \widehat{b_2}}{\sqrt{SE_{b1}^2 + SE_{b2}^2 - 2Cov_{b1b2}}}$$

5. Results

5.1. Descriptive statistics

Table 1 shows that children's reading and mathematics test scores increased over time, but the trajectory was not linear; rather, it flattened as time passed. There was no significant difference in the mean of the intercept in reading and mathematics between boys and girls. However, girls had a greater increase in reading test scores from kindergarten to 1st grade (Mean=30.09, *SE*=.63) than did boys (Mean=28.07, *SE*=.55). Boys had a greater increase in mathematics test scores from 1st grade to 3rd grade (Mean=19.49, *SE*=.31) than did girls (Mean=18.21, *SE*=.30). There was no gender difference in the intercept variance. However,

variances in the change in mathematics test scores from kindergarten to 1st grade, along with the change from 1st to 3rd grade, were significantly larger for boys than for girls.

(Table 1 about here)

Table 2 shows that parental involvement decreased and children's reading effort at home increased over time. Parental involvement did not differ between boys and girls at any of the three time points. There was a significant gender difference in child's effort for reading. From kindergarten through 3rd grade, girls spent more time reading than did boys.

Parents' average length of stay in the U.S. was about 16 years. The negative value for family SES indicated that SES was lower among immigrant families than for the total ECLS-K sample, and this pattern was constant across time. The average number of siblings was less than 2. More than 85% of children lived with two parents. Less than 10% lived in rural areas, and half of all immigrant families lived in large cities. No significant difference in family background between boys and girls was observed except locale of residence at kindergarten, when more boys lived in the suburbs and more girls lived in large cities.

(Table 2 about here)

5.2. Structural models of achievement for boys and girls

The structural models were conducted separately for boys and girls, and indicate a good fit (CFI=.95, RMSEA=.06, SRMR=.06) for both of the models. Table 3 shows that parental involvement was not linked to reading or math achievement for girls, whereas it was for boys. The association of parental involvement at kindergarten with reading scores at that time differed significantly between boys (b=.11) and girls (b=.01). The association of parental involvement at kindergarten with the change in reading test scores from kindergarten to 1st grade was significantly higher for boys (b=.11) than girls (b= -.04). Similarly, parental involvement at 1st

grade (3rd grade) had a greater association with the change in reading scores from 1st to 3rd grade (3rd to 5th grade) for boys than it did for girls. As for math achievement, parental involvement at kindergarten had a greater association with boys' mathematics test scores at kindergarten, and changes from kindergarten to 1st grade, compared to these associations for girls (b=.14 vs. b=.02; b=.09 vs. b= -.05, respectively). Similarly, parental involvement at 1st grade was significantly more associated with boys' increased mathematics test scores from 1st to 3rd grade (b=.08) than with girls' (b= -.05).

For both boys and girls, greater reading effort was associated with higher reading test scores at kindergarten and greater increases in reading achievement through first grade. More reading effort also predicted higher mathematics test scores for both boys and girls at kindergarten, and a larger increase in mathematics test scores for boys from kindergarten to first grade and from first to third grade. The association of child's effort at 3rd grade with the change in scores from 3rd to 5th grade was stronger for boys (b=.16) than for girls (b= -.03).

(Table 3 about here)

5.3. Change in influence over time

To examine whether there were diminished effects of parental involvement and child's effort over time, associations in earlier childhood were compared to the same associations during later childhood. For boys, the association between parental involvement at kindergarten and the change in reading test scores from kindergarten to 1st grade was significantly greater than this association from 1st to 3rd grade. Parental involvement at 1st grade had a greater association with the change in reading test scores from 1st to 3rd grade than it did from 3rd to 5th grade. For girls, there was no difference in the association between parental involvement and changes in reading test scores over time. Parental involvement at kindergarten had a greater association with the

change in boys' mathematics test scores from 1st to 3rd grade than it did with the change from 3rd to 5th grade; whereas there was no difference in the association between parental involvement and girls' mathematics test scores over time.

Boys' and girls' reading effort at kindergarten had a greater association with the change in reading scores from kindergarten to 1st grade than it did from 1st to 3rd grade.

5.4. Effects of family background

Table 4 shows that parents' English proficiency played an important role in children's reading scores at kindergarten and increases in reading scores later on. The positive association of parents' English proficiency with reading scores was significantly greater for boys than it was for girls. Higher family SES was associated with children's higher reading scores at kindergarten and with later increases in scores between grades, and these positive associations were significantly greater for girls' reading skills than for boys' reading skills. Having fewer siblings in the same household was beneficial to girls' reading performance at kindergarten, whereas this had no significant influence on boys' reading performance. But there was no overall gender difference in the association between number of siblings and the target child's reading performance. The benefit of living with two parents on reading skill at kindergarten was greater for boys than it was for girls. The pattern of gender differences observed in reading test scores also appeared in mathematics test scores. The positive association of parents' English proficiency and living with two parents with mathematics scores was greater for boys, and the positive association of family SES at kindergarten with math score was greater for girls (Supplement 1).

(Table 4 about here)

6. Discussion

The purpose of this study was to investigate whether gender differences in reading and mathematics subject domains exist among children of immigrant parents at kindergarten, and whether the growth in their reading and mathematics skills through grade 5 could be explained by two measures comprising home-based activities, namely parental involvement and children's effort.

There were substantial differences in the association between parental involvement and children's reading/mathematics performance by gender. Boys benefited more than girls from parental involvement at home from kindergarten through 5th grade. Greater parental involvement may explain the previous finding that girls' advantage in reading at kindergarten disappeared and boys' advantage in mathematics widened by 5th grade (Robinson & Lubienski 2011). It is surprising that in our research parental involvement shows little linkage with girls' performance on standardized tests. This finding may provide an important message to parents. Boys improve their reading and mathematics skills when their parents involve them in interactions and conversations at home. In contrast to the stereotype of boys needing or deserving more independence (Entwisle, Alexander & Olson, 2007), our findings indicate that boys are, in fact, more dependent upon parental involvement than girls for academic achievement. The fact that we observed no influence of parental involvement on girls' academic performance may mean that although girls of immigrant parents were more likely to be under strict parental control than boys (Lopez, 2003), this may not necessarily entail more parental involvement in girls' literacy-related activities at home. Rather, consistent with previous studies, it may mean that girls spend time at home, where they study, do homework, and read books, thus engaging in activities which more directly influence academic performance (Feliciano, 2012).

The positive effect found for children's effort in reading is well aligned with previous research indicating that reading for pleasure is a significant predictor of children's academic achievement test scores (Hofferth, 2010). There was no difference between boys and girls in the positive influence of reading activity at home during the early elementary school years on their reading and mathematics achievement, but boys benefited more than girls when it came to improving their mathematics test scores from 3rd to 5th grade. Boys who read more at 3rd grade have a stronger reading payoff than do girls. This is another important potential intervention point. Motivation to read among fifth graders apparently does not differ between boys and girls (Neugebauer, 2013), but boys read significantly less than girls at all grade levels. Boys may need more guidance and/or a home context that provides more time for and encouragement of reading.

Parental involvement had a significantly greater association with boys' reading and mathematics test performance during the earlier elementary years than during the later elementary years. This means that, for boys, early parental involvement was crucial for academic performance; these positive effects were significant until 3rd grade. Considering that children tend to spend more time engaged in independent activities as they get older, this long-lasting and significant association of parental involvement suggests that boys need more consistent interactions with their parents during their elementary school years in order to develop academically. The benefit of greater effort on the part of the child was more pronounced during the earlier school years than during later years for both boys' and girls' reading performance. A home environment in which children can be comfortable when reading books, or in which children have more opportunities to read, may be especially important when children are younger.

Higher family SES was assumed to reflect a more affluent home environment, in which children would be provided with cognitively stimulating materials, and which would increase the

likelihood of parental monitoring/guidance of children's education (Bradley & Corwyn, 2002; McLoyd, 1990). However, interestingly, the influence of family socioeconomic status differed by gender. The positive effect of higher SES was greater for girls' reading and mathematics skills than it was for boys' during the early elementary school years. This kind of gender difference in the influence of family SES has not been well investigated, but it may be because young girls were more sensitive to their home environment and could better utilize materials and educational opportunities when these were provided. Alternatively, it may mean that boys benefit more from family economic resources at low levels, whereas resources are more equally shared across boys and girls as SES rises. Contrary to most of the results, there is a negative association between family SES in kindergarten and the change in girls' reading scores from 3rd-5th grade. We speculate that as they move closer to puberty, girls may be starting to express different interests than academic ones, interests supported or encouraged by higher income parents. Even though there is little doubt about the effect of SES on all children, both boys and girls, more research may be needed to investigate why girls are generally better able than boys to benefit from higher SES, and what such a gender difference may imply about boys' and girls' later academic success.

The results support our expectation that a two-parent family would be associated with higher test scores, but this turns out to be more important for boys than for girls. The condition of living with two parents at kindergarten was related to boys' better reading and mathematics test scores at kindergarten. Additional attention and/or monitoring, possible in a two-parent family, may be crucial for boys' academic performance. Having a smaller number of siblings was confirmed to benefit children by giving them more available resources (Downey, 1995), but only for girls, and only when they were in kindergarten.

Parents' English proficiency was positively linked to children's academic skills. Specifically, the benefit of parents' English ability was greater for boys' mathematics skills than for girls' mathematics skills throughout all of the elementary school years. Regardless of parents' length of stay in the U.S., poor English skills may limit their ability to assist their children in performing better in school. Parents who have better English skills tend to exhibit a higher level of parental involvement, such as attendance at school meetings or school events, which has been linked to children's better performance in school (Child Trends, 2010).

7. Limitations and study implications

Several limitations should be addressed. First, this study did not include activities that occurred outside the home. Because of this study's longitudinal design, it is to be expected that, as children grow older, the contributing effects of peer relations and the environments of school, neighborhood and community become more salient. A follow-up study could investigate how in-home and out-of-home factors work together to affect children's performance over time. Second, American children's educational performance is often evaluated by assessing their social skills as well as their standardized test scores (DiPrete & Jennings, 2012). But this study did not include children's social skills (e.g., interpersonal skills, self-control skills) when considering the academic performance of children in immigrant families. These limitations are, however, outweighed by the strength of the representative sample of immigrant children followed from kindergarten over middle childhood, the fact that gender differences have not previously been investigated in immigrant children of this age, the detailed information on family background over time, and the strong measures of reading and mathematics achievement.

This research is the first to examine how parent involvement and individual effort are associated with changes in reading and mathematics achievement over middle childhood for boys and girls from immigrant families. The finding of gender differences in the effects of parental involvement and children's effort suggests that it may be necessary to take different approaches with boys and girls in order to improve child outcomes. Contrary to the traditional child-rearing perspective, which stipulates that boys can be given more independence from parental monitoring, it is actually the case that parental involvement, along with boys' own efforts at home, may be crucial for boys to improve their reading and mathematics skills over time. More structured home-based activities, especially those entailing parental involvement, are therefore recommended for boys in immigrant families. Immigrant children's academic trajectories have been examined compared to native-born children and by country of origin (e.g., Han, 2008). The distinct gender differences found in the influence of parents on immigrant children should be explored in a large sample of non-immigrant children as well, to see whether the current findings are unique to children of families recently arrived in the United States. At the very least, it appears to be essential, in future studies, to examine the achievement of immigrant children separately by gender. In addition, given the typical challenges of low income, language barriers, and cultural conflicts among immigrant families (Bender, Dimitrova & Vijver, 2014; Crosnoe & Fuligni, 2012), the important role of immigrant parents within their home, and the differences observed between boys and girls, may not be unique to immigrant families in the U.S. Home-based activities can be a more accessible avenue for immigrant parents and their children, who are more likely to experience difficulties in taking advantage of the educational resources available to them. More studies need to be conducted in other countries order to better understand the factors that contribute to immigrant children's academic success in a new country.

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Figure 1. Unconditional model of latent difference score of reading and mathematics test scores

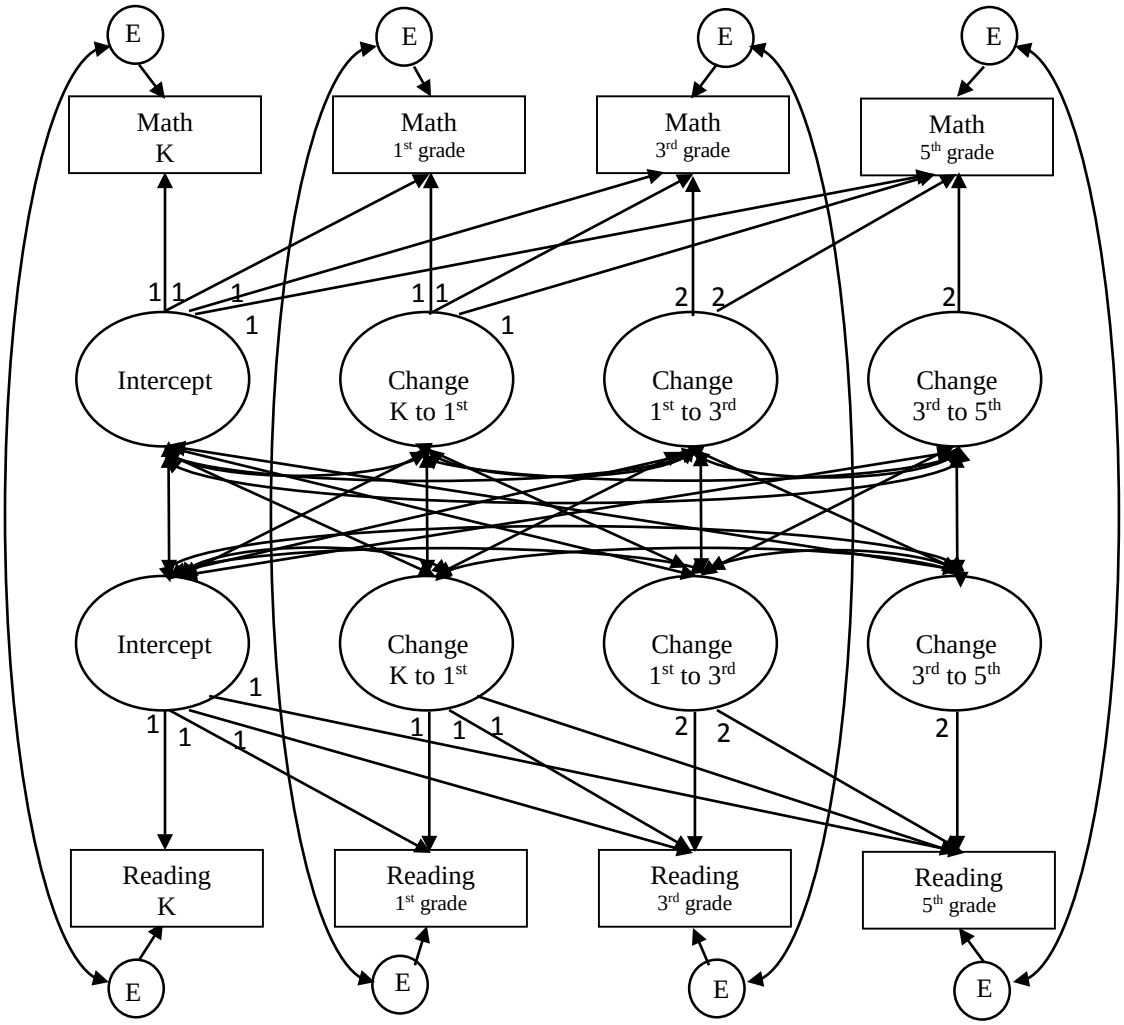
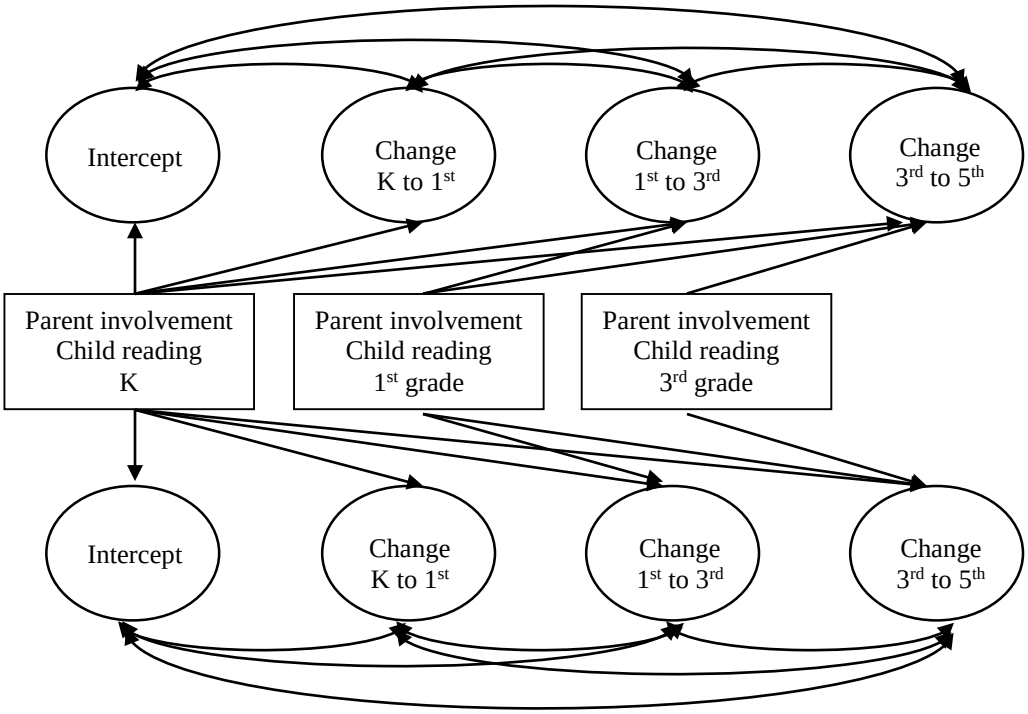


Figure 2. Conditional model with covariates[a]



[a] Controlling family SES, family structure, and immigrant background variables.
For simplicity, covariances among the latent variables are not shown in the figure.

Table 1. Means and Variances of Latent Factors of Reading and Mathematics Scores, for All Children and by Gender.

	All children		Boys		Girls		boys vs. girls	Effect size[a]
	Means	**SE**	**Mean**	**SE**	**Mean**	**SE**		
Reading test scores								
Intercept	44.11	0.52	43.42	0.61	44.81	0.59		0.09
Change K - 1st grade	29.06	0.47	28.07	0.55	30.09	0.63	*	0.13
Change 1st-3rd grade	23.35	0.30	22.87	0.38	23.85	0.36		0.10
Change 3rd-5th grade	11.92	0.21	12.08	0.30	11.74	0.26		0.05
Math test scores								
Intercept	33.52	0.45	33.83	0.54	33.17	0.52		0.05
Change K - 1st grade	24.30	0.41	24.81	0.56	23.76	0.38		0.09
Change 1st-3rd grade	18.86	0.24	19.49	0.31	18.21	0.30	*	0.16
Change 3rd-5th grade	12.85	0.18	12.91	0.25	12.80	0.22		0.02

	All children		Boys		Girls		boy vs. girl
	Variance	**SE**	**Variance**	**SE**	**Variance**	**SE**	
Reading test scores							
Intercept	229.24	17.78	220.34	22.02	238.15	25.59	
Change K - 1st grade	237.67	9.20	232.65	12.38	240.56	11.58	
Change 1st-3rd grade	88.95	3.38	88.32	4.64	89.11	4.32	
Change 3rd-5th grade	57.23	2.00	60.97	2.93	53.60	2.81	
Math test scores							
Intercept	148.15	6.91	158.80	9.74	136.57	7.96	
Change K - 1st grade	124.14	5.82	147.92	9.05	99.04	5.89	*
Change 1st-3rd grade	61.78	2.08	66.52	3.24	56.07	2.47	*
Change 3rd-5th grade	41.20	1.34	40.15	2.10	42.38	2.12	

*Significant difference between boys and girls at the level of .05.

[a] Cohen's d.

Table 2. Descriptives of Background Variables, for All Children and by Gender.

	All children		Boys		Girls		Boy vs. Girl
	Mean/%	SD	Mean/%	SD	Mean/%	SD	
Parent involvement (K)	23.72	66.97	23.79	68.08	23.64	65.85	
Parent involvement (1)	22.87	64.69	22.99	66.21	22.74	63.12	
Parent involvement (3)	22.00	63.62	22.12	63.99	21.88	63.22	
Child effort for reading (K)	3.02	14.31	2.84	14.89	3.20	13.24	***
Child effort for reading (1)	3.10	13.05	2.94	13.86	3.26	11.75	***
Child effort for reading (3)	3.28	11.80	3.17	12.47	3.39	10.84	***
Mother's country of origin							
South America	5.0%	3.05	4.4%	2.92	5.6%	3.18	
Mexico	37.3%	6.78	38.3%	6.89	36.1%	6.65	
Caribbean/Central America	12.5%	4.63	12.5%	4.69	12.5%	4.58	
East Asia	5.5%	3.19	5.5%	3.23	5.5%	3.16	
Southeast Asia	8.9%	3.98	8.9%	4.05	8.8%	3.92	
Other countries	14.6%	4.95	14.5%	4.99	14.8%	4.91	
U.S.-born mother	16.3%	5.17	15.9%	5.18	16.7%	5.17	
Child background							
Girl	48.7%	7.00					
Family background							
Parents length of stay in the US	16.16	136.41	16.13	139.10	16.18	133.71	
Parents English proficiency	8.61	47.02	8.55	47.84	8.68	46.19	
Family SES (K)	-0.20	11.87	-0.21	12.27	-0.19	11.47	
Family SES (1)	-0.25	12.16	-0.24	12.65	-0.25	11.65	
Family SES (3)	-0.24	12.09	-0.24	12.55	-0.25	11.61	
Number of siblings (K)	1.62	17.59	1.62	17.95	1.62	17.22	
Number of siblings (1)	1.68	17.17	1.68	17.67	1.68	16.66	
Number of siblings (3)	1.76	17.09	1.75	17.46	1.76	16.71	
Two parents (K)	86.4%	4.83	86.2%	4.90	86.5%	4.75	
Two parents (1)	87.2%	4.70	87.1%	4.78	87.3%	4.63	
Two parents (3)	88.0%	4.56	87.6%	4.68	88.5%	4.44	
Locale of residence							
Rural (K)	7.3%	3.64	7.2%	3.66	7.4%	3.63	
Rural (1)	6.8%	3.53	6.6%	3.53	7.0%	3.53	
Rural (3)	6.7%	3.50	6.3%	3.44	7.1%	3.55	
Suburb (K)	40.1%	6.87	42.2%	7.00	37.8%	6.72	*
Suburb (1)	38.8%	6.83	39.9%	6.94	37.6%	6.71	
Suburb (3)	38.8%	6.83	39.9%	6.95	37.7%	6.71	
Large city (K)	52.6%	7.00	50.6%	7.09	54.7%	6.89	*
Large city (1)	50.1%	7.01	48.5%	7.09	51.6%	6.92	
Large city (3)	48.1%	7.00	46.6%	7.07	49.8%	6.92	
N	2613		1310		1303		

Data are weighted.
* < .05, ** < .01, *** < .001.

Table 3. Coefficients of Reading and Mathematics Scores Regressed on Parental Involvement and Child effort, by Gender[a].

	Intercept			Change K-1st grade			Change 1st-3rd grade			Change 3rd-5th grade		
	Beta	**b**	**SE**	**Beta**	**b**	**SE**	**Beta**	**b**	**SE**	**Beta**	**b**	**SE**
Reading Test Scores												
Boys Parent involvement (k)	0.11 ***	0.36	0.09	0.11 ***	0.37	0.10 >[b]	0.04	0.08	0.08	0.03	0.05	0.07
Parent involvement (1)							0.14 ***	0.31	0.08 >[b]	-0.01	-0.01	0.09
Parent involvement (3)										0.09 *	0.16	0.06
Child effort (K)	0.22 ***	3.25	0.34	0.08 *	1.11	0.46 >[b]	-0.03	-0.25	0.30	0.05	0.35	0.29
Child effort (1)							0.08 *	0.83	0.35	0.00	0.04	0.34
Child effort (3)										0.05	0.42	0.33
Girls Parent involvement (k)	0.01	0.03	0.09	-0.04	-0.12	0.11	-0.03	-0.05	0.08	0.00	0.00	0.06
Parent involvement (1)							-0.01	-0.01	0.07	0.00	0.00	0.07
Parent involvement (3)										-0.06	-0.09	0.06
Child effort (K)	0.16 ***	2.61	0.39	0.11 **	1.70	0.51 >[b]	-0.08 *	-0.78	0.31	-0.04	-0.26	0.28
Child effort (1)							0.04	0.44	0.43	-0.01	-0.10	0.38
Child effort (3)										0.02	0.19	0.38
Math Test Scores												
Boys Parent involvement (k)	0.14 ***	0.40	0.07	0.09 **	0.24	0.08	0.10 **	0.18	0.05 >[b]	-0.04	-0.05	0.05
Parent involvement (1)							0.08 *	0.16	0.07	0.03	0.04	0.07
Parent involvement (3)										0.04	0.05	0.05
Child effort (K)	0.13 ***	1.69	0.33	0.08 *	0.91	0.40	0.07 *	0.54	0.24	0.03	0.17	0.25
Child effort (1)							0.08 *	0.66	0.26	0.00	0.02	0.31
Child effort (3)										0.16 ***	1.19	0.31
Girls Parent involvement (k)	0.02	0.05	0.07	-0.05	-0.09	0.07	0.02	0.04	0.06	0.00	0.01	0.06
Parent involvement (1)							-0.05	-0.08	0.05	0.01	0.01	0.06
Parent involvement (3)										0.07	0.10	0.06
Child effort (K)	0.11 ***	1.36	0.36	0.03	0.26	0.36	0.05	0.36	0.28	-0.03	-0.19	0.24
Child effort (1)							0.01	0.04	0.30	0.03	0.20	0.28
Child effort (3)										-0.03	-0.26	0.31

* < .05, ** < .01, *** < .001

[a] Controlling for parent's length of stay in the US, English proficiency, mother's country of origin, family SES, number of siblings, two parents, and the locale of residence.

[b] The symbol of > indicates a significant difference in the associations between earlier and later childhood at the level of .05.

Highlighting indicates significant difference in the coefficients between boys and girls.

Number of boys in the model is 1310; and number of girls in the model is 1303.

Table 4. Coefficients of Reading Scores Regressed on Family Background, by Gender[a].

	Intercept			Change K-1st grade			Change 1st-3rd grade			Change 3rd-5th grade		
	Beta	**b**	**SE**	**Beta**	**b**	**SE**	**Beta**	**b**	**SE**	**Beta**	**b**	**SE**
Boys												
Length of stay in the U.S.	0.03	0.04	0.05	-0.02	-0.03	0.06	0.05	0.05	0.03	0.01	0.01	0.03
English proficiency	0.19 ***	0.88	0.15	0.14 **	0.65	0.20	0.17 ***	0.50	0.13	0.04	0.10	0.11
Family SES (K)	0.12 **	2.27	0.77	0.09 *	1.72	0.75	0.01	0.07	0.78	-0.14	-1.29	0.69
Family SES (1)							-0.01	-0.09	0.75	0.19	1.73	1.23
Family SES (3)										-0.15	-1.39	1.13
Number of siblings (K)	-0.05	-0.67	0.34	0.00	-0.04	0.39	-0.08	-0.63	0.75	0.04	0.25	0.66
Number of siblings (1)							0.07	0.55	0.72	0.06	0.37	0.87
Number of siblings (3)										-0.10	-0.63	0.63
Two parents (K)	0.14 ***	6.34	0.93	0.09 **	4.21	1.28	-0.01	-0.31	1.34	0.00	-0.06	1.48
Two parents (1)							0.07	2.09	1.39	-0.03	-0.77	1.45
Two parents (3)										0.10 *	2.29	1.11
Locale of residence (Rural area omitted)												
Suburb (K)	0.29 ***	9.30	1.88	0.17 **	5.37	2.02	0.06	1.21	2.51	0.20	3.16	2.61
Suburb (1)							0.10	2.13	2.10	-0.07	-1.12	2.00
Suburb (3)										-0.04	-0.72	1.59
Large city (K)	0.29 ***	9.15	1.87	0.18 **	5.56	2.08	0.04	0.79	2.49	0.16	2.52	2.34
Large city (1)							0.12	2.37	2.12	-0.18	-2.86	1.73
Large city (3)										0.08	1.29	1.41
Girls												
Length of stay in the U.S.	0.01	0.02	0.04	0.03	0.05	0.06	0.00	0.00	0.03	-0.02	-0.01	0.03
English proficiency	0.02	0.10	0.18	0.14 **	0.66	0.24	0.00	0.01	0.14	-0.01	-0.02	0.11
Family SES (K)	0.37 ***	6.78	0.92	0.23 ***	4.26	0.80	0.21 *	2.34	0.92	-0.29 **	-2.54	0.78
Family SES (1)							-0.13	-1.45	0.90	0.08	0.73	1.20
Family SES (3)										0.13	1.10	1.06
Number of siblings (K)	-0.08 **	-0.95	0.27	-0.04	-0.52	0.35	-0.02	-0.13	0.69	0.02	0.10	0.64
Number of siblings (1)							-0.05	-0.40	0.73	-0.01	-0.06	0.80
Number of siblings (3)										-0.01	-0.07	0.46
Two parents (K)	-0.01	-0.32	1.18	0.03	1.30	1.56	-0.04	-1.03	1.72	0.11	2.40	1.42
Two parents (1)							0.07	2.00	1.74	-0.14 *	-3.06	1.49
Two parents (3)										-0.02	-0.39	0.99
Locale of residence (Rural area omitted)												
Suburb (K)	0.03	0.94	1.75	-0.05	-1.73	2.65	-0.10	-1.89	2.87	0.04	0.62	2.44

Suburb (1)							0.10	1.95	2.79	-0.03	-0.51	2.14
Suburb (3)										0.01	0.07	1.55
Large city (K)	0.00	0.06	1.64	-0.04	-1.22	2.61	0.02	0.40	2.09	0.01	0.20	2.37
Large city (1)							-0.03	-0.55	2.00	-0.04	-0.63	2.01
Large city (3)										0.04	0.54	1.39

* < .05, ** < .01, *** < .001

[a] Parental involvement, child effort for reading, and parent's country of origin not shown
Highlighting indicates significant difference in the coefficients between boys and girls.
Number of boys in the model is 1310; and number of girls in the model is 1303.