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Achievement Gaps and the Doubly Disadvantaged: The Intersection of Socioeconomic Status and Race/Ethnicity on Math and Reading Trajectories

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Abstract

   Numerous studies have examined both the income and race/ethnic achievement gaps. These gaps are particularly striking in the case of minority children, who are more likely than their non-Hispanic white counterparts to be living in poverty. This overlap in achievement gaps makes it difficult to clearly identify the most disadvantaged children. Using two designations in No Child Left Behind (NCLB), socioeconomic status and race/ethnicity, this study examines math and reading trajectories as children move through elementary school. Applying multilevel growth curves to four waves of the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99, I examine the intersection of children's income status and race/ethnicity on their achievement trajectories. My findings show children who are doubly disadvantaged --both poor and minority-- have the worst outcomes. However, non- Hispanic white children who are identified as the most economically disadvantaged have better outcomes than some of their same race peers. These findings point to the importance of examining the intersection of children's socioeconomic status and race/ethnicity as it relates to achievement outcomes over time. Pinpointing who are the most "at risk" children within and/or across socioeconomic status and race/ethnicity can lead to targeted policy intervention ensuring these children are served.

Introduction

   The first line of the No Child Left Behind Act (NCLB) of 2001 states "An Act: To close the achievement gap with accountability, flexibility, and choice, so that no child is left behind (US Department of Education, 2002)." The driving force of NCLB is to reduce educational disparities in an increasingly diverse child population. Researchers in the U.S. have spent a great deal of time examining the income and race/ethnicity gaps in achievement (Entwisle and Alexander, 1993; Yeung, Linver, & Brooks-Gunn, 2002; Seccombe, 2004; Yan & Lin, 2005; Crook & Evans, 2014). One challenge, however, is that these two gaps overlap considerably, often involving the same children trying to catch up. We know that children from lower income homes and minority children start school at a disadvantage compared to children who are non-Hispanic white and those from more affluent families, respectively (Aikens & Barbarin, 2008; Duncan & Magnuson, 2005; Entwisle & Alexander, 1993; Lee & Burkham, 2002).

However, attending to each of these disparities separately can obscure who is most vulnerable in the child population as well as which interventions among these groups are most likely to bring the greatest returns. Clearly identifying where the largest gaps exist along the socioeconomic (SES) spectrum across racial/ethnic groups and within SES groups along the racial/ethnic hierarchy can increase the efficiency of policy intervention and ensure that the most at-risk children are served. Given these overlapping disparities, this paper aims to further our understanding of who are the most "at-risk" kids within and across socioeconomic status and racial/ethnicity.

Background

   Minorities and Blacks in particular have consistently had lower levels of academic achievement than their non-Hispanic white counterparts (Ogbu, 1991, 2003; Jencks & Phillips, 1998; Downey, 2008). These differences are found at very early ages and persist through adulthood into labor force

participation and wage gaps (Coleman, 1961; Jencks, 1972; Downey & Gibbs, 2007). Using data on test scores from The National Assessment of Educational Progress, Miller (1995) documented the differences in test scores among various racial/ethnic groups. White twelfth graders outscored Black, Hispanic and Native American twelfth graders on math tests by 31, 23 and 11 points respectively (Miller, 1995). Asian students outscored whites by 14 points. We see these disparities in other areas all well. Asian students outscored white, Black, Mexican American, and Native American students by 37, 143, 99 and 91 points respectively on 1990 SAT scores. This trend has been consistent over time (Reardon, Robinson-Cimpian, & Weathers 2014). In an analysis of test scores by race/ethnicity from 1971-2012, Reardon et al. (2014) find varying gaps by subject, age, test year and racial/ethnic group, with persistent gaps with Black and Hispanic children underperforming compared to their non-Hispanic white counterparts.

In addition to tracking racial/ethnic achievement gaps, researchers have also examined the impact of SES on academic outcomes. Findings demonstrate children from economically deprived homes have lower educational achievement than their counterparts from more affluent homes (Aikens & Barbarin, 2008; Domina, 2005; Duncan & Magnuson, 2005; Entwisle & Alexander, 1993; McNeal, 1999). The SES achievement gap is particularly striking in the case of minority children, because they are more likely than their non-Hispanic white counterparts to be living in poverty (McLeod & Shanahan, 1993; Seccombe, 2004; U.S. Census Bureau, 2009). In 2010, about 22% of children in the U.S. lived below the poverty line (Macartney, 2011). This number is even worse when examining racial/ethnic differences. Minority children are most likely to live in poverty with Black children being the most disadvantaged followed by Hispanic, white and Asian children with 38, 32, 17 and 13 percent living below poverty respectively (U.S. Census Bureau, 2009). These children are doubly disadvantaged in that they are socially located in two of the lowest performing groups. They

experience an overlap of disadvantaged identities.

Scholars have noted shifts in both the racial/ethnic and income achievement gaps over time. In particular, studies have found a narrowing of the gap between Blacks and whites in math and reading between the 1970s and 1980s (Reardon et al., 2014). However, this gap widened again in the 1990s (Reardon et al., 2014, Neal 2006). With the increasing diversity of the child population scholars have also turned their attention to examining the Hispanic-white achievement gap (Reardon, Valentino, Kalogrides, Shores, & Greenberg, 2013; Reardon & Galindo, 2008). The shifts in this gap mirror those for the Black-white gap. These findings suggest that Black and Hispanic children have poorer achievement outcomes than their non-Hispanic white peers. Findings on the income gap tell a similarly bleak story. The income gap has widened over time (Reardon, 2011) and has been found to account for a proportion of the variation in the racial/ethnic achievement gap (Fryer & Levitt, 2006; Rothstein & Wozny, 2013; Mandara, Varner, Greene, & Richman, 2009).

If we are to reduce achievement gaps across the board, we must pinpoint who the most disadvantaged students are by examining the intersection of race/ethnicity and poverty on children's academic outcomes. Finally, although an explanation for the gaps is beyond the scope of this paper, it is important to note that these gaps don't exist in a vacuum. There are a number of child, family, school and neighborhood characteristics that impact both the racial/ethnic and income achievement gaps.

The Present Study

The general goal of this paper is to identify which specific groups of children should be the focus of policy aimed at decreasing socioeconomic and racial/ethnic gaps in academic achievement. Where and when do the largest disparities occur? Using two of the designations laid out in NCLB, socioeconomic status and race/ethnicity, this study maps out the math and reading trajectories of children from

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diverse segments of the population as they move through elementary school. I am also interested in identifying the socioeconomic strata in which racial disparities in level and growth of achievement are largest and the racial groups in which corresponding socioeconomic disparities are largest. These analyses applies multilevel growth curves to four waves of data from The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K).

Methods

Data

The data used for these analyses come from the first four waves of ECLS-K. The ECLS-K begins with a nationally representative sample of children who entered kindergarten in the U.S. between 1998 and 1999 (n = 21,260). Data were collected by the National Center for Education Statistics (NCES), within the U.S. Department of Education's Institute of Education Sciences, using a multistage probability sampling design.

The data were collected with the intent of studying children's early educational achievement and the context in which they are experiencing the schooling process. The data are designed such that information on children's schooling experience is collected as it is happening. For example, the first grade data is collected while the children are still in first grade (Tourangeau, Nord, Lê, Pollack, & Atkins-Burnett, 2006). According to Tourangeau et al (2006) this is particularly important because it "produces a more accurate measurement of antecedent factors and enables inferences to be made about their relationship to later academic progress" (Tourangeau et al., 2006:1-4). The strength of this dataset is its ability to show change or continuity in the same children's lives over time. I am able to examine initial differences in children's educational outcomes, as well as extent of change over time.

Measures

There are two dependent variables for this study measuring student's academic achievement: math and reading scores. At each wave (spring of kindergarten, first, third, and fifth grade) children were given timed cognitive assessment in both math and reading. Several measures of these cognitive assessments are available at each wave of data. Item Response Theory (IRT) scores rely on patterns of correct answers to obtain final scores (Tourangeau et al., 2006) these scores are scaled for comparisons across waves of the data.

This study is concerned with indentifying where the largest gaps in math and reading scores exist across socioeconomic and racial categories. The focal independent variables for this study are child's socioeconomic status and race/ethnicity. Socioeconomic status is measured using an income-to-needs ratio which is created by combining household size and annual family income. The income-to-needs ratio is then compared to the federal poverty line for 1998 (the initial year of data collection for the ECLS-K) resulting in three categories: those at or below 100% of the poverty line (poor), families between 101 and 200% if the poverty line (low income) and finally those families above 200% (nonpoor). Child's race/ethnicity is measured using the parental designation of the child's racial/ethnic background. Children are classified as either non-Hispanic white, non-Hispanic Black, Hispanic origin or Asian origin. Both socioeconomic status and race/ethnicity are key designations outlined in NCLB as indicators of populations at risk.

Children's academic outcomes are affected by both family and school characteristics (Cooper, Crosnoe, Suizzo, & Pitcuh, 2010; Duncan, 2012; Blair & Raver, 2012); therefore, the models also account for a host of family and school characteristics. At the child level, the models adjust for: child's gender (males are the reference group); family structure (step family, single parent family, some other family form, and two biological parent family [reference group]; home language (English is the reference group); and immigration status (whether the child is foreign-born or has foreign-born parents). School characteristic include: school type (private religious, public and other private schools [reference group]); overall

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racial/ethnic composition of the school; whether or not the school receives Title I funding; and percent of the student body that receives free/reduced lunch.

Analyses

Using SAS 9.4 multilevel growth curve models are estimated with the PROC MIXED command in conjunction with PROC MIANALYZE. This particular type of analysis is useful when examining gaps over time. Using growth curve models, I can examine gaps in initial scores, as well as changes in those gaps over time (Raudenbush & Bryk, 2002; Raudenbush, 2001). This method also accounts for time varying and fixed characteristics of both children and the schools they attend (Raudenbush & Bryk, 2002; Raudenbush, 2001). For this analysis, models are constrained to one slope for growth which smoothes over the variations that occur in the rates of growth throughout the period (see McCoach et al., 2006 for example of differential growth in reading scores in ECLS-K). Data have been weighted and missing data is accounted for using multiple imputation via the PROC MIANALYZE command. Finally, time is centered on the mean age of children in spring of kindergarten. The centering of time is important because it dictates how the intercept and coefficients are interpreted. In this case, since time is centered on age in spring of kindergarten, the intercept represents children's math and reading scores in kindergarten.

Results

Tables 1 and 2 (see Appendix) show the descriptive statistics by each NCLB designation. Minority and poor children come from the most disadvantaged families. As we see in Table 1, children from families that are categorized as poor and low income have lower math and reading scores than their peers from nonpoor families. These children are also more likely to not reside in two-parent families compared to their peers in nonpoor families. Children from poor and low income families are also more likely to have a foreign-born parent or be foreign-born themselves, have a primary home

language that is not English, and attend the most disadvantaged schools, compared to children from nonpoor families. Overwhelmingly, the children who make up the categories of poor and low income are minority children. This point again speaks to these overlapping categories of disadvantage. We see in Table 2 that minority children come from the most disadvantaged background compared to their non-Hispanic white peers.

The multilevel growth curve analyses were run twice for both math and reading scores, once to account for socioeconomic within group difference and then to account for within racial/ethnic group differences. These models can be found in Tables 3 and 4 (see Appendix). These models suggest that there are clear differences in achievement trajectories across and within both socioeconomic status and race/ethnicity. The first set of models in Table 3 examines the socioeconomic status within group differences for math scores. Both within and across all the socioeconomic categories, all minority children except nonpoor Asians start with lower math scores compared to non-Hispanic whites and have slower growth over time. Among all children who fall at or below 100% of the poverty line, attending private school increases their initial scores. In contrast attending schools with higher percentages of children receiving free/reduced lunch decreases initial scores and produces less growth in scores over time. Among poor children, non-Hispanic Blacks are the most disadvantaged both in initial scores and in their growth over time, while poor Asian origin children fare no worse than non-Hispanic whites.

Within the low income SES group we see findings quite similar to those for the poor SES group. There is one exception; Hispanic origin children in the low income group, unlike their peers in the poor group, do not have less growth over time. This suggest that although these children start behind their non-Hispanic white peers, they do not fall further behind over time. Comparing children who are just above and just below the poverty line shows the limitations of relying on a single designation – here race—to decrease educational

disadvantage. Among those children categorized as nonpoor, we see persistent racial/ethnic gaps net of other family and school characteristics, with non-Hispanic Blacks children and children of Hispanic origin having lower initial scores and less growth over time compared to their non-Hispanic white counterparts. This suggests that these two groups of children will not "catch up" to the math scores of their non-Hispanic white peers.

The analysis for reading scores by socioeconomic status show similar findings. For children at or below 100% of the poverty line, we see lower initial reading scores and less growth over time for both non-Hispanic Blacks and children of Hispanic origin in comparison to their poor white counterparts. The racial/ethnic trajectories for children in the poor and low income categories differs for reading compared to their math score trajectories. In contrast to their performance in math, Hispanic origin children in the low income category don't have significantly different initial reading scores or differential growth in their scores over time compared to non-Hispanic whites (i.e., children of Hispanic origin from low income families have reading trajectories that mirror their non-Hispanic white peers). Non-Hispanic Blacks in the low income category don't have different initial scores but they do have less growth over time. This suggests that the scores of non-Hispanic Blacks actually diverge from those of non-Hispanic whites over time. We see this pattern for nonpoor non-Hispanic Blacks as well. In short, across these income groups non-Hispanic Black children are the most likely to start behind their peers and to fall further behind over time.

The six panels in Figure 1 (See Appendix) visually display the diverging trajectories for both math and reading by SES described above.

Much like the analysis for SES, the analyses by race/ethnicity reveal that there is no one trajectory within race/ethnicity for math or reading scores. In Table 4 we see that among non-Hispanic white children, those in the low income group, not the poor group, are the most

disadvantaged compared to their nonpoor peers: low income non-Hispanic white students have lower initial math scores and slower growth in their scores over time. The Asian origin child population displays a similar pattern: the low income group has the lowest initial scores compared to their non-Hispanic white counterparts. In contrast, within both the non-Hispanic Black and Hispanic origin populations, poor children are the most disadvantaged, with lower initial scores and slower growth over time. The racial/ethnic trajectories for reading scores mirror those for math scores.

Discussion

We have seen changes in both the race and income achievement gap over the last 50 years (Reardon, 2011; Reardon, et al., 2014). The racial achievement gap has narrowed while the income achievement gap has widened. The persistent racial achievement gap and increasing income achievement gap are of great concern individually, but the outlook becomes grimmer when we consider the overlapping of these two types of disadvantage. Minority children are the ones most likely to be living in poverty (U.S. Census Bureau, 2009; Macartney, 2011); therefore, children who are both minority and poor are *doubly disadvantaged* and have the worst achievement outcomes.

The significance of this study lies in its ability to elucidate some of the mixed results of NCLB and other educational policies in closing achievement gaps. Policies and programs aimed at increasing the proficiency of these vulnerable groups must be able to clearly identify the children who are most at risk for having the worst academic outcomes. Recognizing the significant overlap between socioeconomic status and racial stratification in these policy goals would better reflect the reality of American society and increase the likelihood that interventions targeting these gaps are delivered to those who most need them. Moving from a universal approach to a more tailored approach could increase the efficiency and effectiveness of these interventions.

This study adds to the current body of literature by examining the intersection of income and race/ethnicity on achievement outcomes and identifying the most disadvantaged children within and across income and racial/ethnic groups. There is not one clear achievement trajectory within or across SES status and racial groups instead as I show the answer is quite complex. It depends on academic subject and whether we focus on within or across group differences. Policymakers tend to expect that the poorest children will have the poorest scores. The trajectories for non-Hispanic Black and Hispanic origin children follow this pattern, non-Hispanic whites do not. Non-Hispanic white children in the low income group have lower scores than their peers in the poor income group, across subjects. This is an important point if the goal is to create interventions that target the lowest performing children. In the case of within racial group differences for non-Hispanic whites, low income children are more "at risk" than the poor children. Findings such as these make a case for more precisely identifying which students are in need of interventions rather than targets based on a single designation.

Although the impact of family and school characteristics are not the focus of this study, these findings suggest that they differential impact initial scores and change in scores over time by both race and SES. Children at or below 100% of the poverty line (those categorized as poor) experience more positive initial scores and less negative growth over time for reading scores and more positive initial scores for math with no significant growth, compared to non-Hispanic whites when they attend a private school. These same trends were not observed for low income and nonpoor children.

One limitation to this study is the categorization of children into large pan-ethnic categories. The racial and ethnic makeup of U.S. schools is changing and now includes children from diverse backgrounds (Fry, 2007; Orfield & Lee, 2005; Reardon, Yun, & Eitle, 2000). A U.S Census Bureau (2008) report estimated that 44% of the children belonged to a racial/ethnic

minority group. Projections suggest that by 2023, 50% of the U.S. child population will be minority children, reaching 62% by 2050 (U.S. Census Bureau, 2008). Similarly the population of immigrant children is growing at a rapid pace, 1 in 4 children in the U.S. either has at least one foreign-born parent or was born outside of the U.S. (Hernandez, Denton and Macartney, 2008). This increasing diversity of the child population must be considered if we intend to create policy aimed at decreasing achievement gaps. Simple Black-white comparisons are no longer feasible. Future studies must investigate student trajectories within and across specific ethic groups and examine the intersection of disadvantage.

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Appendix

Table 1
Descriptive Statistics by Poverty Level

	Nonpoor (n= 4,632)	**Low Income (n= 1,393)**	**Poor (n=2,882)**
Child and Family Characteristics			
Cognitive Achievement			
Math	79.59	71.60 *	70.29 ***
Reading	98.98	89.63 ***	88.96 ***
Child's Race/Ethnicity			
Non-Hispanic white	76.03%	56.63% ***	45.86% ***
Non-Hispanic Black	7.55%	16.43% ***	23.98% ***
Hispanic Origin	10.96%	22.69% ***	24.59% ***
Asian Origin	5.47%	4.25% ***	5.57%
Child's Gender			
Male	51.10%	51.50%	50.11%
Female	48.90%	48.50%	49.89%
Family Structure			
Two-parent Family	87.89%	69.22% ***	61.79% ***
All Other Family Forms	12.11%	30.78% ***	38.21% ***
Nativity			
Child or Parent Foreign Born	11.60%	19.08% ***	23.81% ***
Child or Parent US Born	88.40%	80.92% ***	76.19% ***
Home Language			
English Home Language	94.47%	85.09% ***	80.35% ***
Non-English Home Language	5.53%	14.91% ***	19.65% ***
School Characteristics			
School Type			
Private School	28.71%	11.30% ***	14.30% ***
Public School	71.29%	88.70% ***	85.70% ***
Percent of students receiving free/reduced lunch	22.15%	40.28% ***	42.72% ***
Fifty Percent of student body are minority	19.48%	39.89% ***	46.73% ***
School Received Title I Funds	50.79%	74.78% ***	72.06% ***

Source: The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K).* p<.05. ** p<.01.*** p<.001 denotes statistically different from nonpoor students.

Table 2
Descriptive Statistics by Race/Ethnicity

	Non-Hispanic White (n= 5,705)	Non-Hispanic Black (n= 1,034)	Hispanic Origin (n=1,674)	Asian Origin (n=495)
Child and Family Characteristics				
Cognitive Achievement				
Math	78.86	63.80 ***	68.83 ***	80.79
Reading	97.33	82.81 ***	89.09 ***	100.32 ***
Family Socioeconomic Status				
Poor	25.36%	56.39% ***	48.26% ***	36.27%
Low Income	14.91%	18.39% ***	21.19% ***	13.17%
Nonpoor	59.73%	25.21% ***	30.55% ***	50.56%
Child's Gender				
Male	51.39%	49.62%	49.98%	50.31%
Female	48.61%	50.38%	50.02%	49.69%
Family Structure				
Two-parent Family	82.94%	40.65% ***	74.99% ***	91.93% ***
All Other Family Forms	17.06%	59.35% ***	25.01% ***	8.07% ***
Nativity				
Child or Parent Foreign Born	4.77%	7.63% ***	49.57% ***	79.75% ***
Child or Parent US Born	95.23%	92.37% ***	50.43% ***	20.25% ***
Home Language				
English Home Language	98.62%	98.88% ***	55.30% ***	42.36% ***
Non-English Home Language	1.38%	1.12% ***	44.70% ***	57.64% ***
School Characteristics				
School Type				
Private School	24.87%	11.88% ***	14.93% ***	18.42% ***
Public School	75.13%	88.12% ***	85.07% ***	81.58% ***
Percent of students receiving free/reduced lunch	23.16%	54.61% ***	46.11% ***	30.92% ***
Fifty Percent of student body are minority	10.86%	73.46% ***	67.80% ***	51.83% ***
School Received Title I Funds	55.98%	77.48% ***	72.74% ***	55.75%

Source: The Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLSK). * p<.05. ** p<.01.*** p<.001 denotes statistically different from non-Hispanic white students.

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Table 3

Growth Models Predicting Achievement Scores, Kindergarten Through Fifth Grade by Income

	Math Test Scores			Reading Test Scores		
	Poor	Low Income	Nonpoor	Poor	Low Income	Nonpoor
Race/Ethnicity (vs. Non- Hispanic White)						
Non-Hispanic Black	-6.31 ***	-3.31 **	-4.96 ***	-5.15 ***	0.52	-1.19
× Time	-1.86 ***	-0.76 **	-1.14 ***	-1.47 ***	-1.03 **	-1.01 ***
Hispanic Origin	-4.99 ***	-2.20 *	-3.48 ***	-4.39 ***	-1.51	-2.44 **
× Time	-0.50 *	0.01	-0.38 **	-0.45 ***	0.37	-0.30
Asian Origin	0.94	0.99	3.35 ***	4.01	6.81 **	8.60 ***
× Time	0.19	0.33	0.24	-0.98 **	-0.47	-1.32 ***
Child and Family Characteristics						
Male (vs. Female)	0.59	-0.39	0.53	-3.48 ***	-4.11 ***	-4.32 ***
× Time	0.63 ***	0.68 ***	0.62 ***	-0.16	-0.52 **	-0.12
Family Structure (vs. All Other Family Forms)						
Two-parent Family	2.12 ***	1.54 *	1.57 **	3.40 ***	2.57 **	2.72 ***
× Time	0.17	0.09	0.38 *	0.02	-0.32	0.04
Child or Parent Foreign Born	0.37	-0.37	0.86	1.14	0.19	2.71 **
× Time	0.82 ***	0.89 **	0.29	0.49	0.39	-0.25
Non-English Home Language	-2.61 **	-2.04	-2.57 **	-4.11 ***	-2.55	-2.38
× Time	-0.27	-0.57	0.50 *	-0.66 *	-1.09 **	0.16
School Characteristics						
Private School (vs. Non-private)	2.38 ***	1.67	-0.34	2.60 **	1.05	-0.84
× Time	0.07	-0.08	0.03	1.39 ***	1.18 **	1.16 **
Percent of students receiving free/reduced lunch	-0.02 **	-0.04 **	-0.05 ***	-0.03 **	-0.03	-0.08 ***
× Time	-0.02 ***	-0.01 **	-0.03 ***	-0.03 ***	-0.02 ***	-0.05 ***
Percent of student body that are minority	0.32	1.71 *	-0.08	1.49	2.29 *	1.75 *
× Time	0.14	-0.27	0.27	-0.17	-0.66 *	0.01
School Received Title I Funds	-0.20	-0.77	-0.75 *	-0.50	-0.44	-1.50 **
× Time	0.24	-0.04	0.37 ***	0.36	0.23	0.78 ***
Intercept	38.02 ***	38.07 ***	42.47 ***	47.85 ***	46.75 ***	53.85 ***
Slope (time)	16.00 ***	16.05 ***	16.58 ***	20.76 ***	21.11 ***	21.61 ***

Source: The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K) . * p<.05. ** p<.01.*** p<.001 denotes statistically different from non-Hispanic white students.
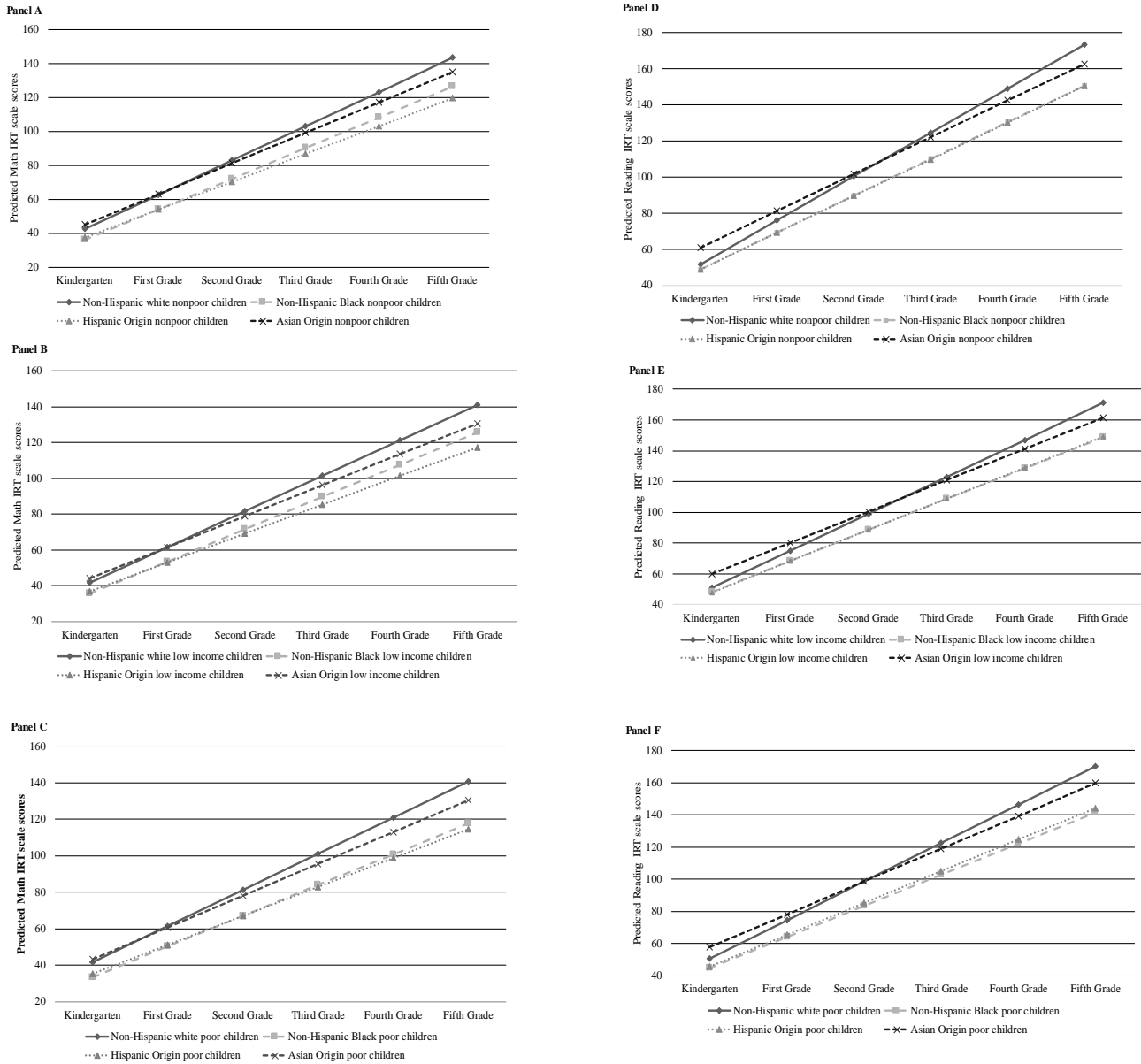
Figure 1

Panel A

Panel D

Panel B

Panel E

Panel C

Panel F

*Figure 1.*Predicted Achievement Trajectories by Race/Ethnicity and SES status.

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Table 4

Growth Models Predicting Achievement Scores, Kindergarten Through Fifth Grade by Student's Race/Ethnic

	Math Test Scores				Reading Test Scores			
	Non-Hispanic White	Non-Hispanic Black	Hispanic Origin	Asian Origin	Non-Hispanic White	Non-Hispanic Black	Hispanic Origin	Asian Origin
Child and Family Characteristics								
Family Socioeconomic Status (vs. Nonpoor)								
Poor	-2.42 ***	-4.43 ***	-4.07 ***	-4.76 ***	-2.81 ***	-7.38 ***	-6.23 ***	-8.40 ***
× Time	-0.38 ***	-1.21 ***	-0.56 **	-0.54	-0.43 ***	-1.02 **	-0.56 *	0.05
Low Income	-3.75 ***	-1.94 *	-2.41 **	-6.25 ***	-4.68 ***	-3.28 *	-4.58 ***	-8.18 **
× Time	-0.31 **	0.02	-0.26	-0.66	-0.31 *	-0.24	0.02	-0.03
Male (vs. Female)	0.49	0.26	0.03	1.20	-4.35 ***	-2.93 ***	-3.37 ***	-4.71 **
× Time	0.56 ***	0.86 ***	0.79 ***	0.34	-0.18	-0.24	-0.36	0.06
Family Structure (vs. All Other Family Forms)								
Two-parent Family	1.93 ***	0.74	2.06 **	1.67	2.87 ***	2.52 **	3.06 ***	4.24
× Time	0.20	0.27	0.17	0.60	-0.16	0.34	-0.24	1.19
Child or Parent Foreign Born	-0.29	2.56	0.60	2.44	0.50	3.24	1.31	5.70 *
× Time	0.52 **	1.40 **	0.32	0.51	0.14	0.94	0.13	-0.79
Non-English Home Language	-1.15	-0.84	-3.38 ***	-2.21	0.37	0.30	-4.04 ***	-4.62 *
× Time	1.34 ***	0.54	-0.27	-0.09	0.50	-0.64	-0.73 **	-0.15
School Characteristics								
Private School (vs. Non-private)	0.13	0.93	1.40	0.71	-0.80	1.08	2.45 *	1.85
× Time	0.15	-0.53	-0.43	0.11	1.37 **	-0.02	1.06 **	1.20 *
Percent of students receiving free/reduced lunch	-0.04 ***	-0.03 *	-0.03 **	-0.07 **	-0.06 ***	-0.05 **	-0.02	-0.12 **
× Time	-0.04 ***	-0.02 ***	-0.01	-0.01	-0.06 ***	-0.03 ***	-0.02 ***	-0.02
Percent of student body that are minority	0.23	0.74	0.24	0.54	1.52	2.60 *	0.19	4.45 **
× Time	0.21	0.48	-0.38	-0.23	0.05	0.16	-0.69 **	-1.14 **
School Received Title I Funds	-0.87 **	-0.38	-0.34	-0.13	-1.27 **	-0.38	-0.52	-0.20
× Time	0.46 ***	0.01	0.00	0.33	0.74 ***	0.32	0.07	0.71
Intercept	41.92 ***	36.33 ***	38.12 ***	43.90 ***	53.26 ***	49.77 ***	49.98 ***	58.80 ***
Slope (Time)	16.78 ***	15.04 ***	16.20 ***	16.44 ***	22.00 ***	19.56 ***	21.07 ***	19.27 ***

Source: The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K) (n=).   * p<.05. ** p<.01.*** p<.001 denotes statistically different from non-Hispanic white students.