PRELIMINARY DRAFT: Please do not cite or quote without authors' permission

Intergenerational Racial Stratification and the Black-White Achievement Gap

Wei-Jun Jean Yeung*

Department of Sociology

National University of Singapore

Caroline H. Persell

Department of Sociology

New York University

Michael Chavez Reilly

Department of Sociology of Education

New York University

September 2009

Word Count:

Keywords: *Racial Stratification, Educational Achievement, Youth*

*Corresponding author: Wei-Jun Jean Yeung, National University of Singapore, socywj@nus.edu.sg. This paper is supported by the National Science Foundation, grant #. We appreciate the excellent research assistance provided by Neil Hlawatsch and Kathryn May Pfeiffer. We are grateful to David Greenberg and Ben Jann for their very helpful comments.

Intergenerational Racial Stratification and the Black-White Achievement Gap

Abstract

This paper combines theories of racial stratification with insights from developmental psychology to test hypotheses about how family and out-of-home inequality (neighborhood, school, and peers) contributes to the black-white achievement gap among children at varying developmental stages. Prior research has found that family socioeconomic status and home environment account for racial educational achievement differences among very young children. However, the same set of covariate can not explain the achievement differences among children in junior and senior high schools. We investigate the large unexplained racial achievement gap among these older children by focusing on a few important clusters of factors: (1) intergenerational resources such as grandparents' education, wealth, and neighborhood characteristics, (2) characteristics of children's neighborhoods, (3) schools, and (4) peers. We draw data from the Panel Study of Income Dynamics (PSID) and its Child Development Supplements (PSID-CDS), the U.S. Census, the Common Core of Data on schools, and the Private School Survey. Our analyses show that these characteristics, when combined with home environment, can statistically explain the differences in the black-white achievement gaps among children in junior and senior high schools. Different sets of factors are important for explaining gaps among children at different developmental stages.

Intergenerational Racial Stratification and the Black-White Achievement Gap

Racial differences in educational achievement in the U.S. exist on a variety of indicators including standardized test scores, grade point averages, rates of placement in gifted or special education programs, dropout rates, and college attendance and graduation rates (Persell and Hendrie 2005). The persistence of racial achievement differences has raised grave concerns for both policy makers and scholars because of its very important individual and societal consequences. At the individual level, relative educational achievement is related to educational attainment, occupations, earnings (Jencks 1998; Johnson and Neal 1998), and health (Reynolds and Ross 1998). At the societal level, cognitive achievement gaps have implications for equal opportunity, for the skills of the workforce, and for international competitiveness. A better understanding of the causes of these racial differences has both theoretical and policy significance. Such knowledge can inform policies such as the reform of the Elementary and Secondary Education Act (ESEA), better known as the No Child Left Behind law, and affirmative action. At the theoretical level, the inability of social and behavioral scientists to explain racial differences in achievement with social structural factors, has kept alive efforts to offer genetic or cultural explanations for racial differences.

BACKGROUND

Until recently, no empirical studies were able to explain fully racial differences in achievement. A few recent studies find that educational differences by race among children entering kindergarten can be completely explained statistically by a set of family, child, and school characteristics. The black-white test score gap among incoming kindergartners in 1998 disappeared when Fryer and Levitt (2004) controlled for a set of covariates using the Early Childhood Longitudinal Study (ECLS) dataset. These covariates included parental education, parental occupational status, and household income, gender, child's age at time of enrollment in

kindergarten, WIC participation (a nutrition program aimed at low income mothers and children), mother's age at first birth, birth weight, and the number of children's books in the home (Fryer and Levitt 2004: 450-451). Yeung and Conley (2008) and Yeung and Pfeiffer (2009), using data from the Panel Study of Income Dynamics (PSID), also found that black-white differences disappeared statistically in children aged 3-5 in 1997 when a similar set of covariates were controlled.

However, research by these authors also found that the racial differences in achievement reappeared in the later school years (Fryer and Levitt 2006; Yeung and Pfeiffer 2009). That is, the variables in the model no longer explained completely the racial differences in achievement among older children. Fryer and Levitt (2006) showed that by the end of first grade, blacks had lost significant ground relative to whites, Hispanics, and to a lesser degree Asians. The achievement gap persisted even when school fixed effects were included in their models, suggesting that something other than family and school factors contribute to racial differences in test scores among older children. Similarly, Yeung and Pfeiffer (2009) showed the gap in Applied-Problems scores up to the third grade, and the gap in letter word scores up to the 6th grade, can be fully explained with a set of family variables but not beyond. An important puzzle that remains is how to explain racial differences in school achievement among older children. To do this, we need to broaden our theoretical framework.

THEORETICAL EXPLANATIONS

RACIAL STRATIFICATION THEORY

Much of the literature on racial differences in educational achievement focuses either on attributes of individuals (gender, race, human capital, psychological traits), home (family SES), or on characteristics of their immediate social situations (the schools they attend or the social networks to which they belong), without considering the relationships between individuals and

their larger social contexts, as Wilson (1998, 2009) urges. He calls for embedding individual and cultural phenomena in structural conditions.

The first condition to consider is race itself, which needs to be viewed not as an individual attribute, but as a system of social relationships that creates systematic advantages for members of one group while disadvantages the members of another group systematically (see work by critical race theorists such as Bonilla-Silva 1996, 2001, 2003; Omi 2001, who see race as a system of organized power in society). A risk here is that race or racism becomes a constant—racism is present everywhere, at least in the U.S.-- and is asserted to be the blanket cause of racial differences in achievement. It is, however, very difficult to conduct research using a constant rather than a variable, so we focus on the relative differences between races in different contexts (Persell and Hendrie 2005).

A group's subordinate position in a racialized system of power relations affects its measured intelligence and school achievement through three processes: 1) socio-economic deprivation, 2) racial/ethnic segregation which concentrates disadvantages and accentuates them, and 3) the "stigma of inferiority based on the wider society's perception of them" (Fischer et al. 1996: 174). This is an excellent framework as far as it goes, but it does not measure and analyze these concepts.

The important work done by critical theorists in race and in education has seldom been linked with quantitative research. We start with the premise that racial stratification is a variable rather than a constant and that it is relational. As a relational concept, racialized structural inequalities rest on relationships between two or more socially defined racial groups. They can be measured in terms of the disparities in power, material resources, and social status between racial groups. From this starting premise, our framework calls for acknowledging the historical differentials between racial groups, which requires intergenerational and contextual data, as well

as individual-level data. Our theory does not offer a single-factor, but instead is a more complex laminate of interrelated structural, institutional, interactional, and attitudinal conditions which operate cumulatively and intergenerationally to create racial variations in educational achievement (Persell and Hendrie 2005). To this elaboration of racial stratification theory, we add insights from developmental theory suggesting that children may be influenced by different factors at various ages.

DEVELOPMENTAL THEORIES

Scholars influenced by Piaget's models of child development (1983), emphasize certain environmental influences that become more important for an older child's educational and cognitive outcomes (e.g., Mickelson, 1989, 1990). They argue that only from early adolescence (from 11 to 12 years) on, is a child likely to understand the full significance of the societal messages that he or she receives from a racialized and impoverished environment (such as neighborhoods, schools and peers). Only from early adolescence on do children start to consider the consequences of decisions, and show the ability to generate and choose from a range of options (Keating 1990; Case, 1985). Also at this time of heightened self-consciousness, schools increasingly emphasize competition, social comparison, and ability which may have a more adverse influence on black adolescents' self perception and motivation. The developmental literature shows the greater susceptibility of adolescents to out-of-family influences in the school and neighborhood compared to younger children. As children move through upper elementary school, their school grades have an increasingly stronger impact on their academic self-perceptions and motivation (Smith, Jussim and Eccles 1999). In short, we propose combining developmental and racial stratification theories to better understand the black-white achievement gaps in a life course framework.

DISTINCTIVE FEATURES OF THIS STUDY

Our central hypotheses are that (1) intergenerational and contextual inequalities feature more prominently in explaining the racial achievement gaps among children in junior and high shools than those among younger children, and (2) they can help account for the large unexplained racial differences among children in higher grades. This paper goes beyond the current literature on the black/white achievement gap to in the following ways:

(1) To our knowledge, this is the first study of the black-white achievement gap that integrates theories of racially-linked contextual inequalities with developmental perspectives in a life course framework. Measures that are appropriate for children at various developmental stages are used to test hypotheses about how different sets of factors contribute to the black-white achievement gaps at different developmental stages.

(2) It uses a rich national longitudinal dataset containing information on children from preschool to high school, allowing for a better examination of the impact of prior events and performance on changes in a child's school performance at different ages (and thus better addresses the unobserved heterogeneity problem) than cross-sectional data.

(3) It extends the traditional intergenerational transmission of (dis)advantages to a third generation by analyzing how grandparents' resources may contribute to cumulative black-white achievement disparities.

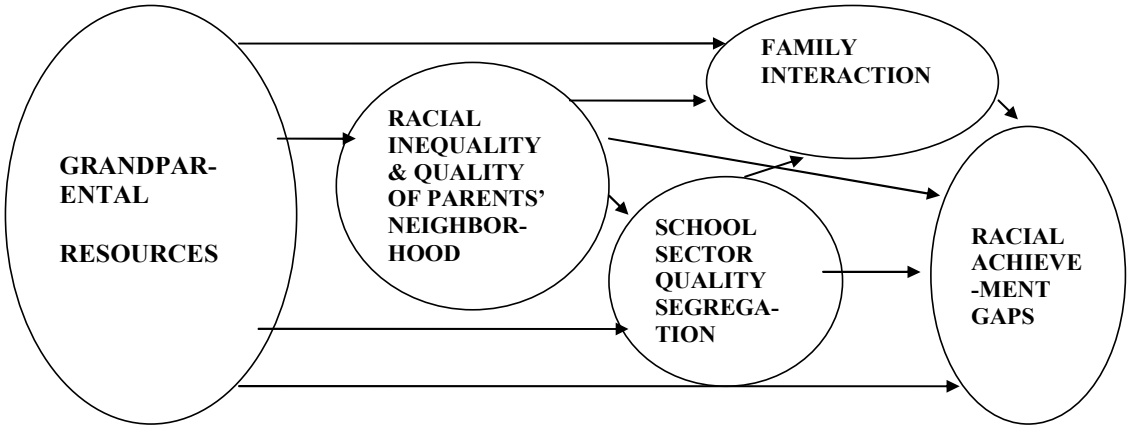
(4) It expands traditional family SES measures in the literature to include family relationships and interactions, including parental expectations and parenting practices.

(5) It examines factors in social contexts outside of the home, including school and neighborhood, by linking individual level data with contextual data, for two generations, using geocodes. In this way, it connects discrete bodies of theory and research on families, schools and

stratification, analyzing, e.g., how neighborhood characteristics are related to family interactions and school characteristics, which in turn are related to racial achievement gaps.

SPECIFIC HYPOTHESES

Informed by developmental and contextual stratification theories, our central guiding hypothesis is that contextual and intergenerational inequalities have a greater explanatory power for black-white achievement disparities among older children than among young children and they will help reduce the large unexplained racial achievement gap in higher grades**.** Below is a schematic conceptual framework for relationships among major concepts and hypotheses about the mechanisms through which these factors affect racial achievement gaps.



H1: Grandparental resources affect racial inequality and quality in parents' neighborhoods. These will influence parents' SES, parenting practices, and expectations, which, in turn, affect the racial achievement gap.

H2: Intergenerational resources have a stronger impact on older children, as the much higher level of extra resources from grandparents available to white children increases the likelihood of better neighborhoods, private school, college attendance, positive role models, and increases adolescents' self esteem which become more relevant as children mature.

H3: Neighborhood and Peers have a stronger impact on the racial achievement gap among older children as they offer role models for children at that developmental stage.

DATA AND METHODS

We analyze data from the Panel Study of Income Dynamics (PSID) and its Child Development Supplements (PSID-CDS). To our knowledge, this is the only current national dataset that includes cognitive assessment data for children from preschool to high school and contains long family histories on children, which can be matched to contextual census data over three decades. The PSID is a longitudinal study that began in 1968 with a nationally representative sample of about 5,000 American families, with an oversample of black low-income families. For the past four decades, the study collected high quality annual data from these families and individuals about their demographic, socioeconomic, and employment characteristics and behaviors. One of the PSID rules is to follow children of the original sample member as they set up their own households. By 1996, the sample had grown to include over 8,700 families through the formation of new families by children or other sample members of the original 5,000 families, with data spanning multiple generations. The initial clustering of households in the original sample has become quite spread out geographically after three decades of interviews.

In 1997, the PSID initiated a Child Development Supplement (CDS-I) to provide data about a nationally representative sample of children aged 0-12 and their families. All children in the CDS were selected from the PSID families. In families that have more than one child, up to two siblings were randomly selected to participate in the study. The sample size of CDS-I is 3,563 children in 2,394 families (with a response rate of 88% at the family level). A follow-up

interview with CDS-I children who were in participating PSID families was conducted in 2003[1]. In CDS-II, 2,019 families were successfully re-interviewed, resulting in 2,907 children. These children were between the ages of 5-17 in 2003. The response rates are about 91% at the family level, and 84% at the child level. Longitudinal sampling weights developed by the PSID staff are used to help adjust for nonresponse and for the original selection probability.

The CDS collects information on child development and family dynamics, including parent-child relationships, HOME-SF cognitive stimulation and emotional support, parenting attitudes and styles, and parental psychological and social resources. In most sections, identical questions were used in both waves. Many are constructed so that they are developmentally appropriate for children of different ages. Age appropriate standardized assessments for cognitive skills were administered in both waves for children aged 3 and above (RR=91%). An audio computer assisted self-interview was added to the study for children who were adolescents in CDS-II, on a wide range of adolescents' attitudes and behavior (including risky and antisocial behavior). For details about the PSID, see the study website http://psidonline.isr.umich.edu/. These PSID data have been linked to neighborhood and school data as discussed in the "Measures" section.

SAMPLE

The sample consists of children aged three to twelve in 1997, who received the assessments in both waves of the CDS (n=2,227). We include black and white children only due to the limited representation of other racial and ethnic groups in the CDS. The final study sample is between 1,532 to 1,670 children, depending on which test score we analyze. To this sample, we added contextual and grandparental variables. This is admittedly not a large sample, particularly when analyzed by three cohorts at distinct developmental stages, yielding about 550 children per

[1] The majority of the children were interviewed in 2003 (61%) with a small proportion of children interviewed in 2002 (39%). For simplicity, we will refer to the CDS II year as 2003 in subsequent text.

cohort. However, this is the only data set we know of that allows one to conduct the intergenerational analyses that we proposed.

KEY THEORETICAL CONSTRUCTS AND MEASURES

DEPENDENT VARIABLES, CHILDREN'S COGNITIVE SKILLS are measured with the Woodcock Johnson Achievement Test-Revised. As the name of the test suggests, the W-J test is a measure of children's achievement, not IQ. All assessments were conducted in children's homes during school years. No data on children's skills during the summer months are available. The scores are age-standardized by children's birth months. We use the Applied Problem score as an indicator of the child's math skills and the Letter-Word test as a measure of children's verbal skills. As the results of the other available assessments are similar and since these other assessments were not given to children under age six, we only present the Applied Problem and Letter-Word analyses in this paper. All assessments were conducted in children's homes during school years. No data on children's skills during the summer months are available. The scores are age-standardized by children's birth months. See the User Guide for the Child Development Supplement (Hofferth et al. 1998) for details about these measures. We have transformed the test scores so that they have a mean of 0 and a standard deviation of 1 on each of these tests to facilitate interpretation of the test gap coefficients.

This paper uses a similar set of parental home environment variables used in Yeung and Pfeiffer (2009). These covariates include a wide range of factors that can potentially affect children's test scores including: factors prior to or at the child's birth, child's characteristics, family socioeconomic background, parental expectations about the child's education, parental feelings of self-efficacy, and family processes, such as the cognitive stimulation parents provided to a child, and emotional support in the home. Description of these covariates can be found in Appendix A and in Yeung and Pfeiffer (2009). In this paper, we add a number of variables

measuring grandparental characteristics and neighborhoods and parental neighborhood contexts, schools, and peers.

INTERGENERATIONAL RESOURCES. Researchers have identified the importance of intergenerational resources such as education and wealth. For example, Phillips et al. (1998) found that combining grandparents' educational attainment and occupation into a broader index of the family environment reduced the test score gap among young children by two-thirds instead of one-third without it. Oliver and Shapiro (1990) and Conley (1999) document the vast intergenerational racial differences in wealth and their impact on children's life chances. Wealth is a better proxy of permanent income than family income. Furthermore, since family income may largely go to pay for basic living expenses and current consumption, the presence or lack of assets may mean the difference between owning a home in a better neighborhood, additional educational resources such as attending private schools, structured activities outside the home, books, magazines, and educational toys, computer related learning programs and so on. These and other experiences such as attending concerts and museums help increase the "cultural capital" for children (Bourdieu, 1977, 1986) that can be positive ly related to academic achievement.

Grandparents' socioeconomic background is measured with maternal and paternal grandparents' completed years of schooling, selecting the higher of the two in each set of grandparents.[2] As noted in Phillips et al. (1998), grandparental resources can affect grandchildren's achievement both directly and indirectly through their impact on parents' socioeconomic status and attitudes. Ignoring grandparents' background would potentially underestimate the overall contribution of socioeconomic status to the black-white test score gap.

[2] We also attempt to capture the nonlinear effect by using a dummy variable indicating whether mother or either grandparent had 12 or more years of school, or some college education (13 years or more). They yield similar results.

Additional resources can also help parents to provide materials that enhance a child's social status or acceptance by his/her peers such as a house in a nice neighborhood, family car, or clothing, which have been shown in adolescent literature to have a positive impact on children's self esteem (Walker and Greene 1986). One of the principle mechanisms through which assets (another term for family wealth) are hypothesized to have a salutary effect on family well being is by acting as a buffer in times of financial need (Sherradan 1991), thus reducing parental stress levels and leading to more positive parenting practices or decreasing the likelihood of family breakups (Yeung and Hofferth 1998).

Grandparent Wealth is operationalized as a dummy variable indicating whether the grandparents of PSID children in 2002 reported zero or negative assets (debt) in 1984. The wealth data is reported by grandparents in the PSID whose records are matched to their grandchildren in the PSID. The data is downloaded from PSID Family Wealth Data for 1984 and includes the value of home equity.

CONCENTRATED NEIGHBORHOOD DISADVANTAGE is measured because blacks are much more likely than whites to live in neighborhoods with much larger numbers of poor people in them. They are also much more likely to live in such neighborhoods for several generations (Sharkey 2008). Catsambis and Beveridge (2001) found significant relationships between neighborhood characteristics (particularly concentrated disadvantage) and four parental practices, specifically parental educational expectations, academic communication, parental supervision of the child, and music/dance lessons, with consequences for mathematics achievement. Wilson (1998) has theorized about how living in a neighborhood where few are employed will affect the models children see of what adults do. Ainsworth (2002) found that the percentage of professionals in a student's social context was related to school effort and achievement, but he did not analyze the racial gap. Dornbusch, Ritter and Steinberg (1991)

conducted exploratory cross-sectional research using self-reported grades and questionnaires from a sample of students in six northern California schools and some students in Milwaukee in 1987. They found that community characteristics (average economic and educational status of adults, the percent of families above poverty, and the percent of adults holding professional or executive jobs) were stronger predictors of self-reported grades than parental characteristics and family structure for blacks than for whites. They did not, however, have longitudinal data to consider whether neighborhood effects operate through selection or socialization. We measure the neighborhood contexts with two theoretical constructs: (1) concentrated disadvantage and (2) role model indices.

We created a **Concentrated Poverty Index** to measure concentrated neighborhood disadvantage in the census tract where a PSID family resided in various point of time.[3] The index was constructed using data from the US Census for the years 1980, 1990 and 2000. The data for interim years between the decennial censuses was computed by calculating adjustment increments for each variable in each year and adding that incremental value onto the decennial base value for each case. The five variables in the index are percent of residents on welfare in the census tract, percent of female headed households, percent of residents who are high school dropouts, percent of residents who are unemployed, and percent of residents living below the poverty line. Each of the five individual variables was standardized and then the five were averaged into one standardized index, with a mean of 0 and a standard deviation of 1. The alpha score of the index is 0.95. A corresponding index of Concentrated Poverty in grandparents' neighborhoods was also constructed using data from the U.S. Census for 1970 and 1980, following the same process as above.

[3] Similar indices were also constructed for the neighborhood in which the grandparents resided when parents of the target child were growing up.

A **Role Model index** was constructed to measure the "presence of role models" in the census tracts where grandparents and PSID families with children under the age of 18 reside. The index was constructed using data from the US Census for the years 1980, 1990 and 2000. The data for interim years between the decennial censuses was also computed by calculating adjustment increments for each variable in each year and adding that incremental value onto the decennial base value for each case. Two variables were used to construct the index. The variables are the percent of professionals in the census tract and the percent of college graduates in the census tract (alpha index = 0.95). The index measure is standardized with a mean of 0 and a standard deviation of 1. A corresponding Role Models index for grandparents' neighborhoods was also constructed using data from the US Census for 1970 and 1980 following the same process as above.

SCHOOL FACTORS. Besides racial inequalities in the neighborhood, children may encounter racial inequalities in their schools. We focus on the degree of economic and racial segregation that has been found to vary by race and to affect educational achievement. [1] We obtain data from the National Center for Education Statistics (NCES) Common Core of Data (CCD) and from the Private School Survey which we match to the PSID-CDS child records by the ID of the school that the child was attending at the time of the 2003 interview. A composite index indicating the **degree of Economic and Racial Segregation** was constructed by averaging the following two NCES variables: "Percent of Students Eligible for Free Lunch" and "Percent of Non-white Students in the School." The "Percent Non-white Students" variable itself was constructed by subtracting the percentage of white students in the school from the overall total percentage of students in the school (the remainder of which was comprised of black, Hispanic, Asian, Native American, and Other students). Since both original variables were measured on a scale from 0-100%, the composite variable itself is measured on a 0-100% scale.

To measure the impact of peers on achievement, an index called **Number of Friends Who Avoid Trouble** was created from interviews with children (age 10 and older) in PSID's Child Development Supplement (2002). The index was constructed as an average score of children's responses to the following questions "How many of your friends do the following things: "Are in gangs?" "Refuse to use drugs when offered?" and "Get in a lot of fights with other kids?" The first and third questions were reverse coded, so that a low number became a high one, and all scales were ordered in the same direction. Then, all three questions were scored on a five point scale, with the lowest score being 1 "none," and the highest score being five, "Almost all or all." The Alpha Index = 0.48. The higher score the more someone has friends who try to avoid trouble.

We also created an index of **Peer Academic Orientation,** based on from interviews with children (age 10 and older) in PSID's Child Development Supplement (2002). The index was constructed as an average score of children's responses to the following questions: "How many of your friends do the following things: "Think schoolwork is very important"; and "Plan to attend a four year college?" Both questions were scored on a five-point scale, The Alpha Index =.58. The higher the score the more someone has friends who are more academically orientated.

Finally, we developed an index based a set of questions in PSID's Child Development Supplement (2002) designed to capture the degree of **a child's individual motivation**. The four questions applied to children age 10 and older and asked them to respond to the following questions on a five point scale ranging from Never (=1) to Always (=5). The questions were: "I stay with a task until I solve it;" "Even when a task is difficult; I want to solve it anyway;" "I try to do my best on all my work;" and "When I start something, I follow it through to the

end." The standardized Alpha Index for this construct was 0.71. The higher score the greater the degree of motivation of the child.

ANALYTICAL STRATEGY

We first divided the sample into three age cohorts. For children in the 1997 CDS sample, the age cohorts corresponded to when children were in pre-Kindergarten years (ages 3-5), grades 1-3, and grades 4-6 in 1997. When these children were reinterviewed in the 2003, these three cohorts were in grades 4-6, 7-9, and 10-12, corresponding roughly to late elementary, junior, and senior high school years. After comparing the racial means and standard deviations on the variables, we use step-wise regression analysis to examinine how the racial achievement gap changes as we add different clusters of covariates to the explanatory models. We begin with the family background variables which have been proven significant in the past (largely following work by Fryer and Levitt, Yeung and Pfeiffer). We then add the grandparent's characteristics, the neighborhood contextual variables, the school context variables, and the peer influence variables. In the final models we are able to reduce the racial achievement gap in both verbal and applied problems to a non-significant level for children at all stages.

Subsequently, we use Oaxaca Decomposition analysis to show the relative importance of different clusters of variables—family, neighborhood, school, and peers—in explaining the black-white achievement gap children in different age cohorts. We find that family factors explain most of the achievement gaps for the youngest cohort (as shown in Yeung and Pfeiffer 2009). For the older cohorts, family factors decline but do not disappear in importance, while neighborhood, school, and peer factors become more important.

RESULTS

COMPARING BLACKS AND WHITES

Table 1 shows the weighted means and standard deviations of the major variables used in the analyses. The grandparents of black children have significantly lower levels of education, wealth, and higher rates of zero wealth or debt than white grandparents. Both black grandparents and parents are much more likely than their white counterparts to live in neighborhoods with high concentrated poverty and fewer positive role models (measured by percent of college graduates and professionals), and the neighborhood differences are larger in the parental compared to the grandparental generation. Although the extent to which and how neighborhood affects children's outcomes has been heavily debated, scholars have identified potential mechanisms through which neighborhoods may affect child development. These mechanisms include peer influences (Harding 2009), violence, institutional factors such as schools, role modeling, and parenting behavior. On average, black children attend schools in which a majority of students are eligible for free lunches (i.e., a high poverty school), while whites attend schools where only one out of five children are eligible for free lunch. Consistent with research by Coleman et al. and Mickelson (1989, 1990), our data also show that Blacks have higher motivation and academic orientations than whites. These differences between black and white children are all statistically significant. White adolescents are somewhat more likely than blacks to have more peers who avoid fights, gangs, and drugs, although this difference is not statistically significant.

(Table 1 about here)

ANALYZING INTERGENERATIONAL RACIAL STRATIFICATION

Our first set of analyses considers whether the racial stratification experienced by grandparents is related to stratification in the parents' generation. To address this question, we regressed parental education, occupation, income, parenting practices, and mother's cognitive

skills, on grandparental education, degree of concentrated neighborhood poverty, and proportion of positive role models in their neighborhoods, and whether they had any assets, while controlling for race and gender of the parent. Grandparents' educational levels show strong positive associations with parental education, occupation, and family income, mother's cognitive skills, parent's educational expectations for their own children, and the cognitive stimulation of the child in the parental home (Table 2). Given that black grandparents on average have over two and a half years less education than white grandparents (as seen in Table 1), this is a significant intergenerational disadvantage experienced by blacks that is significantly related to their children's life chances. Grandparents' self-efficacy is positively associated with the level of education parents obtain, parental family income, net wealth, the cognitive stimulation parents provide to their children, and parents' educational expectations for their child. Grandparents' lack of assets is negatively associated with parents' occupational prestige and net wealth. When grandparents live in neighborhoods with concentrated poverty, parents are also more likely to live in neighborhoods with concentrated poverty when they become adults ($r = .66$) (consistent with findings in Sharkey, 2008, Sharkey and Elwert, 2008 and South and Crowder, 1998) and more likely to have lower family incomes and net worth as adults. One particularly interesting finding is that parents whose own parents lived in neighborhoods with higher proportions of positive role models are more likely to have occupations with higher prestige themselves.

(Table 2 about here)

Parental neighborhood characteristics are related to the schools children attend and to the types of peers they have. Children whose families live in neighborhoods with concentrated poverty are more likely to attend more racially segregated schools with higher proportions of students receiving free lunches and more likely to have peers who engage in problem behaviors, based on regressing school and peer characteristics on family neighborhood characteristics, while

controlling statistically for the race and gender of the child (results available on request). Having established a number of relationships between indicators of grandparental and parental resources and social contexts and child experiences of peers and schools, we now analyze whether the addition of these indicators of intergenerational and contextual racial stratification help statistically to explain the racial gap in achievement test scores.

DO INTERGENERATIONAL AND CONTEXTUAL FACTORS HELP TO EXPLAIN RACIAL GAPS?

GAP IN APPLIED PROBLEMS SCORES ACROSS AGE COHORTS. Tables 3 and 4 summarize results from the step-wise regression for the Applied Problems and Letter-word scores respectively. The race coefficient represents the magnitude of the racial achievement gaps. We observe how the race coefficients change as we add different groups of covariates to the model. We only present the coefficients for neighborhood, schools, and peers factors in these tables. The full models are in Appendices B and C.

In 1997 when the first wave of CDS was conducted, the children were under the age of 13 and there was not sufficient data to allow a full set of analyses on the influence of school and peers factors. For these children, we examine how home and neighborhood environment are associated with the achievement gaps. In Table 3, we see that the racial achievement gaps in the applied problems test score (indicated by the race coefficients) becomes non-significant after the family environment covariates are controlled. The neighborhood factors are not significant, for children in pre-K and Grades 1-3 (Panels A and B). This is consistent with our hypothesis that family factors account for most of the differences in the early school years.

(Table 3 about here)

For children in grades 4-8, however, the gap is reduced to .31 of a standard deviation after the home covariates are controlled for, but remains significant (Table 3, Panel C). The neighborhood covariates explain an additional 5 percent of the total variance. In particular, it is

the percent of educated or professional role models lived in the census tract in which the family resides that is significantly related to children's math skills.

When these children were re-interviewed in 2003, the youngest cohort was in grades 4-6. There is a gap of almost one standard deviation in the applied problems test scores of black and white children. Two thirds of this gap is accounted for by all the family and child factors in the model (Table 3, Panel D). When all family covariates are controlled for, the gap is reduced to .3 of a standard deviation and the R-square almost doubles. The neighborhood and school covariates do not account for much of the gap, although together they further reduce the gap to a non-significant level. The R-square increases by only 1% and none of the neighborhood and school covariates are significant for this cohort.

For children in grades 7-9 in 2003, there is a racial achievement gap in applied problems scores of one standard deviation (Table 3, Panel E). When family covariates are added, the gap is reduced substantially to .4 of a standard deviation, although it remains significant (family covariates account for 60% of the gap). When neighborhood and school covariates are added, they do not reduce the gap further. However, role model in the neighborhood and peer influence are significantly associated with the test scores for this age group. Early adolescents who avoid negative peer influences (i.e., friends who join gangs, use drugs, or fight a lot) have higher math test scores than those who do not. When peer covariates are added the racial gap decreases to .34 of a standard deviation and becomes non-significant. Young adolescents with higher levels of motivation also have significantly higher math achievement than those with lower levels of motivation, seen in the increase in R-square to .45.

For students in grades 10-12, the racial gap in applied problems test scores is at .78 of a standard deviation, meaning that the average black achievement score is more than three quarters of a standard deviation below the average white achievement score, without controlling for other

any factors (Table 3 Panel F). When grandparental characteristics, including their education, wealth, and neighborhood contexts, are added to the regression analysis, it reduces the applied problems test score gap by about 10 percent to .69 of a standard deviation, so grandparental factors (especially grandparental wealth, as seen in Appendix B) matter somewhat, but the gap remains significant (Table 3, Panel F). When child and parental personal characteristics, educational expectations, and parenting practices are added to the regression, the size of the race coefficient drops to .41 of a standard deviation and the R-square increases to .329 (Table 3, Panel F). Clearly parental factors are important, but the racial gap remains significant. Adding parental neighborhood characteristics does not reduce the race coefficient. The degree of economic and racial segregation in the school reduces the race coefficient to .37 of a standard deviation, which is still statistically significant. When children have more peers who seek to avoid trouble, the racial gap is reduced to .36 of a standard deviation, which is statistically insignificant. Controlling for the child's prior 1997 test score has a strong and significant effect on their 2003 achievement, and reduces the race coefficient to -.23, and increases the R–square by .18 to 0.57.

GAP IN LETTER-WORD SCORES ACROSS AGE COHORTS. Do the same factors matter for verbal skills compared to math skills? In Table 4, we see that the gaps in letter-word test scores are reduced to non-significant levels in all three cohorts in 1997 (Panels A-C). Interestingly, the neighborhood covariates are significantly associated with the letter-word scores in both pre-K and grades 4-8 (Panels A and C).

(Table 4 about here)

In 2003, when the youngest cohort of children were in grades 4-6, there is a racial gap of .67 of a standard deviation in verbal achievement (Table 4, Panel D). Family factors account for

almost the entire gap in this age group (Table 4, Panel D). For children in middle school (grades 7-9 in 2003), there is a larger gap of .94 of a standard deviation in verbal test score achievement (Table 4, Panel E). When black and white children have the same family (parental and grandparental) characteristics, the achievement gap is reduced by half. When their neighborhoods are also comparable, the racial gap becomes non-significant. Peer factors are also important for verbal achievement. Young adolescents with more peers who avoid trouble have significantly better verbal achievement than those who have more peers who get into trouble. When prior test scores are held constant, the R-square increases from .33 to .61.

In high school (grades 10-12 in 2003), there is a gap of -.74 of a standard deviation (Table 4, Panel F). This is smaller than the gap among younger children, most likely because some students have already dropped out. Family covariates explain about half of the raw gap and when neighborhood covariates are added, the gap becomes non-significant. None of the other covariates are significant. Peers and child motivation add nothing further to the verbal achievement gap. As with math achievement, prior test scores have a strong positive relationship with verbal achievement and increase the R-square by .311 to .539. Thus, the models explain slightly more of the variance in math achievement compared to verbal achievement.

Do Different Factors Explain Applied Problem Achievement Gaps at Different Developmental Stages?

To address this question, we conducted a two-fold Oaxaca decomposition analysis, using pooled data, as suggested by Ben Jann (2008). The purpose was to more clearly see the degree to which different clusters of factors explain children's achievement gaps at different developmental stages.[2]

These results are summarized in Table 5. For the 1997 tests, (Table 5, Panel A). Family factors are more important for explaining the gap for pre-K children and those in grades 1-3 compared to those in grades 4-8. Neighborhood factors become significant only for children in grades 4-8. Peer and school characteristics were not available for this group.

(Table 5 about here)

In 2003, for students in grades 4-6, the racial gap in applied problems achievement was .94 of a standard deviation (Table 5, Panel B). Of this, almost two-thirds (.63) was explained. Family characteristics explained the most by far (explaining 90% of the total explained). As can be seen in the regression analysis discussed above, these family characteristics include the mother's cognitive test score, the highest level of parental education, and family income during the first five years of the child's life. Apart from the family, some of the gap among elementary students' applied problems achievement is related to the neighborhoods in which they live (explaining 8% of the gap). The two features of neighborhoods were the degree of concentrated poverty and the percentage of residents in the neighborhood who were college graduates and professionals. Whites are considerably more likely than Blacks to live in more advantaged neighborhoods in these respects, and those characteristics are positively related to math achievement. Children who attend schools that are less segregated by race and class achieve better than those who do not, even when family and neighborhood are controlled. If black and white elementary children had the same family, neighborhood, and school characteristics on average, there would be no statistically significant difference in their applied problems achievement scores.

For 2003 middle school students (Table 5, Panel B, grades 7 to 9), about two-thirds of the gap is explained by differences in family characteristics, but the explanatory power of family characteristics has declined compared to younger students. Here family characteristics explain

only 43 percent of the achievement gap compared to 57 percent. For middle schoolers, peers who avoid trouble are important (explaining 14%), as is neighborhood (explaining 11%), and schools to a small degree (4%). If black and white middle school children had the same family, peer, neighborhood, and school characteristics, there would be no statistically significant difference in their applied problems achievement scores. Overall the model explains 68 percent of the gap, slightly more than among younger children.

High school students show a somewhat different pattern (Table 5, Panel B, grades 10-12). First, less of the gap is explained by the full model (38% compared to 63% and 68% for elementary and middle school students) and the explained portion is virtually the same size as the unexplained portion (37%). Second, the importance of family characteristics continues to shrink (explaining only 21% of the gap). School characteristics (specifically the degree of racial and socioeconomic segregation) are more important for explaining the racial gap among high school students than they are for any other cohort (explaining 12%). Peers are also important for high school students (explaining 6%), although not as important as they were for middle school children. Even though the model explains less, it does reduce the race coefficient to insignificance in the regression analyses.

Family factors are important for all age groups, but steadily shrink in importance as children get older. Neighborhood and peer factors are more important for middle schoolers, and somewhat relevant for high school students, compared to elementary students. Our hypothesis that different factors would help explain racial achievement differences among older children is supported.

DO DIFFERENT FACTORS EXPLAIN LETTER SCORE ACHIEVEMENT GAPS AT DIFFERENT DEVELOPMENTAL STAGES? The 1997 tests reveal some interesting differences. For pre-kindergarten children in 1997, family characteristics are less important for explaining the gap

than they are for children in grades 1-3 and the model explains less of the gap overall (Table 5, Panel C). Family factors increase in importance for children in grades 1-3 (explaining 63% of the gap), with neighborhood playing a small role. For children in grades 4-8, family factors shrink to .26, while neighborhood factors increase to .30.

In 2003, children's family characteristics explain 60 percent of the gap in Letter Score Results in grades 4-6, with neighborhood and school making small additional contributions (Table 5, Panel D). The family characteristics that matter are the same as for the applied problems achievement, namely the mother's cognitive test score, the highest level of parental education, and family income during the first five years of the child's life. Overall the model explains 74 percent of the racial gap in letter word scores (even higher than for math), and unexplained factors do not account for any of the verbal gap among elementary children.

Middle schoolers' verbal achievement is explained by the same factors that explained their applied problems achievement (Panel D, grades 7-9). The gap is larger (.97) in middle school than elementary school, as was also the case with applied problems. Family factors are still important, but less so (explaining 44 percent of the gap). Peers are important for explaining the gap among middle schoolers (explaining 15 percent) and neighborhood explains a small amount of the gap (5 percent). Overall, differences in family, peer, neighborhood, and other characteristics explain more than two-thirds (.68) of the racial differences in verbal achievement among middle school students.

For high school students, racial differences in verbal achievement are again smaller (.75 of a standard deviation), as was the case with applied problems scores (Table 5, Panel D, grades 10-12). Family factors continue to shrink in their explanatory importance (explaining 26 percent), while school characteristics increase in importance compared to younger age groups. Overall, differences in family, neighborhood, school, and peer factors account for 42 percent of

the racial differences in verbal achievement among high school students, and reduce the gap to insignificance.

Overall, family factors are important for all cohorts, but particularly for elementary children. They decline in importance among older children. Family is slightly more important relative to other factors for explaining verbal racial differences compared to math variations. Peers, neighborhoods, and schools are important for middle school students and somewhat for high school students. If black and white children had the same family, neighborhood, peer, and school characteristics, there would be no significant racial differences in their verbal achievement.

DISCUSSION AND CONCLUSIONS

The results support our central hypothesis that contextual and intergenerational inequalities can account for the large unexplained racial differences in both math and verbal achievement between black and white children in junior and senior high schools. The measures of intergenerational stratification, neighborhood contexts, school, and peer characteristics, together with home environment, reduce the raw achievement gaps in Applied-Problems and Letter-word scores in high school years from .78 and .74 of a standard deviation to statistically insignificant levels of .37 and .33 of a standard deviation respectively. Although these differences are no longer statistically significant, future studies need to examine what other factors account for the remaining differences in high school years. Measures available to us for the quality of school and other dimensions of neighborhood may not be sufficiently adequate to completely capture these theoretical constructs.

Insights from the developmental theories are useful when combined with stratification theories, as together they help illuminate that racial gaps at different schooling stages are explained by different sets of factors. The black-white differences in early home environment

are largely responsible in setting off the initial racial achievement gap before children start school. We show that there is a deep intergenerational root for the racial achievement gaps, starting with the influence from grandparents, and factors such as having a mother who was a teenager when the child was born or has low cognitive skills, and being born with a low birth weight as precursors of low cognitive achievement in early childhood (as noted in previous studies, Yeung and Pfeiffer, 2009). These early gaps in turn have cumulative implications for the achievement trajectories in later school years. As children reach early adolescent (at the ages of nine or ten) they become increasingly aware of their larger surroundings. When they see adults in their neighborhoods who have obtained college education and achieved professional jobs, they may gain a better sense of how education connects to their future. They are increasingly influenced by their peers, and less by their families, although families remain important. We expected that having peers with stronger academic orientations might be important, but we found that the peers that seem to matter are those who simply stay out of trouble, that is, avoid getting in lots of fights, using drugs, or joining gangs. The influence of neighborhoods and peers seems to start becoming important in late elementary achool and become more prominent for adolescents in middle and high school (i.e., grades 7-9 and 10-12).

For decades social commentators and theorists have been arguing that racial differences in achievement are due more to historical racial inequalities and racially stratified access to key economic, social, and cultural resources than to race per se, but there has been little rigorous quantitative research to assess such claims. By combining three generations of data on individuals and measures of school achievement at two points in time with census data on the neighborhood poverty and role models available in the neighborhoods of both grandparental and parental families, data on school SES and racial segregation, and data on adolescents' peers, we have been able to measure intergenerational, racially-stratified contexts and experiences and see

how they are related to contemporary racial differences in educational achievement. No single factor explains racial differences in educational achievement, but a set of interrelated structural, institutional, interactional, and attitudinal conditions operate cumulatively and intergenerationally to create racial variations in educational achievement.

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Table 1: Weighted Descriptive Statistics for Black and White Children

	Blacks			Whites		
	N	Mean	S.D.	N	Mean	S.D.
Variable Label						
Achievement Tests						
2003 Applied problems test score - standardized	800	-0.47	0.82	875	0.45	0.94
2003 Letter-word test score - standardized	804	-0.43	0.89	878	0.35	0.97
1997 Applied problems test score -standardized	711	-0.36	0.84	818	0.36	0.93
1997 Letter Word score -standardized	856	-0.32	0.85	938	0.25	0.94
Childs Characteristics						
Child's race (1=black)	856	1.00	0.00	938	0.00	0.00
Child's gender (1=female)	856	0.42	0.49	938	0.49	0.50
Low birth weight child	838	0.11	0.32	933	0.05	0.22
Child motivation-index* (range: 1=low, 5=high)	856	3.39	1.46	938	3.12	1.68
Grandparent characteristics						
Grandparents with zero or negative assets (incl home equity)	856	0.40	0.49	938	0.13	0.33
Highest grandparental educational attainment	856	11.03	2.85	938	13.67	2.92
Concentrated poverty in grandparents neighborhoods*	856	0.41	0.64	938	-0.40	0.44
Role models in grandparents neighborhoods-standardized*	856	-0.37	0.56	938	0.38	0.83
Grandparents self-efficacy scale* (low= 1, high=7)	856	2.27	1.51	938	3.55	1.51
Parental Family Background						
Mother's cognitive score *	856	22.27	11.93	938	28.79	12.53
Teenage mother at birth	826	0.14	0.35	927	0.04	0.20
Highest parental education	812	12.52	2.22	923	14.26	2.18
Occupational prestige score (range: 3=low, 82=high)	847	32.24	11.64	926	43.88	15.18
Parental self-efficacy scale (range: 1=low, 4=high)	847	3.06	0.64	934	3.15	0.55
Log of average income when child was age 0 to 5	819	10.01	0.83	908	10.90	0.63
Log of net wealth	851	6.12	4.68	921	9.86	3.59
Parent education expectations (range: low=1, high=8)	841	4.37	2.06	929	5.51	1.58
Discuss school activity (range: low=1, high=4)	672	3.59	0.60	699	3.83	0.32
Mother's cognitive stimulation (range: low=2, high=14)	856	9.43	2.07	938	11.01	1.76
Emotional support of child-scale (range:low=2, high=14)	856	9.18	2.08	938	10.68	1.82
Parents' Neighborhood Characteristics						
Concentrated poverty in neighborhoods (low= -1.3, high=4.5)	854	0.73	0.82	934	-0.54	0.42
Role models in neighborhoods (range: low= -1.4, high=4.6)	854	-0.47	0.58	934	0.34	1.03
School Characteristics						
Degree of school's economic and racial segregation*	856	0.52	0.32	938	0.15	0.15
Peer Characteristics						
Peer avoidance of trouble-index* ^ (range: low=1, high=5)	856	3.39	1.53	938	3.48	1.87
Peer academic orientation-index * (range: low=1, high=5)	856	3.40	1.35	938	3.16	1.40

* Missing cases imputed for these variables

^ Note: Difference between blacks and whites not statistically significant by two-tailed t-tests.

Table 2: Partial Regressions of grandparent characteristics on parent characteristics

	Parent's Characteristics							
Grandparent's Characteristics	Education	Occupation	Income	Wealth	Mother's cognitive skills	Parent's educational expectations	Parents' Emotional support	Cognitive stimulation
educational attainment	0.18**	1.04**	0.06**	0.06	0.43**	0.09**	0.01	0.11**
	(0.03)	(0.16)	(0.01)	(0.05)	(0.14)	(0.02)	(0.02)	(0.02)
self-efficacy scale	0.17**	0.30	0.05**	0.28**	0.13	0.09*	0.07+	0.17**
	(0.05)	(0.35)	(0.02)	(0.10)	(0.30)	(0.04)	(0.04)	(0.04)
Concentrated Poverty in neighborhood	-0.15	0.99	-0.11*	-0.97**	-0.90	-0.13	0.07	0.10
	(0.14)	(0.80)	(0.05)	(0.30)	(0.75)	(0.12)	(0.11)	(0.11)
Role Models in neighborhood	0.23+	2.71**	0.03	0.05	-0.43	0.08	-0.01	0.11
	(0.12)	(0.79)	(0.03)	(0.22)	(0.65)	(0.08)	(0.08)	(0.08)
No or negative assets (incl home equity)	-0.03	-2.31*	-0.09+	-0.72*	0.17	-0.07	-0.21+	0.01
	(0.15)	(0.90)	(0.05)	(0.31)	(0.90)	(0.14)	(0.12)	(0.14)
Constant	9.83**	24.87**	9.31**	5.45**	21.04**	3.32**	8.82**	8.50**
	(0.41)	(2.56)	(0.13)	(0.78)	(2.30)	(0.35)	(0.29)	(0.34)
Observations	1735	1773	1727	1772	1794	1770	1794	1794
R-squared	0.277	0.210	0.446	0.242	0.076	0.111	0.229	0.175

Robust standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

Note: The entire CDS sample (n=1794) was used for these regressions. The race and gender of the parents were held constant as control variables (not shown here).

Table 3- Regression of Applied Problems Test Score

Panel A: **Grades Pre-K** 1997

	Race only	+grand-parents	+family	+ neighborhood
Child's Race (black=1)	-0.78**	-0.66**	-0.24+	-0.20
	(0.11)	(0.12)	(0.13)	(0.15)
Concentrated poverty in parents neighborhoods				-0.05
				(0.14)
Role models in neighborhoods				0.04
				(0.06)
Observations	537	537	490	487
R-squared	0.103	0.115	0.211	0.213

Note: Regression for this age cohort does not contain school, peer, or motivation variables due to large number of missing cases

Panel B: **Grades 1-3** 1997

		Race only	+ grand-parents	+ family	+ neighborhood
Child's Race (black=1)	-0.67**	-0.49**	-0.13		-0.09
	(0.11)	(0.12)	(0.14)		(0.17)
Concentrated poverty in parents neighborhoods					-0.01
					(0.12)
Role models in neighborhoods					0.12
					(0.08)
Observations	453	453	434		433
R-squared	0.080	0.105	0.250		0.259

Note: Regression for this age cohort does not contain school, peer, or motivation variables due to large number of missing cases

Panel C: **Grades 4-8** 1997

	Race only	+ grand-parents	+Family	+ Neighborhood
Child's Race (black=1)	-0.77**	-0.56**	-0.31**	-0.29*
	(0.08)	(0.11)	(0.11)	(0.13)
Concentrated poverty in parents neighborhoods				-0.04
				(0.09)
Role models in neighborhoods				0.22**
				(0.07)
Observations	534	534	470	469

R-squared		0.117	0.147	0.226		0.264		

Note: Regression for this age cohort does not contain school, peer, or motivation variables due to large number of missing cases

Robust standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

Table 4 cont'd, p. 2

Panel D: **Grades 4-6** 2003

	Race only	+grand parents	+family	+ngbhd	+schools		+prior test
Child's Race (black=1)	-0.98**	-0.79**	-0.30*	-0.29+	-0.31		-0.25
	(0.13)	(0.13)	(0.14)	(0.16)	(0.19)		(0.18)
Concentrated poverty in parents neighborhoods-standardized				-0.01	-0.03		-0.03
				(0.10)	(0.11)		(0.10)
Role models in neighborhoods-standardized				0.06	0.06		0.04
				(0.06)	(0.06)		(0.06)
Degree of school's economic and racial segregation*					0.13		0.17
					(0.36)		(0.33)
1997 Applied problems test score -standardized							0.37**
							(0.06)
Observations	583	583	510	507	507		440
R-squared	0.151	0.182	0.287	0.290	0.291		0.401

Panel E: **Grades 7-9** 2003

	Race only	+grand parents	+family	+ngbhd	+schools	+peers	+motvn	+prior test
Child's Race (black=1)	-1.00**	-0.87**	-0.40**	-0.41*	-0.40*	-0.34+	-0.34+	-0.33+
	(0.11)	(0.13)	(0.14)	(0.16)	(0.20)	(0.19)	(0.18)	(0.17)
Concentrated poverty in parents neighborhoods-standardized				0.06	0.07	0.04	0.02	0.00
				(0.12)	(0.13)	(0.12)	(0.12)	(0.11)
Role models in neighborhoods-standardized				0.18*	0.19*	0.17*	0.17*	0.14*
				(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
Degree of school's economic and racial segregation*					-0.04	0.04	0.10	0.12
					(0.34)	(0.31)	(0.30)	(0.29)
Peer avoidance of trouble-index*						0.26**	0.23**	0.19**
						(0.06)	(0.06)	(0.07)
Peer academic orientation-index*						-0.02	-0.06	-0.05
						(0.05)	(0.05)	(0.04)
Child motivation-index*							0.22**	0.17**
							(0.07)	(0.06)
1997 Applied problems test score -standardized								0.43**

								(0.05)
Observations	487	487	453	452	452	452	452	397
R-squared	0.166	0.182	0.378	0.394	0.394	0.429	0.449	0.580

*Missing cases imputed for these variables

Table 3 cont'd, p. 3

Panel F: **Grades 10-12** 2003

	Race only	+grand parents	+family	+ngbhd	+schools	+peers	+motvn	+prior test
Child's Race (black=1)	-0.78**	-0.69**	-0.41**	-0.42*	-0.37*	-0.36+	-0.37+	-0.23
	(0.10)	(0.12)	(0.14)	(0.18)	(0.18)	(0.19)	(0.19)	(0.18)
Concentrated poverty in parents neighborhoods-standardized				0.02	0.09	0.09	0.09	0.05
				(0.09)	(0.09)	(0.10)	(0.10)	(0.09)
Role models in neighborhoods-standardized				0.14*	0.17*	0.15*	0.15*	0.07
				(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Degree of school's economic and racial segregation*					-0.47+	-0.40+	-0.38	-0.50*
					(0.24)	(0.23)	(0.23)	(0.20)
Peer avoidance of trouble-index*						0.18**	0.17**	0.12*
						(0.06)	(0.06)	(0.05)
Peer academic orientation-index*						0.01	-0.01	-0.00
						(0.05)	(0.06)	(0.05)
Child motivation-index*							0.07	0.03
							(0.08)	(0.08)
1997 Applied problems test score -standardized								0.54**
								(0.07)
Observations	600	600	511	510	510	510	510	417
R-squared	0.115	0.128	0.329	0.341	0.347	0.385	0.386	0.566

*Missing cases imputed for these variables

Robust standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

Table 4- Regression of Letter Word Test Score

Panel A: **Grades Pre-K-K** 1997

	Race only	+grand parents	+family	+nghbd
Child's Race (black=1)	-0.43**	-0.31**	0.05	-0.04
	(0.09)	(0.11)	(0.13)	(0.15)
Concentrated poverty in parents neighborhoods				0.10
				(0.11)
Role models in neighborhoods				0.23**
				(0.06)
Observations	543	543	495	492
R-squared	0.041	0.059	0.205	0.247

Note: Regression for this age cohort does not contain school, peer, or motivation variables due to large number of missing cases

Panel B: **Grades 1-3** 1997

	Race only	+grand parents	+family	+nghbd
Child's Race (black=1)	-0.84**	-0.62**	-0.21	-0.12
	(0.18)	(0.17)	(0.20)	(0.19)
Concentrated poverty in parents neighborhoods				-0.10
				(0.16)
Role models in neighborhoods				-0.03
				(0.10)
Observations	453	453	434	433
R-squared	0.096	0.125	0.266	0.267

Note: Regression for this age cohort does not contain school, peer, or motivation variables due to large number of missing cases

Panel C: **Grades 4-8** 1997

	Race only	+grand parents	+family	+nghbd
Child's Race (black=1)	-0.77**	-0.57**	-0.25+	-0.18
	(0.10)	(0.13)	(0.14)	(0.17)
Concentrated poverty in parents neighborhoods				-0.09
				(0.13)
Role models in neighborhoods				0.24**
				(0.08)
Observations	536	536	471	470
R-squared	0.094	0.112	0.203	0.245

Note: Regression for this age cohort does not contain school, peer, or motivation variables due to large number of missing cases

Robust standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

Table 4 cont'd, p. 2

Panel D: **Grades 4-6** 2003

	Race only	+grand parents	+family	+nghd	+school	+Prior test
Child's Race (black=1)	-0.67**	-0.49**	-0.03	-0.02	0.00	0.02
	(0.09)	(0.10)	(0.11)	(0.12)	(0.13)	(0.14)
Concentrated poverty in parents neighborhoods				-0.02	-0.00	-0.03
				(0.11)	(0.12)	(0.12)
Role models in neighborhoods				0.07	0.08	0.02
				(0.06)	(0.06)	(0.06)
Degree of school's economic and racial segregation*					-0.12	-0.15
					(0.28)	(0.28)
1997 Applied problems test score -standardized						0.28**
						(0.06)
Observations	586	586	513	510	510	448
R-squared	0.091	0.131	0.301	0.306	0.307	0.358

*Missing cases imputed for these variables
Note: Regression for this age cohort does not contain peer, or motivation variables due to large number of missing cases

Panel E: **Grades 7-9** 2003

	Race only	+grand parents	+family	+nghd	+school	+peers	+motvn	+Prior test
Child's Race (black=1)	-0.94**	-0.75**	-0.43*	-0.39+	-0.36	-0.29	-0.29	-0.17
	(0.14)	(0.13)	(0.17)	(0.21)	(0.25)	(0.23)	(0.23)	(0.19)
Concentrated poverty in parents neighborhoods				-0.05	-0.04	-0.05	-0.07	-0.01
				(0.15)	(0.15)	(0.15)	(0.15)	(0.11)
Role models in neighborhoods				-0.04	-0.03	-0.05	-0.04	0.00
				(0.09)	(0.09)	(0.09)	(0.09)	(0.07)
Degree of school's economic and racial segregation*					-0.12	-0.04	-0.02	-0.25
					(0.37)	(0.37)	(0.37)	(0.35)
Peer avoidance of trouble-index*						0.25**	0.24**	0.12*
						(0.08)	(0.07)	(0.06)
Peer academic orientation-index*						-0.07	-0.09	0.01
						(0.06)	(0.06)	(0.05)
Child motivation-index*							0.10	0.01
							(0.07)	(0.05)
1997 Applied problems test score -standardized								0.62**
								(0.07)
Observations	488	488	454	453	453	453	453	398
R-squared	0.135	0.165	0.300	0.300	0.301	0.330	0.333	0.608

*Missing cases imputed for these variables

Table 4 cont'd, p. 3

Panel F: **Grades 10-12** 2003

	Race only	+grand parents	+family	+nghbd	+school	+peers	+motvn	+prior test
Child's Race (black=1)	-0.74**	-0.66**	-0.37*	-0.33	-0.30	-0.31	-0.33	-0.19
	(0.12)	(0.15)	(0.16)	(0.22)	(0.23)	(0.23)	(0.23)	(0.22)
Concentrated poverty in parents neighborhoods				-0.03	0.00	-0.00	-0.00	0.00
				(0.14)	(0.14)	(0.14)	(0.13)	(0.12)
Role models in neighborhoods				0.07	0.09	0.07	0.07	-0.03
				(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
Degree of school's economic and racial segregation*					-0.27	-0.24	-0.21	-0.22
					(0.34)	(0.33)	(0.32)	(0.28)
Peer avoidance of trouble-index*						0.10	0.09	0.03
						(0.07)	(0.07)	(0.07)
Peer academic orientation-index*						0.05	0.01	-0.00
						(0.05)	(0.05)	(0.05)
Child motivation-index*							0.18+	0.07
							(0.10)	(0.09)
1997 Applied problems test score -standardized								0.60**
								(0.05)
Observations	603	603	514	513	513	513	513	421
R-squared	0.081	0.085	0.279	0.283	0.284	0.304	0.311	0.539

*Missing cases imputed for these variables

** p<0.01, * p<0.05, + p<0.1
Robust standard errors in parentheses

Table 5- Oaxaca Decomposition of Racial Test Score Gap by Variable Category

Panel A: 1997 Applied Problems Z score

	Pre-K		Grades 1 - 3		Grades 4 - 8	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Family	0.41**	2.76+	0.43**	1.09	0.25*	0.69
	(0.14)	(1.61)	(0.10)	(1.53)	(0.11)	(1.36)
Neighborhood	0.10	0.00	0.12	-0.05	0.22*	0.09
	(0.16)	(0.22)	(0.13)	(0.24)	(0.10)	(0.25)
Total	0.54**	0.20	0.58**	0.08	0.46**	0.29*
	(0.13)	(0.15)	(0.14)	(0.16)	(0.13)	(0.13)
Observations	487	487	433	433	469	469

Panel B: 2003 Applied Problems Z score

	Grades 4-6		Grades 7-9		Grades 10-12	
VARIABLES	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Family	0.57**	1.93	0.43**	-0.47	0.21	-0.07
	(0.14)	(1.78)	(0.10)	(1.55)	(0.13)	(1.61)
Neighborhood	0.08	-0.05	0.11	0.73**	0.01	-0.06
	(0.11)	(0.19)	(0.13)	(0.24)	(0.12)	(0.25)
School	-0.04	-0.11	-0.04	0.53*	0.12+	0.14
	(0.12)	(0.26)	(0.13)	(0.26)	(0.07)	(0.19)
Peers			0.14**	-0.46	0.06+	0.52
			(0.05)	(0.48)	(0.03)	(0.41)
Total	0.63**	0.31+	0.68**	0.33+	0.38*	0.37*
	(0.15)	(0.17)	(0.18)	(0.17)	(0.16)	(0.17)
Observations	507	507	452	452	510	510

Table 5, cont'd., p. 2

Panel C: 1997 Letter Word Z score

	Pre-K		Grades 1 - 3		Grades 4 - 8	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Family	0.34**	0.91	0.63**	3.99+	0.26*	-1.81
	(0.10)	(1.32)	(0.13)	(2.11)	(0.11)	(1.70)
Neighborhood	0.08	-0.29+	0.09	0.07	0.30*	-0.23
	(0.11)	(0.17)	(0.20)	(0.34)	(0.13)	(0.35)
Total	0.44**	0.04	0.74**	0.12	0.57**	0.18
	(0.12)	(0.15)	(0.17)	(0.19)	(0.16)	(0.17)
Observations	492	492	433	433	470	470

Panel D: 2003 Letter Word Z score

	Grades 4-6		Grades 7-9		Grades 10-12	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Family	0.60**	-0.81	0.44**	-0.76	0.26+	-5.40*
	(0.11)	(1.38)	(0.12)	(1.91)	(0.14)	(2.41)
Neighborhood	0.07	-0.10	0.05	0.47	0.06	-0.54+
	(0.12)	(0.20)	(0.17)	(0.34)	(0.16)	(0.31)
School	0.04	0.01	0.01	0.44	0.06	-0.06
	(0.10)	(0.24)	(0.16)	(0.29)	(0.09)	(0.23)
Peers			0.15**	0.25	0.03	-0.71
			(0.05)	(0.51)	(0.03)	(0.46)
Total	0.74**	-0.00	0.68**	0.28	0.42*	0.33
	(0.13)	(0.13)	(0.20)	(0.22)	(0.19)	(0.22)
Observations	510	510	453	453	513	513

Appendix 1: Full Model Regression of Applied Problems Test Scores

Grades 4-6 2003

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Child's race (1=black)	-0.98**	-0.79**	-0.30*	-0.29+	-0.31	-0.34+
	(0.13)	(0.13)	(0.14)	(0.16)	(0.19)	(0.18)
Grandparents with zero or negative assets (incl home equity)		-0.19	-0.09	-0.12	-0.12	-0.22
		(0.15)	(0.15)	(0.16)	(0.15)	(0.17)
Highest grandparental educational attainment		0.05*	0.01	0.01	0.01	0.01
		(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Mother's cognitive score *			0.03**	0.03**	0.03**	0.02*
			(0.01)	(0.01)	(0.01)	(0.01)
Teenage mother at birth			-0.18	-0.19	-0.18	-0.08
			(0.16)	(0.16)	(0.16)	(0.19)
Highest parental education			-0.02	-0.02	-0.02	0.00
			(0.03)	(0.03)	(0.03)	(0.03)
Occupational prestige score of head of household			0.00	0.00	0.00	-0.00
			(0.00)	(0.00)	(0.00)	(0.00)
Log of average income when child was age 0 to 5			0.25**	0.23*	0.23*	0.12
			(0.09)	(0.10)	(0.10)	(0.11)
Log of net wealth			-0.00	-0.00	-0.00	0.01
			(0.01)	(0.01)	(0.01)	(0.01)
Female			-0.07	-0.07	-0.07	-0.15
			(0.10)	(0.10)	(0.10)	(0.10)
Low birth weight dummy			-0.32**	-0.33**	-0.33**	-0.27*
			(0.10)	(0.10)	(0.10)	(0.12)
Parent education expectations for child			0.07*	0.06+	0.06+	0.06+
			(0.03)	(0.03)	(0.03)	(0.03)
Mother's cognitive stimulation of child-scale			-0.01	-0.00	-0.00	-0.02
			(0.04)	(0.04)	(0.04)	(0.04)
Emotional support of child-scale			-0.01	-0.01	-0.00	-0.02
			(0.04)	(0.04)	(0.04)	(0.03)
Parental self-efficacy scale			0.13	0.13	0.13	0.09
			(0.09)	(0.09)	(0.09)	(0.09)
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Concentrated poverty in parents neighborhoods-standardized				-0.01	-0.03	0.01
				(0.10)	(0.11)	(0.13)
Role models in neighborhoods-standardized				0.06	0.06	0.05
				(0.06)	(0.06)	(0.06)
Degree of school's economic and racial segregation*					0.13	0.15
					(0.36)	(0.35)
1997 Applied problems test score -standardized						0.37**
						(0.06)
Constant	0.59**	-0.03	-3.94**	-3.55**	-3.58**	-1.73
	(0.06)	(0.30)	(1.11)	(1.22)	(1.26)	(1.15)
Observations	583	583	510	507	507	440

R-squared	0.151	0.182	0.287	0.290	0.291	0.401

** p<0.01, * p<0.05, + p<0.1

Robust standard errors in parentheses

*Missing cases imputed for these variables

Note: Each column represents regression models with variables added in the following order: (1)= Child's race; (2)= grandparent characteristics; (3)= family characteristics; (4)=neighborhood characteristics; (5)=school characteristics; (6)= prior test score in 1997. Regression for this age cohort does not contain peer, or motivation variables due to large number of missing.

Grades 7-9 2003

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child's race (1=black)	-1.00**	-0.87**	-0.40**	-0.41*	-0.40*	-0.34+	-0.34+	-0.18
	(0.11)	(0.13)	(0.14)	(0.16)	(0.20)	(0.19)	(0.18)	(0.17)
Grandparents with zero or negative assets (incl home equity)		-0.20	-0.18	-0.19	-0.18	-0.19	-0.19	-0.07
		(0.14)	(0.13)	(0.12)	(0.12)	(0.12)	(0.12)	(0.11)
Highest grandparental educational attainment		0.04	-0.01	-0.01	-0.01	-0.02	-0.02	-0.00
		(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Mother's cognitive score *			0.04**	0.03**	0.03*	0.03*	0.03*	0.02
			(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Teenage mother at birth			-0.25	-0.25	-0.25	-0.19	-0.24	-0.05
			(0.18)	(0.19)	(0.19)	(0.17)	(0.19)	(0.17)
Highest parental education			0.08**	0.07*	0.07*	0.06*	0.05*	0.04
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Occupational prestige score of head of household			0.00	0.00	0.00	0.00	0.00	0.00
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Log of average income when child was age 0 to 5			-0.08	-0.14	-0.14	-0.14	-0.13	-0.08
			(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Log of net wealth			0.01	0.01	0.01	0.01	0.01	0.00
			(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female			-0.16+	-0.17+	-0.17+	-0.20*	-0.21*	-0.07
			(0.10)	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)
Low birth weight dummy			-0.39	-0.39	-0.39	-0.43+	-0.44+	-0.29+
			(0.24)	(0.25)	(0.25)	(0.24)	(0.24)	(0.17)
Parent education expectations for child			0.08*	0.08*	0.08*	0.09**	0.09**	0.05
			(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
Parent school talk			-0.07	-0.07	-0.07	-0.08	-0.11	-0.10
			(0.16)	(0.16)	(0.16)	(0.16)	(0.15)	(0.15)
Mother's cognitive stimulation of child-scale			0.04	0.04	0.03	0.02	0.03	0.01
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Emotional support of child-scale			0.05	0.06	0.06	0.05	0.05	0.04
			(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental self-efficacy scale			0.06	0.05	0.04	0.00	0.00	-0.08
			(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Concentrated poverty in parents neighborhoods-standardized				0.06	0.07	0.04	0.02	-0.11
				(0.12)	(0.13)	(0.12)	(0.12)	(0.11)
Role models in neighborhoods-standardized				0.18*	0.19*	0.17*	0.17*	0.13+
				(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
Degree of school's economic and racial segregation*					-0.04	0.04	0.10	0.14
					(0.34)	(0.31)	(0.30)	(0.29)
Peer avoidance of trouble-index*						0.26**	0.23**	0.19**
						(0.06)	(0.06)	(0.07)

Peer academic orientation-index *						-0.02	-0.06	-0.08+
						(0.05)	(0.05)	(0.05)
Child motivation-index*						0.22**	0.19**	
						(0.07)	(0.06)	
1997 Applied problems test score -standardized								0.43**
								(0.05)
Constant	0.49**	0.00	-2.41*	-1.46	-1.44	-1.93+	-2.42*	-1.51
	(0.07)	(0.38)	(0.97)	(1.00)	(1.01)	(1.00)	(0.98)	(1.03)
Observations	487	487	453	452	452	452	452	397
R-squared	0.166	0.182	0.378	0.394	0.394	0.429	0.449	0.580

** p<0.01, * p<0.05, + p<0.1

Robust standard errors in parentheses

*Missing cases imputed for these variables

Note: Each column represents regression models with variables added in the following order: (1)=child's race; (2)= grandparent characteristics; (3)= family characteristics; (4)=neighborhood characteristics; (5)=school characteristics; (6)=peer characteristics; (7)= index of child motivation; and column (8)=prior test score in 1997.

Grades 10-12 2003

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child's race (1=black)	-0.78**	-0.69**	-0.41**	-0.42*	-0.37*	-0.36+	-0.37+	0.03
	(0.10)	(0.12)	(0.14)	(0.18)	(0.18)	(0.19)	(0.19)	(0.15)
Grandparents with zero or negative assets (incl home equity)		-0.26+	-0.31*	-0.31*	-0.30*	-0.33**	-0.33**	-0.24*
		(0.14)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.10)
Highest grandparental educational attainment		0.01	0.05	0.04	0.03	0.04	0.04	0.03
		(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Mother's cognitive score *			-0.01	-0.01	-0.01	-0.00	0.00	0.00
			(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Teenage mother at birth			-0.46**	-0.43**	-0.42**	-0.43**	-0.44**	-0.32*
			(0.17)	(0.16)	(0.16)	(0.16)	(0.16)	(0.14)
Highest parental education			0.01	0.01	0.01	0.01	0.01	0.03
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.02)
Occupational prestige score of head of household			0.01	0.00	0.01	0.00	0.00	0.00
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Log of average income when child was age 0 to 5			-0.14	-0.20*	-0.21*	-0.21*	-0.21*	-0.13+
			(0.09)	(0.10)	(0.10)	(0.10)	(0.10)	(0.08)
Log of net wealth			0.01	0.01	0.01	0.00	0.00	0.01
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Female			-0.37**	-0.36**	-0.36**	-0.36**	-0.36**	-0.12
			(0.09)	(0.09)	(0.09)	(0.08)	(0.08)	(0.07)
Low birth weight dummy			0.44*	0.43*	0.43*	0.33+	0.34+	0.46*
			(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
Parent education expectations for child			0.18**	0.17**	0.18**	0.16**	0.16**	0.04
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Parent school talk			0.19+	0.18+	0.20+	0.17+	0.17+	0.18+
			(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.11)
Mother's cognitive stimulation of child-scale			0.02	0.02	0.01	0.01	0.01	-0.02
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Emotional support of child-scale			-0.06*	-0.05	-0.05	-0.05+	-0.06+	-0.04
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental self-efficacy scale			0.02	0.02	0.01	0.03	0.02	-0.21**
			(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)
Concentrated poverty in parents neighborhoods-standardized				0.02	0.09	0.09	0.09	0.02
				(0.09)	(0.09)	(0.10)	(0.10)	(0.08)
Role models in neighborhoods-standardized				0.14*	0.17*	0.15*	0.15*	0.05
				(0.07)	(0.07)	(0.07)	(0.07)	(0.05)
Degree of school's economic and racial segregation*					-0.47+	-0.40+	-0.38	-0.48*

					(0.24)	(0.23)	(0.23)	(0.20)
Peer avoidance of trouble-index*						0.18**	0.17**	0.07
						(0.06)	(0.06)	(0.05)
Peer academic orientation-index *						0.01	-0.01	0.00
						(0.05)	(0.06)	(0.05)
Child motivation-index*							0.07	0.01
							(0.08)	(0.07)
1997 Applied problems test score -standardized								0.54**
								(0.07)
Constant	0.28**	0.24	-0.24	0.61	0.91	0.13	-0.07	0.60
	(0.06)	(0.33)	(0.81)	(0.95)	(0.97)	(0.99)	(1.06)	(0.74)
Observations	600	600	511	510	510	510	510	417
R-squared	0.115	0.128	0.329	0.341	0.347	0.385	0.386	0.566

Robust standard errors in parentheses

** p<0.01, * p<0.05, + p<0.1

*Missing cases imputed for these variables

Note: Each column represents regression models with variables added in the following order: (1)=child's race; (2)= grandparent characteristics; (3)= family characteristics; (4)=neighborhood characteristics; (5)=school characteristics; (6)=peer characteristics; (7)= index of child motivation; and (8)=prior test score in 1997.

Appendix 2 - **Full Model Regression of Letter Word Test Scores**
Grades 4-6 2003

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Child's race (1=black)	-0.67**	-0.49**	-0.03	-0.02	0.00	-0.06
	(0.09)	(0.10)	(0.11)	(0.12)	(0.13)	(0.16)
Grandparents with zero or negative assets (incl home equity)		-0.01	-0.03	-0.06	-0.05	-0.11
		(0.13)	(0.12)	(0.13)	(0.13)	(0.14)
Highest grandparental educational attainment		0.06**	0.03	0.02	0.02	0.02
		(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Mother's cognitive score *			0.05**	0.05**	0.05**	0.04**
			(0.01)	(0.01)	(0.01)	(0.01)
Teenage mother at birth			-0.19	-0.20+	-0.20+	-0.11
			(0.12)	(0.12)	(0.12)	(0.14)
Highest parental education			0.01	0.01	0.01	0.02
			(0.03)	(0.03)	(0.03)	(0.03)
Occupational prestige score of head of household			0.01	0.00	0.00	0.00
			(0.00)	(0.00)	(0.00)	(0.00)
Log of average income when child was age 0 to 5			0.09	0.06	0.06	0.06
			(0.08)	(0.09)	(0.09)	(0.09)
Log of net wealth			-0.01	-0.01	-0.01	-0.00
			(0.02)	(0.02)	(0.02)	(0.02)
Female			0.00	0.00	0.00	-0.06
			(0.09)	(0.09)	(0.09)	(0.09)
Low birth weight dummy			-0.40**	-0.40**	-0.40**	-0.25*
			(0.13)	(0.13)	(0.13)	(0.13)
Parent education expectations for child			0.05+	0.04	0.04	0.02
			(0.03)	(0.03)	(0.03)	(0.03)
Mother's cognitive stimulation of child-scale			0.03	0.03	0.03	0.01
			(0.03)	(0.03)	(0.03)	(0.03)
Emotional support of child-scale			0.01	0.02	0.01	0.03
			(0.03)	(0.03)	(0.03)	(0.03)
Parental self-efficacy scale			0.01	0.01	0.01	-0.06
			(0.08)	(0.08)	(0.08)	(0.08)
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Concentrated poverty in parents neighborhoods-standardized				-0.02	-0.00	-0.00
				(0.11)	(0.12)	(0.14)
Role models in neighborhoods-standardized				0.07	0.08	0.01
				(0.06)	(0.06)	(0.06)
Degree of school's economic and racial segregation*					-0.12	-0.05
					(0.28)	(0.31)
1997 Applied problems test score -standardized						0.28**
						(0.06)
Constant	0.33**	-0.44*	-3.69**	-3.16**	-3.13**	-2.50**
	(0.05)	(0.21)	(0.73)	(0.81)	(0.79)	(0.84)

Observations	586	586	513	510	510	448
R-squared	0.091	0.131	0.301	0.306	0.307	0.358

** p<0.01, * p<0.05, + p<0.1

Robust standard errors in parentheses

*Missing cases imputed for these variables

Note: Each column represents regression models with variables added in the following order: (1)= Child's race; (2)= grandparent characteristics; (3)= family characteristics; (4)=neighborhood characteristics; (5)=school characteristics; (6)= prior test score in 1997. Regression for this age cohort does not contain peer, or motivation variables due to large number of missing.

Grades 7-9 2003

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child's race (1=black)	-0.94**	-0.75**	-0.43*	-0.39+	-0.36	-0.29	-0.29	-0.17
	(0.14)	(0.13)	(0.17)	(0.21)	(0.25)	(0.23)	(0.23)	(0.19)
Grandparents with zero or negative assets (incl home equity)		-0.32+	-0.30+	-0.29+	-0.30+	-0.30+	-0.31+	-0.12
		(0.18)	(0.17)	(0.17)	(0.17)	(0.16)	(0.16)	(0.11)
Highest grandparental educational attainment		0.05*	0.02	0.02	0.02	0.01	0.01	0.02
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Mother's cognitive score *			0.05*	0.05*	0.05*	0.04*	0.04*	0.01
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Teenage mother at birth			-0.23	-0.23	-0.22	-0.17	-0.19	-0.13
			(0.22)	(0.21)	(0.22)	(0.21)	(0.21)	(0.18)
Highest parental education			0.06	0.06	0.06	0.05	0.05	0.01
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Occupational prestige score of head of household			0.01+	0.01+	0.01+	0.01+	0.01+	0.01
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Log of average income when child was age 0 to 5			-0.14	-0.13	-0.14	-0.15	-0.15	-0.15+
			(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.09)
Log of net wealth			-0.01	-0.01	-0.01	-0.00	-0.00	-0.01
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Female			0.20	0.20	0.20	0.18	0.17	0.05
			(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.10)
Low birth weight dummy			-0.37	-0.37	-0.37	-0.41	-0.42	-0.16
			(0.30)	(0.30)	(0.30)	(0.29)	(0.29)	(0.21)
Parent education expectations for child			0.12**	0.12**	0.12**	0.13**	0.13**	0.05+
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Parent school talk			-0.07	-0.07	-0.06	-0.08	-0.10	-0.08
			(0.16)	(0.16)	(0.16)	(0.15)	(0.15)	(0.12)
Mother's cognitive stimulation of child-scale			0.01	0.01	0.01	-0.00	0.00	-0.02
			(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
Emotional support of child-scale			-0.04	-0.04	-0.04	-0.04	-0.04	-0.01
			(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.03)
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental self-efficacy scale			-0.10	-0.10	-0.10	-0.14	-0.14	-0.10
			(0.12)	(0.11)	(0.11)	(0.11)	(0.11)	(0.08)
Concentrated poverty in parents neighborhoods-standardized				-0.05	-0.04	-0.05	-0.07	-0.05
				(0.15)	(0.15)	(0.15)	(0.15)	(0.12)
Role models in neighborhoods-standardized				-0.04	-0.03	-0.05	-0.04	-0.00
				(0.09)	(0.09)	(0.09)	(0.09)	(0.07)
Degree of school's economic and racial segregation*					-0.12	-0.04	-0.02	-0.22
					(0.37)	(0.37)	(0.37)	(0.35)
Peer avoidance of trouble-index*						0.25**	0.24**	0.13*
						(0.08)	(0.07)	(0.06)
Peer academic orientation-index *						-0.07	-0.09	-0.02

						(0.06)	(0.06)	(0.05)
Child motivation-index*							0.10	0.01
							(0.07)	(0.05)
1997 Applied problems test score -standardized								0.62**
								(0.07)
Constant	0.34**	-0.32	-0.85	-0.95	-0.88	-1.14	-1.36	0.98
	(0.07)	(0.34)	(1.21)	(1.30)	(1.32)	(1.38)	(1.35)	(1.01)
Observations	488	488	454	453	453	453	453	398
R-squared	0.135	0.165	0.300	0.300	0.301	0.330	0.333	0.608

** p<0.01, * p<0.05, + p<0.1

Robust standard errors in parentheses

*Missing cases imputed for these variables

Note: Each column represents regression models with variables added in the following order: (1)=child's race; (2)= grandparent characteristics; (3)= family characteristics; (4)=neighborhood characteristics; (5)=school characteristics; (6)=peer characteristics; (7)= index of child motivation; and column (8)=prior test score in 1997.

Grades 10-12 2003

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child's race (1=black)	-0.74**	-0.66**	-0.37*	-0.33	-0.30	-0.31	-0.33	-0.06
	(0.12)	(0.15)	(0.16)	(0.22)	(0.23)	(0.23)	(0.23)	(0.16)
Grandparents with zero or negative assets (incl home equity)		-0.12	-0.01	0.01	0.01	-0.01	-0.03	0.00
		(0.25)	(0.23)	(0.22)	(0.22)	(0.23)	(0.22)	(0.20)
Highest grandparental educational attainment		0.02	0.05+	0.04	0.04	0.04+	0.05+	0.02
		(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Mother's cognitive score *			0.00	0.00	0.00	0.01	0.01	0.01
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Teenage mother at birth			-0.23	-0.21	-0.20	-0.21	-0.24	-0.09
			(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.13)
Highest parental education			-0.00	-0.00	-0.00	-0.00	-0.00	-0.01
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.02)
Occupational prestige score of head of household			0.01*	0.01*	0.01*	0.01*	0.01*	0.00
			(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Log of average income when child was age 0 to 5			-0.25	-0.30+	-0.30+	-0.30+	-0.30+	-0.34*
			(0.18)	(0.18)	(0.18)	(0.18)	(0.18)	(0.17)
Log of net wealth			0.02	0.02	0.02	0.02	0.02	0.03+
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Female			0.04	0.04	0.04	0.03	0.03	0.03
			(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.09)
Low birth weight dummy			0.07	0.07	0.07	0.01	0.04	0.02
			(0.14)	(0.15)	(0.15)	(0.15)	(0.15)	(0.16)
Parent education expectations for child			0.18**	0.18**	0.18**	0.17**	0.16**	0.06**
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Parent school talk			-0.09	-0.10	-0.09	-0.10	-0.11	-0.09
			(0.12)	(0.11)	(0.12)	(0.11)	(0.12)	(0.09)
Mother's cognitive stimulation of child-scale			0.06+	0.06	0.06	0.05	0.05	0.01
			(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Emotional support of child-scale			-0.04	-0.03	-0.03	-0.04	-0.04	-0.01
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental self-efficacy scale			0.17+	0.16	0.15	0.16	0.15	0.12
			(0.10)	(0.11)	(0.11)	(0.11)	(0.10)	(0.08)
Concentrated poverty in parents neighborhoods-standardized				-0.03	0.00	-0.00	-0.00	-0.10
				(0.14)	(0.14)	(0.14)	(0.13)	(0.08)
Role models in neighborhoods-standardized				0.07	0.09	0.07	0.07	0.03
				(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
Degree of school's economic and racial segregation*					-0.27	-0.24	-0.21	-0.15
					(0.34)	(0.33)	(0.32)	(0.28)
Peer avoidance of trouble-index*						0.10	0.09	0.02
						(0.07)	(0.07)	(0.06)
Peer academic orientation-index *						0.05	0.01	-0.00

						(0.05)	(0.05)	(0.05)
Child motivation-index*						0.18+	0.06	
						(0.10)	(0.08)	
1997 Applied problems test score -standardized								0.60**
								(0.05)
Constant	0.37**	0.16	0.18	0.73	0.87	0.34	-0.15	2.12
	(0.07)	(0.32)	(1.55)	(1.57)	(1.65)	(1.72)	(1.73)	(1.61)
Observations	603	603	514	513	513	513	513	421
R-squared	0.081	0.085	0.279	0.283	0.284	0.304	0.311	0.539

Robust standard errors in parentheses

** p<0.01, * p<0.05, + p<0.1

*Missing cases imputed for these variables

Note: Each column represents regression models with variables added in the following order: (1)=child's race; (2)= grandparent characteristics; (3)= family characteristics; (4)=neighborhood characteristics; (5)=school characteristics; (6)=peer characteristics; (7)= index of child motivation; and column (8)=prior test score in 1997.

[1] We had hoped to analyze private school attendance because whites are much more likely than blacks to attend private school, and attending private school is related to higher chances of taking an academic curriculum, being in smaller schools, having student bodies with higher average SES, greater discipline, and higher rates of attending college. However, the number of black students attending private school in each cohort was so small that it could not reasonably be analyzed.

[2] For other discussion of this analytical method, see Blinder. For examples of other studies using the method, see REFS.