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# Race-Gender Inequality across Residential and School Contexts: What can Federal Policy Do?

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# Race-Gender Inequality across Residential and School Contexts: What can Federal Policy Do?[1]

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**ABSTRACT**

Achieving the elimination of racial differences in test performance as set forth in the No Child Left Behind Act of 2001 (NCLB) requires policies that acknowledge that African American test performances are not only about race, but also gender and residential status. In an effort to inform policymaking with research that explores race-gender and residential inequality, I assess the growth of reading gaps within school and non-school contexts using a national and city sample of children from the Early Childhood Longitudinal Study. I find that inequality in test performances is greater in the city than elsewhere, and African American boys shoulder a disproportionate educational burden related to city residency and enrollment in city schools. In addition, children within city neighborhoods where drugs and burglary are big problems experience large shortfalls in reading in school and non-school contexts. I conclude with a discussion of the study's implications for policy making, especially NCLB, which mandates that public schools achieve parity among racial groups by the end of the 2013-2014 academic year.

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## INTRODUCTION

Federal policy continues to struggle with the stubborn reality of racial differences in achievement. Over a decade ago, the No Child Left Behind Act of 2001 (NCLB) was passed to eliminate these inequalities by 2014. Yet progress toward achieving racial parity on the National Assessment of Educational Progress has halted (Rampey, Dion and Donahue 2009), casting serious doubt on the likelihood that NCLB will realize its policy goals. More recently, President Obama (2012) signed the *White House Initiative on Educational Excellence for African Americans Executive Order*, noting that "African American student achievement not only lags behind that of their domestic peers by an average of two grade levels, but also behind students in almost every other developed nation." Whether this effort will become the latest attempt of many more to come depends, in part, on the ability of research to sharpen the focus of these policy directives. Hence, informing policymakers of the social realities that confound the intent of federal education policies is pivotal and necessary to stop the reproduction of policy failures.

This chapter addresses three of these important social realities. First, if inequality grows when children are away from school—before they enter kindergarten or during the summer recess—holding schools accountable for learning disparities that arise at a time and place beyond their reach will not help NCLB to close achievement gaps. In this article, I address this possibility by examining social background differences in reading across four contexts: two K-12 school contexts (i.e. kindergarten and first grade) and two non-school contexts (i.e. before children enter kindergarten and the following summer recess). Growth in achievement inequality is therefore separated and contrasted in a natural experimental framework, between children's school and non-school contexts. Second, policy will have performance problems of its own if it fails to intervene where its impact is needed most. Children within troubled city environments, for example, perform less well and are usually underserved, educationally, relative to children nationally (Rampey, Dion and Donahue 2009; Shaughnessy, Nelson and Norris 1998). Therefore, I present estimates

of learning for children in central cities and use a multilevel statistical methodology to examine relationships between children's residential features and achievement. Third, other social factors, especially gender, intersect with race to make the policy-needs of some African Americans more critical than others. I consequently estimate how achievement varies according to gender within and across racial groups. The results show that African-American test-score shortfalls are essentially "African American male gaps," and that while city schools appear to do a better job than schools nation-wide at elevating the scores of disadvantaged children, it is within the city-school context that African American males are placed at their greatest educational risk. I conclude with a discussion of the study's implications for educational and urban policymaking and the success of African American boys.

## INEQUALITY IN SCHOOL AND NON-SCHOOL CONTEXTS

### SCHOOL CONTEXT OF INEQUALITY

Federal interest in public education extends, in part, from the observation of numerous ways in which schools contribute to social background differences in learning. Racial disparities, for example, appear related to inequities in school resources and instruction. African Americans attend elementary schools that rank lower on all 14 indicators of school resources measured by the Early Childhood Longitudinal Study, among them, teacher qualifications, class-size, average student achievement, and teacher attitudes (Lee and Burkham 2002). African-Americans, followed by Hispanics, are the least likely of the major racial groups to attend majority white, higher resourced schools (Acevedo et al. 2007). In addition, racial bias in the instruction of African Americans has been documented at length in ethnographic research (Wells and Crain 1997); laboratory experiments (Ferguson 2003); and relocation studies (Kaufman and Rosenbaum 1992; Rosenbaum, Kulieke, and Rubinowitz 1988). Others contend that instruction often lacks the cultural relevancy required to engage children of color (Gay 2010) and prepare them to be effective citizens (Tate 1994). For Asian Americans, racial/ethnic stereotypes about their culture

often serve to enhance pressures for high performance while underestimating their instructional needs, and heightening feelings of personal inadequacy when they might not meet these expectations (Lee 2009).

Gender inequality within schools is also a concern. NAEP gender gaps have converged since the year 2000, and are significantly smaller than the racial and social class gaps (Rampey, Dion, and Donahue 2009), yet their sizes may vary across racial groups for several reasons. First, while the perception of gender bias in instructional settings has long been thought to advantage males over females (Mickelson 1989), some argue it poses unique consequences for African American and Hispanic males. African American boys, for instance, are thought to clash with the inflexible culture and expectations of schools (Harding 2010), and are more frequently and severely disciplined (Ferguson 2001). This may explain why they lose more ground on their white male counterparts between kindergarten and 3rd grade than do African American girls (Fryer and Levitt 2005). Gender disparities may also exist among Hispanic learners because, as Noguera (2008) argues, they are as likely as African Americans to attend the kind of urban schools that are least able to offset the social circumstances particular to males of color. While Hispanics and African Americans are labeled as troublesome, Asian American males are often stereotyped as docile and consequently, receive less guidance and attention from school staff (Lee 2009).

Other accounts of schooling suggest that social class remains a primary determinant of educational stratification. Not only are children sorted into different schools according to their SES (Brantlinger 2003), researchers have long held that instruction differs within schools and classrooms according to social class, favoring higher income children (Anyon 1981). In addition to SES differences in instructional practices, the qualifications and training of teachers (Clotfelter, Ladd, Vigdor and Wheeler 2007), and teachers' decision to transfer to different schools (Johnson, Kraft and Papay 2011) are associated with lower test-scores for lower income children. Finally, the concentration of low income—and consequently, lower performing children—within public schools reduces the occurrence of beneficial spillover effects that disadvantaged children experience in economically heterogeneous instructional settings (Johnson 2012c).

Recent analyses of the ECLS-K provide general support for many of these concerns. For instance, Lee et al., (2004) and Reardon (2003) report that pre-existing disparities in math grow during first grade for Hispanics, and for low income and African American children in reading. The thought that schools contribute to achievement disparities is reinforced by studies that have minimized the possibility that racial and SES differences are due to what children lose, retain or learn during the summer recess (Downey, von Hippel and Broh 2004; Benson and Borman 2010). On this point, Downey, von Hippel and Broh (2004) and Benson and Borman (2010) report no significant growth in the African American-white or Hispanic-white reading gaps during the summer, while Lee et al. (2004) find no losses or gains during the summer recess after considering social background characteristics. Since these findings imply that inequality develops while children are engaged in schooling, federal policies that target their school experiences may yield the greatest benefit.

## NON-SCHOOL CONTEXTS

In contrast to the hypothesized dis-equalizing influence of schooling, another group of studies posit that racial test-score differences are largely, if not entirely, due to social class differences in what children do or do not learn during the summer months (Heyns 1978; Entwisle and Alexander 1992). In the first study, Heyns (1978) follows sixth- and seventh-grade students in the Atlanta public schools for two academic years and one intervening summer. She finds that affluent and white students have higher test-scores in word recognition than their poor and African American counterparts during the school-year and the summer, with the school-year difference being much smaller.

The research of Entwisle and Alexander (1992) tells a similar story. The authors find that the achievement levels of white and African American children are nearly equal at kindergarten's start, but favor white Americans after two years of schooling. The disparity was not caused by differences in school achievement, however; African Americans and low SES students tended to gain as much or more than

relatively advantaged students while in school. Most of the African American-white difference in test-scores was due to the effects of African Americans' relatively lower SES during the summer. Summer gains and losses did not vary much according to race when poverty status was controlled. These achievement patterns imply that it is the interaction of race and SES *outside of school* that should be of greatest concern to policymakers and educators that seek reductions in the African American-white achievement gap.

The findings of these investigations were reaffirmed in recent studies. Lee and Burkham (2002), Reardon (2003), and Lee et al. (2004) show that test-performance gaps also accrue as children experience their initial context of learning, before they start formal education. Low income children, and to a lesser degree, African Americans, begin schooling less cognitively prepared in reading and math than their white and middle-class counterparts. A meta-analysis of seasonal learning research shows that, during the summer, the significant moderating effects found for race disappear after controlling for SES (Cooper et al. 1996). Unfortunately, race-gender estimates of summer achievement are not available in these studies. This is a gap in the literature that this study seeks to fill.

## THE CITY AND NEIGHBORHOOD SOCIAL DISORGANIZATION

The thought that non-school contexts contribute to educational inequality has led researchers and policymakers to question the influence of city-life and neighborhood qualities on children's academic growth. As Wilson (1998) observes, a fuller accounting of educational inequality has eluded us because, in research, "measures of the environment remain incomplete" (p. 507). The consequences of this missing dimension are especially noteworthy in the aforementioned studies. This is because the data analyzed by Heyns (1978) and Entwisle and Alexander (1992) are collected in the large urban cities of Atlanta and Baltimore, respectively, while the studies that report no initial gap or summer loss (Downey, von Hippel and Broh 2004; Benson and Borman 2010), use the ECLS-K, a nationally representative sample, whose participants, Lee and Burkham (2002) contend, are seldom located in disadvantaged areas (p. 74).

Despite Lee and Burkham's observation, there are several ways in which children's city residency may inform the stratification of learning-readiness and educational experiences, as well as the differences between city and national examinations of achievement disparities. For starters, central cities are qualitatively different than other environments. They are areas of greater population density, and diminished personal space (Park, Burgess and McKenzie 1925), with fewer places than in the suburbs for children to play and engage in out-of-school enrichment activities (Celano and Neuman 2001). Consequently, crowding has been found negatively related to young children's vocabulary development before they begin schooling (Chase-Lansdale and Gordon 1996; Chase-Lansdale et al. 1997; Klebanov et al. 1997). Also, city children are often served by large school systems that seem to perform lower than their suburban counterparts. On this point, evaluations of the Gautreaux Housing Mobility Demonstration have noted that parents of children that moved within the city were less likely than movers to the suburbs to report higher educational standards, more academic rigor, and teachers that provided greater educational support in their schools (Kaufman and Rosenbaum 1992). Therefore, knowing whether summer learning losses are due to city influences would inform the need for policies that speak to the particularities of cities.

In addition to the city context, the composition and social organization of children's neighborhoods may also bear on their learning. For example, studies contend that racial segregation has negative (Card and Rothstein 2007), or at best, varied consequences for African American learners (Johnson 2010), and for Hispanic and Filipino children (Pong and Hoa 2007). Others note that a neighborhood's level of violence and crime accompanies the cultivation of modest aspirations among African American boys (Harding 2010); lower levels of educational engagement (Nash 2002); while, parent perceptions of safety, social disorder, and crime have been found negatively related to participation in non-school learning activities (Wimer 2005), educational outcomes (Woolley and Grogan-Kaylor 2006; Madyun and Lee 2007) and, lower vocabulary scores for African American first graders (Caughy and O'Campo 2006). Furthermore, sociologists have argued that high rates of neighborhood male joblessness bear on achievement through

an associated scarcity of role models for boys of color (Wilson, 1996), absence of adults with knowledge of how to effectively sponsor children's educational development (O'Connor 2000), and a lack of consistent daily routines that support children's activities (Connell, Spencer and Aber 1994). Neighborhood joblessness effects in educational research are infrequent however, having been found negatively related to the education of African American boys in only one study of inner-cities (Halpern-Felsher et al. 1997).

While these studies hypothesize linkages between neighborhood dimensions and learning, only a few examine neighborhood influences on learning in the absence of schooling or with race-gender differences in mind. Those using data from the Infant Health and Development Program report that the vocabulary of children, before they begin schooling, is lower in ethnically/racially diverse neighborhoods, especially for white children (Chase-Lansdale et al. 1997; Klebanov et al. 1997). Another study reports that racial segregation is unrelated to test-scores and that the economic segregation of zip code areas is the most salient social background dimension of reading gaps in the summer (Benson and Borman 2010).

With regard to race-gender inequality within the neighborhood context, research shows that African American girls seem to fall further behind boys in math (Entwisle, Alexander and Olson 1994), and Puerto Rican girls become less likely to matriculate (Flores 2002) as an area's income level rises. Other studies have found a context's SES is related to race-gender interaction effects, favoring the education of white males most, while unexpectedly disadvantaging African-American males (Johnson 2008). Johnson's study shows that residing in middle class neighborhoods may not insulate African American males from educational disadvantage to the degree it appears to for white males and African American females.

In summary, existing studies offer much information about achievement inequality according to social background differences, within school/non-school contexts, and in residential areas. Few however provide a comprehensive analysis that addresses all of these dimensions. Studies of school/non-school differences have not considered the important dimension of city residency and neighborhood quality, while neighborhood studies have not considered if the influence of environmental features vary given the

presence and absence of schooling. Finally, race-gender interactions within school/non-school contexts, cities and neighborhoods remain understudied social manifestations of academic differentiation. Consequently, I explore in this study the following questions:

a. In which context (non-school/school) does more racial/ethnic, social class and race-gender inequality in reading develop?

b. Do gaps in reading exist between neighborhoods that vary in quality, and if so, how might they change across school/non-school contexts, or account for other social differences in testing?

c. How might achievement inequality among central city children differ from that found among children of all locations?

## RESEARCH DESIGN AND METHODS

To pursue these questions, I use a research design that includes two key components. First, it exploits an infrequent opportunity to apply observational data to a natural ecological experiment. In this design depicted in figure 1, children experience two "treatments". In the first treatment, city features, neighborhood conditions, and social background characteristics are mediated by children's exposure to K-12 educational programs, and less time in their family and neighborhood contexts. In the second treatment, learning outcomes are generated outside the K-12 context, when children are spending more time in their neighborhoods, families, day-care and any optional learning experiences arranged by parents (e.g. Head Start, Pre-school). This alternative treatment is experienced by children before they enroll in kindergarten, and intermittently during summer breaks. Assessments that occur at the beginning and end of the school year separate the school context periods from the non-school periods, and also partition any seasonal fluctuations in neighborhood social organization and parenting strategies. These naturally occurring treatments present an opportunity for an experimental study in which I distinguish the effects of non-school and school contexts on social inequalities in achievement. Second, the research design reflects a multilevel

conceptual model in which test-scores are nested within children, who are also nested within neighborhoods (Raudenbush and Bryk 2002). Subsequently, I employ a 3-Level Hierarchical Linear Growth Model to consider the contributions of child, social background and neighborhood factors to learning across different contexts.

## DATA

The Early Childhood Longitudinal Study, Kindergarten Cohort 1998 -1999 (ECLS-K) is ideal for this analysis since no other national survey of children includes biannual assessments. The National Center for Education Statistics (NCES) collected data about the families, schools, neighborhoods and activities of 22,782 children, who were chosen at random from 1277 randomly selected public and private kindergarten programs. This analysis uses a panel weight to compensate for the unequal probabilities of selection inherent in the ECLS-K's stratified sampling design. Thus, the findings of this study are generalizable to the U.S. population of children that entered kindergarten in 1998 and continued on to first grade.

I limit the analysis to the random 30 percent subsample of children that were assessed near the beginning and end of kindergarten and first grade. This subsample reduced from 5470 to 5354 once I eliminated children that did not have parent data or were missing all four cognitive scores.[2] Since the analysis accounts for differences in the type of kindergarten program, I omitted 98 children that experienced more than one program type due to a change schools. Next, my interest in ecological factors required that I eliminate children that changed neighborhoods between assessments, which reduced the sample from 5256 to 4993.[3] Since all racial groups were not sufficiently present in central cities, I removed children that were not Hispanic, White, Asian or African American. Multi-racial children were recoded to the race of the mother or father when possible. Last, an estimation of summer context effects free of unwanted

[2] Parents were surveyed to gather social background measures in the spring of the 1999 kindergarten year. In cases where the information is missing, I added values from identical measures collected in the fall of first grade.

[3] The ECLS-K reports moves for rounds 3 and 4 only at the zip code level.

school effects required that I omit children who were attending year-round schools. The final sample includes 2905 White, 776 Hispanic, 338 Asian and 729 African-American children, for a total of 4748. Preliminary analyses reveal the final study-sample mirrors the properties of the larger ECLS-K sample.

I also rely on an NCES companion data file that links ECLS-K children to the tract and zip code in which they reside (Beveridge et al. 2004). Tract level measures are used in this analysis to denote neighborhoods. While the use of census tracts as proxies for neighborhoods has been called "arbitrary" (Jencks and Mayer 1990), I use them because the larger size of zip-code areas makes it uncertain that its average on any characteristic is similar to that of the children's immediate residential area. Subsequently, this study will be the first tract-level analysis of neighborhood impacts across school and non-school contexts. The geo-coding process of the ECLS-K resulted in a less than 1 percent difference in the identification of children's zip-codes and tracts across the four assessments (Beveridge et al. 2004). Rather than deleting children from the sample, I linked those who had no tract identified to their zip code characteristics. The merging resulted in the inclusion of 3612 geographic units. A list of variables and their definitions appear in Table 1.

[TABLE 1 NEAR HERE]

TEST-SCORE GROWTH

I use the *reading* Item Response Theory (IRT) scale-scores since they are designed to reduce ceiling and floor effects in estimates of cognitive growth (Rock and Pollack 2002).[4] These scores were released in 2009 as the survey's final recalibrated scale-scores.[5] Children of the wave 3 subsample were assessed near the beginning and end of kindergarten and first grade. These biannual assessments permit the measurement of what children learned by the fall kindergarten assessment; from the fall kindergarten

[4] Reading assessments include concepts related to letter-case recognition; reading words in context; recognizing common words; and knowing letter sounds at the beginning and end of words.

[5] Refer to Rock and Pollack (2002) for more information on the calibration of scale scores.

assessment to the year-end assessment; between the year-end kindergarten assessment and the beginning of the first grade assessment (over the summer); and, from the fall first grade assessment until the year-end assessment. Hence, the ECLS-K presents for comparison two schooling contexts (kindergarten and first grade) and two non-school contexts (before-school and summer recess).

One complication with these data regarding the estimation of periodic growth is that the testing dates did not coincide with the beginning and ending dates of the school year, leading to both the contamination of the summer period by the inclusion of days of schooling (that occurred after the last assessment of kindergarten and before the first assessment of first grade), and the exclusion of relevant days of instruction from school estimates. Knowing the test dates and the beginning and ending dates of the school year allowed me to create a series of variables to account for the elapsed time between them measured in months.[6] Under the assumption that growth within each period was linear, I calculated the amount of growth that would have occurred during the time missing from the assessment periods and reapportioned the test-scores accordingly. When included in the models, these time-elapsed variables indicate any significant change in the *points per month* growth of the adjusted reading scores.

## CONSIDERING SOCIAL BACKGROUND AND SCHOOL CONTEXTS

I also compare growth rates according to child-level social background characteristics across contexts while controlling for school-related factors. Social background variables were coded as 1 = yes, 0 = no for race/ethnicity (*Hispanic*, *white, Asian, and African American*), race-gender *(i.e. Asian Male, Asian Female* etc.*)*, and *family SES*. In order to examine achievement differences between social classes, I use a composite measure of family SES that is segmented into equal-sized quintiles (e.g. *Low SES*, 1 = yes, 0 = no). This composite measure of family SES, provided by NCES, reflects the occupational status,

[6] I used the beginning and end school dates supplied by school administrators, and when those dates were not provided, those given by parents.

educational level and total household income of parents (NCES 2001). I also consider children's *gender* (1 = female, 0 = male) and *single parent* (1 = yes, 0 = no) family structure.

Although my growth modeling strategy isolates the effects of schools versus non-school contexts, three additional education-related factors were needed to account for variation in the amount of schooling children receive. I consider whether the child attended a *full-day kindergarten* program (versus half-day), *attended summer school* and *repeated kindergarten*, (1 = yes, 0 = no), the last of these also serving as a control for children who may be older than average. These measures account for differences in the amount of children's exposure to school while also removing its influence during the summer context.

NEIGHBORHOOD AND CITY DETERMINANTS

In addition to the investigation of differences in learning through the juxtaposition of school and non-school contexts, I also explore them according to children's residential qualities and classification. Addressing the latter first, I used the *location type* variable to identify children that reside in central cities—approximately 39 percent of the analytical sample—and save them to a second file. This city sample, consisting of 1889 children from 1515 geographic units, will contrast the analysis of the national sample.

I use subjective and objective measures of neighborhood conditions to estimate within-context effects for both samples. The subjective measures consist of social disorganization variables. Parents were asked: "*how much of a problem is burglary*", "*violent crime*" and "*selling/using drugs in the area*" (1 = big problem, 2 = somewhat a problem, 3 = no problem). I dichotomized these variables so that 1 indicates a big problem, and 0, not a big problem.

The objective variables include three census measures of the tract's *median family income*; the *percentage of Hispanic and African Americans*; and the *percentage of jobless males* age 16 or over within the civilian labor force. Including the median income measure to account for a neighborhood's economic composition allows the joblessness variable to better reflect its hypothesized impact on a neighborhood's

social organization. The median income variable was created by first using a natural log transformation to achieve a more suitable distribution of incomes, then converting those values into z-scores. For the sake of interpretation, Table 1 reports the original values of this variable. I combined measures of the proportion of African American and Hispanic individuals to create the tracts' *minority composition* measure because those racial groups tend to reside in highly segregated areas with more social problems (Wilson, 1996).

ESTIMATION

I use HLM version 6.08 to estimate achievement growth (Raudenbush and Bryk 2002). The 3-level model consists of within-child test-score measures at Level 1, between child-measures reflecting social background and school-related factors at Level 2, and neighborhood measures at Level 3. Given growth is viewed as happening in distinct contexts, I elected a piecewise approach for the separate estimation of growth parameters. To model growth rates, I view test-scores $Y_{tcn}$ as a function of an intercept representing reading performance before kindergarten for child *c* in neighborhood *n*, and her or his exposure to kindergarten, summer, and 1st grade at the time of test *t*, yielding the Level 1 equation:

$$Y_{tcn} = \pi_{0cn} + \pi_{1cn}(Kindergarten_{tcn}) + \pi_{2cn}(Summer_{tcn}) + \pi_{3cn}(First\ Grade_{tcn}) + e \qquad (1)$$

Since this analysis estimates four parameters from four test-scores, I constrain the value of the error term within the statistical program settings to equal the average amount of measurement error across contexts. Using the test reliability estimates provided by Rock and Pollack (2002), I computed the measurement error variance for each assessment as one minus the reliability of the test, multiplied by its total variance. I then averaged the measurement error variance across the four assessments. As seen in Table 2, the measurement error range is largest for the city sample, and averages 12.97 and 12.46 for the city and national sample, respectively.

[TABLE 2 NEAR HERE]

Level 2 of the multilevel model includes the social background and school variables. Each Level 2 parameter represents the adjustment in the neighborhood average performance slope, $\beta_{10n}$. Since I investigate racial, SES and race-gender differences in cognitive growth over time, there are two Level 2 specifications for each of the four contexts. In the first Level 2 model, test-score growth $\pi_{1cn}$ is a function of the child's gender, single parent family structure, race, and the quintiles of family SES (with the middle quintile excluded). I model achievement gaps according to race-gender interactions in the second specification, so the variables for race and gender are replaced with those for Asian boys, Asian girls, etc., leaving white boys, as the reference group. The only way in which these models differ across contexts is in the addition of the *all-day kindergarten* variable in kindergarten, and the addition of the *attended summer school* variable in the summer. The full Level 2 equation is as follows:

$$\pi_{1cn} = \beta_{10n} + \beta_{1n}(\textit{Repeated kindergarten}_{cn}) + \beta_{12n}(\textit{Gender}_{cn}) + \beta_{13n}(\textit{Single parent}_{cn}) + \beta_{1,4\text{-}7n}(\textit{SES quintiles}_{cn}) + \beta_{1,8\text{-}12n}(\textit{Race}_{cn}) + \beta_{1,13\text{-}19n}(\textit{Race/Gender}) + \beta_{120n}(\textit{All-day kindergarten}_{cn}) + \beta_{121n}(\textit{Summer school}_{cn}) + a_{cn} \quad (2)$$

At Level 3, I model neighborhood-based variation in mean achievement with random intercept models (Raudenbush & Bryk, 2002). The Level 3 equation models neighborhood-to-neighborhood variation in their characteristics in each of the four contexts for models 3 and 6. Hence, test-score growth in each context, $\beta_{10n}$ is a function of the census tracts' median income; percentage of African Americans and Hispanics; percentage of jobless males, and three variables representing parents' report that burglary, drug trafficking/use, and violence are problems in their neighborhood. I express the Level 3 equation as:

$$\beta_{10n} = \gamma_{100} + \gamma_{101n}(\textit{Median family income}_{n}) + \gamma_{102n}(\%\ \textit{minority}_{n}) + \gamma_{103n}(\%\ \textit{Jobless males}_{n}) + \gamma_{104n}(\textit{Burglary}_{n}) + \gamma_{105n}(\textit{Drugs}_{n}) + \gamma_{106n}(\textit{Violence}_{n}) + r_{10n} \quad (3)$$

In this equation, the intercept $\gamma_{100}$, represents the average growth rate of a specific context for all neighborhoods in the sample. The first three continuous neighborhood parameters, $\gamma_{101n}$ - $\gamma_{103n}$ indicate the

estimated deviation from the neighborhood mean growth rate associated with a point increase among those characteristics. The second set of neighborhood parameters is categorical, and represents the average point change in kid's test score associated with a neighborhood's identification as having those problems.

## ANALYSIS

### DESCRIPTIVE STATISTICS

Tables 1 and 3 provide descriptive information for the national sample and the city subsample. The time elapsed between the assessments and the beginning and end dates of schooling reported in Table 1 show that without the steps taken in this study to compensate for the unaligned dates, approximately 2.17 months of schooling would have been misattributed to children's before-school context. Likewise, the 1.08 months that occurred after the spring-kindergarten assessment would have been excluded from the kindergarten period and misattributed to the summer. With the adjusted test-scores, the before kindergarten and summer periods contain no school-time growth, while kindergarten and first grade now reflect the full 9.39 and 9.43 months of schooling, respectively.

The means reported in Table 1 show moderate differences between the national and city sample in the higher proportion of African Americans and Hispanics, and lower proportion of white children in the city sample. Also city children have a greater representation than children do nationally within the lowest SES quintile, within single parent families, and slightly higher reports of drug, burglary and violence problems in their neighborhoods.

[TABLE 3 NEAR HERE]

More notable demographic differences are revealed in Table 3. These figures show that African-Americans and Hispanics constitute 25.7 and 37.8 percent of the children in the low SES quintile though they are only 15 and 16 percent of the total sample, respectively. Approximately 38 and 28 percent of all Hispanic and African American children, respectively, are in low-income families, compared to 7.6 percent

of white children. In fact, the largest proportion (31 percent) of white children is in the top SES quintile. In the city, social class cleavages across racial groups are more pronounced. For instance, while the presence of African Americans and Hispanics in the lowest SES category increases to 28.4 and 46.8 percent, respectively, the percentage of white children in the highest SES category increases to 41.7. So not only are populations of color in central cities more likely to be disadvantaged, their relative disadvantage appears greater than it is among children of all residential types. All underrepresented groups in the city have the highest proportion of their population in the lowest SES category.

## INEQUALITIES IN NON-SCHOOL/SCHOOL CONTEXTS, NEIGHBORHOODS AND CITIES

Tables 4 and 5 report the reading analysis in the before-school, kindergarten, summer and first grade contexts for the national (models 1 – 3) and city samples (models 4 – 6). Along with the estimates in the models convey deviations from test-score averages, I also report test-score inequality in terms of monthly school-year gains and losses and plot these trajectories in figures 2 and 3.[7]

[TABLE 4 NEAR HERE]

Model 1 addresses the first research question regarding the context in which more racial, social class, and race-gender gaps in achievement grow. In the first non-school contexts, model 1 shows that inequality in the performance of children within the lowest and highest SES quintiles equals 9.04 points. Not only do children in the lowest income category fall behind the average test-score by just over a standard deviation unit (-4.34 points), children in the highest income exceed the average test-score by 4.70 points. The race/ethnicity gaps are much smaller, with African American and Hispanics matching the average test-score performance, but trailing the higher than average test-scores of Asian/Pacific Islanders (3.91 points).

[7] To do this, I difference the estimates from the mean amount of test-score growth in a context (before-school, kindergarten, summer or first grade), then divide the sum by the number of months in the academic year to arrive at the average monthly growth for that particular social group. This sum can be subtracted from the average monthly growth rate of that context to calculate monthly gains or losses. Model estimates are divided by the average monthly growth rate to determine the number of academic-year months lost or gained.

Model 2 addresses the second question of race-gender differences and finds that the higher than average test-scores for Asian/Pacific Islanders is due to the stronger performance of Asian American girls (6.17 points). There are no other significant race-gender gaps. Model 3 includes the neighborhood characteristics to determine if their inclusion results in changes in the race-gender and social class gaps, and the amount of inequality between neighborhoods according to aspects of their social disorganization and composition. Only modest reductions in the social class gap appear in model 3 and the race-gender estimates remain similar. However, neighborhood drug problems are related to lowered test-scores (-3.61 points).

Models 4 – 6 reveal that educational inequality is much different in the city context. Social class differences between the least and most advantaged in the city (10.41 points) are larger than for children nationally (9.04 points), with the higher than average gains of advantaged children (6.57 points) accounting for the majority of social class inequality. In terms of race, the average test-score performance of African Americans in the city trail that of the other racial groups (-2.92 points). Model 5 suggest that the African American shortfall is due to the performance of African American males and not their female counterparts. This gap remains in model 6, which adds the neighborhood features and shows all of them to be insignificant.

The next set of estimates reveal race, social class, and race-gender inequalities continue to grow within the school context. While this may appear consistent with earlier studies, there are some ways in which the kindergarten estimates depart from previous analyses. First, model 1 shows the most prominent gap is according to social class, where children in the lowest SES category have a test-score performance 1.78 points lower than the average. This social class setback exceeds the shortfall that African Americans experience. When contrasted with the number of months (~9.4), children in the lowest SES category lost .19 points per month of kindergarten growth for a total of 1.17 months of kindergarten learning. The greater magnitude of the low SES gap remains throughout models 1 – 3. Second, the race-gender interactions in models 2 and 3 show no significant setback in achievement growth for African American boys or girls, and

that the race differences found in model 1 were due to the greater than average performance of white girls (1.19 points). Third, test-scores for children nationally continue to lag behind the average in neighborhoods with drug problems (-2.99 points). The largest test-score gap in kindergarten for children nationally is between neighborhoods that do and do not report having drug problems, amounting to a loss of 1.95 months of kindergarten learning by year's end.

In contrast, models 4 – 6 reveal that race, social class, race-gender and neighborhood inequality is greater in the city context. First, all three models show that social class inequality is greater than racial inequality in the city, and that it arises from the greater than average gains of advantaged children rather than lower test-scores for disadvantaged children. Second, the race-gender estimates depict losses for African American boys that eclipse the size of any of the other test-score gaps reported during kindergarten. In the full model, the estimate of -3.87 points equals a loss of .41 points per month for African American boys, relative to the other racial groups, for a total loss of 2.52 months of kindergarten-year learning. Neighborhood drug problems (-3.50 points) in the city present similar setbacks for children, equaling .37 points per month loss and 2.28 months of kindergarten-year learning.

[TABLE 5 NEAR HERE]

The third set of models (Table 5) estimate achievement differences over the summer, accounting for the possibility that children attended summer school. In this second non-school context, a social class gap appears only among children in the city, and again due to the higher than average performance of advantaged children. As shown in model 6, city children in the high SES category exceed the test-score average by 3.64 points, amounting to a 1.56 point gain each month for roughly 2.6 summer months. To put this summer growth in context, higher SES children gain the equivalent of 2.7 months of kindergarten-year learning. Asian American girls, nationally (model 3), experience roughly the same boost in summer-time learning. Inequality among children within city neighborhoods where burglary is a problem (model 6) is

especially prominent (-4.05 points), amounting to a summer loss of 2.64 months of kindergarten-year learning, relative to those who are not in such neighborhoods.

The final set of models estimate the education gaps in first grade. In the race model, there are losses for African Americans (-4.76 points) and for the first time in this analysis, Hispanics (-2.90 points). African Americans trail the average monthly growth rate by .50 points per month for a total setback of 1.30 months of first grade learning, while Hispanics lose .79 months. The social class gap in reading widens during first grade due to the significantly lower growth rate of children within the low SES category (-4.08 points) and the stronger gains of advantaged children (3.36 points). Model 2 reveals that once again, the loss for African Americans is due to the lower performance of boys (-7.49 points), which is the only race-gender group to experience a shortfall. Model 3 shows that African American boys' loss of roughly two months of first grade learning reduces little with the consideration of neighborhood characteristics, which are all insignificant. Within the city (models 4 – 6), African Americans and African American boys lose even more relative to other racial and race-gender groups, while the children in the highest social class category gain more than their counterparts do nationally (models 1 – 3). The estimate of -8.17 points in model 6 implies that African American boys lose .87 points per month, for a total loss of 2.30 months of learning by first grade's end. Figures 2 and 3 depict the learning growth trajectories according to race-gender over across all four contexts and show how the shortfall for African American boys is most acute within cities.

## DISCUSSION

This chapter posed several questions regarding the relative performances of children according to their social background and residential characteristics across non-school and school contexts. Specifically, I asked, 1) in which context (non-school/school) does more racial/ethnic, social class and race-gender inequality in reading develop; 2) do test-score gaps exist between neighborhoods that vary in quality, change across school/non-school contexts, and account for other social background differences; and, 3)

how might achievement inequality among central city children differ from that found among children of all locations? Answers to these questions could help fashion federal initiatives to fit the particularities of the problem, and direct resources to the appropriate context in which residential and social background disparities in achievement are produced.

Pursuant to these questions, the analysis shows that social class inequality exists in all contexts, for children nationally, as well as within the city. Yet, the nature of social class stratification in testing outcomes differs according to residency; in the city, it is due to the gains of higher income children rather than a lag in the test-score growth of lower income children. City children within the highest SES category experienced greater than average gains in every context, while their low SES counterparts experienced no losses once they started K-12 programs. Finally, there is no evidence that schools, nationally, shield the test performances of children from the effects of their lower SES as apparently city schools do.

While the social class findings are insightful, the patterns of race/ethnic and race-gender inequality are even more notable. First, I found no setbacks according to race for children in the national sample during either of the non-school contexts. Second, inequality in the city is greater than it is nationally for African Americans and African American boys in all contexts. In the city, these are the only two groups that start school with lower than average test-scores. Third, African American boys were the only race-gender group to fall short of average growth at any point in this study, suggesting that the black/non-black gap is essentially a black-male/non-black gap. At no time in this analysis did the test-score growth of African American girls fall significantly short of the average. In the city, African American boys have a test-score disadvantage before they enter school, and by the end of first grade, an additional 4.82 months of school-time test-score growth—over half of an academic year—is added to their initial shortfall (see figure 3).

While the consideration of neighborhood features did not alter, much, the size of other social background differences in test outcomes, large neighborhood effects were found for city children that resided where drugs and burglary were big problems. So while city schools can shield children of a lower

income from test-score losses, they do little to offset the shortfalls that children experience within the most troubled neighborhoods.

Given the findings of this analysis, how should we assess current federal efforts to reduce educational inequality? First, this analysis justifies the attention given to racial inequality in NCLB's mandates, since much of it across the nation arises in schools. The imperative of addressing racial differences in test outcomes also supports the White House Initiative on Educational Excellence for African American Education, which identifies the racial group this analysis finds in greatest need of federal support. However, until educational policy efforts increase the test performance of African American boys in particular, we will see little convergence in racial test-score gaps. On this point, Section 5131(a)(23) of the reauthorized Elementary and Secondary Education Act allows local educational agencies (LEAs) to offer same-gender schools and programs. Yet the low numbers of LEAs that offer single-sex education options make it unlikely that a significant number of boys will have access to this opportunity. Furthermore, evidence that single-sex arrangements are related to improved test-scores is mixed, and less evidence finds that such arrangements include curricular materials that are tailored to the needs of specific gender groups (U.S. Dept. of Education 2008). In addition, it is not certain that single-sex educational arrangements will persist long enough to understand their potential. Organizations such as the American Civil Liberties Union have filed litigation to end what they call "gender segregation in public education." While the record is mixed on whether these arrangements help children, far less evidence suggests that gender separation causes them harm.

Second, NCLB appears especially complicated by this chapter's identification of clear patterns of residential inequality in test-scores. Test-score gaps were larger in the city context, for African Americans, African American boys, during non-school and school contexts, and according to neighborhood problems. Whether cities and distraught neighborhoods cause children to perform less well, or merely serve to attract families to reside in them that are less prepared for success, the challenge they present to federal policy is

the same: increased educational inequality. This problem is not one that can be addressed simply through conventional policy proposals, such as year-round schooling. Federal officials have highlighted the idea of year-round schooling because it would keep children academically engaged while reducing their time in other less-supportive learning environments. However, it is not clear whether lowered scores come directly from children's experiences in problematic neighborhoods, or whether schools convey the neighborhood effect as they provide educational services (Johnson 2012a). If it is the latter, giving children more time within "institutional conduits of inequality" is unlikely to solve the problem.

There are associational redistributive policies that seek to disrupt the covariation of neighborhood and school quality by relocating children within NCLB and other federal programs. NCLB provides a choice mechanism that releases children from local school attendance mandates if their school consistently fails to demonstrate average yearly progress (AYP) so they may attend higher performing schools within the school district. However, in any given year, the majority of schools within our largest LEAs fail to make AYP, which does not permit the transfer provision to accomplish its aim for the majority of children. Unless NCLB incentivizes inter-district transfers between city systems and their satellite districts, which it does not, its school choice provision does little to challenge the correspondence of neighborhood and school quality.

Other efforts to accomplish this have been undertaken by the Department of Housing and Urban Development (HUD) since 1976. Instead of merely expanding underrepresented children's options for school enrollment, these remedies have provided families residency within other neighborhoods and enrollment in their schools. However, a synthesis of these programs has suggested that the neighborhood-school correspondences that operate in destination neighborhoods are socially structured to benefit the residents that create them, and not necessarily those who join them (Johnson 2012b). Nonetheless, these remedies have not been of the scale to support the need of so many families within low income areas.

This analysis makes clear, however, that city-schools are less effective in elevating test outcomes according to race-gender than they appear to be in raising the scores of low income children. These

realities suggest federal policy should seek to retool city schools with better teachers and an appropriate level of resources to address school determinants of city performance gaps, but not leave the duty of eradicating these gaps to schools alone. On this point, more comprehensive and geographically specific approaches are now underway in the federal government's Promise Neighborhoods—an effort that mirrors the Harlem Children's Zone. These programs seek to coordinate resources that affect children at the neighborhood, school and family level, directly and indirectly, and during the summer and academic term. Future evaluations will reveal whether these approaches can address, more fundamentally, the circumstances that continue to place educational equality beyond our reach.

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TABLE 1. Descriptive Statistics, N = 4748 National Sample, N = 1889 City Sample

| | Mean National | STDV | Mean City | STDV |
|---|---|---|---|---|
| Gender (1 = Female, 0 = male) | .49 | .50 | .49 | .50 |
| Black (1 = yes, 0 = no) | .15 | .36 | .21 | .41 |
| White (1 = yes, 0 = no) | .61 | .49 | .45 | .50 |
| Hispanic (1 = yes, 0 = no) | .16 | .37 | .27 | .44 |
| Asian/Pacific Islanders (1 = yes, 0 = no) | .07 | .26 | .06 | .24 |
| Repeat Kindergarten (1 = yes, 0 = no) | .04 | .20 | .06 | .23 |
| Low SES (1 = yes, 0 = no) | .17 | .38 | .24 | .42 |
| Low Middle SES (1 = yes, 0 = no) | .18 | .39 | .17 | .37 |
| Middle SES (1 = yes, 0 = no) | .20 | .40 | .17 | .38 |
| Middle High SES (1 = yes, 0 = no) | .22 | .41 | .20 | .40 |
| High SES (1 = yes, 0 = no) | .23 | .42 | .23 | .42 |
| Black male (1 = yes, 0 = no) | .08 | .27 | .11 | .31 |
| Black female (1 = yes, 0 = no) | .07 | .26 | .10 | .30 |
| White female (1 = yes, 0 = no) | .30 | .46 | .22 | .41 |
| White male (1 = yes, 0 = no) | .31 | .46 | .23 | .42 |
| Hispanic male (1 = yes, 0 = no) | .08 | .28 | .13 | .34 |
| Hispanic female (1 = yes, 0 = no) | .08 | .27 | .14 | .34 |
| Asian/Pacific Islander female (1 = yes, 0 = no) | .03 | .18 | .03 | .17 |
| Asian/Pacific Islander male (1 = yes, 0 = no) | .04 | .19 | .03 | .17 |
| Attended Summer School (1 = yes, 0 = no) | .11 | .31 | .12 | .33 |
| Single Parent (1 = yes, 0 = no) | .22 | .42 | .26 | .44 |
| Months before school start (Age at kindergarten start) | 65.53 | 4.28 | 65.66 | 4.34 |
| Months between kindergarten start and test 1 | 2.17 | .51 | 2.16 | .46 |
| Months between test 2 and kindergarten end | 1.08 | .49 | 1.06 | .50 |
| Months between kindergarten end and grade 1 start | 2.62 | .28 | 2.60 | .27 |
| Months between grade 1 start and test 3 | 1.43 | .52 | 1.39 | .52 |
| Months between kindergarten start and test 2 | 8.31 | .51 | 8.33 | .53 |
| Months between grade 1 start and test 4 | 8.30 | .57 | 8.36 | .50 |
| Months between test 4 and grade 1 end | 1.13 | .55 | 1.07 | .49 |
| Neighborhood median family income | 52574.00 | 23182.19 | 53150.50 | 23481.98 |
| Neighborhood percentage Black and Hispanic | 25.14 | 29.97 | 24.55 | 29.42 |
| Neighborhood percentage males jobless | 6.77 | 8.39 | 6.65 | 8.59 |
| Big drug problem in area (1 = yes, 0 = no) | .03 | .17 | .05 | .23 |
| Big burglary problem in area (1 = yes, 0 = no) | .02 | .13 | .03 | .18 |
| Big violence problem in area (1 = yes, 0 = no) | .01 | .11 | .03 | .16 |
| Reading test 1 score | 36.10 | 10.67 | 35.75 | 10.63 |
| Reading test 2 score | 47.52 | 14.51 | 47.05 | 14.71 |
| Reading test 3 score | 53.89 | 18.17 | 53.10 | 18.47 |
| Reading test 4 score | 78.85 | 24.58 | 77.79 | 25.51 |

TABLE 2. Measurement Error Variance on Four Reading Tests in National and City Sample

| Assessment Period | Fall 1998 | Spring 1999 | Fall 1999 | Spring 2000 | Average |
|---|---|---|---|---|---|
| Reading | | | | | |
| Total variance | 113.80 | 210.56 | 330.07 | 604.36 | |
| Reliability | 0.93 | 0.95 | 0.96 | 0.97 | |
| Measurement error variance | 7.97 | 10.53 | 13.20 | 18.13 | 12.46 |
| Reading City | | | | | |
| Total variance | 113.02 | 216.30 | 341.08 | 650.72 | |
| Reliability | 0.93 | 0.95 | 0.96 | 0.97 | |
| Measurement error variance | 7.91 | 10.82 | 13.64 | 19.52 | 12.97 |

*Note*: Reliabilities were calculated by Rock and Pollack (2002). With a reliability of *r,* and total test variance *Var* (*Ysct*), the measurement error variance is (1–*r*) *Var* (*Ysct*).

Table 3. Cross-tabulations According to Race/Ethnicity and SES for National and City Sample

| Race/Ethnicity | National Sample SES, N = 4748 | | | | | City Sample SES, N = 1889 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Low | Middle Low | Middle | Middle High | High | Low | Middle Low | Middle | Middle High | High |
| Asian/Pacific Islander | | | | | | | | | | |
| Number | 56 | 53 | 70 | 59 | 91 | 29 | 14 | 22 | 20 | 28 |
| % Within Asian | 17.0 | 16.1 | 21.3 | 17.9 | 27.7 | 25.7 | 12.4 | 19.5 | 17.7 | 24.8 |
| % Within Quintile | 7.6 | 6.3 | 7.6 | 6.1 | 8.1 | 7.3 | 4.4 | 6.6 | 6.1 | 6.3 |
| African American | | | | | | | | | | |
| Number | 190 | 170 | 155 | 109 | 67 | 108 | 92 | 82 | 65 | 33 |
| % Within Black | 27.5 | 24.6 | 22.4 | 15.8 | 9.7 | 28.4 | 24.2 | 21.6 | 17.1 | 8.7 |
| % Within Quintile | 25.7 | 20.1 | 16.8 | 11.3 | 6.0 | 27.1 | 29.2 | 24.7 | 19.8 | 7.4 |
| Hispanic | | | | | | | | | | |
| Number | 279 | 146 | 131 | 98 | 88 | 228 | 94 | 76 | 52 | 37 |
| % Within Hispanic | 37.6 | 19.7 | 17.7 | 13.2 | 11.9 | 46.8 | 19.3 | 15.6 | 10.7 | 7.6 |
| % Within Quintile | 37.8 | 17.2 | 14.2 | 10.1 | 7.8 | 57.1 | 29.8 | 22.9 | 15.9 | 8.3 |
| White | | | | | | | | | | |
| Number | 214 | 474 | 564 | 697 | 876 | 34 | 114 | 151 | 189 | 349 |
| % Within White | 7.6 | 16.8 | 20.0 | 24.7 | 31.0 | 4.1 | 13.6 | 18.0 | 22.6 | 41.7 |
| % Within Quintile | 29.0 | 56.0 | 61.1 | 72.1 | 77.9 | 8.5 | 36.2 | 45.5 | 57.6 | 78.1 |

TABLE 4. Hierarchical Linear Models of Reading Growth, Before School and Kindergarten

| | National | | | City | | |
|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| *Before-School Context* | Race | Race/gender | Full | Race | Race/gender | Full |
| Intercept | 33.88*** | 34.91*** | 34.91*** | 33.84*** | 33.86*** | 33.88*** |
| Months before school | 0.44*** | 0.44*** | 0.44*** | 0.42*** | 0.40*** | 0.41*** |
| Gender | 1.21** | | | 1.24 | | |
| Single parent | -1.35** | -1.34** | -1.32** | -1.25 | 1.26 | -1.22 |
| Repeated Kindergarten | 0.06 | 0.07 | 0.14 | 0.45 | 0.43 | 0.35 |
| Low SES | -4.34*** | -4.35*** | -4.25*** | -3.84*** | -3.81*** | -3.79*** |
| Mid low SES | -1.93* | -1.94* | -1.88* | -1.50 | -1.46 | -1.44 |
| Mid high SES | 1.80* | 1.80* | 1.84* | 0.88 | 0.94 | 0.94 |
| High SES | 4.70*** | 4.71*** | 4.71*** | 6.57*** | 6.63*** | 6.66*** |
| Asian/Pacific Islander | 3.91** | | | 2.90 | | |
| Black | -1.03 | | | -1.98* | | |
| Hispanic | -1.16 | | | -1.77 | | |
| Asian boys | | 3.11 | 3.11 | | 3.58 | 3.53 |
| Asian girls | | 6.17** | 6.35** | | 3.49 | 3.69 |
| Black boys | | -1.23 | -1.26 | | -2.92** | -2.79** |
| Black girls | | 0.21 | 0.23 | | 0.52 | 0.76 |
| Hispanic boys | | -1.39 | -1.40 | | -0.16 | -0.12 |
| Hispanic girls | | 0.11 | 0.10 | | -1.70 | -1.81 |
| White girls | | 1.05 | 1.04 | | 1.53 | 1.64 |
| Drug Problem | | | -3.61** | | | -2.57 |
| Burglary Problem | | | 0.37 | | | 2.16 |
| Violence Problem | | | 6.72 | | | 0.20 |
| Median income | | | -0.11 | | | -0.14 |
| % Jobless | | | 0.04 | | | -0.10 |
| % Black & Hispanic | | | 0.01 | | | 0.02 |
| Level 1 & 2 variance | 32.29*** | 32.23*** | 32.55*** | 39.15*** | 38.12*** | 37.84*** |
| Standard deviation | 5.68 | 5.68 | 5.71 | 6.26 | 6.17 | 6.15 |
| Level 3 variance | 40.14*** | 40.11*** | 38.96*** | 16.54*** | 16.97*** | 16.86*** |
| Standard deviation | 6.34 | 6.33 | 6.24 | 4.07 | 4.12 | 4.11 |
| *Kindergarten Context* | | | | | | |
| Points/Month | 1.27 | 1.30 | 1.34 | 1.18 | 1.37 | 1.39 |
| Gender | 1.05* | | | 1.66* | | |
| Single parent | -0.65 | -0.66 | -0.64 | -0.83 | -0.82 | -0.85 |
| Repeated Kindergarten | -1.98 | -1.98 | -2.07 | -2.63 | -2.74 | -2.64 |
| All day Kindergarten | 2.20*** | 2.21*** | 2.22*** | 0.82 | 0.86 | 0.67 |
| Low SES | -1.78* | -1.78* | -1.73* | -0.16 | -0.09 | 0.35 |
| Mid low SES | -1.00 | -1.00 | -0.96 | -0.45 | -040 | -0.36 |
| Mid high SES | 0.64 | 0.65 | 1.45 | -0.06 | -0.02 | 0.12 |
| High SES | 1.46 | 1.45 | -1.53 | 2.77* | 2.82* | 2.84* |
| Asian/Pacific Islander | -0.57 | | | -0.48 | | |
| Black | -1.55* | | | -2.50** | | |
| Hispanic | -0.55 | | | -0.48 | | |
| Asian boys | | -0.18 | 0.10 | | 2.33 | 2.10 |
| Asian girls | | -0.46 | -0.29 | | 0.66 | 0.86 |
| Black boys | | -1.52 | -1.53 | | -3.51** | -3.87*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Black girls | | -0.42 | -0.38 | | -0.58 | -0.88 |
| Hispanic boys | | -0.28 | -0.23 | | -1.19 | -1.28 |
| Hispanic girls | | 0.46 | 0.38 | | 1.13 | 0.84 |
| White girls | | 1.19* | 1.18* | | 0.93 | 0.81 |
| Drug Problem | | | - 2.99* | | | -3.50** |
| Burglary Problem | | | 0.26 | | | 1.92 |
| Violence Problem | | | 5.97 | | | 6.06 |
| Median income | | | - 0.07 | | | 0.63 |
| % Jobless | | | 0.00 | | | -0.02 |
| % Black & Hispanic | | | 0.01 | | | 0.01 |
| Level 1 & 2 variance | 35.49*** | 35.48*** | 35.27*** | 31.21*** | 30.82*** | 30.73*** |
| Standard deviation | 5.96 | 5.96 | 5.94 | 5.59 | 5.55 | 5.54 |
| Level 3 variance | 31.59*** | 31.56*** | 31.45*** | 25.95*** | 26.17*** | 25.43*** |
| Standard deviation | 5.62 | 5.62 | 5.61 | 5.09 | 5.12 | 5.04 |

*** = p < .000, ** = p < .01, * = p < .05

TABLE 5. Hierarchical Linear Models of Reading Growth, Summer and First Grade

| | National | | | City | | |
|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| *Summer Context* | Race | Race/gender | Full | Race | Race/gender | Full |
| Points/Month | -0.08 | -0.14 | -0.09 | 0.47 | 0.51 | 0.51 |
| Gender | 0.22 | | | 0.63 | | |
| Single parent | -0.28 | -0.29 | -0.21 | 1.40 | 1.43 | 1.46 |
| Repeated Kindergarten | 0.77 | 0.69 | 0.54 | 0.78 | 0.78 | 0.61 |
| Summer school | 0.54 | 0.60 | 0.56 | 1.22 | 1.21 | 0.98 |
| Low SES | -1.16 | -1.14 | -1.24 | - 1.37 | -1.39 | -1.51 |
| Mid low SES | -0.45 | -0.43 | -0.51 | 0.12 | 0.12 | 0.02 |
| Mid high SES | 0.16 | 0.17 | 0.07 | 0.41 | 0.41 | 0.38 |
| High SES | 0.68 | 0.68 | 0.66 | 3.72** | 3.70** | 3.64** |
| Asian/Pacific Islander | 2.16* | | | 2.24 | | |
| Black | 0.09 | | | - 0.96 | | |
| Hispanic | 0.85 | | | - 0.20 | | |
| Asian boys | | 1.09 | 1.24 | | 1.15 | 1.21 |
| Asian girls | | 3.62* | 3.65* | | 3.95 | 3.96 |
| Black boys | | -0.51 | -0.27 | | -0.65 | -0.58 |
| Black girls | | 0.67 | 0.92 | | -0.48 | -0.17 |
| Hispanic boys | | 1.15 | 1.26 | | 0.06 | 0.28 |
| Hispanic girls | | 0.61 | 0.84 | | 0.40 | 0.57 |
| White girls | | 0.02 | 0.10 | | 0.85 | 0.84 |
| Drug Problem | | | 0.77 | | | 1.64 |
| Burglary Problem | | | -1.80 | | | -4.05** |
| Violence Problem | | | -1.55 | | | -1.60 |
| Median income | | | -0.69* | | | -0.54 |
| % Jobless | | | 0.03 | | | -0.02 |
| % Black & Hispanic | | | -0.05* | | | -0.00 |
| Level 1 & 2 variance | 31.61*** | 31.32*** | 31.50*** | 52.44*** | 52.02*** | 50.93*** |
| Standard deviation | 5.62 | 5.60 | 5.61 | 7.24 | 7.21 | 7.14 |
| Level 3 variance | 21.14*** | 21.35*** | 20.69*** | 5.93 | 6.31 | 7.04 |
| Standard deviation | 4.60 | 4.62 | 4.55 | 2.43 | 2.51 | 2.65 |
| | | | | | | |
| *First Grade Context* | | | | | | |
| Points/Month | -2.31 | -2.32 | -2.34 | -2.62 | -3.12 | -3.55 |
| Gender | 2.03* | | | 1.91 | | |
| Single parent | -0.83 | -0.83 | -0.85 | -3.50 | -3.44 | -3.32 |
| Repeated Kindergarten | - 5.64** | -5.78** | -5.91** | -0.62 | -0.75 | -1.19 |
| Low SES | -4.08* | -4.10* | -3.92* | -0.67 | -0.45 | -0.48 |
| Mid low SES | -0.95 | -1.05 | -1.02 | -0.25 | -0.13 | -0.06 |
| Mid high SES | 2.29 | 2.33 | 2.36 | 1.63 | 1.84 | 2.10 |
| High SES | 3.36* | 3.32* | 3.42** | 4.99* | 5.02* | 5.11* |
| Asian/Pacific Islander | -0.46 | | | -1.41 | | |
| Black | -4.76** | | | -5.02* | | |
| Hispanic | -2.90* | | | -2.62 | | |
| Asian boys | | 2.08 | 2.02 | | 2.69 | 3.07 |
| Asian girls | | -2.43 | -2.73 | | -5.83 | 5.82 |
| Black boys | | -7.49*** | -7.29** | | -8.71** | -8.17** |
| Black girls | | -0.41 | -0.34 | | -1.01 | -0.48 |
| Hispanic boys | | -2.62 | -2.85 | | -3.42 | -3.57 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Hispanic girls | | -1.55 | -1.54 | | -1.97 | -1.46 |
| White girls | | 1.61 | 1.58 | | -0.14 | -0.04 |
| Drug Problem | | | -0.66 | | | 0.09 |
| Burglary Problem | | | -2.27 | | | -1.00 |
| Violence Problem | | | -0.64 | | | -4.67 |
| Median income | | | -1.08 | | | -1.74* |
| % Jobless | | | -0.15 | | | -0.04 |
| % Black & Hispanic | | | -0.02 | | | -0.05 |
| Level 1 & 2 variance | 250.46*** | 249.39*** | 249.58*** | 231.28*** | 232.32*** | 232.33*** |
| Standard deviation | 15.83 | 15.79 | 15.80 | 15.21 | 15.24 | 15.24 |
| Level 3 variance | 78.02*** | 77.62*** | 75.41*** | 67.91*** | 63.28*** | 60.62*** |
| Standard deviation | 8.83 | 8.81 | 8.68 | 8.24 | 7.96 | 7.79 |

*** = p < .000, ** = p < .01, * = p < .05

FIGURE 1. NATURAL EXPERIMENTAL DESIGN

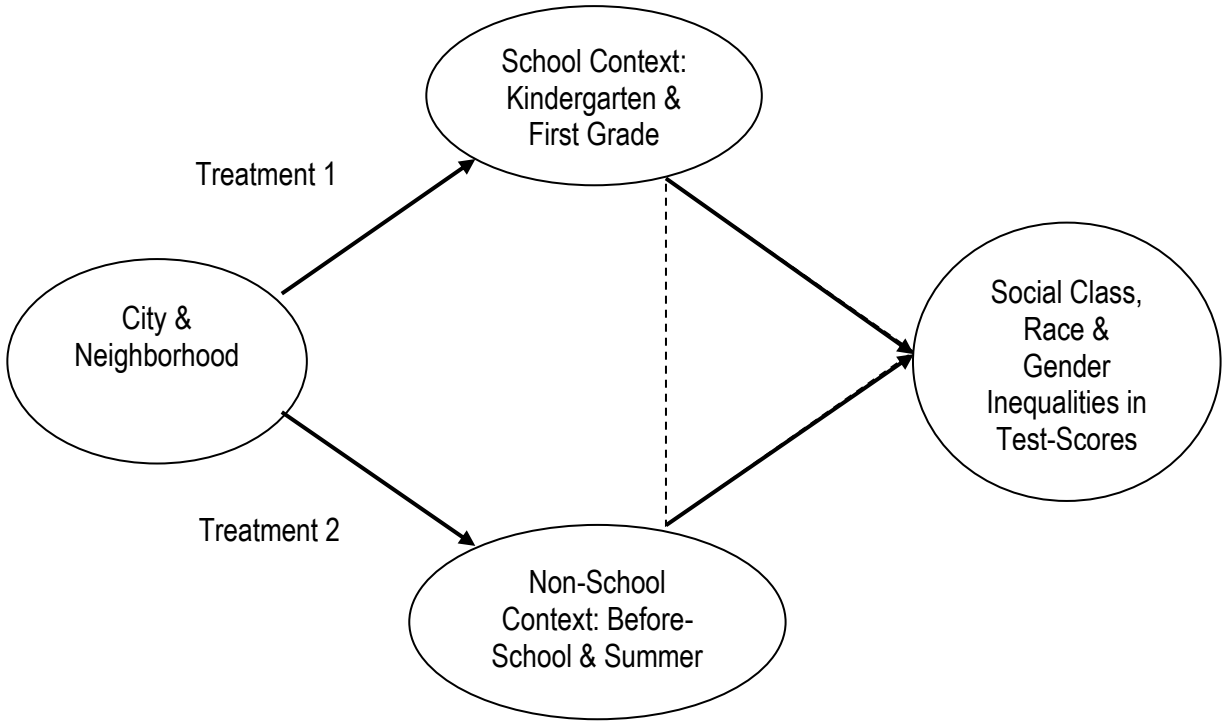


FIGURE 2. Reading Average Growth Nationally with White Boys as Referent, Full Model (N=4748)

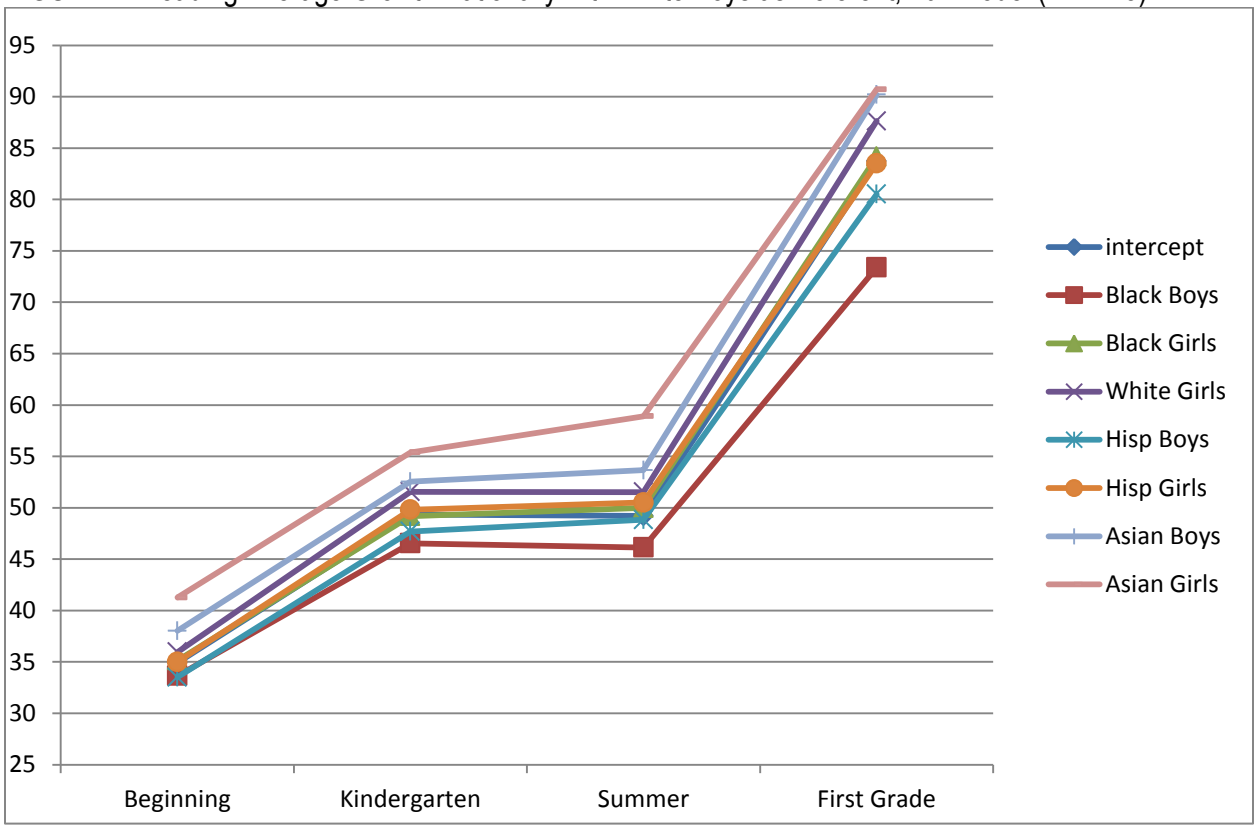

FIGURE 3. Reading Average Growth in Cities with White Boys as Referent, Full Model (N=1889)