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## The Returns to Skill and Racial Difference in Parenting: Evidence from the Civil Rights Movement

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# DEPARTMENT OF ECONOMICS

## Working Paper

### **The Returns to Skill and Racial Difference in Parenting: Evidence from the Civil Rights Movement**

By

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**UNIVERSITY OF MASSACHUSETTS  
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# **The Returns to Skill and Racial Differences in Parenting: Evidence from the Civil Rights Movement**

Owen Thompson

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*Abstract:*

*On average, the parental practices adopted by African American parents of young children are much less cognitively stimulating than those of their white counterparts. This paper argues that these differences stem from the low rates of return to human capital historically experienced by African Americans. To study the relationship between the race-specific returns to skill and parenting, I use intergenerational data containing direct measures of parental behaviors, and examine the child rearing practices of mothers who came of age in the wake of the Civil Rights Movement, during a period of rapidly increasing returns to skill for African Americans in the US South. I find that among Southern African American mothers born between 1957 and 1964, each yearly birth cohort increased their parental investment levels by over .07 standard deviations, but that there was no increase among Southern whites or non-Southern African Americans. These differences are interpreted as being due to the disproportionately large increase in the rate of return to skill experienced by Southern African Americans, suggesting a strong relationship between the returns to human capital and parental behaviors.*

## Introduction

On average, the home environments of young African American children are much less cognitively stimulating than those of white children. This basic fact is demonstrated in Table 1 using data from the Children of the National Longitudinal Survey of Youth (CNLSY).<sup>1</sup> The first row reports average scores from the Home Observation for Measurement of the Environment (HOME) Inventory's cognitive component, measured as a z-score. The HOME inventory score, described in more detail below, is constructed using a combination of maternal reports and interviewer observations, and is widely utilized by child development researchers as a reliable index of factors that contribute to children's cognitive growth. The racial differences in HOME score are strikingly large. While the average white child lives in an environment that is .28 standard deviations above the mean in terms of cognitive stimulation, the average African American child's home is .28 standard deviations below the mean, so that the overall racial gap is approximately .56 standard deviations.

To provide a more concrete impression of what these differences entail, the remaining rows of Table 1 report race-specific averages from three important components of the HOME score: the percentage of children who are read to at least 3 times a week, who have 10 or more children's books in their home, and whose caregivers were observed verbally responding to their speech. In all cases, large racial gaps are present. For example over 63% of white children are read to three or more times a week, but the corresponding percentage for African American children is just 37%.<sup>2</sup> These differences do not simply reflect lower levels of socioeconomic status among African Americans. When HOME score is regressed onto maternal education, household income, and mother's age at birth as well as a black indicator variable, the results (not shown) indicate that even after controlling for these factors the home environments of African American children are still an average of .37 standard deviations less cognitively stimulating than those of white children.

The most obvious area where we might expect these racial differences in home environments to have important consequences is in children's academic and cognitive

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<sup>1</sup> This data is described in detail in Section 2 below.

<sup>2</sup> Similarly large differences have been found, especially with respect to language use, by researchers using extended in-home observation techniques. Classic studies of this kind include Heath (1983) and Hart & Risley (1995).

performance. Table 2 displays regression results showing that this is indeed the case. The first and third columns of Table 2 regress children's performance on the Peabody Individual Achievement Tests (PIAT) in reading recognition and mathematics, taken around the time of school entry, onto a black indicator variable. Consistent with extensive existing research on the racial achievement gap, the results show that on average, African American children score .217 standard deviations below white children in reading recognition, and .576 standard deviations below white children in mathematics. The second and fourth columns of Table 2 add HOME score as a sole control variable, and the resulting reduction in the achievement gap is quite dramatic. For the reading recognition test, the entire black-white gap is eliminated. The results for math scores, while somewhat less marked, are still substantive as the coefficient on the black indicator falls by over 30%, from -.576 to -.398.<sup>3</sup>

Despite the clear importance of the topic, the origin of the observed racial differences in home environment has been the subject of surprisingly little empirical research. A large literature documents the developmental importance of early childhood environmental conditions, and much of this literature specifically addresses the effects of racial differences in home environments on school and cognitive test performance.<sup>4</sup> But it is important to remember that the home environment is itself largely a product of decisions made by parents. Given this, it is sensible to study the home environment as an outcome in and of itself, and not solely as an explanatory variable for some other end result. Yet early childhood environment has remained almost exclusively on the right hand side of regression specifications, and only a limited number of studies have considered its determination.

I have been able to identify 3 studies that explicitly examine the determinants of children's home environments. In a study of the relationship between income and child development outcomes, Blau (1999) estimates the effect of household income on HOME score and finds a reasonably large and statistically significant positive relationship. However, Blau

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<sup>3</sup> While the overall differences between the mathematical and verbal test score gaps found here are consistent with previous research (e.g. Fryer 2010), I have not been able to find a compelling explanation for these differences.

<sup>4</sup> See Heckman (2007) and Cunha & Heckman (2007) for examples of research on the general relationship between early childhood environment and subsequent socioeconomic outcomes. Influential studies of the relationship between home environments and the racial achievement gap include (Brooks-Gunn & Markman, 2005; Ferguson, 2005; Fryer & Levitt, 2004; Phillips, Duncan, & Klebanov, 1998; and Todd & Wolpin, 2007).

estimates no race specific models, and his main focus is on the determination of children's cognitive test scores rather than intermediary environmental conditions. More recently, a 2009 working paper (Frank & Meara, 2009) used propensity score matching to estimate the effect of maternal mental health conditions on children's home environments, and found that maternal depression and alcohol abuse reduced emotional support for children at home and increased their behavioral problems. But the effects of maternal mental health problems on cognitive stimulation as opposed to emotional support were generally not significant, and again no race-specific relationships were estimated.

The prior study most closely related to the analysis performed here is a 2007 working paper by Carneiro & Meghir that uses instrumental variable techniques to estimate the causal effect of maternal education on specific parental behaviors such as reading to children and eating joint meals. The authors do present separate results for white and African American children, and find substantial racial differences in the determination of parental behaviors. But unlike the present study, Carneiro & Meghir do not specifically address the origins of these racial differences in regression coefficients or the overall racial gap in parenting.<sup>5</sup>

On the whole then, existing empirical research offers few clues as to why the home environments of African American children are on average so much less cognitively stimulating than those of their white counterparts. The remainder of this paper attempts to begin filling this gap in the literature. The paper will proceed in 4 sections. Section 1 provides a theoretical framework and outlines my basic empirical strategy. Section 2 describes the data. Section 3 presents the paper's main results. Section 4 offers a discussion of the findings and concludes.

## **1. Theoretical and Empirical Framework**

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<sup>5</sup> In addition to these three studies, two other published papers (Guo & Harris, 2000 and Mandara, Varner, Greene, & Richman, 2009) assess how various family characteristics effect parental behaviors, but limit their analysis to bivariate correlations. Also, there is a substantial empirical and theoretical literature on the related question of how child characteristics (e.g. low birth weight) may impact parental investment decisions. See Almond & Currie (2010) for a review.

While several bodies of economic theory have some relevance to the investment decisions made by parents with respect to their children,<sup>6</sup> the strand of theoretical research most directly applicable to racial differences in child rearing practices comes from models of so-called statistical discrimination (Arrow, 1973; Coate & Loury, 1993; Lundberg & Startz, 1983). An important feature of these models is their treatment of how racial differences in the economic returns to human capital may affect human capital investment decisions. The basic logic of the relevant models is as follows: Many important worker characteristics (such as cognitive ability) are only noisily observable to employers, but are often perceived to on average be lower among African Americans than whites.<sup>7</sup> Given this, firms will *ceteris paribus* prefer whites over African Americans when making decisions with respect to hiring, promotion or assignment of workers to high output tasks. Observing these behaviors by employers and the corresponding lower return to the imperfectly observable skills in question, African Americans will rationally make fewer investments in those skills.<sup>8</sup> In the resulting equilibrium, low returns to skills and low levels of investment in skills among African Americans become mutually reinforcing phenomenon.

While it is conceptually reasonable, the statistical discrimination line of argument has serious empirical flaws. One of the strongest criticisms of these models is that for at least the past several decades, the economic returns to skill have been as high or higher among African Americans than among whites (Carneiro, Heckman, & Masterov, 2005; Neal & Johnson, 1996). Given this, lower levels of skill investment among African American parents and youth would have to be the result of substantial misperceptions regarding rates of return to skill, and many researchers consider persistent misperceptions of this kind implausible. For example Neal (2005) comprehensively documents the high rate of return to cognitive skills and educational attainment among African Americans, and asks “for the parents of these black students, what information could sustain the belief that their children have little to gain from improving their reading and math skills?”

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<sup>6</sup> The canonical work on the theory of parental investment is (Becker & Tomes, 1976), while overviews of race specific models of human capital formation can be found in (Lundberg & Startz, 2000 and Cain, 1987).

<sup>7</sup> Many models alternatively assume an informational structure in which the productive characteristics of African Americans are more difficult for employers to observe than those of whites, but the initial underlying distributions of the characteristics are identical. For present purposes the consequences of this alternative formulation are not important.

<sup>8</sup> In most models of statistical discrimination, individuals make decisions about their own skill investments, but the basic logic of the model applies equally well to skill investment decisions made by parents.

An alternative theoretical explanation, which allows for the simultaneous existence of high returns to human capital and child rearing practices that do little to foster human capital development, emphasizes the role of persistent social and cultural norms in determining parental behaviors. Considerable empirical evidence supporting the importance of norms in determining parenting practices can be found in ethnographic studies, and this evidence indicates that the child rearing norms adopted by a particular ethnic or cultural group in large part reflect the basic economic circumstances they face.

For example, in a canonical anthropological study Barry, Child & Bacon (1959) ranked 104 indigenous societies in terms of both their primary method of economic subsistence (fishing and hunting, animal husbandry, agriculture, etc.) and in the extent to which the society's child rearing practices encouraged "compliance" as opposed to "assertion." The authors hypothesized that in societies with food production technologies which necessitated food storage, child rearing practices would encourage strict adherence to the routine responsibilities which ensure the survival of domesticated animals or improve the likelihood of an adequate harvest (compliance). In contrast, it was hypothesized that in societies that relied primarily on non-storable food sources such as gathering, hunting or fishing, child rearing practices would encourage individual initiative and innovation (assertion). These hypotheses were strikingly confirmed in empirical testing. The simple correlation coefficient between the measures of economic structure and child rearing techniques was .94, leading the authors to conclude that "knowledge of the economy alone would allow one to predict with considerable accuracy whether a society's socialization pressures were primarily toward compliance or assertion."

More recently, a team of economists and anthropologists (Mulder et al., 2009) studied intergenerational wealth transmission in 21 small scale societies around the world. Different societies have different forms of wealth, as well as different mechanisms for transmitting wealth across generations. For example, farmable land is an important form of wealth in most agrarian societies, and can often be transmitted directly to offspring as a bequest. In other societies, the most important form of wealth may be hunting skills or durable ties to a social network, which can only be transmitted genetically or via the extended training of offspring. The authors document a powerful positive correlation (.48) between the importance of a particular type of wealth to a given society and how strongly that form of wealth is transmitted across generations.



They conclude that their results are “consistent with the view that parents differentially transmit to their offspring the forms of wealth that are most important in that society.”

These results are potentially germane to observed modern day racial parenting differences because there is no question that African Americans faced centuries of severe discrimination during which the returns to human capital were effectively fixed at zero. If this extended period of low returns became reflected in parenting norms that are transmitted from generation to generation, then lower levels of investment in children’s skills among contemporary African Americans are not especially surprising, despite the high current returns to skill. Indeed, given the depth of the discrimination historically faced by African Americans, it would be far more surprising to find that the child rearing conventions of African Americans and whites were similar than to find the differences that actually do exist.

It is straightforward to capture this reasoning in a simple economic model. Let  $R_t$  denote the returns to human capital in generation  $t$ , let  $P_{it}$  be the level of human capital encouraging parental behaviors adopted by parent  $i$  in generation  $t$ , and let  $N_{it}$  denote the level of parenting that parent  $i$  in generation  $t$  considers ideal or appropriate (i.e. a parenting norm). Suppose that parental investment levels translate directly into children’s human capital and that parents are altruistic with respect to their children, so that each parent chooses  $P_{it}$  to maximize the following utility function:

$$u_{it} = P_{it}R_t - \frac{1}{2}(P_{it} - N_{it})^2$$

The first term expresses the benefit derived from good parenting as the product of human capital encouraging parental behaviors and the returns to human capital. The second term captures the idea that increased parenting can cause disutility, but only after it exceeds what parents consider an appropriate or normal level. Anecdotally, most parents do not report an unconditional aversion to, say, reading their kids bedtime stories (indeed just the opposite). Still, few parents are likely to derive positive utility from reading their kids bedtime stories for several hours each night, especially if they feel that 30 minutes of reading is the “normal amount.”

As a simple representation of how parenting norms are formed, suppose that the parenting norm for a given individual can be expressed as the weighted average that individual’s

own parents behaviors and an idiosyncratic individual shock that captures random formative experiences or parenting-relevant personality traits, so that

$$N_{it} = \alpha P_{it-1} + (1 - \alpha)\varepsilon_{it}$$

where  $0 < \alpha < 1$  and  $\varepsilon_{it}$  is a normally distributed disturbance with mean zero. Substituting this expression into the utility function and maximizing yields an optimal parenting level of

$$P_{it}^* = R_t + \alpha P_{it-1} + (1 - \alpha)\varepsilon_{it}.$$

Since the expected value of  $\varepsilon_{it}$  is zero, the average level of parenting in generation  $t$  is simply given by  $P_{it}^* = R_t + \alpha P_{t-1}$ . By repeatedly lagging this equation then substituting in the lags from  $t = 0$  to  $t = T$  (and assuming an initial parenting level of  $P_0 = R_0$ ) we can express the current optimal parenting level as a function of current and past returns to human capital:

$$P_T^* = R_T + \alpha R_{T-1} + \alpha^2 R_{T-2} + \alpha^3 R_{T-3} + \dots + \alpha^T R_0.$$

Since  $0 < \alpha < 1$ , the level of returns to human capital in recent generations is more heavily weighted than the returns in distant generations, but incorporating parenting norms that are transmitted across generations causes the full history of returns to human capital to affect the current optimal parenting level.<sup>9</sup> This solution generates two clear and empirically testable predictions about contemporary race specific parental behaviors.

The model's first prediction is that the extremely low returns to human capital historically experienced by African Americans will continue to effect parental investment decisions today, resulting in lower overall investment levels. The evidence presented in the

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<sup>9</sup> Notably absent from this model is a parental budget constraint. As will be noted in the data section below, the measure of parental investment used in this study (HOME score) has few significant monetary costs. Also, while it is true that there are substantial time costs associated with HOME score's components, studies of parental time use (e.g. Guryan, Hurst & Kearney 2008) consistently find that parents with higher wages and education levels actually spend more time on parenting activities, not less. This suggests that the opportunity cost of parental time is of minimal importance for parenting decisions.

opening of this paper, as well as a large interdisciplinary literature, unequivocally documents the existence of such differences.

The model's second basic implication has received far less empirical attention. While much of American history has been characterized by severe racial inequality, the intensity of that racial inequity has not been static across time or geographic location. In particular, the economic returns to human capital among African Americans in the South increased dramatically in the period following the Civil Rights Movement, which culminated with the passage of the 1964 Civil Rights Act. The proposed theoretical framework predicts that these changes in the severity of racial discrimination should result in observable increases in parental skill investment levels among Southern African Americans. Additionally, the model predicts that these increases will not be onetime events, but rather will occur steadily over time as the weights placed on previous generations that experienced low returns to skills fall, and the relative importance of more recent generations with high returns increases.

To test these predictions empirically, below I examine the parenting behaviors of African American mothers in the South who came of age over the course of the Civil Rights Movement and its aftermath. To control for race-specific and region-specific secular trends in parental behaviors, I compare Southern African Americans to quasi-control groups of non-Southern African Americans and Southern whites. To control for unobservable maternal characteristics that may affect parenting, I compare the parenting behaviors of mothers who are sisters. Using these strategies, I find considerable support for the prediction that increased returns to human capital gradually come to be reflected in parental investment decisions.

## **2. Data**

My empirical approach requires an unusually rich data set. Not only must the data contain credible measures of parental investment levels, it also must cover individuals of different racial groups over the appropriate time period and in different regions of the country. To my knowledge, the only existing data set that meets these requirements is the linked mother-child files of the National Longitudinal Survey of Youth (NLSY) and the Children of the National Longitudinal Survey of Youth (CNLSY).

The first NLSY began in 1979 with a sample of 12,686 individuals between the ages of 14 and 21. Original participants included a cross section designed to be nationally representative of non-institutionalized young people, as well as supplements that oversampled minorities, economically disadvantaged whites, and military personnel. While funding restrictions limited the number of participants from the military and economically disadvantaged white supplements who were interviewed in later waves of the survey, all members of the original representative cross section and the supplement oversampling minorities were eligible to be interviewed annually until 1994 and biennially thereafter, with the most recent wave available at the time of writing occurring in 2008.

Starting in 1986, a separate biannual survey of all biological children of female NLSY respondents began and has been conducted biennially thereafter, allowing for the creation of an unusually rich intergenerational data set. Of the 6,283 original female NLSY respondents, 4,929 gave birth to a total of 11,495 children who participated in the CNLSY. When appropriate sampling weights are applied, the children in the CNLSY are representative of all children born to women who were aged 14 to 21 in 1979. Following the approach of Blau (1999) and the recommendation of the Center for Human Resource Research (1994) I do not use sampling weights in my analysis, but the results reported below are similar those when sampling weights are applied. After dropping observations missing important data elements, the working sample used in this study includes 5,068 children, although my specific models split this sample by race and region.

One of the most unique characteristics of the linked data is that it contains explicit information on parental behaviors. The primary measure of parenting I utilize is the cognitive stimulation sub-score from the Home Observation for Measurement of the Environment (HOME) Inventory (Caldwell & Bradley 1984). As noted above, the HOME score is a widely used measure of environmental stimulation, and is constructed using a combination of interviewer observations and maternal reports. The exact contents of the HOME inventory score depend on the age of the child, but prototypical components include indicators for the presence of children's books and other reading materials in the home, whether the mother reports helping the child learn numbers, the alphabet, shapes and colors, the frequency with which the mother speaks to the child, how often the child visits museums and goes on other educational outings,

and whether the home and child's play space are reasonably clean and well lit. Importantly, most of the items comprising the HOME score are reasonably direct consequences of decisions made by parents, and few are associated with prohibitive monetary costs.

Although the CNLSY collects HOME scores through adolescence, I limit my analysis to observations occurring from birth through age 5. The reasons for this restriction are twofold. First, there are large literatures in economics and elsewhere demonstrating that experiences in early childhood have a disproportionately large effect on adult outcomes (Heckman 2007; Almond & Currie, 2010). Second, parental behaviors observed through age 5 are less likely to be influenced by child and school characteristics. An important concern is that children with certain predetermined traits may be able to directly influence the parenting they are subject to, for example by requesting more children's books or asking their parents to read to them. Also, after children enter the formal educational system, a large number of school and teacher characteristics could potentially have direct or indirect influences on children's home environments. My hope is that restricting the analysis to children ages 5 and under will mitigate these problems and help to ensure that HOME scores accurately measure independent parental decision making.

HOME scores were collected during each survey wave, so that most children in the CNLSY have multiple recorded scores. To create a single measure of early childhood environment for each child over the relevant age range, all recorded HOME scores were standardized within child age groups to have a mean of zero and a standard deviation of one, then these standardized scores were averaged over all valid observations for each child occurring from birth through age 5.<sup>10</sup> Two different versions of the HOME inventory are used for children in this age range, one designed for children ages 0-2 (HOME A), and the other for children ages 3-5 (HOME B). Because the CNLSY did not begin until 1986, any CNLSY participants who were born before 1983 (and were therefore over age 2 in 1986) were never eligible for the HOME A assessment. To ensure that the child age ranges included in my measure of home

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<sup>10</sup> Note that scores are standardized within age groups as opposed to within birth cohorts. This standardization approach allows me to observe how age adjusted parenting practices have evolved over time.

environment are consistent across observations, I therefore include in my sample only children born after 1983.<sup>11</sup>

To construct measures of maternal education and household income, I take the same approach as with HOME score and average all valid observations of these variables occurring before each child's 6<sup>th</sup> birthday. Income data was inflated to 2008 dollars using the CPI-U-RS and is expressed in thousand dollar increments. The other variables used in the analysis are either self explanatory or are described below as needed.

A final important feature of the data is that in cases where multiple individuals within the NLSY's target age range lived in the same household in 1979, all such individuals were asked to participate in the study. This led to a large numbers of sister-groups being included in the original NLSY cohorts. Many of these sister groups went on to have children who participated in the CNLSY, and this allows me to compare the parenting behaviors of mothers who are sisters, thereby holding constant unobserved household fixed factors that likely influenced subsequent parenting behaviors.

### 3. Results

#### 3.1 *The Civil Rights Movement and Changes in the Returns to Human Capital*

Before studying whether changes in the returns to human capital associated with the Civil Rights Movement affected parental behaviors, it is important to establish the existence and scale of those changes. Figure 1 reproduces diagrams from Donohue & Heckman (1991) showing the time series of the black-white wage ratio by region. The figures' most important feature is that while wage ratios in the Northeast and Midwest were largely stagnant throughout the 1960's and 1970's, Southern African Americans experienced large improvements in their relative wages over the same period.

An important distinction for present purposes is whether these improvements in economic status were due to increases in the level of human capital characteristics among

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<sup>11</sup> An alternative is to include all children born after 1980 and compare them only in terms of their observed HOME B values. While this alternative increases the number of eligible children in the sample by approximately 20%, the inclusion of environmental conditions at very young ages was deemed a priority.

Southern African Americans, or to increase in the returns to those characteristics. While the changes in Figure 1 did occur in a period when the educational opportunities of Southern African Americans were sharply improving, the best available evidence suggests that relative wage gains were mostly the result of increasing returns to skill for African Americans, as opposed to simply improved average skills. For example Smith & Welch (1989) demonstrate that the coefficient on an education variable in a standard earnings equation increased much more for African Americans than for whites between the 1940s and 1980s. Similarly, Darity, Dietrich & Guilkey (2001) perform a modified Blinder-Oaxaca decomposition on the determinants of occupational prestige, and find that the percent reduction in occupational prestige experienced by African American men due to differential returns to characteristics falls from 17.8% in 1960 to 13.3% in 1970 to 8.7% in 1980, while reductions attributable to changes in characteristics themselves were far more modest. After a thorough assessment of the available evidence, Donohue & Heckman (1991) report that “black economic progress has come more from changes in the *rewards* to black education than increases in the relative quantity of education” (*italics original*) and that “over time labor markets priced black skills more favorably.”<sup>12</sup>

The cohorts of women who participated in the NLSY grew up during this period of unprecedented increases in the returns to human capital and general socioeconomic mobility for African Americans. Born between 1957 and 1964, the NLSY cohorts entered school between 1962 and 1969, just as full enforcement of the 1954 *Brown v. Board* desegregation ruling was being implemented, and in the immediate aftermath of the landmark 1964 Civil Rights Act. Not only did Southern African American NLSY participants belong to the first generations to experience far-reaching increases in the returns to skill, but there was very likely to have been sizeable variation even between birth year cohorts in the NLSY sample in terms of basic day to day economic and social realities.

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<sup>12</sup> A related question which has received considerable attention is whether the increased returns to education for African Americans reflect improved educational quality as opposed to reduced labor market discrimination. The bulk of the evidence indicates that better schools drive only a modest portion of the improvement in relative earnings. For example, (Card & Krueger, 1992) estimate that higher quality schools for Southern African Americans account for 15-20% of the black-white wage convergence that occurred between 1960 and 1980, while Donohue & Heckman (1991) note that there was substantial wage convergence in this period even among African American workers who had completed their educations before school improvements occurred. In any case, to the extent that home and school inputs are complimentary in the process of skill formation, improved school quality may induce higher parental investment at home even if the return to quality adjusted education was constant.

As a result, the level of exposure to the “treatment” of high returns to human capital was greater for Southern African American NLSY participants belonging to later birth year cohorts than for those belonging to earlier birth year cohorts. If parental behaviors are in fact influenced by beliefs about the rate of return to human capital, then all else equal we would expect these later cohorts to exhibit higher levels of parental investment. Conversely, changes in the rate of return to human capital among Southern whites and non-Southern African Americans were far smaller over this time period, and we would therefore expect a correspondingly lower cohort effect in these populations.

### 3.2 *Cross-Sectional Estimates*

Figure 2 illustrates the unconditional trends in cognitive HOME score levels by non-parametrically regressing HOME score onto maternal year of birth for Southern African Americans, Southern whites, and non-Southern African Americans.<sup>13</sup> The figure shows substantial convergence. Children of Southern African American mothers who were born in 1957 lived in home environments that were on average approximately .5 standard deviations less cognitively stimulating than those of non-Southern African Americans, and nearly a full standard deviation below those of Southern whites. As a result of both steady improvements among Southern African Americans and stagnant or declining HOME scores among the other groups, the children born to Southern African American mothers from the 1964 birth cohort actually lived in more cognitively stimulating home environments than their non-Southern African American counterparts, and the gap between them and Southern whites narrowed considerably to approximately .4 standard deviations.<sup>14</sup>

While these unconditional trends are suggestive, the period under study was one of profound social and economic transition. In addition to the large increases in Southern African

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<sup>13</sup> A mother is considered to be Southern if she reported having lived in the South at age 14. Defining Southern by region of birth does not substantively change the results.

<sup>14</sup> The overall downward trends among non-Southern African Americans and Southern whites in Figure 2 are somewhat puzzling, and I cannot offer any simple explanation. As will be shown presently, conditioning on background variables causes the cohort effects for these groups to be approximately flat as opposed to downward sloping. For current purposes, the important point is simply that increases in HOME scores among later Southern African American birth cohorts are not merely the result of secular region or race specific increases in parental investment levels.



American education noted above, there were important secular changes in the basic nature of the Southern economy (Wright, 1986), the overall structure of the national economy (Feldstein, 1980), and the economic and social institutions of African Americans in industrial Northern cities (Wilson, 1987). In short, numerous concurrent phenomena could spuriously produce the trends in HOME score from Figure 1, and additional controls are clearly necessary.

Table 3 reports models that estimate the relationship between maternal birth year and HOME score while controlling for a rich set of covariates. These include the mother's education, the mother's score on the Armed Forces Qualification Test (AFQT),<sup>15</sup> household income, the mother's age at the time of birth, child birth weight, child birth order, and child gender. Columns one through three show the results for Southern African Americans, Southern whites and non-Southern African Americans, respectively. The differences between these groups are quite striking. Among the children of Southern African American mothers, a one year increase in maternal birth year is associated with a .0732 standard deviation increase in HOME score, holding constant all of the factors listed above, and this improvement is highly statistically significant. In contrast, the relationship between maternal birth year and HOME score is entirely absent among Southern whites and non-Southern African Americans, for whom the coefficients on birth year are not practically or statistically different from zero.

### 3.3 *Fixed-Effect Estimates*

The models reported in Table 3 control for the most obvious factors that could be correlated with both birth cohort and parental investment levels as measured by HOME score. For instance, if the relative improvements in HOME score were simply due to disproportionate increases in the educational attainment or incomes of Southern African Americans in the period under study, both of which were indeed occurring, then conditioning on these variables should eliminate any distinct cohort effects in the regression models. Other factors that are difficult to observe but potentially important to the result, for example relative changes in school quality, are

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<sup>15</sup> AFQT is a widely used measure of general cognitive performance that was taken by most NLSY respondents in 1980. Since NLSY respondents were different ages at the time of testing, I adjusted their raw scores by regressing them onto comprehensive sets of year and month of birth indicators and using the residuals of this regression as my AFQT measure. Scores are measured in standard units (i.e. z-scores).

partially accounted for by the inclusion of AFQT score. The fact that such large differences in cohort effects remain even after adding these controls is strong evidence that changes in the returns to human capital associated with the Civil Rights Movement impacted the parental investment decisions of Southern African Americans above and beyond any general increases in socioeconomic status.

However, the set of controls thus far employed are not fully comprehensive, and there still remains some concern that omitted variables associated with both birth cohort and HOME score are driving the results. Given the theoretical emphasis I have placed on intergenerationally transmitted parenting norms, the lack of controls for the type of parenting that mothers in the NLSY were themselves subject to as children is particularly concerning. The fact that the original NLSY participants included a large number of sister groups, who were youths living in the same household as of 1979, allows me to estimate models that compare the parental behaviors of sisters who have now become mothers. I will refer to these models as grandparent fixed effect models, since the children whose home environments are being compared share a common set of grandparents.

In addition to the explicit controls from previous models, the grandparent fixed effect models hold constant all factors that are specific to each sister group's childhood home, many of which could impact subsequent parenting. Such factors might include general socioeconomic status indicators such as parental occupation, household income or parental education, geographic variables such as state of origin and urban versus rural residence, and perhaps most importantly all common parenting practices that each sister group was subject to in childhood, as well as any corresponding formation of parenting norms.

Using the restricted sample of children with mothers that had at least one sister in the original NLSY sample who also had children, the final three columns of Table 3 report estimates from the grandparent fixed effects models.<sup>16</sup> The results are very similar to those from the cross sectional models, lending further support to the hypothesis that changes in the returns to human capital substantially affected the parental investment decisions of Southern African Americans.

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<sup>16</sup> One possible concern is that selection into this restricted sample is non-random, so that the results may be effected simply by to the nature of the subsample used to estimate the fixed effects models. When the OLS models from Table 3 are re-estimated using the same sample as the fixed effect models, the results are very similar, suggesting that non-random selection into the fixed effects sample is not a major concern.

Table 3 reports that each yearly maternal birth cohort is associated with a .0648 standard deviation increase in HOME score among Southern African Americans, and that this effect is statistically significant. For the quasi-control groups of Southern whites and non-Southern African Americans, the cohort effects are again much smaller and fail to achieve statistical significance.

### 3.4 *Heterogeneity Within the Southern African American Sample*

While virtually all Southern African Americans experienced large relative increases in the returns to human capital during the period under study, these increases were not uniformly distributed. In particular, numerous factors combined to make the gains in economic status greatest among the lowest and highest skilled African Americans, but more moderate among semi-skilled African Americans. For example Butler & Heckman (1977) emphasize the importance of Southern African Americans moving from very low-skill professions into relatively higher paying production jobs during the 1960's, and Smith & Welch (1989) examine relative wage gains by educational group and report a "U-shaped" distribution between 1940 and 1980 with "the least and best educated blacks receiving the largest benefits."

This heterogeneity presents an additional opportunity to test for a relationship between increases in the returns to skill among African Americans and changes in parental behaviors. Specifically, NLSY participants who were the children of low and high skill workers would on average have been more exposed to increasing returns to skill than the children of semi-skilled workers. When NLSY respondents from these different backgrounds become parents themselves, we would expect the trends in their parenting behaviors to differ as a result of different perceptions regarding the returns to skill. The NLSY contains two reasonably direct measures of the skill level of each participant's father: their years of education and their occupational category when the respondent was 14.<sup>17</sup>

I used each of these variables to divide the Southern African American sample of mothers into three groups, corresponding to those who were raised in households with low-skilled, semi-

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<sup>17</sup> These variables are also available for each respondent's mother, but contain far more missing values.

skilled and high-skilled fathers, then ran cross-sectional regressions like those in Table 3 for the three groups separately.<sup>18</sup> The results are reported in Table 4, and are again consistent with the proposition that parenting behaviors are affected by changes in the returns to human capital. The first three columns display the results when skill group is defined by father's educational attainment. For mothers from households with low education fathers, the association between year of birth and parental investment levels is .063 standard deviations. This relationship is modestly lower (.057 standard deviations) for mothers from households with semi-educated fathers, and then much higher (.13 standard deviations) for mothers from households with highly educated fathers. That is, the relationship between changes in parenting behaviors and father's skill level is moderately U-shaped, which is similar to the relationship between changes in the returns to human capital and skill level.

The next three columns of Table 4 show that this U-shaped relationship is considerably more pronounced when father's skill level is defined in terms of occupational category. For mothers from households with fathers who worked in low-skill occupations, the association between birth year and parental investment level is .171 standard deviations. This relationship falls dramatically to .026 standard deviations for mothers from households with fathers in semi-skilled occupations, then increases to .117 standard deviations for mothers from households with fathers in high-skilled occupations. Again, the shape of this relationship generally corresponds to changes in the returns to human capital among Southern African Americans of different skill levels.

#### **4. Discussion and Conclusion**

In some regards, the results presented above give cause for optimism, as they suggest that while adjustment may not be immediate, parenting behaviors do display a reasonably high degree of plasticity and are responsive to broad shifts in incentives. This malleability allows for

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<sup>18</sup> For father's educational attainment, the three groups correspond to 8 or fewer years of schooling completed, 9 to 11 years of schooling completed, and 12 or more years of schooling completed. For occupational categories, the low-skilled group contains fathers who were service workers or farm workers, the semi-skilled group contains fathers who were laborers or operatives, and the high-skilled group contains fathers who were craftsmen, managers or professionals, where all definitions refer to the three digit occupational categories of the 1970 census.

the possibility that increases in economic well being can be self-sustaining, as the higher returns to human capital experienced by one generation translate into increased parental investment in the skills of the next generation. A recent study by Fryer & Levitt (2004) is one of the first to find non-trivial convergence in the test scores of young African American and white children, and the authors report that “real gains by blacks in recent cohorts appear to be an important part of the [difference] between our results and past research.” If these gains prove to be authentic, they are consistent with the presence of gradual parenting adjustments made in response to higher returns to human capital, like those found above.

At the same time, the descriptive statistics presented in Table 1 and in Figure 2 are a reminder that absolute racial differences in parenting behaviors remain large, irrespective of recent convergence or strong partial relationships. The theoretical and empirical arguments of this paper hold that these absolute differences are a legacy from the extended period of severe discrimination experienced by African Americans. While the large reductions in discrimination resulting from the Civil Rights Movement and the associated legislative and judicial actions have had discernable and non-trivial effects on parental behaviors, the legacy of earlier historical eras appear to be sufficiently great that large differences remain.

The results of this study have potential implications for several important policy areas. First, past research on the effectiveness of affirmative action has focused almost exclusively on potential benefits for current minority workers or on the policy’s overall economic impacts (see Holzer & Neumark, 2000 for a review). But if the return to skill experienced by a minority group impacts the level of skill investment that parents make in the next generation, as the results above suggest, then affirmative action policies could potentially benefit the next generation of minority workers as well current workers. Of course, increases in the rate of return to skill for African Americans due to affirmative action policies are small compared to those studied here, and further research is clearly needed before any firm conclusions can be drawn.

A parallel argument can be made with respect to early childhood intervention programs. The results above are consistent with a model of parental investment determination where social norms that are influenced by an individual’s own parents affect subsequent parenting behaviors. This implies that interventions which directly influence the parenting a child is subject to could benefit not only the child in question, but eventually their own children as well. Interventions

that include home visits designed to help the parents of disadvantaged children improve their parental behaviors have had some success (McIntosh, Barlow, Davis, & Stewart-Brown, 2009; Olds, 2006) while a number of intensive out of home interventions such as all day preschool have been highly effective for participating children (Currie, 2001). But again, research has focused on the original participants in these programs, and little is known about how they may affect subsequent generations. If the interventions in question affect not only a child's personal development but also their conception of what normal parenting consists of, then focusing only on a child's own outcomes may substantially understate the benefits of the intervention program.

This study began by documenting that large racial differences in the home environments of young children both exist and have important implications for children's cognitive development. It was hypothesized that these differences reflect the disparate levels of returns to skill historically experienced by different racial groups. Using the dramatic increase in the returns to skill experienced by African Americans in the South following the Civil Rights Movement, I documented that there is indeed a strong relationship between race specific returns to human capital and parental behaviors. This relationship remains after controlling for an unusually extensive set of possible confounders, is present in models comparing the behaviors of mothers who are sisters, and exists across different subpopulations of Southern African Americans as well.

Roland Fryer (2010) concludes his recent review of racial inequality in the United States by writing that "closing the achievement gap is the most important civil rights battle of the twenty-first century." The existing evidence makes it clear that this battle cannot be won without major improvements in the home environments of young minority children, and understanding what determines those environments is therefore of great importance. The present study has attempted to show that the rate of return to human capital is one major determinant of this essential outcome. However, it is unlikely to be the only important factor, and more research is surely needed on both the determination of parenting behaviors in general and on how the relevant relationships are affected by race.

## References

- Almond, D., & Currie, J. M. (2010). Human capital development before age five. *NBER Working Paper*.
- Arrow, K. (1973). The theory of discrimination. In O. Ashenfelter, & A. Rees (Eds.), *Discrimination in labor markets*. Princeton, N.J.: Princeton University Press.
- Barry, H., III, Child, I. L., & Bacon, M. K. (1959). Relation of child training to subsistence economy. *American Anthropologist*, 61(1), pp. 51-63.
- Becker, G. S., & Tomes, N. (1976). Child endowments and the quantity and quality of children. *The Journal of Political Economy*, 84, pp. S143-S162.
- Blau, D. M. (1999). The effect of income on child development. *The Review of Economics and Statistics*, 81(2), pp. 261-276.
- Brooks-Gunn, J., & Markman, L. B. (2005). The contribution of parenting to ethnic and racial gaps in school readiness. *The Future of Children*, 15, pp. 139-168.
- Cain, G. G. (1987). *The economic analysis of labor market discrimination: A survey*; In O. Ashenfelter & R. Layard (eds.) *Handbook Of Labor Economics*.
- Caldwell, B. M., Bradley, R. H. (1984). *HOME observation for measurement of the environment*. Little Rock, Ark.: University of Arkansas at Little Rock.
- Card, D., & Krueger, A. B. (1992). School quality and black-white relative earnings: A direct assessment. *The Quarterly Journal of Economics*, 107(1), 151-200.
- Carneiro, P., & Meghir, C. (2007). Maternal education, home environments and the development of children and adolescents. *IZA discussion paper*.
- Carneiro, P., Heckman, J. J., & Masterov, D. V. (2005). Labor market discrimination and racial differences in premarket factors. *The Journal of Law & Economics*, 48(1), 1.
- Center for Human Resource Research. (1994). *NLS user's guide* Ohio State University.
- Coate, S., & Loury, G. C. (1993). Will affirmative-action policies eliminate negative stereotypes? *The American Economic Review*, 83(5), 1220-1240.
- Cunha, F., & Heckman, J. J. (2007). The technology of skill formation. *The American Economic Review Papers and Proceedings*, 97(2), 31-47.
- Currie, J. (2001). Early childhood education programs. *Journal of Economic Perspectives*, 15(2), 213-238.

- Darity, W., Dietrich, J., & Guilkey, D. K. (2001). Persistent advantage or disadvantage?: Evidence in support of the intergenerational drag hypothesis. *American Journal of Economics and Sociology*, 60(2), 435-470.
- Donohue, J. J., & Heckman, J. (1991). Continuous versus episodic change: The impact of civil rights policy on the economic status of blacks. *Journal of Economic Literature*, 29(4), 1603-1643.
- Feldstein, M. S. (1980). *The American economy in transition*. Chicago: University of Chicago Press.
- Ferguson, R. (2005). Why america's black-white school achievement gap persists. In G. C. Loury, T. Modood & S. M. Teles (Eds.), *Ethnicity, social mobility, and public policy : Comparing the USA and UK*. Cambridge; New York: Cambridge University Press.
- Frank, R. G., & Meara, E. (2009). The effect of maternal depression and substance abuse on child human capital development. *NBER Working Paper*.
- Fryer, R. G., & Levitt, S. D. (2004). Understanding the black-white test score gap in the first two years of school. *The Review of Economics and Statistics*, 86(2), 447-464.
- Fryer, R.G. (2010). Racial Inequality in the 21<sup>st</sup> Century: the Declining Significance of Discrimination. *NBER Working Paper*.
- Guo, G., & Harris, K. M. (2000). The mechanisms mediating the effects of poverty on children's intellectual development. *Demography*, 37(4), pp. 431-447.
- Guryan J., Hurst E., & Kearney M. (2008). Parental education and parental time with children. *Journal of Economic Perspectives*, 22(3), 23-46.
- Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore: P.H. Brookes.
- Heath, S. B. (1983). *Ways with words : Language, life, and work in communities and classrooms*. Cambridge; New York: Cambridge University Press.
- Heckman, J. J. (2007). The economics, technology, and neuroscience of human capability formation. *Proceedings of the National Academy of Sciences*, 104(33), 13250-13255.
- Holzer, H., & Neumark, D. (2000). Assessing affirmative action. *Journal of Economic Literature*, 38(3)
- Lundberg, S., & Startz, R. (2000). Inequality and race: Models and policy. In K. Arrow, S. Bowles & S. Durlauf (Eds.), *Meritocracy and economic inequality*. Princeton, NJ: Princeton University Press.



- Lundberg, S. J., & Startz, R. (1983). Private discrimination and social intervention in competitive labor markets. *American Economic Review*, 73(3)
- Mandara, J., Varner, F., Greene, N., & Richman, S. (2009). Intergenerational family predictors of the Black–White achievement gap. *Journal of Educational Psychology*, 101(4), 867-878.
- McIntosh, E., Barlow, J., Davis, H., & Stewart-Brown, S. (2009). Economic evaluation of an intensive home visiting programme for vulnerable families: A cost-effectiveness analysis of a public health intervention. *Journal of Public Health*, 31(3), 423-433.
- Mulder, M. B., Bowles, S., Hertz, T., Bell, A., Beise, J., Clark, G., et al. (2009). Intergenerational wealth transmission and the dynamics of inequality in small-scale societies. *Science*, 326(5953), 682-688.
- Neal, D., & Johnson, W. (1996). The role of premarket factors in black-white wage differences. *Journal of Political Economy*, 104(5), 869-895.
- Neal, D. A. (2005). *Why has black-white skill convergence stopped?* NBER Working Paper.
- Olds, D. L. (2006). The nurse-family partnership: An evidence-based preventive intervention. *Infant Mental Health Journal*, 27(1), 5-25.
- Phillips, M., Duncan, G., & Klebanov, P. (1998). Family background, parenting practices, and the black white test score gap. In C. Jencks, & M. Phillips (Eds.), *Black-white test score gap* (pp. 103-145). Washington, DC, USA: Brookings Institution Press.
- Butler, Richard & Heckman, James J. (1977). *The government's impact on the labor market status of black Americans: A critical review*. In *Equal Rights and Industrial Relations*. Eds: Farrel & Bloch. Industrial Relations Research Association.
- Smith, J. P., & Welch, F. R. (1989). Black economic progress after Myrdal. *Journal of Economic Literature*, 27(2), 519-564.
- Todd, P., & Wolpin, K. I. (2007). The production of cognitive achievement in children: Home, school, and racial test score gaps. *Journal of Human Capital*, 1(1), 91-136.
- Wilson, W. J., (1987). *The truly disadvantaged : The inner city, the underclass, and public policy*. Chicago: University of Chicago Press.
- Wright, G. (1986). *Old South, new South : Revolutions in the southern economy since the civil war*. New York: Basic Books.

**Table 1: Cognitive Stimulation in the Home by Race**

	<b>White</b>	<b>Black</b>
HOME score	0.28	-0.28
Child is read to 3 or more times per week	63.16%	37.08%
Home contains 10 or more children's books	78.18%	44.33%
Caregiver responds verbally to child's speech	75.74%	65.56%

Notes: reported HOME scores are the mean of all valid observations occurring from birth through age 5, measured as a z-score. Variables in the other rows use the most common response of all observations occurring over the same child age range. When two responses occurred with equal frequency, the less favorable response was assigned. Data is from a subsample of the CNLSY, as described in Section 3 below.

**Table 2: Effect of HOME Score on the Racial Test Score Gap**

	PIAT Reading Recognition		PIAT Mathematics	
	Unadjusted	HOME score added	Unadjusted	HOME score added
Black indicator	-0.217*** (0.0372)	0.00830 (0.0398)	-0.576*** (0.0359)	-0.398*** (0.0388)
HOME Score	- -	0.332*** (0.0242)	- -	0.264*** (0.0235)
Constant	0.133*** (0.0218)	-0.00172 (0.0233)	0.258*** (0.0211)	0.157*** (0.0227)
Observations	3,115	3,067	3,182	3,133
R-squared	0.011	0.068	0.075	0.111

Dependant variable is the child's first score on the indicated test that was recorded after their fifth birthday but no later than age 6, and is measured in standard units (z-scores). Sample includes only black and non-black non-Hispanic children, the latter being overwhelmingly white. Other sample restrictions are described in Section 3. Standard errors are in parenthesis. \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 3: Effect of Birth Cohort on HOME Score by Race and Region**

	Cross-Sectional Estimates			Grandparent Fixed Effect Estimates		
	Southern Blacks	Southern Whites	Non-Southern Blacks	Southern Blacks	Southern Whites	Non-Southern Blacks
Mother year of birth	0.0745*** (0.0158)	0.00462 (0.0116)	-0.000358 (0.0177)	0.0648* (0.0337)	0.0205 (0.0515)	-0.00716 (0.0416)
Maternal education	0.0722*** (0.0208)	0.0110 (0.0125)	0.0807*** (0.0204)	-0.0204 (0.0481)	0.0437 (0.0474)	0.0753 (0.0818)
Mean household income	0.0104 (0.00721)	0.00557*** (0.00196)	0.0116*** (0.00420)	0.00202 (0.00356)	0.00603 (0.00385)	0.0166* (0.00922)
Maternal AFQT score	0.143*** (0.0480)	0.224*** (0.0406)	0.103** (0.0509)	0.364*** (0.124)	0.301 (0.197)	0.0144 (0.187)
Maternal age at birth	0.0719*** (0.00763)	0.0373*** (0.00768)	0.0567*** (0.0106)	0.0779*** (0.0151)	0.00406 (0.0203)	0.0353* (0.0210)
Child is male	-0.130** (0.0587)	-0.0556 (0.0489)	-0.0863 (0.0695)	-0.114* (0.0674)	-0.0336 (0.0480)	-0.287*** (0.0728)
Child birth weight	-0.000867 (0.00137)	0.00330*** (0.00116)	0.00360** (0.00145)	0.000163 (0.00165)	0.00252 (0.00164)	0.00649*** (0.00167)
Child birth order	-0.146*** (0.0255)	-0.153*** (0.0327)	-0.157*** (0.0302)	-0.0991* (0.0544)	-0.0340 (0.0637)	-0.0187 (0.0616)
Constant	-7.196*** (1.139)	-1.444* (0.809)	-2.817** (1.266)	-5.633*** (2.16)	-2.152 (3.483)	-2.387 (2.39)
Observations	734	758	526	680	685	496
R-squared	0.273	0.264	0.266	0.155	0.062	0.136
Grandparent groups	-	-	-	347	384	235

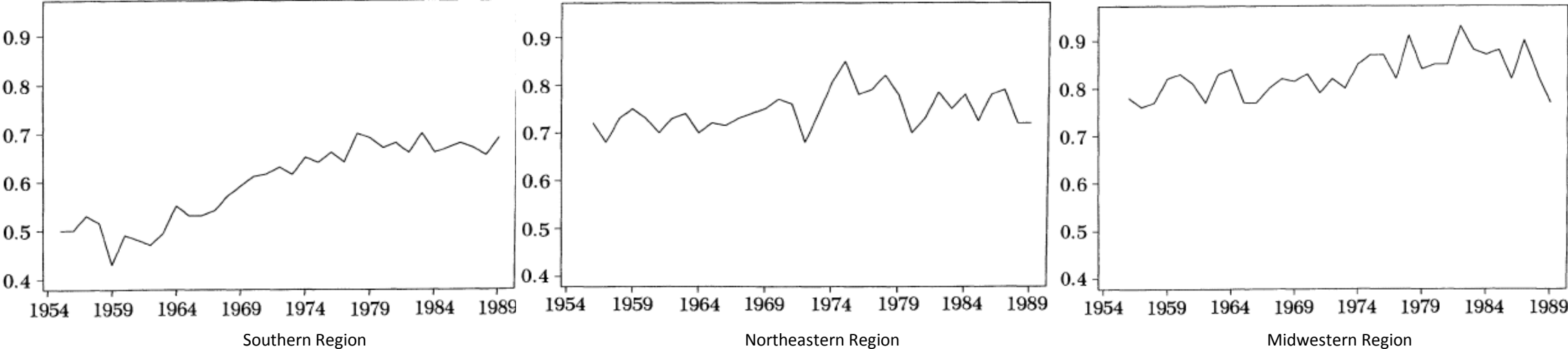
Notes: Dependant variable is the average of all age standardized cognitive HOME index scores observed from birth through age 5. Maternal education and income refer to the average values of those variables over the same child age range. All regressions contain dummies indicating observations with missing HOME score values for at least one survey wave. Standard errors are in parenthesis, and are robust in columns 1-3 and clustered for grandparent groups in columns 4-6. \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 4: Effect of Birth Cohort on HOME Score by Grandfather's Skill Level**

	Educational Skill Measure			Occupational Skill Measure		
	Low-Skilled	Semi-Skilled	High-Skilled	Low-Skilled	Semi-Skilled	High-Skilled
Mother year of birth	0.0632* (0.0342)	0.0574* (0.0340)	0.130*** (0.0269)	0.171** (0.0657)	0.0257 (0.0300)	0.117*** (0.0326)
Maternal education	0.131*** (0.0338)	0.103* (0.0556)	0.00934 (0.0306)	0.150** (0.0586)	0.0848* (0.0433)	0.0283 (0.0514)
Mean household income	0.0479*** (0.0149)	-0.0168** (0.00812)	0.0766*** (0.0196)	0.0558** (0.0228)	-0.0107* (0.00619)	0.0475** (0.0240)
Maternal AFQT score	0.133 (0.0948)	0.176 (0.107)	0.0332 (0.0777)	-0.0815 (0.175)	0.226** (0.0937)	0.119 (0.124)
Maternal age at birth	0.0586*** (0.0161)	0.109*** (0.0173)	0.0636*** (0.0130)	0.106*** (0.0278)	0.0453** (0.0179)	0.0451*** (0.0159)
Child is male	0.0424 (0.121)	-0.244* (0.141)	-0.0374 (0.0960)	0.00423 (0.213)	-0.111 (0.124)	-0.0568 (0.132)
Child birth weight	-0.00440** (0.00218)	0.00551 (0.00337)	-0.00474** (0.00239)	-0.000151 (0.00984)	-0.00157 (0.00261)	-0.00637** (0.00291)
Child birth order	-0.173*** (0.0578)	-0.147** (0.0645)	-0.0389 (0.0490)	-0.252*** (0.0934)	-0.146** (0.0662)	-0.0438 (0.0518)
Constant	-6.820*** (2.536)	-7.972*** (2.567)	-9.662*** (1.742)	-15.30*** (4.529)	-3.497* (2.057)	-8.259*** (2.230)
Observations	171	146	225	55	190	137
R-squared	0.419	0.338	0.277	0.600	0.207	0.281

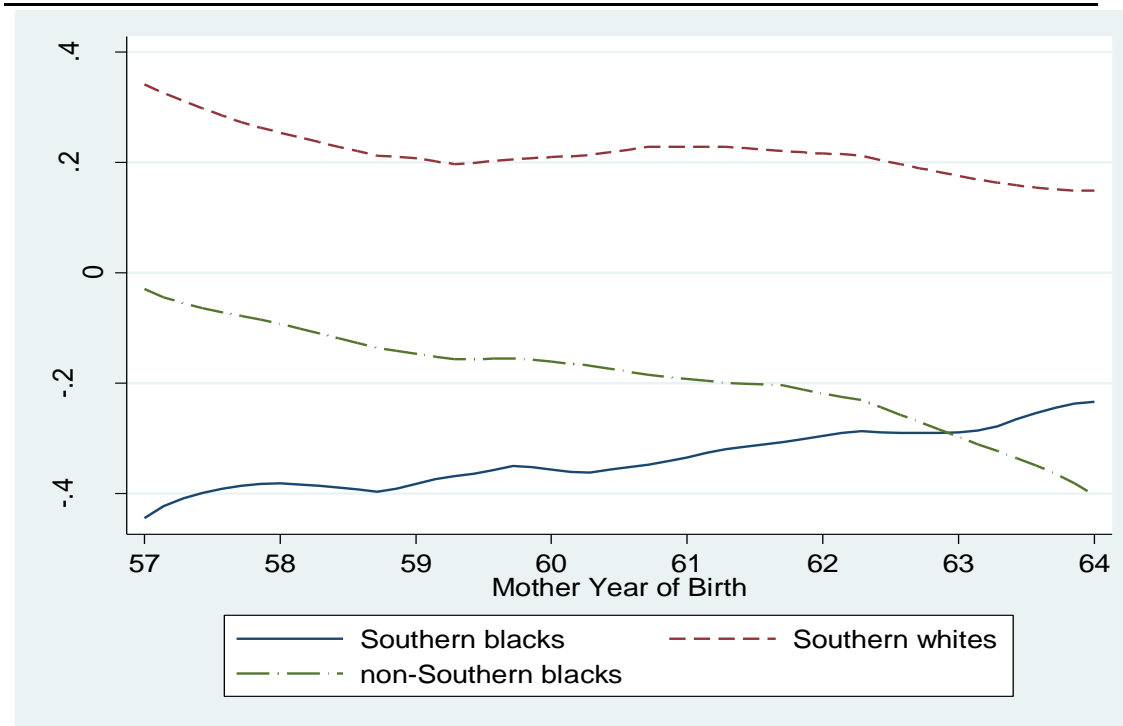
Notes: Sample is restricted to Southern African Americans. Educational criteria for skill groups are as follows: 8 or fewer years of schooling is low skilled; 9 to 11 years of schooling is semi-skilled; and 12 or more years of schooling his high-skilled. Occupational criteria are as follows: service workers and farm workers is low-skilled; non-farm laborers and operatives is semi-skilled; and craftsmen, managers and professionals is high-skilled. All occupational categories refer to the three digit codes from the 1970 census The dependant variable is the average of all age standardized cognitive HOME index scores observed from birth through age 5. Maternal education and income refer to the average values of those variables over the same child age range. All regressions contain dummies indicating observations with missing HOME score values for at least one survey wave. Robust standard errors are in parenthesis. \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

Figure 1: Black-White Wage Ratios by Region



Source: Donohue & Heckman (1991) Figures 2, 3 and 5.

**Figure 2: Unconditional Trends in HOME Score by Race and Region**



Lines are first degree epanechnikov kernels with a bandwidth of 1.