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Black–White Achievement Gap and Family Wealth

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This article examines the extent to which family wealth affects the Black–White test score gap for young children based on data from the Panel Study of Income Dynamics (aged 3–12). This study found little evidence that wealth mediated the Black–White test scores gaps, which were eliminated when child and family demographic covariates were held constant. However, family wealth had a stronger association with cognitive achievement of school-aged children than that of preschoolers and a stronger association with school-aged children's math than on their reading scores. Liquid assets, particularly holdings in stocks or mutual funds, were positively associated with school-aged children's test scores. Family wealth was associated with a higher quality home environment, better parenting behavior, and children's private school attendance.

Research based on test results from the National Assessment of Educational Progress conducted since the 1970s showed a substantial lag in the achievement of Black students vis-à-vis their White counterparts. These disparities had been observed to exist before children enter kindergarten, widen as they move through elementary and middle schools, and persist into adulthood (Phillips, Crouse, & Ralph, 1998). Analyses by Hedges and Nowell (1998) showed that the gap had narrowed in the past three decades but the rate of decrease had slowed down since 1988. Results from the early 1990s, however, indicated that the gap had widened again (Campbell, Harnbo, & Mazzeo, 1999). This early achievement gap between Blacks and Whites has very important individual and societal consequences. At the individual level, it is related to one's later life chances such as educational attainment, earnings (Jencks & Phillips, 1998; Johnson & Neal, 1998), employment behavior, and health (Reynolds & Ross, 1998). At the societal level, cognitive achievement gaps have implications for raising the next generation, for the skills of the workforce, for racial dynamics, and for international competitiveness. Understanding factors contributing to this gap, therefore, is of paramount importance.

Much research has documented the association between children's achievement and parental socioeconomic status (SES) as measured by education level, occupation, and income (see review in Bradley & Corwyn, 2002; Hoff, Laursen, & Tardif, 2000). Many of these studies focused on the effect of poverty—defined by family income—on children's achievement (e.g., Duncan & Brooks-Gunn, 1997; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Huston, McLoyd, & Garcia-Coll, 1994; Yeung, Linver, & Brooks-Gunn, 2002). However, household wealth (i.e., net worth)—which displays a distribution that is more unequal than that for income—has received little attention in this body of literature.

There are ample reasons to suspect that race differences in family wealth levels may help explain differences in child outcome measures. First, wealth displays greater racial disparities than any other socioeconomic measure; furthermore, these differences have grown since the civil rights triumphs of the 1960s. In 1998, the median African American family owned about one eighth the net worth that the median White family did (Wolff, 1999). This difference was not explained by income or other demographic characteristics (Oliver & Shapiro, 1995). In other words, at every income level, the Black–White gap in net worth persists.

Of added importance to the current study is the fact that Conley (1999) found that family (parental) wealth was a strong predictor of teenage and young adult outcomes ranging from teenage premarital childbearing to educational attainment to welfare dependency to filial wealth accumulation. In many cases, when parental wealth was taken into account, Black–White differences are eliminated or even flip direction. Several studies have examined the relationship between family wealth and young children's cognitive achievement where a marked racial disparity has been shown to persist based on data from the Children of the

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National Longitudinal Study of Youth (CNLSY). This article used another national data set to provide an independent replication of findings that have until now all derived from a single sample that suffers from considerable missing data on family wealth. We extended previous work on the extent to which family net worth affects the Black–White test score gaps by examining potential mechanisms through which different sources of family wealth influence children's achievements. We also conduct separate analysis for preschool and school-aged children. Finally, we attempted to strengthen the causal relationship with an instrumental variable (IV) approach.

Data for this study come from the Panel Study of Income Dynamics (PSID) and its Child Development Supplement (CDS). The PSID has collected data on family wealth every 5 years since 1984. These data provide a unique opportunity for intergenerational analysis on consequences of wealth accumulation on children's outcomes while holding other family factors constant. Data on children's cognitive development for children aged 3–12 were collected in the 1997 CDS. An extensive battery of questions about parent–child relationships, parenting practices, and the learning environment at home was also included in this supplement. In combination with the extensive family histories available in the PSID, these data allow us to better ascertain causal direction and explore potential mediating pathways through which family wealth may affect children's achievement.

Theoretical Framework

Although the relationship between parental wealth and child development has not been adequately theorized, work on income differences is relevant to the conceptualization of how wealth affects children's well-being. Explanations for income gradients can roughly be divided into three camps. First, some researchers focus on the *material deprivations* that low income induces such as poor nutrition, lack of adequate medical care, or unsafe environments (see, e.g., Callan, Nolan, & Whelan, 1993; Mack & Lansley, 1985; McGregor & Borooah, 1992). Research in this tradition has shown that low-income households do experience a degree of deprivation and that this may explain part of the effect of income on children's cognitive outcomes (Mayer, 1997). For instance, some work has shown that poor children are less likely to have educational toys or books in the household, and such items are positively associated with healthy cognitive development (Duncan, Brooks-Gunn & Klebanov, 1994; Smith, Brooks-Gunn, & Klebanov, 1997; Zill, 1988; Zill, Moore, Smith, & Coiro, 1991).

A second paradigm, often called the family stress/processes hypothesis, sees low income as exacerbating household stress levels, frequently exhibited in parental depression, which in turn leads to detrimental parenting practices, such as yelling, shouting, and hitting, that are not conducive to healthy child development (Conger, Ge, Elder, Lorenz, & Simons, 1994; Conger et al., 1992; Elder, Nguyen, & Caspi, 1995; Hanson, McLanahan, & Thomson, 1997; Lempers, Clark-Lempers, & Simons, 1989; McLeod & Shanahan, 1993; Whitbeck et al., 1991).

The past theory asserts that it is not lack of income that is so detrimental to child development as much as it is the fact that low-income parents differ from higher income parents (Mayer, 1997). Scholars in this camp assert that the association between family income and child developmental outcomes is largely spurious. They claim that the same parental characteristics (often unmeasured) that lead to low income also lead to detrimental developmental outcomes for offspring. These characteristics may range from parents' aspiration to parenting styles to genetic endowments.

Within each of these paradigms, there would seem to be room to expect a role of family wealth in addition to effects of family income; subsequently, we address the salience of family net worth to each of these theoretical models.

Material deprivation. By now, many scholars have acknowledged that single-year income measures are woefully inadequate in capturing the overall economic resource levels of a family. Particularly, at the low end of the economic spectrum, income has been shown to substantially vary from year to year (Duncan, 1988). Thus, it has now become standard to use multiyear income measures. However, even if researchers have made significant progress in reducing the measurement error associated with income and are approaching a reasonable estimate of ''permanent income,'' they are still neglecting a very important component of family economic resource-sassets. This oversight is worrisome because the income and wealth distributions are hardly colinear. Previous research has shown that the correlation between a multiyear income measure and a net worth for families with teenagers and young adults to be around .45 (Conley, 1999) and that between single-year earnings and wealth is about .23 (Diaz-Gimenez, Quadrini, & Rios-Rull, 1997). In other words, even a multilayer income measure is a poor proxy for wealth and by extension for total family economic resources available to children. Furthermore, because family income may largely go to pay for basic living expenses and current consumption, the presence or lack of substantial assets may mean the difference

between additional educational resources such as attending private schools, structured activities outside the home, books, magazines, and educational toys, computer-related learning programs, and so on. These and other experiences such as attending museums and theaters or learning a musical instrument help increase the ''cultural capital'' for children (Bourdieu, 1977, 1986) that can have a positive effect on their academic achievement.

Family stress/process. One of the principle mechanisms through which assets (another term for family wealth) are hypothesized to have a salutary effect on family well-being is by acting as a buffer in times of financial need (Sherradan, 1991). If assets smooth out consumption during periods of income strain or increased costs—such as an unemployment spell or medical crisis, for example—then they may reduce parental stress levels and lead to more positive parenting practices or decrease the likelihood of family breakups (Yeung & Hofferth, 1998). Further, the presence of untapped reserve funds in the form of wealth may help reduce day-to-day financial anxiety even if they are not used. Also, because the most significant form of equity in the modal American family is housing wealth in the form of a primary residence, this sort of wealth—which has a ''conspicuous consumptive'' aspect to it—may serve to alleviate class anxiety as compared to families that live in less valuable residences or who rent and do not enjoy the pride and security of ownership.

Additional resources can also afford parents to provide materials that enhance a child's social status or acceptance by his/her peers such as a nice family car, ''cool'' birthday parties, or expensive clothing or school supplies, which have been shown in the adolescent literature to have a positive impact on children's self-esteem (Walker & Greene, 1986).

Spurious correlation. Theorists who claim that evidence shows that the effect of income may be largely spurious base their claims on several main findings. First, additional dollars from nonlabor market sources (such as welfare) do not appear to have much of a positive effect on child development. The theory is that income from earnings is much more likely to be associated with positive parenting qualities like skill and responsibility. Income from welfare is independent of these unobservable characteristics; however, income from welfare may be *negatively* correlated with unobservable factors that correlate with positive parenting and positive child outcomes. Second, marginal changes in income have a weak effect on outcomes (Mayer, 1997).

Wealth is worth considering in this paradigm. Because some economists estimate that half or more of life time family wealth accumulation can be attributed to past generations in the form of gifts, inheritances, or indirect support (Kotlikoff & Summers, 1991; Modigliani, 1988), wealth may be less associated with the unobservable characteristics that covary with labor market income. In other words, wealth may have less to do with the life skills of the parents but rather the economic conditions of their ancestors (though this is less likely the case for families with young children). In addition, the extent to which parents cumulate wealth and what types of asset portfolio parents choose to own may reflect certain personality traits that are otherwise unobserved.

How Wealth From Different Sources Affect Children

Wealth can affect young children's achievement in multiple ways depending on the sources of wealth. One theory of wealth effects would suggest that the primary role of assets is to smooth consumption over income shocks. This theory would predict that liquid forms of wealth—such as cash accounts, securities, and the like—would have more of a positive effect. However, another theory suggests that it is the social–psychological returns to wealth that matter most for young children: the sense of relative class privilege that is engendered through the ownership of assets, the economic confidence of the parents, the sense of security and future aspirations, and expectations that come from the presence of visible forms of wealth in the life course of the family. This latter mechanism would imply greater relative importance of tangible—less fungible—forms of assets such as business and homes.

Likewise, assets that result from inter vivo transfers, inheritance, or high returns on investment may have different effects from wealth accumulated through investing in business, real estates, or savings that tend to constrict current consumption. The former source of wealth can be seen as more exogenous to the family situation and therefore may have more of the windfall effect on consumption and less of the social–psychological effect that successful savings may have on the family's future orientation, belief in the value of education and work, and so on. We examine wealth from multiple sources in this article including the effect of ''windfall'' wealth through use of inheritance as an IV.

Previous Literature on Family Wealth Effect and Children's Test Scores

Several articles have examined the effect of family wealth on young children's test scores for different age

groups. All of these studies to date have been based on the National Longitudinal Study of Youth (NLSY). Despite the rich information on child development, NLSY data overrepresent children of relatively young mothers in early years and have considerable missing data on family wealth, thus calling into question the generalizability of the findings.

Phillips et al. (1998) included net family wealth when examining the Black–White Peabody Picture Vocabulary Test–Revised gap among 5- and 6-year-olds based on the CNLSY data. They found that total net worth, represented as five wealth categories, was not significantly associated with the gap. Haurin, Parcel, and Haurin (2001) examined the relationship between homeownership and NLSY Pennsylvania's Initiative on Assistive Technology (PIAT) math and reading recognition scores for children who were aged 4–8 in 1988 and were interviewed in three subsequent waves (in 1990, 1992, and 1994). They found that homeownership was positively associated with home environment, which in turn was positively related to children's math and reading scores. The direct effect of homeownership was marginally significant for math scores (t statistic = 1.7) and not significant for reading scores when net worth and home environment were held constant. They also found that total net wealth (measured as a continuous variable in its original scale) did not predict test scores. The authors did not examine other types of assets. Orr (2003) used more recent data examining PIAT math scores measured in 1996 for school-aged children (aged 5–14). She found that family net worth (in logarithmic form) was positively associated with a child's math scores both directly and through its effect on the level of cultural capital to which he or she was exposed (measured with reports of whether a child was taken to museums or theaters, had a musical instrument at home, or received special lessons). The article also reported that only income-producing assets such as CDs, stocks, bonds, and saving accounts were positively associated with the math scores. This study did not examine children's reading scores.

This article extends previous analyses in several ways. First, we used data from a new national study to conduct an independent test for how wealth affects the Black–White test score gaps. Second, we examined the impact of family wealth in greater detail by exploring multiple functional forms of wealth and a full range of sources of wealth. Third, we examined different mediating pathways that wealth from distinct sources affects the test scores gaps. Fourth, we conducted separate analysis for preschool and school-age children to observe how wealth affects children's cognitive achievement at different childhood stages.

Method

Data

Analysis in this article is based on data from PSID, which offer an opportunity of independent test from earlier studies that are based on the CNLSY. The PSID data have the following characteristics: (a) a nationally representative sample of families with young children, (b) family wealth history data that have fewer missing data than that in most national data sets and high-quality income history data (more discussion on this issue in the measurement section), and (c) children's test scores obtained from the Woodcock–Johnson (W–J) Revised test, a different achievement test than PIAT and PPVT–R that allow us to further explore the association of wealth and children's cognitive development.

The PSID is a longitudinal study that began in 1968 with a nationally representative sample of about 5,000 American families. For the past three decades, the study collected high-quality annual data from these families and individuals about their demographic, socioeconomic, and employment behavior. By 1996, the sample had grown to include more than 8,700 families through the formation of new families by children or other sample members of the original 5,000 families. In 1997, the PSID added a refresher sample of immigrant families that migrated to the United States since 1968. Historically, the PSID has maintained a high annual response rate of 95%–98%, except for the first wave of the study (74%). In 1997, the PSID initiated a CDS to collect data about children's development and family dynamics from the PSID families with children aged 0–12. Information collected in this supplement includes parent–child relationships, Home Observation for Measurement of the Environment (HOME)-SF cognitive stimulation and emotional support, parenting attitudes and styles, as well as cognitive assessment for children and the primary caregiver of the target child. In families that have more than one child within this age range, up to two siblings were randomly selected to participate in the study. The total sample size of CDS is 3,563 children in 2,394 families from all socioeconomic strata. The response rate is 88% at the family level. The study oversampled low-income Black families, with Black families accounting for about 40% of the CDS sample. To adjust for the original selection probability and the nonresponse in the study, longitudinal sampling weights developed by the PSID staff are used in analysis in this article.

Participants

The analysis sample for this article includes children between the ages of 3 and 12 who had valid

family wealth data and a cognitive assessment at the time of the survey in 1997 (the response rate for child assessment is approximately 80%). As the developmental needs and measures are different for older children, and our preliminary analysis indicated an interaction between age and wealth, we examined preschoolers separately from school-aged children. We included only Black and White children in our analyses for two reasons. First, PSID does not include an adequate sample of children of other ethnic identities that allows us to make a detailed crossgroup comparison. Second, our main concern is whether family wealth can explain part of the residual variance left in the Black–White achievement gap after a set of conventional covariates is taken into account in the model. The final sample consists of 2,222 children: 1,177 Whites, and 1,045 Blacks.

Analysis Plan

We conducted regression-based analysis to examine the relationship between family wealth and children's test scores. Each child outcome was analyzed separately. A series of stepwise regression analyses was conducted with different groups of predictors in the models, first with only race, then with race and controls for family SES (as traditionally measured), subsequently with parental wealth measures added, and finally with mediators (from both material deprivation and family process pathways) added to the models. We conducted separate analysis for preschool and school-age children as our preliminary analysis indicated that there was an interaction between wealth and age. Our models used Huber–White adjusted standard errors that allow for multiple respondents from the same family. We hypothesize that the Black–White test score gap that has remained when traditional measures of parental SES are included will be reduced when parental wealth is held constant.

We investigate potential mediating pathways through which wealth mediates or moderates the racial disparities in children's achievement. Our analysis is guided by a conceptual framework that incorporates both groups of mediators representing constructs in the ''material deprivation'' and ''family stress/process'' paradigms outlined in the Background section. Material deprivation measures include physical home environment, cognitively stimulating materials (e.g., books, toys, musical instruments) and, for school-aged children, private school attendance. Measures for the family processes pathway include two indicators of parenting practices assessing the level of warmth/responsiveness of the mother and activities parents do with the child. We further hypothesize that wealth can influence children's achievement indirectly through its positive association to a child's self-esteem, which has been shown in the previous literature to be associated with a higher academic performance (Liu, Kaplan, & Risser, 1992). Finally, we employ an IV strategy to conduct a series of analysis using inheritance as an instrument of family wealth to check the causality between wealth and children's test scores.

Measures

Child's cognitive ability, conceived broadly to include language skills, literacy, and problem-solving skills, was assessed in 1997 through the W–J Achievement Test–Revised (Woodcock & Johnson, 1989). As the name of the test suggests, the W–J test is a measure of children's achievement, not IQ. To assess the cognitive ability of the preschoolers, two age-standardized subscales were used: Applied Problems (AP) and Letter-Word scores. For school-age children, their cognitive skills were assessed with the Broad Mathematics and Broad Reading scores. Broad Math scores are combined scores from the calculation test and the AP Subscales, and Broad Reading scores are combined scores from the Passage Comprehension and the Letter-Word Subscales. These scores were also standardized to children's age. For a detailed description of these measures, see the user guide for the PSID CDS (Hofferth, Davis-Kean, Davis, & Finkelstein, 1997).

Wealth. Family wealth data were drawn from measures collected in two waves of the PSID—1994 and 1989. PSID had collected asset data every 5 years since 1984. The wealth data collected each time represent the total assets values for the family in the past 5 years. For children who were aged 8 or younger in 1997, we used the wealth data collected in 1994, which represent wealth accumulated from 1989 to 1994. For children aged 9 and above in 1997, we used the wealth data collected in both 1994 and 1989, reflecting assets accumulated between 1984 and 1994. Thus, our measures approximate family wealth over the entire life course of most children and for some children even a few years before they were born. These data allow us to examine the cumulative impact of the family wealth on children's test scores assessed in 1997.

The PSID had collected information about the equity of owner-occupied real estate, real estate other than main home, vehicles or other assets on ''wheels,'' farm or business assets, shares of stock in publicly held corporations, and mutual funds or investment

trusts, including stocks in IRAs, checking and savings accounts, money market funds, certificates of deposit, savings bonds, treasury bills (T-bills), and other investments in trusts or estates, bond funds, life insurance policies, and special collections. The family net worth was measured as the sum of all above items minus the value of debts, such as credit cards, student loans, medical or legal bills, and personal loans.

The PSID wealth data had been shown to be of high quality and correspond well with the wealth data from the Survey of Consumer Finance and from the Health Retirement Study (Juster, Smith, & Stafford, 1999). The PSID employed an innovative survey method that obtains estimated values of wealth on which basis the study then imputes the missing wealth data. When a respondent reported ''don't know'' or refused to answer a wealth question, a set of follow-up questions was designed to probe for an approximate amount. These questions used several benchmark values to assess whether the amount is more than a certain value (e.g., $5,000 for cash accounts, money markets funds, CD, bonds, or treasury bills), if ''yes,'' a follow-up question asked if it amounted to a higher value or more (e.g., $10,000); if ''no,'' then another question asked if it amounted to a lower value (e.g., $1,000). These benchmark values were set at different levels depending on which type of assets was in question. For example, if a respondent answered ''don't know'' or refused to answer the question of how much money the family had in stocks or mutual funds, a follow-up question would assess whether the total value amounted to $25,000 or more. If the respondent answered ''yes,'' then another question asked whether it amounted to $50,000 or more, and if it was, yet another question probed to assess if it was $100,000 or more. If the respondent answered ''no'' to the first follow-up question, then there was a question probing whether it amounted to $5,000 or more. For more details on these questions, see the PSID questionnaires for the Wealth section on the PSID Web site. In comparison to the NLSY wealth data that have about 10% of missing values (Corwyn & Bradely, 2003) and a response rate of about 90%, the PSID wealth data have few missing data and the study has maintained an annual response rate of 95%–98%. In contrast to the annual data collection on wealth in the NLSY, the PSID collected wealth data only every 5 years before 1999.

We attempted to capture the wealth effects in multiple ways. First, as family wealth distribution is rather skewed, we created the log form of the total net wealth for the regression analysis. We also included a dummy variable indicating whether the child was living in a family that had no net wealth. We also conducted analysis with a square root transformation of family wealth. As results are similar, we do not present them in the article. A second wealth measure was calculated by excluding the main home equity. We used the logarithmic forms of these wealth measures in our multivariate analyses. Third, to capture nonlinear effect of family wealth, we included a set of dummy variables indicating the quartiles in which a family's wealth fell.

In addition, we separated total wealth into liquid (such as cash accounts, stocks, and mutual funds) and illiquid assets (such as real estates and business) and examined their respective impact. We also examined in greater detail the impact of various types of assets—(a) home equity; (b) checking and saving accounts, T-bills, and certificate of deposits; (c) stocks and mutual funds; (d) business and other illiquid assets; and (e) debts other than mortgage such as credit cards, student loans, medical or legal bills, and personal loans. Controlling for whether a family owns that particular type of assets, we examined the relationship between the log value of each type of assets and the children's test scores. This was intended to test the various mechanisms by which wealth may have an effect: through increased and smoother consumption (liquid assets), through social–psychological signaling of class privilege and relative advantage vis-à-vis other households (illiquid assets), or through constricted consumption due to debts or long-term investments (e.g., business or other real estate).

Finally, we created a series of income plus wealth measures by converting total net wealth into an income stream and adding it to total family income (see Conley, 2001, for this approach). We compared estimates for these measures to those in models that include only the family income to see if adding family wealth reduces the race-achievement coefficients or augments the explanatory power of the models. In this set of analyses, we assessed the differential wealth impact with a series of measures adding to income an arbitrary proportion of wealth—6%, 8%, 10%, 15%, and 20%. We also created two additional measures that include income plus a portion (10% and 20%, respectively) of the liquid assets, that is, those that can be easily converted into income such as stocks, bonds, mutual funds, and cash accounts. Then, we calculated the logarithmic forms of these values.

Income measures. Our income measure is the total pretax income of all family members, inflated to 1997 price levels using the Consumer Price Index (CPI-UX1) and averaged over all the years since the child's birth through 1996, 1 year prior to the time child

well-being was assessed. These data were drawn from the annual reports of family income collected in the 1986–1997 waves of the PSID. We used this measure to approximate the permanent income concept. The *average family income since birth* variable used in our analysis is scaled in $10,000s. We chose not to use a frequently used size-adjusted measure of family income—the ''income-to-needs'' ratio—because we wanted to distinguish the effect of family size from that of family income. For our multivariate analysis, we used a logarithmic transformation of family income. Several other functional forms of family income, including dummy variables that capture five different income levels, separate income measures for early and middle childhood stages, and the proportion of years a child lived in poverty, were also tested in our preliminary analyses. As basic patterns are similar, we show only the results with log family income since child's birth.

Constructs in the material deprivation model. We used several indicators to measure the material resources that a family provides for the child, including the physical home environment, cognitive stimulating materials provided to the child, and number of years a child attended private school (for school-age children).

The physical environment of the home was assessed with four items from the HOME; a subset of the full HOME scale (Bradley & Caldwell, 1980; Bradley, Casey, & Caldwell, 1997) was administered in the PSID–CDS. Interviewers rated four aspects of the physical environment of a home assessing the extent to which the home was cluttered, monotonous, safe (reverse coded), or clean (reverse coded). The four physical environment items were averaged to form a scale. This scale measures a mixture of parental investment of both money and time in the sense that poor housing conditions are usually less safe and more monotonous, whereas a clean and organized home requires either parental time or money to purchase help with these tasks. An advantage of these measures in the PSID CS over those in other surveys is that they were measured on 5-point Likert scales, whereas in other studies, they were often reduced to 1/0 variables. The scale ranged from 0 = *very cluttered/monotonous/not at all clean/not safe* to 4 = *not at all cluttered/monotonous/very clean/safe*. For analyses using HOME items in the present study, we made an effort to keep variability of responses intact, so we used the full range of responses in all subscales created from the HOME items.

Cognitively stimulating materials provided to children at home were measured with items from the HOME scale, all reported by the primary caregiver. HOME scale include age-appropriate items such as how many books the child has (0 = *none*, 4 = *20 or more*), whether the child has the use of a CD or tape player and at least five CDs or tapes (0 = *no*, 1 = *yes*), and how many things, of numbers, alphabet, colors, and shapes/sizes, the primary caregiver used to helped the child learn at home (0 = *none*, 4 = *all*). Another item in the cognitively stimulating materials scale is how many newspapers and magazines the family gets regularly (0 = *none*, 2 = *3 or more newspapers/magazines*). This item is a rough indicator of family engagement in everyday literacy activities expected to be an important vehicle for parents to transmit cultural capital to their children. For older children, the HOME scale includes also participation in extracurricular activities and frequency of attendance to museums, musical, or theatrical performances.

The second group of mediators includes parenting behavior measures. The *warm parenting* (or responsiveness) construct is comprised of nine observational HOME items. These items were rated by the interviewer, who observed interactions between the child and his or her primary caregiver during the interview. Sample items include how often primary caregiver spontaneously spoke/conversed with child; spontaneously praised child; provided toys/interesting activities; and caressed, kissed, or hugged child; responses on most items ranged from 4 = *often* to 0 = *never*. The warm parenting construct was created by taking the average of all nine items (Cronbach's $\alpha = .88$).

Another measure is parents' *activities with the child*. This scale is comprised of six items that include parents' report of doing various activities with the child, such as reading books or stories, playing sports, doing a puzzle, playing on a computer, or building something together (0 = *not in past month*, 4 = *every day*). The scale was formed by taking the mean of all six items (Cronbach's $\alpha = .67$). The correlation between cognitively stimulating materials and activities with the child is .24.

Child's self-esteem. This measure is only available for children aged 8 and older. We measure child's self-esteem with a subscale on global self-concept created by Marsh (1990). This scale consists of eight self-reported items assessing, on a 7-point scale, the extent to which a child feels ''I do lots of important things,'' ''I like being the way I am,'' ''Overall, I have a lot to be proud of,'' ''I can do things as well as most people,'' ''A lot of things about me are good,'' and so on. The scale, formed by taking the mean of all eight items, ranges from 1 to 7 (Cronbach's $\alpha = .75$).

Other control variables. The PSID collects a wide range of children's characteristics and family histories

that can be included in our analysis as statistical controls. They include child's characteristics, parental characteristics, and family characteristics that may be associated with children's achievement and behavior. Characteristics of the child include age, gender, race, birth order, and low versus normal birth weight. *Age of child* ranged from 3 to 12 years. *Child gender* is coded as 0 = *boy* and 1 = *girl*. *Child's race* was dichotomized into Black and White (0 = *White*, 1 = *Black*). *Low birth weight status* of the child served as a rough proxy for child's health. This variable is coded as 1 = *low birthweight* (less than or equal to 5.5 lbs at birth) or 0 = *birthweight greater than 5.5 lbs*.

Parental characteristics we controlled for include family head's age, parental education, family head's occupational prestige measured with the Hodge–Siegel–Rossi prestige scores, whether the mother received public assistance when pregnant with the child, and mother's cognitive ability measured with a passage comprehension score.

Parental education measures the years of parents' completed schooling where 12 years is equivalent to a high school degree. When there is more than one parent in the family, we use the higher of the two values. Though *occupational prestige* was collected in 1997—ostensibly after the wealth measure was collected—we do not anticipate problems with using it as a control because it is a relatively stable measure of parental life chances in the labor market. Empirically, the correlation between the occupational prestige for the 1997 family head in our analysis sample and that for those who were a family head in 1994 is .96.

Due to PSID's genealogical design, some information about the child's grandparents is also available. We also controlled for *grandparents' years of education* to parse out the influence of grandparents' SES from that of family wealth on children's test scores.

Mother's cognitive ability is assessed with a passage comprehension test of the W–J Achievement Test–Revised at the time of the CDS interview in 1997. Raw scores on this test ranged from 6 to 43.

Other family characteristics include family structure, number of children in the family, region of residence, and whether the family resided in a metropolitan area in 1997. *Family structure* was coded based on mother's marriage history into four dummy variables: intact two-parent family; never married single-mother family; married once but currently divorced, separated, or widowed in 1997; and others. The intact two-parent family was the omitted category in all the multivariate analyses. *Metropolitan statistical area* was measured as 1 = *MSA (urban)* and 0 = *non-MSA (suburban/rural)*.

Results

Table 1 presents the weighted family income, wealth, and test scores for Black and White children. Consistent with the literature, marked differences exist between these two groups. All measures are significantly different between the two groups at an alpha equals .05 level. White children enjoy a family income level that is a little more than twice as high as Black children. The income levels for our sample are higher than the national average as this sample consists of families with children that generally have higher level of financial resources, and it excludes the Hispanic families whose income and wealth tend to be lower than national averages. Consistent with the national data, racial disparity in wealth is considerably larger than in family income. The large difference between the mean and median levels in wealth testifies the highly skewed distribution of family wealth. This is particularly true for these relatively young families when home equity is included in the net worth calculation, reflecting the greater propensity for Whites to initiate homeownership than their Black counterparts (Charles & Hurst, 2002). Note that a much higher percentage of White children lived in households that owned both liquid and illiquid assets, such as ownership of business or farm (17% vs. 1%), checking or saving account (83% vs. 33%), stocks/mutual funds (42% vs. 8%). Even when Black families owned a certain type of assets, the values were substantially lower than those for White families. On average, 11% of White children—as opposed to 35% of Black children—lived in households that owned no assets.

With respect to test scores, we also see large gaps between the two groups even before the children enter kindergarten. For preschoolers, Black children scored about 7 points (0.4 *SD*) lower in Letter-Word and 14.5 points (1.1 *SD*) lower in the AP test than did their White counterparts. For school-aged children, Blacks scored 11–12 points (about two thirds of a standard deviation) lower in both mathematics and reading tests than White children.

Table 2 shows the correlations among various versions of income, wealth, and a child's cognitive ability measures. Consistent with the previous literature, single-year family income and family wealth—though significantly correlated—were not highly correlated. The coefficients between family income in 1997 with various forms of wealth data collected in 1994, ranged from .18 to .55. When the average income since birth was used, the coefficients increased in magnitude, to a highest level of .55 between the logarithmic form of the multiple-year family income

Table 1
Weighted Means for Total Family Income, Family Wealth, and Children's Test Scores by Race

	White			Black		
	n	*M*	*SD*	*n*	*M*	*SD*
Family income variables (in 1997$)						
Average income since birth	1,177	57,622	47,271	1,045	26,480	20,167
(Median) income since birth	1,177	48,130			21,016	
Log average income since birth	1,177	10.59	0.87	1,045	9.89	0.55
Wealth measures (in 1997$)						
Net worth, not including home equity	1,177	119,867.82	478,670.66	1,045	13,559.68	53,359.4
(Median), net worth, not including home equity	1,177	17,327.94		1,045	1,920.15	
Net worth, including home equity	1,177	123,316.06	206,864.39	1,045	23,638.37	60,143.80
(Median) net worth, including home equity	1,177	45,919.03		1,045	2,707.49	
Log net worth, not including home equity	1,177	8.56	4.94	1,045	5.34	2.88
Log net worth, including home equity	1,177	9.45	4.68	1,045	6.03	3.00
% with zero or no wealth (not include home equity)	1,177	0.15	0.44	1,045	0.39	0.32
% with zero or no wealth (include home equity)	1,177	0.11	0.39	1,045	0.35	0.31
Illiquid assets						
% own home	1,177	0.75	0.43	1,045	0.42	0.50
Value of home equity	1,177	52,031.49	101,675.71	1,045	12,247.49	32,444.53
% own farm or business	1,177	0.17	0.46	1,045	0.01	0.07
Value of farm or business	1,177	49,570.72	349,562.25	1,045	1,061.2	18,782.24
% own other real estates	1,177	0.17	0.47	1,045	0.03	0.12
Value of other real estate	1,177	27,960.99	211,945.91	1,045	3,504.63	32,652.02
% own cars and other vehicles	1,177	0.94	0.29	1,045	0.65	0.31
Value of cars, vehicles	1,177	13,938.30	17,443.54	1,045	7,027.01	12,533.49
Liquid assets						
% own checking/savings account, CD, T-bill	1,177	0.83	0.46	1,045	0.33	0.30
Value of checking/saving account, CD, T-bill	1,177	16,073.65	48,157.66	1,045	2,498.26	12,567.94
% own stocks/mutual fund/IRA	1,177	0.42	0.61	1,045	0.08	0.18
Value of stocks/mutual fund/IRA	1,177	35,335.50	223,231.07	1,045	1,164.70	6,525.73
% had debts	1,177	0.63	0.59	1,045	0.36	0.31
Value of debts	1,177	9,296.27	26,661.47	1,045	3,308.61	10,008.17
Children's achievement scores						
Letter-Word score (aged 3–5)	288	102.10	16.21	254	95.45	13.62
Applied Problems score (aged 3–5)	285	107.22	19.26	257	92.70	17.94
Broad Math score (aged 6–12)	640	110.22	18.88	579	98.65	16.13
Broad Reading score (aged 6–12)	644	109.61	17.35	584	97.54	15.81

and that of family wealth. The coefficients between wealth measures and test scores, though significant, were modest, ranging from .06 to .27, with the magnitude of association to the logarithmic forms of wealth higher.

Table 3 shows the descriptive statistics for the other measures used in our multivariate analysis, including family process and material deprivation covariates, as well as demographic control variables. Consistent with the previous literature, a higher proportion of Black children were born at a low birth weight ($<$ 5.5 lbs or 2,500 g). Parents of Black children had lower average education levels and occupational prestige, were more likely to be unemployed, and scored lower on a verbal test. Two thirds of the White children, compared to 29% of the Black children, lived in intact two-parent families. Close to 50% of the Black children compared to approximately 5% of White children lived with a never married single mother. Regarding the material resources and family process mediators, White children on average enjoyed a home setting that had a better physical environment, higher level of cognitive stimulation, and had parents who were reported being ''warmer'' and doing activities with children more frequently.

Multivariate Analyses

Tables 4–6 present results of a series of ordinary least squares (OLS) regression analysis for preschool

Table 2

Correlation Among Family Income, Wealth, and Children's Cognitive Ability Measures

Race	BLKWHITE	INC97	LOGINC97	INCSINB	LINCSINB	WLTH941	WLTH942	LWLTH941	LWLTH942	Q3BMA_SS	Q3BRE_SS
BLKWHITE (1 = *Black*, 0 = *White*)	1										
Family income in 1997 (INC97)	−0.34479	1									
Log family income in 1997 (LOGINC97)	−0.36478	0.67791	1								
Average income since birth, in 97$ (INCSINB)	−0.36916	0.89069	0.61033	1							
Log average income since birth, in 97$ (LINCSINB)	−0.45089	0.68455	0.75034	0.79585	1						
94 wealth no home equity, in 97$ (WLTH941)	−0.14409	0.29127	0.18203	0.3001	0.21903	1					
94 wealth including home equity, in 97$ (WLTH942)	−0.2885	0.35734	0.22154	0.38256	0.27077	0.6812	1				
Log 94 wealth no home equity, in 97$ (LWLTH941)	−0.34381	0.38642	0.41608	0.4296	0.53437	0.24522	0.48065	1			
Log 94 wealth including home equity, in 97$ (LWLTH942)	−0.34966	0.38672	0.42105	0.43018	0.54917	0.21124	0.47326	0.86879	1		
Broad Math Summation score (Q3BMA_SS)	−0.31272	0.33446	0.30296	0.35205	0.35125	0.12065	0.26575	0.27449	0.26533	1	
Broad Reading Summation score (Q3BRE_SS)	−0.3041	0.31857	0.30516	0.34308	0.36149	0.06356	0.20509	0.27258	0.27391	0.71641	1

Note. All coefficients are significant at .001 level.

children, whereas Tables 7–9 present corresponding analyses for school-aged children. In each set of tables, the first table shows the estimates on the child's Letter-Word (verbal) scores, the second table shows the estimates on the child's problem-solving (or math) scores, and the third table presents estimates on the mediators. We conducted separate models for each child outcome. Due to space constraints, we only show the estimates for key covariates in the tables. Covariates not shown in the tables are noted at the bottom of each table.

Preschool Children

In Table 4, we observed a pattern that is in contrast to findings in the previous literature on racial achievement gaps. Our first regression model included only race as a predictor. In Model (2), we added child characteristics and other family control variables. Note that the race coefficient on the Letter-Word score for preschool children became nonsignificant in this second model and remained so in all subsequent models. That is, test scores for Black and White children with the same parental and individual characteristics were no longer significantly different. This finding is consistent with results reported in Fryer and Levitt (2004) with the Early Childhood Longitudinal Study, Kindergarten Cohort (ECLS–K) data that racial achievement gap from kindergarten to second grade can be completely accounted for with a set of family and school factors. In our Model (2), several of the parental and other family characteristics—parental occupational prestige, mother's cognitive ability, and number of children in the family (coefficient not shown)—were significantly associated with the test scores in an expected direction. Not shown in the table but worth noting is the fact that the race coefficient became nonsignificant even before mother's test score was included in the model. Adding these demographic variables increased the explanatory power of the model substantially, from 3%–24% of the variance explained. In Model (3), we added the average family income. The explanatory power of the model increased only by 1%, and family income is not significant associated with preschooler's Letter-Word scores.

In Models (4)–(7), we added four forms of wealth measures. As described in the Measures section, we estimated many different functional forms of wealth. However, due to space constraints, we only present four of these models. In Model (4), wealth was measured with the log form of total net worth including home equity and a dummy variable indicating whether the family had negative or zero wealth. In Model (5), we divided the total net

Table 3
Weighted Mean, Standard Deviation, Number, and Range of Other Constructs in the Model

	White			Black		
	N	*M*	*SD*	*N*	*M*	*SD*
Demographic controls—child						
Age	1,177	7.47	3.54	1,055	7.57	1.81
% girls	1,177	0.49	0.62	1,055	0.42	0.32
% low birth weight (< 5.5 lbs)	1,177	0.06	0.30	1,055	0.15	0.23
Birth order	1,184	1.90	1.16	1,019	2.43	0.89
Demographic controls—parents						
Average parental education	1,177	14.14	2.67	1,053	12.58	1.35
Parents' occupation prestige	1,161	42.69	20.61	1,031	26.55	11.09
Whether family head not employed	1,183	0.04	0.24	1,049	0.20	0.26
Family head age	1,177	37.80[a]	8.32	1,054	37.26[a]	6.28
Cognitive ability (mother's verbal test score)	937	33.47	5.04	832	27.72	3.36
Whether received AFDC at child's birth	1,158	0.06	0.28	1,004	0.33	0.30
Demographic controls—family						
Number of children in the family	1,177	2.33	1.09	1,055	2.79	0.89
% intact two parent	1,177	0.67	0.58	1,055	0.29	0.30
% never married single mother	1,177	0.05	0.26	1,055	0.44	0.32
% married once, now divorced, separated, widowed	1,177	0.11	0.38	1,055	0.17	0.25
% other	1,177	0.17	0.46	1,055	0.10	0.20
% in metropolitan statistical area	1,177	0.48	0.62	1,037	0.39	0.32
Material deprivation measures						
Physical home environment (0–4)	932	3.38	0.94	831	2.86	0.65
Cognitively stimulating materials (*Z* score)	1,177	0.27	0.54	1,056	−0.08	0.42
Ever attended private school	914	0.18	0.45	841	0.11	0.20
Family stress/process measures						
Warm parenting (0–4)	916	2.68	0.90	799	1.96	0.55
Activities with child (0–4)	1,177	1.43	0.82	1,052	1.20	0.46
Child's self-esteem	480	5.65[a]	1.06	428	5.63[a]	0.54

Note. AFDC = Aid to Families with Dependent Children.
[a]Group means are not significantly different between the two groups at .05 level, all others are significantly different.

worth (including the main home equity) into quartiles, with the lowest quartile treated as the omitted group in the model. As in most surveys, the very top of the wealth distribution is underrepresented in the PSID. The PSID families in the top wealth quartile represent upper middle class American families, with an average annual family income of about $87,000 in 1996. In Model (6), we divided the total wealth into the value of liquid assets (checking, saving accounts, bonds, stocks, mutual funds, and so on) and illiquid assets (such as real estate, farms, or businesses). In Model (7), we examined in greater detail the (log) value of various types of assets (controlling for whether the family owns that type of assets), dividing them into five categories as follows: (a) checking/saving accounts, CD, T-bills; (b) stocks, mutual funds, investment trusts; (c) main home equity; (d) business and other real estates; and (e) debts. We also included dummy variables that indicate whether the family owns each type of asset.

When we added wealth measures in these four models, family income became nonsignificant though the R^2 increased only in the last Model (7). Most of the variants of the wealth measures were not significantly associated with the test scores (including the ones noted in the Measures section but not presented in the tables). In the final Model (8), we added the four mediators to the equations. The explanatory power of the model increased by 3% to an R^2 of .31; the value of debts was negatively associated with, and the level of activities parents did with the child was positively associated with, a preschooler's Letter-Word score. The *F* statistics from joint significant tests for the wealth variables, however, revealed that we could not reject the null hypotheses that these wealth coefficients were zero or that they were not different from each other. The child's gender, parent's occupational

Table 4
Estimates on the Letter-Word Score for Children Aged 3–5 in 1997

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
Black	−6.65***	(1.66)	3.06	(2.10)	3.79	(2.08)	3.89	(2.01)	3.88	(2.06)	4.08	(2.08)	3.19	(2.16)	3.56	(2.19)
Girl			2.39	(1.40)	2.44	(1.39)	2.60	(1.38)	2.60	(1.38)	2.53	(1.39)	2.49	(1.47)	2.98*	(1.48)
Parental education			0.17	(0.49)	0.02	(0.49)	0.05	(0.48)	0.02	(0.50)	−0.10	(0.50)	0.05	(0.49)	−0.19	(0.49)
Occupation			0.12**	(0.05)	0.10**	(0.05)	0.10*	(0.05)	0.10*	(0.05)	0.10**	(0.05)	0.14**	(0.05)	0.13**	(0.05)
Mother's score			0.78***	(0.18)	0.78***	(0.18)	0.80***	(0.18)	0.78***	(0.18)	0.75***	(0.18)	0.77***	(0.18)	0.75***	(0.17)
Grandmother education			0.39	(0.34)	0.30	(0.34)	0.30	(0.35)	0.30	(0.34)	0.27	(0.34)	0.27	(0.33)	0.17	(0.33)
Grandfather education			0.13	(0.33)	0.07	(0.32)	0.04	(0.32)	0.04	(0.33)	0.04	(0.32)	−0.21	(0.33)	−0.16	(0.32)
Family income					2.32†	(1.23)	1.98	(1.38)	1.86	(1.30)	1.74	(1.34)	2.69	(1.51)	2.31	(1.60)
Wealth																
1. Net worth							−0.15	(0.49)								
2. Second quartile									2.90	(2.15)						
Third quartile									2.50	(2.21)						
Top quartile									3.27	(2.30)						
3. Liquid assets											0.24	(0.22)				
Nonliquid assets											0.19	(0.18)				
4. Checking/saving													0.05	(0.51)	0.05	(0.52)
Stocks/mutual funds													−0.82	(0.67)	−0.81	(0.66)
Home equity													0.23	(0.18)	0.21	(0.17)
Business													0.20	(0.26)	0.19	(0.26)
Debts													−1.11†	(0.61)	−1.14*	(0.57)
Mediators																
Home environment															1.47	(1.05)
Stimulation															0.36	(0.50)
Parent warmth															−0.83	(1.03)
Activities															2.67*	(1.35)
Observations	545		532		532		531		530		529		529		527	
R^2	0.03		0.24		0.25		0.25		0.25		0.25		0.28		0.31	

Note. Robust standard errors are given in parentheses. The models also include the following covariates (but not shown in the table): whether low birth weight, birth order of the child, family head's age, family structure, number of children in the family, whether living in metropolitan area, dummy variables indicating whether own no assets, and missing indicators of mother's test score and grandparents' education.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

prestige, and mother's cognitive ability remained to have a significant association with a preschooler's Letter-Word score. We tested for an interaction effect between race and wealth, and between child's gender and wealth, and found no significant interaction.

In Table 5, we also found that the Black–White difference in the AP scores became nonsignificant once the child, parents, and family characteristics were added to Model (2) and remained nonsignificant in all subsequent models. Family income was not significantly associated with the AP scores. The value of debts is negatively associated with preschooler's AP scores. We conducted further tests that indicated that this coefficient was significantly different from zero and that the coefficients for each type of wealth holding were significantly different from one another. In Model (8), we found that physical home environment and parental warmth were positively associated with the AP scores. The negative association between the debts and the AP scores remained.

Mediators

Next, we examined whether family wealth helped to explain the Black–White test score gaps through their impact on the level of material deprivation and on parenting behavior. In this set of analyses, each mediator was treated as a dependent variable in a series of stepwise regressions, with race, demographic controls, income, and wealth variables added to the model sequentially. Again, we used many variants of wealth measures in our analyses but present only some of these models. As seen in Table 6, some of the wealth measures were significantly and positively associated with these mediators. The value of liquid wealth is positively associated with parenting behavior both in terms of warmth and activities parents do with a child. Cash account was associated with parental warmth and stock holding is positively associated the physical environment at home, though the value of a business or other real estates was negatively associated with home environment,

Table 5
Estimates on the AP Score for Children Aged 3–5 in 1997

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
Black	−14.24***	(2.57)	−5.71	(4.46)	−4.53	(4.55)	−3.83	(4.70)	−4.73	(4.65)	−4.08	(4.57)	−1.45	(4.20)	−1.90	(4.66)
Girl			0.68	(1.99)	0.75	(1.99)	0.68	(1.95)	0.76	(1.91)	0.74	(1.99)	0.18	(1.42)	1.33	(1.98)
Parental education			0.58	(0.60)	0.45	(0.61)	0.55	(0.61)	0.52	(0.63)	0.33	(0.59)	0.56	(0.48)	−0.03	(0.64)
Occupation			0.18**	(0.08)	0.17**	(0.08)	0.17**	(0.08)	0.17**	(0.08)	0.17**	(0.08)	0.12	(0.07)	0.18**	(0.07)
Mother's score			1.02***	(0.22)	1.02***	(0.22)	1.05***	(0.22)	1.04***	(0.22)	0.98***	(0.22)	0.79***	(0.19)	1.04***	(0.22)
Grandmother education			0.37	(0.46)	0.30	(0.45)	0.32	(0.46)	0.29	(0.47)	0.27	(0.45)	0.71	(0.38)	0.02	(0.25)
Grandfather education			−0.60	(0.41)	−0.64	(0.41)	−0.64	(0.41)	−0.63	(0.39)	−0.66	(0.41)	−0.42	(0.31)	−0.55	(0.37)
Family income					2.00	(1.57)	2.66	(1.72)	2.37	(1.70)	1.67	(1.66)	1.15	(1.43)	2.04	(1.68)
Wealth																
1. Net worth							−0.81	(0.53)								
2. Second quartile									−1.38	(3.07)						
Third quartile									−0.85	(3.22)						
Top quartile									−2.89	(3.61)						
3. Liquid											0.24	(0.28)				
Illiquid											0.00	(0.32)				
4. Checking/saving													0.22	(0.44)	0.15	(0.43)
Stocks/mutual funds													0.33	(0.24)	0.16	(0.22)
Home equity													−0.41	(0.26)	−0.40	(0.25)
Business/farm													−0.38	(0.25)	−0.40	(0.25)
Debts													−0.56*	(0.28)	−0.67*	(0.28)
Mediators																
Home environment															2.48*	(1.24)
Stimulation															0.01	(0.88)
Parent warmth															2.17*	(1.05)
Activities															2.22	(1.58)
Observations	537		524		524		524		524		524		524		522	
R^2	0.10		0.26		0.27		0.27		0.27		0.27		0.27		0.32	

Note. Robust standard errors are given in parentheses. The models also include the following covariates (but not shown in the table): whether low birth weight, birth order of the child, family head's age, family structure, number of children in the family, whether living in metropolitan area, dummy variables indicating whether own no assets, and missing indicators of mother's test score and grandparents' education.
*$p < .05$. **$p < .01$. ***$p < .001$.

perhaps suggesting a constricted consumption at home due to investment in illiquid assets. Total net worth was positively associated with the level of activities parents and child do together. That said, race differentials in these mediators were only moderately reduced when family wealth measures were added to the model. The results for the cognitive stimulation are not presented here as none of the wealth variables were found to have a positive association with it.

School-Aged Children

Tables 7–9 present results from a set of corresponding analyses for school-aged children. For older children, we included two additional mediators—whether the child attended a private school and the self-esteem of the child. Again, we see in Table 7 that the racial gap in both the reading and the math scores became nonsignificant when measures for child, parental, and basic demographic characteristics were entered in the model. Parents' education and occupation, as well as grandfather's education, indicative of previous generation's SES, were positively associated with a child's reading score. Family income did not have a significant net effect on school-aged children's reading and math scores. As in previous tables, the race differential was not substantially reduced when family wealth was introduced to the models. When all the mediators were included in Model (8), we found that cognitive stimulation, parental warmth, and activities were positively associated with the child's reading scores. Again, we found that child's gender (girls had higher scores) and mother's cognitive ability are positively associated with a child's reading score. The effects of parental education and occupation were mediated by these materials and family processes factors. Adding these mediators increases the explanatory power of the model by about 3%. In Model (9), we added child's self-esteem, which had a positive association with a child's reading scores. The association between stocks and reading scores

Table 6
OLS Estimates on the Mediators for Children Aged 3–5 in 1997

	Physical home environment								Parental warmth/responsiveness								Parent activities with child							
	I		II		III		IV		I		II		III		IV		I		II		III		IV	
Black	0.18	(0.19)	0.19	(0.20)	0.24	(0.19)	0.18	(0.19)	−0.48***	(0.17)	−0.44**	(0.17)	−0.37**	(0.18)	−0.39**	(0.17)	−0.20***	(0.07)	−0.18**	(0.07)	−0.17**	(0.08)	−0.18**	(0.07)
Girl	−0.17	(0.15)	−0.17	(0.15)	−0.15	(0.15)	−0.17	(0.15)	−0.21	(0.13)	−0.22	(0.13)	−0.18	(0.13)	−0.19	(0.13)	−0.12**	(0.06)	−0.13**	(0.06)	−0.12**	(0.06)	−0.12**	(0.06)
Parental education	0.16***	(0.05)	0.15***	(0.06)	0.13**	(0.06)	0.12**	(0.05)	0.11**	(0.05)	0.10**	(0.05)	0.07	(0.05)	0.07	(0.05)	0.02	(0.02)	0.02	(0.02)	0.02	(0.02)	0.02	(0.02)
Occupation	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)
Family income	−0.08	(0.15)	−0.11	(0.15)	−0.13	(0.16)	−0.10	(0.15)	−0.17	(0.16)	−0.17	(0.15)	−0.24	(0.14)	−0.22	(0.14)	0.03	(0.06)	0.06	(0.05)	0.05	(0.06)	0.05	(0.06)
Wealth																								
1. Net worth	0.01	(0.06)							0.07	(0.06)							0.06***	(0.02)						
2. Second quartile			0.00	(0.23)							−0.14	(0.21)							−0.12	(0.09)				
Third quartile			0.08	(0.24)							0.27	(0.23)							−0.06	(0.10)				
Top quartile			0.20	(0.27)							0.34	(0.26)							0.08	(0.11)				
3. Liquid					0.05	(0.03)							0.08***	(0.03)							0.02*	(0.01)		
Illiquid					−0.01	(0.02)							0.00	(0.02)							−0.00	(0.01)		
4. Cash account							0.05	(0.03)							0.07**	(0.03)							0.00	(0.01)
Stock/mutual funds							0.04**	(0.02)							0.03	(0.02)							0.01	(0.01)
Home equity							−0.02	(0.02)							0.00								0.01	(0.01)
Business/farm							−0.05**	(0.02)							0.00	(0.02)							0.01	(0.01)
Debts							−0.02	(0.02)							−0.01	(0.02)							−0.00	(0.01)
Observations	701		702		701		701		701		702		701		701		678		679		678		678	
R^2	0.08		0.09		0.10		0.12		0.11		0.12		0.14		0.14		0.22		0.21		0.20		0.21	

Note. Robust standard errors are given in parentheses.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 7
Estimates on the Broad Reading Score for Children Aged 6–12 in 1997

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Black	−10.93*** (1.04)	0.10 (2.26)	0.17 (2.27)	0.15 (2.32)	0.21 (2.30)	0.65 (2.32)	0.20 (2.33)	0.01 (2.30)	−2.03 (2.58)
Girl		2.99*** (0.89)	2.99*** (0.89)	3.00*** (0.90)	2.99*** (0.89)	2.92*** (0.89)	2.97*** (0.90)	2.50*** (0.88)	2.24** (1.00)
Education		1.34*** (0.30)	1.31*** (0.32)	1.34*** (0.32)	1.29*** (0.32)	1.18*** (0.32)	1.17*** (0.33)	0.99*** (0.33)	0.27 (0.36)
Occupation		0.10** (0.04)	0.10** (0.04)	0.10** (0.04)	0.10** (0.04)	0.10** (0.04)	0.09** (0.04)	0.07† (0.04)	0.06 (0.05)
Mother's score		0.71*** (0.11)	0.70*** (0.11)	0.69*** (0.11)	0.71*** (0.11)	0.67*** (0.11)	0.67*** (0.11)	0.53*** (0.11)	0.67*** (0.13)
Grandmother education		−0.28 (0.20)	−0.29 (0.21)	−0.29 (0.21)	−0.30 (0.20)	−0.30 (0.20)	−0.30 (0.21)	−0.32 (0.20)	−0.31 (0.22)
Grandfather education		0.70*** (0.24)	0.70*** (0.24)	0.69*** (0.24)	0.67*** (0.24)	0.70*** (0.24)	0.71*** (0.24)	0.62*** (0.24)	0.74*** (0.25)
Family income			0.43 (1.09)	0.36 (1.17)	0.19 (1.16)	−0.17 (1.05)	−0.20 (1.05)	−0.58 (0.95)	−1.14 (0.88)
Wealth									
1. Net worth				0.06 (0.33)					
2. Second quartile					−0.78 (1.33)				
Third quartile					1.83 (1.47)				
Top quartile					0.87 (1.77)				
3. Liquid assets						0.38† (0.21)			
Illiquid assets						−0.04 (0.15)			
4. Cash account							0.16 (0.18)	0.14 (0.17)	0.24 (0.19)
Stocks/mutual funds							0.24† (0.14)	0.23† (0.14)	0.39** (0.15)
Home equity							0.03 (0.11)	0.02 (0.11)	0.01 (0.12)
Business/farm							−0.04 (0.13)	−0.07 (0.13)	−0.12 (0.14)
Debts							0.05 (0.12)	0.06 (0.11)	0.06 (0.13)
Mediators									
Private school								1.11 (1.76)	0.57 (2.06)
Home environment								0.70 (0.58)	0.67 (0.65)
Stimulation								0.91*** (0.30)	1.12*** (0.35)
Parent warmth								2.46*** (0.62)	2.12*** (0.68)
Activities								−1.93*** (0.71)	−1.45* (0.78)
Self-esteem									1.30** (0.62)
Observations	1,228	1,206	1,206	1,198	1,206	1,206	1,198	1,197	866
R^2	0.10	0.27	0.27	0.28	0.28	0.28	0.28	0.30	0.35

Note. Robust standard errors are given in parentheses. The models also include the following covariates (but not shown in the table): whether low birth weight, birth order of the child, family head's age, family structure, number of children in the family, whether living in metropolitan area, dummy variables indicating whether own no assets, and missing indicators of mother's test score and grandparents' education.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 8
Estimates on the Broad Math Score for Children Aged 6–12 in 1997

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Black	−12.12*** (1.12)	−1.48 (2.66)	0.05 (2.67)	3.97 (3.24)	0.29 (2.66)	1.14 (2.73)	−0.08 (2.69)	−0.36 (2.62)	−3.07 (3.00)
Girl		−1.75* (1.00)	−1.43 (1.00)	−3.84*** (1.28)	−1.45 (1.00)	−1.58 (1.00)	−1.29 (0.99)	−1.80* (0.98)	−2.05* (1.11)
Education		2.14*** (0.33)	1.69*** (0.35)	1.58*** (0.47)	1.63*** (0.35)	1.50*** (0.35)	1.41*** (0.36)	1.19*** (0.36)	0.72* (0.41)
Occupation		0.13** (0.05)	0.10* (0.05)	0.13** (0.06)	0.09* (0.05)	0.10* (0.05)	0.08 (0.05)	0.06 (0.05)	0.07 (0.06)
Mother's score		0.22*** (0.05)	0.59*** (0.12)	0.54*** (0.16)	0.60*** (0.12)	0.55*** (0.12)	0.61*** (0.12)	0.43*** (0.12)	0.56*** (0.14)
Grandmother education		0.08 (0.11)	−0.05 (0.23)	0.15 (0.31)	−0.06 (0.23)	−0.07 (0.23)	−0.06 (0.23)	−0.10 (0.22)	−0.12 (0.25)
Grandfather education		0.08 (0.14)	0.62** (0.26)	0.14 (0.31)	0.57** (0.26)	0.63** (0.26)	0.63** (0.26)	0.49† (0.26)	0.62** (0.27)
Family income			1.18 (0.86)	1.76 (1.30)	0.57 (0.83)	0.10 (0.76)	0.34 (0.79)	−0.17 (0.75)	−0.52 (0.77)
Wealth									
1. Net worth				1.01** (0.46)					
2. Second quartile					−0.53 (1.40)				
Third quartile					3.09† (1.58)				
Top quartile					3.44† (1.88)				
3. Liquid						0.51** (0.21)			
Illiquid						0.16 (0.17)			
4. Cash account							0.14 (0.18)	0.09 (0.18)	0.18 (0.19)
Stocks/mutual funds							0.45*** (0.15)	0.42*** (0.15)	0.55*** (0.16)
Home equity							0.19 (0.12)	0.19 (0.12)	0.11 (0.13)
Business/farm							−0.14 (0.13)	−0.16 (0.14)	−0.31** (0.15)
Debts							−0.30** (0.13)	−0.28** (0.13)	−0.29** (0.15)
Mediators									
Private School								4.01** (1.83)	3.40 (2.12)
Home environment								1.32** (0.65)	1.31† (0.72)
Stimulation								0.78** (0.32)	0.92** (0.38)
Parent warmth								3.41*** (0.71)	2.53*** (0.80)
Activities								−1.36 (0.78)	−0.62 (0.89)
Self-esteem									2.80*** (0.76)
Observations	1,219	1,197	1,197	1,189	1,197	1,197	1,189	1,188	860
R^2	0.10	0.23	0.25	0.26	0.25	0.25	0.26	0.29	0.34

Note. Robust standard errors are given in parentheses. The models also include the following covariates (but not shown in the table): whether low birth weight, birth order of the child, family head's age, family structure, number of children in the family, whether living in metropolitan area, dummy variables indicating whether own no assets, and missing indicators of mother's test score and grandparents' education.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

became stronger and significant. Note, however, that as self-esteem was assessed only for children aged 8 and above in 1997 (thus the sample size in this last model is substantially smaller than that in previous models), it is possible that the significant association with stocks may apply only to this group of older children.

The results for math scores in Table 8 show a rather different pattern—a stronger wealth association. In Models (4)–(7), total net worth, above-median wealth, the value of liquid assets, and stock holding were all positively associated with a child's math score. The magnitude of the coefficients is modest. About 1% of increase in net worth is associated with an increase of 1 point in math scores, 1% increase in liquid assets is associated with an increase of 0.5 points in math scores, and 1% increase in stock/mutual funds holdings is associated with 0.45 point increase. Being in the third and fourth quartiles of the wealth distribution is associated with approximately a 3 and 3.5 points increase in math score, respectively, compare to being in a family in the lowest quartile of wealth, though these coefficients are only significant at the 10% level. These are relatively large associations. To put them in context, a 1-year increase in parental education is associated with 1.6-point increase in math score, and an 1-point increase in mother's test score is associated with an increase of 0.5 points in a child's math score. Examining the standardized coefficients for Model (4) (not shown in table) reveals that the beta for net worth is .22, relative to .26 for mother's verbal score, .17 for parents' education, .11 for family head's occupation, and .10 for child's gender. The value of debts, in contrast, was negatively related to the math scores (1% increase lead to 0.3 point decrease in the math score). The F statistics from joint significant tests revealed that we can reject the null hypotheses that these wealth coefficients were equal to or smaller than zero. The coefficients for stocks/mutual fund and debts were significantly different from those for wealth from other sources. The increment in R^2 when these wealth measures were added, however, was trivial. It is not clear to us why the coefficients for math scores are larger than those for reading scores. One explanation may be that we controlled for mother's verbal skills but not her math skills (not available in the PSID data) but we could not test this hypothesis.

When all the mediators were added to Model (9), the explanatory power of the model increases by about 8% (from Model [7]) and the association between the math score and the value in stocks and debts remained. We also found that assets in business, farm, or other real estates has a negative association with the math score, perhaps again reflecting the constricted effect of these illiquid investments on children's current consumption. Cognitive stimulation, parental warmth, and a child's self-esteem were all positively associated with a child's math score.

Table 9 shows that the value of net wealth is positively associated with a child's private school attendance status, the cognitive stimulation provided to the child, and the activities parent and child did together. Compared to being in a family at the lowest quartile of wealth, being in the top quartile was positively associated with the cognitive stimulation a child received and a child's self-esteem (only marginally with private school attendance). Being in the third quartile was also positively associated with the physical home environment. The race coefficients became nonsignificant after the child's and parents' demographic variables were held constant. Adding wealth measures did not reduce the magnitude of the race coefficients further (results not shown). In most models, except those for cognitive stimulation, family income was not significantly associated with the mediators.

IV Regression Estimates

Of course, any wealth effects we detect could be biased due to family wealth's association with unobserved factors—such as future orientation, intelligence, investment savvy, and so on. Though we have argued in the introductory paragraph that wealth parameter estimates—due to the important role of gifts, inheritances, and differential returns to investments (i.e., windfalls) on asset levels—may be less affected by selection bias of this type, we do want to address this possibility head on. However, there is no simple solution to this problem. Any factor causally related to wealth levels is probably, in some way, related to child outcomes; in other words, there is no perfect IV to test the relationships we posit.

We tested an ''imperfect'' instrument for wealth: inheritance (defined as any large gifts or inheritances of money or property worth $10,000 or more in the past 10 years) for school-aged children. Results showed that although the inheritance variables were strong in the first stage (F statistics = 33.06), the instrumented wealth variable in the second stage was not a significant predictor of children's test scores and was marginally significant for only one of the mediators—''parental warmth'' (results not shown due to space constraints). We do not take this lack of significance as conclusively dismissive of our OLS results for several reasons. First, IV estimation is quite inefficient and thus requires large sample sizes to

Table 9
Estimators on the Mediators for Children Aged 6–12 in 1997

	Private school attendance				Physical home environment				Cognitive stimulation			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Black	0.70 (0.27)	0.65 (0.26)	0.68 (0.27)	0.80 (0.30)	0.40** (0.16)	0.39** (0.17)	0.43** (0.17)	0.42** (0.17)	−0.68*** (0.18)	−0.64*** (0.18)	−0.61*** (0.19)	−0.57*** (0.19)
Girl	0.91 (0.23)	0.92 (0.23)	0.89 (0.22)	0.87 (0.21)	0.04 (0.11)	0.06 (0.11)	0.04 (0.11)	0.05 (0.11)	0.31*** (0.11)	0.32*** (0.11)	0.31*** (0.11)	0.31*** (0.11)
Education	1.01 (0.08)	1.02 (0.08)	1.01 (0.09)	0.97 (0.08)	0.02 (0.04)	0.02 (0.04)	0.02 (0.04)	0.00 (0.04)	0.23*** (0.04)	0.24*** (0.04)	0.23*** (0.04)	0.22*** (0.04)
Occupation	1.00 (0.01)	1.00 (0.01)	1.00 (0.01)	1.00 (0.01)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)
Family income	1.34 (0.41)	1.33 (0.40)	1.42 (0.49)	1.27 (0.41)	0.09 (0.13)	0.11 (0.13)	0.04 (0.13)	0.02 (0.13)	0.52*** (0.14)	0.45*** (0.14)	0.46*** (0.14)	0.40*** (0.14)
Wealth												
1. Net worth	1.31*** (0.12)				−0.01 (0.02)				0.05** (0.02)			
2. Second quartile		0.66 (0.33)				0.00 (0.18)				−0.02 (0.20)		
Third quartile		1.52 (0.77)				0.38* (0.19)				0.36† (0.19)		
Top quartile		2.89† (1.61)				0.01 (0.23)				0.48** (0.22)		
3. Liquid			1.09 (0.09)				0.02 (0.03)				0.04 (0.03)	
Illiquid			1.04 (0.05)				0.02 (0.02)				0.01 (0.02)	
4. Cash account				1.18** (0.08)				0.03 (0.02)				0.05† (0.03)
Stocks/MF				1.01 (0.03)				0.03 (0.02)				0.01 (0.02)
Home equity				0.99 (0.03)				0.01 (0.01)				0.01 (0.02)
Business/farm				1.04 (0.03)				−0.02 (0.02)				0.01 (0.01)
Debts				0.96 (0.03)				−0.02 (0.02)				0.00 (0.01)
Observations	1,503	1,511	1,511	1,503	1,503	1,511	1,511	1,503	1,503	1,511	1,511	1,503
R^2					0.08	0.08	0.08	0.09	0.30	0.30	0.29	0.30

	Parental warmth				Parent activities				Child's self-esteem			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Black	−0.04 (0.12)	−0.05 (0.12)	−0.04 (0.13)	−0.06 (0.13)	−0.08 (0.08)	−0.08 (0.07)	−0.11 (0.08)	−0.08 (0.08)	−0.02 (0.14)	0.04 (0.15)	0.05 (0.15)	0.04 (0.16)
Girl	0.03 (0.09)	0.03 (0.09)	0.03 (0.09)	0.04 (0.09)	−0.01 (0.05)	−0.01 (0.05)	−0.01 (0.05)	−0.01 (0.05)	0.00 (0.08)	0.01 (0.08)	0.01 (0.08)	0.00 (0.08)
Education	0.05 (0.03)	0.05 (0.03)	0.05 (0.03)	0.04 (0.03)	0.02 (0.02)	0.02 (0.02)	0.03† (0.02)	0.02 (0.02)	−0.00 (0.02)	−0.00 (0.02)	−0.01 (0.02)	−0.01 (0.02)
Occupation	0.01** (0.00)	0.01* (0.00)	0.01** (0.00)	0.01* (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)
Family income	0.06 (0.10)	0.10 (0.10)	0.08 (0.11)	0.07 (0.11)	0.07 (0.05)	0.07 (0.06)	0.12** (0.06)	0.09 (0.06)	0.06 (0.09)	−0.00 (0.08)	−0.00 (0.08)	−0.01 (0.08)
Wealth												
1. Net worth	0.01 (0.02)				0.02* (0.01)				0.02 (0.02)			
2. Second quartile		0.11 (0.14)				−0.02 (0.08)				0.15 (0.14)		
Third quartile		0.23 (0.15)				0.08 (0.09)				0.24 (0.15)		
Top quartile		−0.04 (0.18)				0.11 (0.10)				0.30* (0.15)		
3. Liquid assets			0.02 (0.02)				0.01 (0.01)				−0.00 (0.01)	
Illiquid assets			−0.01 (0.02)				−0.02† (0.01)				0.03 (0.02)	
4. Cash account				0.01 (0.02)				0.00 (0.01)				0.02 (0.02)
Stocks/MF				0.02 (0.01)				−0.00 (0.01)				0.01 (0.01)
Home equity				−0.00 (0.01)				0.00 (0.01)				0.01 (0.01)
Business/farm				−0.01 (0.01)				−0.01 (0.01)				−0.00 (0.01)
Debts				−0.00 (0.01)				−0.00 (0.01)				−0.01 (0.01)
Observations	1,503	1,511	1,511	1,503	1,500	1,508	1,508	1,500	876	883	883	876
R^2	0.07	0.07	0.07	0.07	0.04	0.04	0.04	0.03	0.02	0.03	0.02	0.03

Note. Robust standard errors are given in parentheses. Estimates from private school attendance model are from logistic regression and those from the other models from ordinary least squares regression.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

obtain reasonable standard errors. The standard errors in our IV estimates were quite large (and our point estimates are in the right direction), reflecting that our sample size may be too limited to satisfy the demanding requirement. Second, as many of the families in our sample were relatively young and only 12% of the children were in families that had received any bequest, the assumption that a large proportion of the family wealth comes form inheritance does not apply to these families. Third, inheritance is most likely associated with a family death, which itself could have an independent, *negative* effect on child cognitive development, thereby biasing the instrumented parameter estimate downward. More effort is needed in the future to strengthen the causal inferences.

Discussion

We have advanced the literature on intergenerational transfer with a better understanding about the relationship between family wealth, income, family dynamics, and young children's cognitive development based on high-quality income and wealth history data from a national sample. We have examined wealth from different sources and in different functional forms more carefully than previous research has. We also conducted separate analysis on how family wealth may affect preschool and school-aged children. Our results demonstrate that family wealth accumulated from different sources can have distinct influence on children at different developmental stages.

Our investigation yielded little evidence in support of the hypothesis that family wealth mediates the Black–White test score gaps for young children. The racial disparities in the test scores were essentially eliminated when family and child demographic covariates were held constant. This pattern is consistent with recent findings by Fryer and Levitt (2004) based on the ECLS–K data that the test score gaps in the first 3 years of schooling can be completely accounted for by a set of family and school covariates, though at odds with findings in their subsequent paper (Fryer & Levitt, 2006) that by the end of third grade, the gaps can no longer be explained away by the same covariates included in their first paper. Further work is warranted to address the differences between these two data sets, in contrast, and results that come out of analyses of the NLSY, which show the race gap to be more tenacious. This difference can partly be attributed to the different assessment instruments used in the PSID and the ECLS–K that produce a smaller raw gap than the PPVT and PIAT used in the NLSY in the first place. In addition, we included a large set of relevant family history data, child characteristics, home environment, and family interaction measures. Family income data in the PSID are of higher quality and the wealth data have fewer missing data than those in NLSY. We measured both income and wealth over the child's entire childhood, which is likely to capture more of the otherwise unobserved heterogeneity than in previous studies.

Despite our effort in constructing many variants of wealth measures, most of them were not significantly associated with preschoolers' test scores. The only exception was the negative association with debts (other than mortgage) such as credit cards, student loans, medical or legal bills, and personal loans. This overall weak relationship is consistent with findings in Phillips, Brooks-Gunn, Duncan, Klebanov, and Crane (1998) for the 5- and 6-year-olds. This pattern may reflect the fact that wealth accumulation for very young families requires a large start-up payment for investment in homes, business, or savings such as cash accounts and/or stocks/mutual funds, which, in turn, requires lowering current consumption. Under such circumstances, family wealth may or may not benefit a child's test scores when children are young while investing in other assets or save. A positive impact may occur if children work hard expecting that they will be able to attend college because their parents save, or if parents who value college teach their children more skills at home and push them harder to do well in school (in this case, the wealth effect is spurious).

Our analyses showed that family wealth had a stronger association with the cognitive achievement of school-aged children than that of preschoolers and a stronger association with school-aged children's math than on their reading scores. Liquid assets, particularly those held in stocks/mutual funds, were positively associated with school-aged children's math scores (and reading scores for those aged 8 and above) when all other covariates were held constant. Relating to previous studies, these patterns are consistent with the nonsignificant relationship between net wroth and test scores for the 5- to 6-year-olds reported in Phillips et al. (1998), and Haurin et al.'s (2001) finding of a stronger relationship between homeownership with math than with reading scores of school-aged children. They are also in agreement with Orr's report (2003) of a positive association between income-producing (i.e., liquid) assets and math scores for school-aged children, and Haurin et al.'s finding that homeownership is not statistically significant when net worth and home environment are controlled for. The differential patterns by child's age are at odds with Orr's report of

a nonsignificant interaction between age and wealth on math scores in a model where she specified child's age as a continuous rather than a categorical variable.

We speculate that the stronger impact on school-aged children than on preschool children may result from: (a) school-aged children may benefit more from family wealth for educational resources that require substantial financial investment such as private schools and (b) older children are more conscious of the wealth differences relative to their peers exhibited as class markers in the quality of the learning environment, possessions, and the type of neighborhood in which a child resides. These differences may influence their self-esteem and aspirations, which in turn are positively associated with their school performance.

What does the positive association between stocks/mutual funds holdings and children's test scores represent? We speculate that this may be partly due to a stronger future orientation or financial savvy of parents who invest in these kinds of assets. Parents who own such assets also generally have a broader asset portfolio, owning other types of assets like cash accounts, home and cars, and more likely to have the highest level of wealth. We see some suggestion of a nonlinear effect of high wealth on the math scores for school-aged children. Results from another set of analyses we conducted showed that ownership of three or more types of assets was positively related to children's test scores (not shown due to space constraint).

One contribution of this article was to examine the mediating pathways of wealth on children's achievement. For preschoolers, there was some evidence that the value in cash accounts was positively associated with parenting behavior, possibly through reducing the financial stress at home (though, of course, this relationship may reflect unobserved heterogeneity as well). For school-aged children, we found that a higher wealth level was associated with higher quality material resources (better physical home environment and learning resources and private school attendance). This is in general agreement with the findings in Orr (2003) and in Haurin et al. (2001) that owning a home, compare to renting, is associated with a higher quality home environment, which in turn is positively related to school-aged children's math and reading scores. We observed some evidence of a nonlinear relationship between wealth and material deprivation mediators and school-aged children's self-esteem, which in turn were positively associated with math and reading scores.

We argue that although wealth may help smooth consumption on a more short-term basis, the presence of wealth over time in a family (or extended family) may have a stronger impact of engendering a sense of economic security, future orientation, and the ability to take risks among all family members, which, in turn, positively affect child development. Although wealth may not have a substantial short-term benefit in narrowing the Black–White achievement gap among young children, allowing and encouraging low-income families to accumulate wealth may improve family dynamics and foster a forward-looking attitude, which may benefit children in the long run. The financial effects of wealth would likely to be observed later in life when school financing becomes an issue. It is plausible that in young adulthood, wealth may become an even more critical factor in shaping one's path to college attendance, career success, or even the timing of marriage and choice of partners. This argues for taking into account the developmental stages of children when considering the impact of family resources on child development. Testing these hypotheses is warranted in future research in this field.

Although we found that wealth had a weak association with children's cognitive skills in the presence of other factors, it is worth noting that family income had no net effect on children's test scores in any of the models. The only exception is when we analyzed the income in categorical forms, a family income of $75,000 or higher, when compared to an income under $15,000, is associated with higher test scores at preschool but not later childhood stages. This argues for including wealth in considering the impact of family financial resources in future intergenerational studies of child development. In addition to being an indicator of financial resources, parents' efforts in accumulating wealth and their choice of what types of assets to hold may capture some unobserved psychological traits of the parents that themselves are positively associated with child outcomes. For example, the ability to accumulate wealth may reflect—rather than cause—unmeasured aspects of a beneficial home environment, positive parenting behavior, or a forward-looking orientation (i.e., a higher discount rate).

We strived to address the potential bias in establishing a causal relationship between wealth and children's test scores by including an extensive list of relevant covariates measured in a proper temporal order in our analysis and by attempting an IV approach. Given the limitations of available data, our results remain inconclusive. More work is needed in future studies to strengthen the causal inference between family wealth and multiple domains of child development.

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