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HOW EDUCATIONAL INEQUALITY DEVELOPS¹

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Academic achievement – the credentials of schooling completed and degrees attained, as well as the skills and capabilities associated with these credentials - is an important determinant of socioeconomic success. Few if any personal characteristics are more strongly and positively related to an individual's later occupational attainment, employment, earnings, home ownership, health, and other measures of a successful life. In addition, as the U.S. and other national economies have evolved, technological innovation and globalization have advanced, and labor union strength has declined, the economic return to academic achievement has increased. Thus, for example, in inflation-adjusted, 1999 dollars, the average U.S. male high school dropout earned \$13.61/hour in 1973, and \$9.78/hour in 1999, a decline of 28 percent. By contrast, the earnings of workers with an advanced degree (beyond college) increased by more than 20 percent during this time period (Krueger, 2003: 4). A given educational achievement gap between two individuals leads to a larger earnings gap today than it did in the past.

This trend has been particularly disadvantageous for race/ethnic groups such as African-Americans and Latinos, whose academic achievement has historically lagged behind that of whites. At the same time, this trend has benefited Asians, whose academic achievement has equaled and in some areas surpassed that of whites. The great importance of racial/ethnic academic achievement gaps for understanding racial/ethnic earnings gaps is illustrated by the finding that the earnings gap between African-American and white men can be fully explained by a calculation that accounts for, among other variables, the educational credentials (years of schooling completed) and cognitive skills (test score) gaps between these groups. Here, the portion (40%) of the Black-White hourly wage gap accounted for by the cognitive skills gap is four times the size of the

portion (10%) accounted for by the credentials gap (Farkas and Vicknair, 1996, Table 1). Thus, the study of racial/ethnic gaps in academic achievement - test scores and credentials - is central to understanding poverty and income differentials across these groups in America today.

Approximately fifty years after the *Brown* decision, forty years after the Coleman Report, and during a period of intense discussion of *No Child Left Behind*, concern with these gaps is hardly new. What *is* new is recent evidence on the sources of these disparities in the early lives and school careers of children. This new understanding of the early development of race/ethnic inequalities in educational achievement is the focus of this chapter. I will discuss the theoretical framework and data that have been used to address these issues, the questions that have been asked, and the answers that have emerged. The goal is scientific knowledge leading to programs and policies capable of narrowing the gaps.

Theoretical Framework

A variety of theoretical perspectives, each with its own disciplinary tradition, have been employed to understand how race/ethnicity and poverty affect children's schooling outcomes. However, while each of these perspectives has its own particular emphasis, they are essentially all grounded in a concern for the resources that parents have available for parenting, and the life stressors that may make successful parenting difficult to achieve. These resources and stressors include those stemming from educational, social, economic, cultural, and psychological factors. In general, families with higher social status (measured by education, income, and occupation) and those embedded in stronger networks of social relationships have more resources available for parenting, experience

fewer social stressors, and can use their resources to ameliorate the effects of stressors. By contrast, families closer to the bottom of status hierarchies, and those embedded in fewer and/or weaker networks of social relationships, have fewer resources for parenting and dealing with stress, while experiencing more powerful negative stressors in their daily lives.

Family economic status is a common beginning point for analyses in this tradition. Economists tend to emphasize the parental economic resources that are available to be invested in the human capital of their children (Becker 1981). Psychologists and sociologists, as well as some more eclectic economists, have also focused on income, but have been more interested in its absence – families in poverty – as a determinant of the daily life stressors that make parenting difficult (McLoyd 1990; Duncan and Brooks-Gunn 1997; Mayer 1997).

A second resource is whether or not the child's parents are a co-resident married couple. Single parent households not only tend to have fewer financial resources than two-parent households, but they also have half the amount of parental time and other parental non-monetary resources (such as social contacts) available for care-giving. It is therefore not surprising that, after statistically adjusting for the effects of other variables, children raised in single-parent households tend to have less positive outcomes than children from two-parent families (McLanahan and Sandefur 1994; McLanahan 1997; Carlson and Corcoran 2001; McLanahan, Donahue, and Haskins 2005).

A third resource is the educational level of parents, and related to this, parents' cognitive skill level. Well-educated parents tend to have greater financial resources to be used in parenting and coping with the stresses of daily life. They also tend to have a

greater focus on promoting the cognitive and educational attainment of their children, as well as the skills and knowledge necessary to do so (Lareau 2003). Further, their children likely inherit above-average cognitive ability from them. Essentially all empirical studies have found that parents' educational performance and attainment are strongly and positively associated with the performance and attainment of their children (Jencks et al. 1979; Duncan and Brooks-Gunn 1997; Entwisle, Alexander, and Olson 1997; Jencks and Phillips 1998; Duncan and Magnuson 2005).

Thus, whether or not both parents are present in the household, as well as the levels of parental education and income, have been found to be *the* primary determinants of children's outcomes. When there are two parents, and their educational, income, and occupational levels are high, a rich set of resources – financial, cognitive, social, emotional, and psychological – are available to achieve high educational aspirations for the child. By contrast, single parent households in which parental education and income are low have far fewer resources that can be devoted to parenting, and at the same time are more exposed to negative stressors from everyday life. They are thereby much less able to prepare their children for success in school.

In addition, parental household structure, education, income, and occupation are correlated with other variables that tend to magnify their effects. Thus, single parents who are high school dropouts and have low earnings are also more likely to be teenage parents, to suffer from inadequate health care, to be depressed and to have other psychological, behavioral, and health-related problems, to reside in unsafe neighborhoods, and to send their children to substandard schools. When these and related risk factors cumulate, the results for children can be devastating.

The factors just described are relatively exogenous to parenting itself. They provide the setting within which parents' time and effort can be employed to help their children develop those cognitive skills and behavioral habits that lead to success in school and subsequent employment. However, different theoretical traditions have emphasized different aspects of parenting as being more or less crucial to children's development.

Perhaps the most widely-used perspective builds on the work of Bradley and Caldwell (1984a, b) to conceptualize and measure parenting along three dimensions – the learning, physical, and emotional warmth environments provided in the home. An additional perspective investigates parental social support, depression, and active behavioral coping (Moos et al. 1986). The home learning and emotional warmth environments have been found to exert positive effects on children's cognitive development, and the learning environment and parental active behavioral coping have been found to reduce child externalizing behavior problems (Phillips et al. 1998; Duncan, Brooks-Gunn, and Klebanov 1994; Farkas and Beron 2004; Brooks-Gunn and Markman 2005). These and related variables have also been found to fully account for the effects of poverty on child outcomes (Guo and Harris 2000, and the papers cited above).

Variants of this perspective typically focus on one or another detailed aspect of parenting. One such perspective, derived from developmental psychology and research on the early development of literacy skills, stresses parental oral language and its use with children. Hart and Risley (1995, 1999) showed that, for children between 12 and 36 months of age, better educated parents converse far more with them, using a much richer vocabulary, than do less well-educated parents. As a consequence, by 36 months of age

the children of the better educated parents had developed far more extensive vocabularies than those raised by less educated parents. These social class differences in vocabulary are maintained as the children age from 3 to 13 years of age (Farkas and Beron 2004). It has also been shown that the child's preschool oral vocabulary, as well as other preschool oral language skills, are the primary determinants of reading success in early elementary school (Whitehurst and Lonigan 2002; NICHD Early Child Care Research Network 2005; Brooks-Gunn and Markman 2005). In addition, early elementary school success – along both cognitive and behavioral dimensions - has schooling effects that carry through to the end of high school, and beyond (Ensminger and Slusarcik 1992; Alexander, Entwisle, and Horsey 1997; Entwisle, Alexander and Olson 1997; Duncan et al. 1998; McLeod and Kaiser 2004).

Research has also shown that higher parental social class status, particularly higher levels of parental education, is positively associated with higher levels of early mathematics skills by their children (Downey et al. 2004; Duncan and Magnuson 2005; Farkas and Hibell forthcoming). Whether or not this is a result of specific instruction provided by better-educated parents has yet to be ascertained.

In a different, but related, research tradition, Lareau (2003) has reported on how higher SES parents schedule their children for a great many activities, and in general focus on the “concerted cultivation” of their children’s skills, abilities, and behaviors. (For supporting quantitative evidence, see Farkas and Hibell, forthcoming.) By contrast, Lareau observes that lower SES parents view their role as permitting their children to “accomplish natural growth,” which involves far less stimulation of specific, school-relevant skills and behaviors. This connects to the cultural capital research tradition,

where higher SES parents transfer school-relevant skills, habits, and styles to their children (Swidler 1986; Lamont and Lareau 1988; Farkas et al. 1990; Farkas 1996; Lamont and Small, this volume).

Finally, another related research tradition demonstrates that the skills and behaviors that higher SES and two parent families inculcate in their preschool children transfer almost immediately to placement into higher ability groups in elementary school, which in turn raises the student's school engagement and academic performance, setting her or his academic trajectory on a steeper growth slope (Alexander, Entwisle, and Dauber 1993; Pallas et al. 1994; Marks 2000; Carbonaro 2005; Tach and Farkas, forthcoming). Once ability and curriculum group placement are in place to reinforce the higher academic performance and school engagement of more advantaged students, the gap between their performance and that of less advantaged students continues to increase as students move to higher schooling levels (Kerckhoff and Glennie 1999).

Figure 1 summarizes the resulting theoretical perspective. Parental and family resources, combined with family and neighborhood stressors and risk factors, determine the child's learning engagement and cognitive achievement during each of the stages – preschool, elementary, middle, and high school. Learning engagement and cognitive achievement during each of these time periods also determine these variables during the following period. These cumulate into trajectories of academic achievement, so that, by the end of high school, students from more advantaged backgrounds are advancing much more successfully toward college, advanced degrees, and highly placed and rewarded employment. The emphasis is on the student's engagement with learning in school, as well as actual learning achievement – measured by test scores – in grades K-12, because

studies have shown that these variables are highly correlated with course grades during this time period, and that engagement, achievement, and course grades are the primary determinants of high school graduation, college attendance and graduation, the achievement of subsequent educational credentials, and labor market success (Jencks et al. 1979; Farkas 1996, 2003; Rosenbaum 2001).

Figure 1 about here

Measurement and Data

The most important measurement instruments in this research area have been created by developmental and educational psychologists, and then administered as part of the collection of nationally representative databases. For cognitive development, the central measures have been (a) the Peabody Picture Vocabulary Test – Revised (PPVT-R) administered during the Infant Health and Development Program (IHDP) and National Longitudinal Survey of Youth 1979 (NLSY79) data collection efforts, (b) the reading and mathematics performance measures collected as part of the National Assessment of Educational Progress (NAEP), National Educational Longitudinal Survey (NELS), and Prospects Studies, and (c) the reading, mathematics, and general knowledge measures collected as part of the Early Childhood Longitudinal Study -- Kindergarten Cohort (ECLS-K). For learning-related behavior, the central measures have been (a) items derived from the Behavior Problems Index of the Achenbach Child Behavior Checklist, producing scales of Externalizing and Internalizing Behavior Problems, rated by mothers on the IHDP, NLSY79 and ECLS-K datasets, as well as rated by teachers on the ECLS-K data, (b) measures of child behavior in the Early Childcare Network studies, (c) measures of “Approaches to Learning,” “Self-Control,” and “Interpersonal Skills,” rated

by teachers on the ECLS-K, and (d) teacher judgments of student learning-related behaviors, as well as student self-reports of these, collected on the NELS.

The cognitive assessments emphasize academic skills that both contribute to and include those that are taught in school. The PPVT measures one of the earliest-developing of these skills -- listening (receptive) oral vocabulary. It is administered one-to-one to children as young as three years of age. A word is said to the child, and she or he must select one of four pictures that best illustrates the word. The number right is a direct measure of vocabulary size. From 1986 to the present, the PPVT-R has been administered to all children born to female members of the NLSY79 sample, as they aged from 3 to 14 years of age. At the end of the 1980s it was also administered to three and five year olds studied as part of the IHDP, a study of low birthweight children in eight cities.

Reading and mathematics tests, focused on the skills taught in school, are administered on a regular basis to a nationally representative sample of 9, 13, and 18 year-olds as part of the NAEP assessments. Similar tests were used in the Congressionally-mandated Prospects Study of Title I Program effectiveness, as well as in the NELS study of a representative sample of 8th, 10th, and 12th graders.

The ECLS-K study focused on a nationally representative sample of children enrolled in kindergarten in 1998. They were given Item Response Theory (IRT)-based tests of reading, mathematics, and general knowledge in kindergarten, first, third, and fifth grade, and will be followed through to twelfth grade. As in the NAEP, NELS, and Prospects studies, these tests are based on standard test items appropriate to the student's grade level in school.

Where behavior is concerned, externalizing behavior problems refer to outward-directed aggressive or disobedient behaviors (survey items include: cheats or tells lies, bullies or is cruel/mean to others, is not sorry for misbehaving, argues too much, and so on). Internalizing behavior problems refer to inward-directed feelings such as depression or moodiness (items include is unhappy, sad, or depressed, feels worthless or inferior, and so on). NLSY79 mothers rated their children aged 4 – 14 on these behaviors. These scales were also collected on the IHDP, the ECLS-K, and other data sets. Further, the ECLS-K had elementary school teachers rate each student on a scale called Approaches to Learning. This included items on attentiveness, task persistence, eagerness to learn, learning independence, flexibility, and organization. I have found that when these items are combined into the scale Approaches to Learning, it is the best among the behavior measures on this database in predicting achievement, net of prior achievement.

Inequality in Family Resources

Children from different race/ethnic backgrounds are, on average, raised in households possessing enormously different resources. These are in many cases so different, and are correlated with so many additional unmeasured variables, as to render our main goal – understanding the determinants of academic achievement differences across race/ethnic groups – quite difficult.

Table 1 summarizes some of these differences in family circumstances, using ECLS-K data for children enrolled in kindergarten in 1998. Among Asians, only 10 percent of children are being raised in a single-parent household. Among Whites, it is 15 percent. Thus the overwhelming majority of Asian and White children are receiving the attention, interaction, instruction, monitoring, and financial resources of two resident

parents. Among Hispanics, the percent raised by a single parent rises to 27, and among African-Americans, to 54. These are large inter-group differences in a characteristic that is negatively correlated with social class, is a powerful indicator of living in poverty, and has been found to have significant negative effects on child outcomes (McLanahan and Sandefur 1994; McLanahan 1997; McLanahan, Donahue, and Haskins 2005). It is perhaps not surprising that the rank order of groups on this characteristic – Asians, Whites, Hispanics, and Blacks – is also the rank ordering that we shall observe on many child outcomes.

Table 1 about here

We see that fully 42 percent of African-American children are being raised in poverty. For Hispanics the figure is 37 percent, and for Whites, 10 percent. Social class is a composite measure taking into account parents' levels of education, occupation, and income. It is constructed to have a mean of zero and a standard deviation of one. As was the case for two parent families, we find that Asians have the highest average score on this variable, 0.5, with Whites coming second, at 0.2. Hispanics average -0.4, and Blacks average -0.5. Thus the Asian average is a full standard deviation above that for African-Americans, with each group being distributed around the group average. Of these distributions, the most spread-out is for Asians, who have larger shares at both the highest and lowest SES levels. Hispanics have the narrowest distribution, relatively tightly distributed around its mean. With a higher average SES and percentage of two parent families than Whites, it is not surprising that Asian students out-perform Whites in school. Nor is it surprising that, with much lower SES and percentage of two parent

families, African-American and Hispanic students have lower school performance than Whites.

A major disadvantage for the children of immigrants is the likelihood that their parents are non-English speaking. This is a major challenge to parents' ability to prepare children for, and assist them with schoolwork. Significant shares of this characteristic are found only among Hispanics (30.7 %) and Asians (50.5%), and can be expected to depress the performance of children from these groups.

Reflecting the high share of immigrants from less developed countries where educational attainment is low, 35 percent of Hispanic mothers did not complete high school. For African-Americans the figure is 18 percent, and for Whites, 7 percent. Twenty-two percent of African-Americans were teenage mothers. For Hispanics the figure is 19 percent, and for Whites, 10 percent. Fully 20 percent of African-American mothers have symptoms of depression. For Hispanics the figure is 13 percent, and for Whites, 11 percent. Fifteen percent of the African-American children had low birth weight. This was true of 8 percent of Hispanics and 6 percent of Whites. Low birth weight is associated with health, cognitive, and behavior problems, and increased chances of learning and emotional disabilities (Reichman 2005).

Overall, 29 percent – almost a third -- of African-American children were being raised in households with four or more hardships; comparable figures for Hispanics and Whites were 18 percent and 4 percent, respectively. Since the presence of multiple family hardships is one of the most powerful predictors of early school unreadiness (Duncan and Magnuson 2005; Farkas and Hibel, forthcoming), we can expect particularly large readiness gaps among African-American children, compared to Whites.

Also included in this table are two measures of household material resources that likely impact the child's preparation for, and performance in, school. The first of these is the number of children's books in the home and available for the child to use. The highest average is found in White households, 93.1 books. Next come Asians, with 55.8, and Hispanics, with 52.5. For African-Americans, the average is 39.6. A computer is owned by 65.7 percent of Whites, 64.8 percent of Asians, 41.5 percent of Hispanics, and 32.9 percent of African-Americans. Of course, the number of children's books and ownership of a home computer are very imperfect measures of the relative resources and effort that parents devote to helping their child prepare to succeed in school. However, they are likely to be positively correlated with those detailed aspects of parent-child interaction and the home environment that have been shown to positively affect school readiness and performance. These include the parents' vocabulary and grammar, and the nature of parent-child verbal and non-verbal interaction. They also include the amount of time the child is read to, and the amount of formal and informal instruction the child receives from the parent and other caregivers (Hart and Risley 1995, 1999; Lareau 2003; Hoff 2003; Farkas and Beron 2004; NICHD Early Child Care Research Network 2005; Brooks-Gunn and Markman 2005; Farkas and Hibbel forthcoming).

In addition to cognitive instruction, behavioral socialization is also important. Indeed, when combined with cognitive skills, these behavioral habits constitute important aspects of the child's cultural and human capital (Farkas 1996; 2003). For a child to be ready to succeed at school, he or she must be able to sit still, pay attention, and concentrate on their own tasks without disturbing others. Some households are much more successful than others in inculcating these skills, habits, and behaviors, and they are

the same households that have more abundant parental resources of time, skills, and money (Campbell and von Stauffenberg, forthcoming).

The Preschool Period

During the preschool period, unequal parental resources and behaviors produce unequal cognitive and behavioral outcomes for children. The process begins as early as the end of the first year of life, when the child typically utters her or his first words. Between 12 and 36 months of age children work to establish their place within the family conversational culture. They begin barely able to speak, but two years later emerge as full-fledged conversational participants, able to “hold the floor” in conversation with other household members. By this time they have internalized family vocabulary and speech patterns, as well as the habits of thought and behavior associated with these. And these vary enormously by social class background. Central to differential parenting by SES background are the differential vocabulary and oral language skills possessed by parents with different educational backgrounds, and their differential use of these linguistic resources with their children. Hart and Risley (1995, 1999) showed that by 36 months of age, professional parents had addressed more than 30 million words to their children, whereas for low income parents, the comparable figure was below 10 million. Further, better educated parents used a more extensive vocabulary with their children, and involved them in more fully interactive, interrogatory, and direct instructional conversations. As a consequence, Hart and Risley found that by 36 months of age, children differed markedly in their spoken vocabulary usage, with children from professional parents using a vocabulary more than twice as large as that of children from low-income families. (For further evidence see Hoff, 2003.)

Farkas and Beron (2004) extended this research by using PPVT scores from the NLSY79 data to estimate oral vocabulary growth curves for African-American and White children as they aged from 3 to 14 years of age. The result is shown in Figure 2. Here, the estimated regression coefficients are used to show typical growth profiles for Black and White children who have had their social class backgrounds equated to either the typical low or high value of Black SES (one standard deviation below or above the Black mean). We see that when these children were first tested at 36 months of age, substantial differences in oral vocabulary knowledge already existed across social class and race groups. As children aged into the teenage years, these early vocabulary gaps were maintained relatively unchanged. (For further discussion, see Farkas and Beron 2004 and Farkas 2004. Hispanic and Asian children could not be included in this study because of measurement problems associated with the high percentage of these groups in non-English speaking households.)

Figure 2 about here

Much research has focused on those preschool and kindergarten skills that best predict the student's success in early elementary school reading performance. The most important predictors are oral vocabulary size, knowledge of the alphabet, letter-sound linkages, and phonological processing skills (sensitivity to, and manipulation of the sounds in spoken words). Stronger skills on the latter two dimensions are often associated with a larger vocabulary size, so that the more extensive and complex linguistic environment of higher SES households serves as a powerful determinant of early school success for these children (Whitehurst and Lonigan 2002; Durham, Farkas et al. 2004; NICHD Child Care Network, 2005). For research showing that the language gap

between Whites and Blacks fully explains the reading gap between these groups, see Beron and Farkas (2004).

Of course, more than complex vocabulary instruction occurs in higher SES families (and their daycare providers) during the preschool ages. As documented by Lareau (2003) and others, higher SES parents treat child-raising as a process involving the active cultivation of the child's skills and knowledge. The material to be inculcated is wide-ranging, including such disparate subjects as the names for and uses of colors, objects, foods, shapes, numbers, and so on. In combination with differential language use, these SES differences in preschool child activities and instruction lead to relatively large SES differences in children's cognitive readiness for school.

Similar phenomena occur on the behavioral side. Research has found a greater incidence of child behavior problems reported by lower SES and African-American mothers. This is at least partially because these families experience greater adversity and typically have fewer resources to cope with these difficulties, leading to less successful parenting. It may also be associated with the greater use of physical discipline in these families (McLoyd 1990, 1998; Duncan et al. 1994; McLeod and Nonnemaker 2000; Bradley et al. 2001; McLoyd and Smith 2002), although this issue is controversial. (For arguments and evidence that physical discipline is less damaging to African-American than to White children, see Deater-Deckard, Dodge, and Sorbring, 2005.) Low-income families also tend to employ lower quality and/or a greater quantity of non-maternal childcare, and a study by the NICHD Early Child Care Research Network (2003) found more behavior problems in preschool children who experienced such non-maternal childcare. These researchers also found that, net of such childcare, lower SES and

African-American children show greater behavior problems in the preschool period. (These findings may depend on whether the behavior problems measure is reported by a preschool caregiver, a kindergarten teacher, or by the child's parent. Downey and Pribesh (2004) find that, in ECLS-K data, White kindergarten teachers report more behavior problems among Black students than do Black kindergarten teachers. However, the NICHD study does not report results that control the race of the caregiver or teacher.)

Thus, since family child-rearing culture is affected by social class, and since different race/ethnic groups have very different social class distributions, it is not surprising that children from these groups arrive at kindergarten with very different levels of cognitive and behavioral readiness.

School Readiness

The cognitive skills that teachers want students to have at the beginning of kindergarten include, on the pre-reading side, oral vocabulary knowledge, letter-sound knowledge, and phonological awareness (particularly the ability to identify the beginning sounds in spoken words). On the pre-mathematics side they include knowledge of shapes, numbers, and simple counting. The NLSY79 and IHDP surveys administered vocabulary tests to preschool children in the 1980s and 1990s. The ECLS-K administered tests of these skills to a national sample of children entering kindergarten in 1998. The results showed that, on average, the highest scores were earned by Asians, followed in order by Whites, African-Americans, and Hispanics. The magnitudes of the racial gaps are shown in Table 2.

Table 2 about here

The gaps are measured in standard deviation units, with Whites as the reference category. The largest gaps are found for oral language vocabulary, with the Black-White gap being more than one standard deviation. (This may be at least partially due to the fact that the NLSY79 and IHDP samples overrepresented more disadvantaged families.) The ECLS-K reading test shows African-Americans 0.40 standard deviation, and Hispanics 0.43 standard deviations, below Whites. (The Hispanic gap would be larger, but students with very weak oral English language skills were excluded from testing.) Asians begin kindergarten with higher reading and mathematics scores than Whites.

Where behavior is concerned, Whites score approximately 0.4 standard deviation higher than African-Americans on Approaches to Learning and Self-Control, and 0.3 standard deviation lower than African-Americans on Externalizing Behaviors. The two groups are close to one another on Internalizing Behaviors. Among these behaviors, teachers' judgments of students' approaches to learning – including attentiveness, ability to focus, flexibility, organization, eagerness, and independence - is the most important, since when the student behavior variables (approaches to learning, internalizing and externalizing behavior problems, and self control) are included together in an equation to predict later achievement, only the approaches variable shows strong effects (author's calculations and Tach and Farkas, forthcoming). Further, although Downey and Pribesh (2004) show that the White-Black gap on Externalizing Behaviors is significantly higher when the teacher is White rather than Black, they find that the Approaches gap is the same whether the teacher is White or Black. (In separate calculations, I have found the same result.) There is also a White-Hispanic gap, but of smaller magnitude, on Approaches to Learning and Self-Control.

Table 3 examines race gaps in these behaviors in greater detail, using three items from the Approaches scale – persists at tasks, seems eager to learn, and pays attention.

Table 3 about here

We see that 81 percent of Asian kindergartners are rated by their teachers as persisting at tasks. Comparable figures are 75% for Whites, 67% for Hispanics, and 61% for Blacks. Similar race gaps are observed for “seems eager to learn” and “pays attention.” These emotional and behavioral maturity measures – key features of school engagement - are quite important for success in school. Indeed, in calculations I have performed with the ECLS-K data, the lower performance of Blacks compared to Whites on these measures of learning-related behaviors explains a very significant share of the widening White-Black achievement gap as students move up through the elementary school grades.

Let us summarize what we have learned about race gaps in school readiness. On the cognitive side, African-Americans and Hispanics begin kindergarten approximately 0.5 standard deviation below Whites and Asians in reading and mathematics. African-Americans also begin schooling with Approaches to Learning behaviors approximately 0.4 standard deviation below Whites; for Hispanics the comparable figure is 0.2. In a comprehensive previous study, Phillips et al. (1998) concluded that for Blacks, the early cognitive skills gap of 0.5 standard deviation grows to a full standard deviation by 12th grade, so that approximately half of the final gap occurs in the preschool period, and the other half occurs after students begin schooling. In the following section, I focus on the magnitudes and determinants of achievement growth trajectories after students begin their schooling.

Achievement Growth

Table 4 shows the magnitude of the reading, mathematics, and science achievement gaps, in standard deviation units, that are observed for the different race/ethnicity groups by the spring of third grade. (These have been calculated from the ECLS-K data.) The largest gaps are for African-Americans, who are 0.7 standard deviation below Whites in reading, 0.9 standard deviation below Whites in mathematics, and 1.0 standard deviation below Whites in science. By contrast, Hispanics show stronger achievement growth during this time period, so that their gaps with Whites are only about half of these magnitudes. Gaps for Asians are much smaller, and are essentially insignificant for reading and mathematics.

Table 4 about here

How important, in practical terms, are these gaps? One way to gain some perspective on this is to look at achievement on the specific skill measures underlying the composite scales used in the ECLS-K data collection. One such measure is mastery of multiplication and division, from the mathematics assessment. By the spring of third grade, 84 percent of Whites, 83 percent of Asians, and 75 percent of Hispanics had achieved such mastery. However, only 58 percent of African-Americans had achieved mastery (Rathbun and West, 2004). These are the sorts of important gaps in practical skills, occurring for higher level skills at higher grade levels, which underlie the important White-Black and White-Hispanic achievement gaps.

Fitting growth curve models to the ECLS-K data for the same children as they age from the fall of kindergarten through spring of first grade, Downey, von Hippel, and Broh (2004) have shown that attending school *does* matter for cognitive achievement. All

students learn significantly more when school is in session than during the summer. And individual achievement inequalities tend to increase less when school is in session than during the summer; that is, they are decreased by schooling. As for trends in race/ethnic group achievement gaps as children age, these calculations show that, when school is in session between approximately September and June, these gaps tend to increase for Blacks, decrease for Asians, and stay relatively unchanged for Hispanics.

The finding that the black-white cognitive skills gap is not only significant when schooling begins, but also widens substantially as children move up through the grade levels, was first reported by Phillips, Crouse, and Ralph (1998), utilizing a variety of data sets. The ECLS-K calculations presented by Downey et al. further corroborate this result. Both sets of authors also report that the reasons for this finding are somewhat mysterious – most variables show little ability to explain the increasing gap. And yet, some variables are obvious candidates for this task. To learn successfully, students need adequate basic skills, a good quantity and quality of instruction, an appropriate level of attentiveness and effort, and parental support. Yet, as compared to Whites, African-American students begin school with lower basic skills, lower attentiveness and effort, typically come from a family with very much lower SES, and typically attend lower quality schools. At least some of these factors likely account for the lower gains of African-American students during grades K – 12. However, Downey et al. report that little of this increasing White-Black gap is explained by school-level variables. Further, as reported by Bodovski and Farkas (2005), Black kindergartners are *not* disadvantaged by the instruction they receive. Indeed, because full day kindergarten is more common in schools with a high percentage of African-American students, these students actually receive, on average,

more hours of instruction than White students. An area where school structure *does* contribute to the White-Black gap is the use of ability grouping by teachers. Tach and Farkas (forthcoming), analyzing ECLS-K data, find that, because of the lower reading and mathematics achievement with which Black students enter Kindergarten, they are placed into lower ability groups than Whites, and this placement contributes to the widening White-Black achievement gap as students age. Further in ongoing analyses of the ECLS-K data, I am finding that the lower school engagement (“approaches to learning”) ratings that African-American students receive from their teachers explain a significant share of their lower test score growth during the K-3rd grade period.

What about immigrant status, and its effect on school achievement and ethnic/racial achievement gaps? This issue can be examined by using the NAEP test score data collected by the National Center for Education Statistics. These data include information on whether or not the student is a second language learner, thereby identifying a major handicap often experienced by recent immigrants to the United States. Table 5 shows average reading and mathematics test scores for public school students sorted according to their race/ethnicity and second language learner status, separately for fourth and eighth graders in 2005. (There were too few second language twelfth graders to calculate reliable performance scores for them.) It also shows the performance gap between each group and the comparison group – White, native English speakers.

Table 5 about here

Among White fourth graders, the second language learner gap is 27 points in reading, and 17 points in mathematics, a pattern consistent with the fact that reading is

more language-intensive than mathematics. Among Black fourth graders who are proficient in English, we find reading and mathematics gaps of 29 and 26 points, while the gaps for English-proficient Hispanic fourth graders are slightly more than half these magnitudes. When English language proficiency is not an issue, the greater resources possessed, on average, by Hispanic versus Black families produce these differential outcomes. However, the achievement gaps for Black second language learners are similar to those for Hispanic second language learners. In this case, the additional hardship of being a second language learner appears to be larger for Hispanics than for Blacks. Overall, there is a performance decrement associated with being Black or Hispanic, and an additional decrement associated with being a second language learner. The results are consistent with our overall model of family and individual resource and risk factors – the fewer the resources and the greater the risks, the lower the school performance.

Asian fourth graders with no English deficit out-perform Whites in both reading and mathematics. This is not surprising, particularly since, as shown in Table 1, Asians have higher average SES and a higher percentage of two-parent families than Whites. However, as with the other groups, Asian second language learners suffer performance deficits, although more in reading than in mathematics. In general, Asian and White second language learners show quite similar performance levels.

Performance patterns for eighth graders are generally similar. However, particularly large performance gaps are observed for Black and Hispanic second language learners. These students, who, by eighth grade, have not mastered English, have likely missed a great deal of their education, and/or have been educated in less developed countries where the instructional level is significantly below that of the United States.

What about possible interactions between gender and race? It is typically found that girls perform better than boys in reading, a pattern that is reversed for mathematics. But do these gender gaps differ across race/ethnicity groups? This question is answered by Table 6, which uses NAEP data to show the male-female test score performance gap, separately for each race/ethnicity group.

Table 6 about here

We see that it is indeed the case that the gender gap favors girls in reading, and boys in mathematics. However, the male advantage in mathematics is quite small, whereas the female advantage in reading tends to be substantial across all race and grade combinations. It is particularly large for 12th grade Whites, due to the extraordinary high reading performance of 12th grade White girls.

Achievement Gap Trends

Since publication of the papers in *The Black-White Test Score Gap* (Jencks and Phillips, 1998), and even more strongly since passage of the *No Child Left Behind* (NCLB) Act in early 2002, there has been unprecedented attention to the details of over-time trends in racial gaps in educational inequality. Since passage of the NCLB, most of the more than 16,000 local school districts in the U.S. have for the first time experienced strong pressures to narrow these gaps. Also, following a report of the National Research Council (Snow, Burns, and Griffin, 1998), there has been a nationwide emphasis, led by the U.S. Department of Education, on the implementation of “evidence based reading instruction” in early elementary school. This has been accompanied by efforts to improve the school readiness instruction provided by Head Start and other preschool programs (Whitehurst and Massetti 2004). Are these efforts having any effect in narrowing the White-Black and

White-Hispanic achievement gaps for K-12 students? The answer is provided in Table 7. (This table is based on results for Whites, Blacks and Hispanics. Results for Asians were not reported in the historical trends analyses conducted by the NCES.)

Table 7 about here

This table reports the results of the long-term trends project conducted by the National Center for Education Statistics, using its uniformly scaled NAEP examination data in reading and mathematics, administered to representative national samples of students from 1973 to 2004. I will summarize the trends in these scores for three time periods: 1973 – 1988, 1988 – 1999, and 1999 – 2004.

Table 7 shows that during most of the 1970s and 1980s, the reading and mathematics gaps narrowed at all ages and for both Blacks and Hispanics. For example, between 1975 and 1988, the White-Black reading performance gap fell from 35 to 29 points among 9 year olds, from 36 to 18 points among 13 year olds, and from 52 to 26 points among 17 year olds. Similar declines occurred for the White-Black mathematics gap, and for the White-Hispanic gaps in each subject. Hedges and Nowell (1998) and Grissmer, Flanagan, and Williamson (1998) undertook extensive analyses in an effort to identify the forces that helped narrow these gaps. However, these efforts were relatively unsuccessful. (For example, demographic trends, such as those related to family characteristics, do not explain the trends.) Thus far, no clear explanation for these declining White-Black and White-Hispanic achievement gaps, supported by detailed data analysis, has emerged.

The 1990s tell a very different story. For both reading and mathematics, for both Blacks and Hispanics, and for all age groups, the achievement gap with Whites either

remained unchanged, or increased somewhat. The reasons for this abrupt end to the positive trends of the 1970s and 80s also remain a mystery. The only explanation that Grissmer, Flanagan and Williamson (1998) can offer is that Black teenage violence was at a particularly high level during this time period. However, it is doubtful that this explanation can explain relative achievement losses at all age groups, and among Hispanics as well as African-Americans.

The five years from 1999 to 2004 tell yet another story. Achievement gaps have begun narrowing again, most strongly and ubiquitously for 9 year olds, where the trend is observed for both African-Americans and Hispanics in both reading and mathematics. African-American 13 year olds also narrowed the gap in both reading and mathematics, but Hispanic 13 year olds did not. Finally, among 17 year olds, Blacks showed small gains in reading and mathematics. Hispanics did not gain; in fact they appear to have lost ground.

The U.S. Department of Education attributes at least portions of these gains to NCLB, with its explicit focus on holding local school districts accountable for narrowing these achievement gaps. Some support to this view is provided by the fact that NCLB has been accompanied by a sharp focus on “scientifically based reading instruction,” which in practical terms has meant more emphasis on explicit instruction in basic skills during preschool and early elementary school. Since achievement gaps have narrowed most substantially among 9 year olds (fourth graders), it may be that this emphasis on both narrowing gaps and doing so by improving instruction, has been successful. (However, since more emphasis has been placed on early reading than on early mathematics instruction, the narrowing of gaps in the latter subject remains unexplained.)

Alternatively, the narrowing of achievement gaps between 1999 and 2004 may be at least partially a delayed consequence of the effect of the booming 1990's economy in narrowing employment and earnings gaps between Whites and the other race/ethnic groups. Further, we must recognize that the five years from 1999 to 2004 is a relatively narrow time period compared to the previous time periods examined. It remains to be seen whether these gains will be maintained and/or extended during subsequent time periods.

Intervention Programs

NCLB aims to improve school performance for all K – 12 students nationwide. While it contains provisions and policies focused on narrowing achievement gaps for groups defined by race/ethnicity, it can have no effect on the gaps that already exist when students begin kindergarten. Narrowing these gaps is the task of compensatory preschool intervention programs. Head Start is the only such program implemented on a large scale.

However, there is evidence that, since its inception in 1966, Head Start has had an insufficiently strong emphasis on instruction, and that as a consequence it has achieved at best modest-sized cognitive gains for participants (Whitehurst and Massetti 2004).

Perhaps the best evidence on current magnitudes of Head Start effect is provided by the recent Head Start Impact Study, a designed experiment in which some low-income students were randomly assigned to Head Start, while others were not.

The impacts on four-year-olds are shown in Table 8. We see that of six standardized tests, Head Start had no significant effect on three. For the other three tests it did have a significant positive effect, but with an effect size of about 0.2. This means that the program raised students' performance by .2 of a standard deviation on each of these tests.

Since, for example, preschool White-Black cognitive skills gaps may approximate one standard deviation, effects of this magnitude narrow these gaps by only about 20 percent for three of the tests, and not at all for the other three. Head Start effects will have to increase substantially in size and scope if the program is to substantially narrow White-Black and White-Hispanic preschool academic readiness.

Table 8 about here

As for the effects of Head Start on the problem behaviors, social skills and approaches to learning, or social competencies of four-year olds, no significant effects were found. Here too, the program will have to improve its performance if it is to play a significant role in reducing poverty and race/ethnic disparities.

A relatively large number of small, experimental preschool intervention prototypes have been tried over the past 40 years. Some appear to produce larger effects than Head Start, including effects that persist through to adulthood. However, the findings on these programs are mixed, and sometimes contradictory. Further, most effects become smaller as children age (Brooks-Gunn 2003). While it is possible to view the evidence on these programs in a positive light (Magnuson and Waldfogel 2005), it is disappointing that 40 years of research in this area have not produced greater success in narrowing the school readiness gaps of children from low-income families.

President Johnson's 1966 "War on Poverty" was built around two programs – Head Start, to narrow the preschool achievement gap between poor and non-poor children, and Title I of the Elementary and Secondary Education Act (of which NCLB was the 2001 reauthorization), to narrow this gap during elementary school. Current funding for Head Start is approximately \$5 billion; funding for Title I is more than twice

this level. Yet, as noted above, the effects of Head Start are, at best, modest. Worse, the effects of Title I have been essentially nonexistent (Farkas and Hall 2000).

Why has Title I been ineffective in raising the elementary school performance of disadvantaged students? As discussed by Farkas and Hall, this program has always been more of a funding stream than a structured program. In low-income schools, the lowest performing students were pulled-out in groups of 3 – 8 or more students, to work with specially-designated teachers. Unfortunately, these teachers had little effective curriculum or training, the students were at different performance levels and had different learning problems, their school engagement was often poor, and the resulting program was stigmatizing and demoralizing. Meanwhile, students in the regular class were moving ahead. Little wonder that the program was largely ineffective.

Beginning around 1990, a number of smaller scale programs began trying to develop more successful intervention models for at-risk elementary school students. Many of these focused on structured curricula, and one-to-one tutoring in reading and language arts. Such programs have been able to show effect sizes in the .25 - .50 standard deviation range (Farkas 1998; Invernizzi 2002; Borman et al. 2005). Now that NCLB has greatly increased funding for supplemental educational services, including tutoring, it seems possible that these services will be deployed on a much larger scale than previously. However, the expansion of tutoring services under NCLB is only now occurring, and the evidence on the effects of these services is not yet in (Farkas and Durham, 2006).

As for intervention programs to assist middle and high school students with their schoolwork, systematic work on such programs, accompanied by program evaluations

with adequate research designs, is just beginning. This is a likely growth area in the years ahead.

Conclusion

We have seen that African-American and Hispanic students are raised in families that have, on average, many fewer resources than those of White and Asian families. These families and students also experience far more negative stressors than Whites and Asians. These resource and stressor gaps have a dramatic effect in creating relatively large pre-reading, pre-mathematics, and behavioral readiness gaps between the groups during the preschool years. Once school begins, the Black-White achievement gaps widen further. However, the Hispanic-White achievement gap does not widen. It seems likely that Hispanics do better than Blacks during the schooling years because they overcome their most important risk factor – lack of English language proficiency. By contrast, the most important problem for African-American families may be their high share of single parent households, and the low resources and high risk factors associated with this. On the other hand, Hispanics have a particularly high rate of school dropout, the determinants of which are poorly understood.

Since comparable data were first collected in the early 1970s, the White-Black and White-Hispanic achievement gaps have narrowed substantially. This occurred in three phases, with improvement during the 1970s and 1980s, stagnation during the 1990s, and the resumption of improvement from 1999 to 2004. The determinants of these trends are not well understood either, although it is plausible that the very recent improvements are at least partially due to a combination of *No Child Left Behind* and a delayed effect of

the relative economic gains experienced by Blacks and Hispanics during the economic boom of the late 1990s .

At present, the most urgent need is for research and development that can help to maintain and improve upon recent success in narrowing the White-Black and White-Hispanic achievement gaps. Such research will focus on policies, programs, interventions, and other mechanisms for educational improvement, particularly in neighborhoods and schools serving high percentages of low income African-American and Hispanic students. Separate efforts are needed in the areas of preschool, elementary school, and middle and high school. I discuss each of these in turn.

Head Start is by far the largest compensatory preschool program aimed at low-income children. But, as shown in Table 8, its effects are modest. This is not surprising, since after almost 40 years of operation, the program still has no mandated curriculum. It is imperative that Head Start be reformed to achieve stronger effects. Unfortunately, efforts to do so continue to be embroiled in political struggles (Zigler and Styfco 2004). Given the importance of the preschool period for later school success, improving Head Start should be the top priority for anyone interested in narrowing poverty and racial/ethnic gaps in school performance.

Much effort has been spent on improving literacy instruction in the early elementary grades, and these efforts are showing success. More work is needed on mathematics instruction in these grades. Whole school improvement and tutoring interventions have been deployed relatively widely, with some success (Borman et al. 2005; Farkas 1998). However, Title I, for the past 40 years the principal funding source

for compensatory programs in elementary school, has yet to show positive effects. As with Head Start, significant reform is needed.

Relatively less is known and has been undertaken in terms of programs, policies, and interventions for middle and high school students. This area is ripe for future development, particularly since it is at these higher grade levels that we have made the least progress in closing the achievement gaps.

Perhaps the best news is that, since 1999, the Black-White and Hispanic-White achievement gaps have resumed closing among younger students. We have also improved our understanding of the sources of these gaps, and programs and policies by which they can be narrowed. The continuing challenge is that the gaps remain large, and there is much we still do not understand about their determinants and how they can be further reduced.

In a recent review of these issues (Farkas 2004), it was noted that when, in 2003, the Supreme Court ruled in favor of Affirmative Action by colleges and universities, the majority opinion suggested that special treatment for minorities may no longer be necessary in 25 years. But the students who will be applying for college in 2028 will be born in 2010. And the racial gaps in resources and risks between the families of, on the one hand, Blacks and Hispanics, and on the other hand, Whites and Asians, will at that time be very similar to what they are now. This does not leave many years in which to meaningfully reform programs such as Head Start or Title I.

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Table 1. Disparities in Family Circumstances When Schooling Begins, Selected Estimates

	<u>White</u>	<u>Black</u>	<u>Hispanic</u>	<u>Asian</u>
% Single Parent ¹	15	54	27	10
% Experiencing Poverty ²	10	42	37	
Average SES (SD) ¹	0.2 (1.0)	-0.5 (1.0)	-0.4 (0.9)	0.5 (1.1)
% Non-English Household ¹	1	1	31	51
% Mother H.S. Dropout ²	7	18	35	
% Teen Mother ²	10	22	19	
% Mother Depressed ²	11	20	13	
% Low Birth Weight ²	6	15	8	
% Four or More Hardships ²	4	29	18	
Average Number of Books ¹	93	40	53	56
% Own Home Computer ¹	66	33	42	65

Source: ¹Lee and Burkam (2002) ²Duncan and Magnuson (2005)

Table 2. Reading, Mathematics, and Behavior Gaps When School Begins, Selected Estimates (standard deviation units)

	<u>White-Black</u>	<u>White-Hispanic</u>	<u>White-Asian</u>
PPVT-R, NLSY79	1.15		
PPVT-R, IHDP	1.63		
Reading Test, ECLS-K	0.40	0.43	-0.34
Math Test, ECLS-K ²	0.64	0.72	-0.15
Approaches to Learning, ECLS-K	0.36	0.21	
Self-Control, ECLS-K	0.38	0.13	
Externalizing Behavior, ECLS-K	-0.31	0.01	
Internalizing Behavior, ECLS-K	-0.06	-0.05	

Source: Collected by Rock & Stenner (2005)

²Fryer & Levitt (2004)

Table 3. Percentage of Students Demonstrating Specific Learning-Related Behaviors
When Schooling Begins

	White	Black	Hispanic	Asian
Persists at Tasks	75	61	67	81
Seems Eager to Learn	79	66	72	82
Pays Attention	70	56	62	70

Source; West, Denton, and Reaney (2001: Table 7)

Table 4. Reading, Mathematics, and Science Gaps with White Students in Spring, Third Grade (standard deviation units)

	<u>Black</u>	<u>Hispanic</u>	<u>Asian</u>
Reading	-0.70	-0.35	-0.05
Mathematics	-0.89	-0.39	-0.06
Science	-1.04	-0.52	-0.21

Source: Calculated from Rathbun and West (2004: Tables A-4, A-5, A-7, A-8)

Table 5. Test Score Performance by Race/Ethnicity and Whether or Not Student is a Second Language Learner

	<u>Reading</u>		<u>Mathematics</u>	
<u>Fourth Grade (2005)</u>		<u>Gap</u>		<u>Gap</u>
<u>White</u>				
Second Language Learner	201	27	229	17
Not Second Language Learner	228	---	246	---
<u>Black</u>				
Second Language Learner	186	42	208	38
Not Second Language Learner	199	29	220	26
<u>Hispanic</u>				
Second Language Learner	184	44	214	32
Not Second Language Learner	211	17	232	14
<u>Asian</u>				
Second Language Learner	203	25	233	13
Not Second Language Learner	233	-5	255	-9
 <u>Eighth Grade (2005)</u>				
<u>White</u>				
Second Language Learner	239	31	261	17
Not Second Language Learner	270	---	288	---
<u>Black</u>				
Second Language Learner	224	46	233	55
Not Second Language Learner	242	28	254	34
<u>Hispanic</u>				
Second Language Learner	220	50	238	50
Not Second Language Learner	253	17	269	19
<u>Asian</u>				
Second Language Learner	240	30	270	18
Not Second Language Learner	274	-4	299	-11

Source: National Center for Education Statistics, NAEP Data, calculated for public school students using NAEP data explorer, downloaded on 1/2/06 from <http://nces.gov/nationsreportcard/nde>

Table 6. Gender Gaps (Male – Female) in Test Score Performance, By Race/Ethnicity

	<u>White</u>	<u>Black</u>	<u>Hispanic</u>	<u>Asian</u>
<u>Reading</u>				
Grade 4 (2005)	-6	-10	-5	-7
Grade 8 (2005)	-11	-12	-8	-9
Grade 12 (2002)	-20	-11	-7	-7
<u>Mathematics</u>				
Grade 4 (2005)	3	-1	-6	2
Grade 8 (2005)	1	-1	2	1
Grade 12 (2000)	3	1	4	2

Source: National Center for Education Statistics, NAEP Data, calculated for public school students using NAEP data explorer, downloaded on 1/2/06 from <http://nces.gov/nationsreportcard/nde>

Table 7. Test Score Performance Gaps (Compared with Whites), Historical Trends For Blacks and Hispanics

<u>Year</u>	<u>Age 9</u>		<u>Age 13</u>		<u>Age 17</u>	
	<u>Black</u>	<u>Hispanic</u>	<u>Black</u>	<u>Hispanic</u>	<u>Black</u>	<u>Hispanic</u>
	<u>Reading</u>					
1975	35	34	36	30	52	41
1988	29	24	18	21	26	24
1990	35	28	21	24	29	22
1999	35	28	29	23	31	24
2004	26	21	22	24	29	29
	<u>Mathematics</u>					
<u>Year</u>						
1973	35	23	46	35	40	33
1986	25	21	24	19	29	24
1990	27	21	27	22	21	26
1999	28	26	32	24	31	22
2004	23	18	27	23	28	24

Source: National Center for Education Statistics, NAEP data, Long-Term Trend Reading and Mathematics Assessments, downloaded on 1/2/06 from <http://nces.gov/nationsreportcard/nde>

Table 8. Significant Effects and Effect Sizes for 4-Year Olds, Head Start Impact Study
(June, 2005: Exhibit 1 of the Executive Summary)

Test Scores	
Woodcock-Johnson Letter-Word ID	.22
Letter Naming	.24
McCarthy Draw-A-Design	NS
Woodcock-Johnson Spelling	.16
PPVT Vocabulary	NS
PPVT Color Naming	NS
Problem Behaviors	
Total Behavior Problems	NS
Hyperactive Behavior	NS
Aggressive Behavior	NS
Withdrawn Behavior	NS
Social Skills and Approaches to Learning	NS
Social Competencies	NS

NS = Not significant.

Source: Downloaded on 12/1/05 from
http://www.acf.hhs.gov/programs/opre/hs/impact_study/

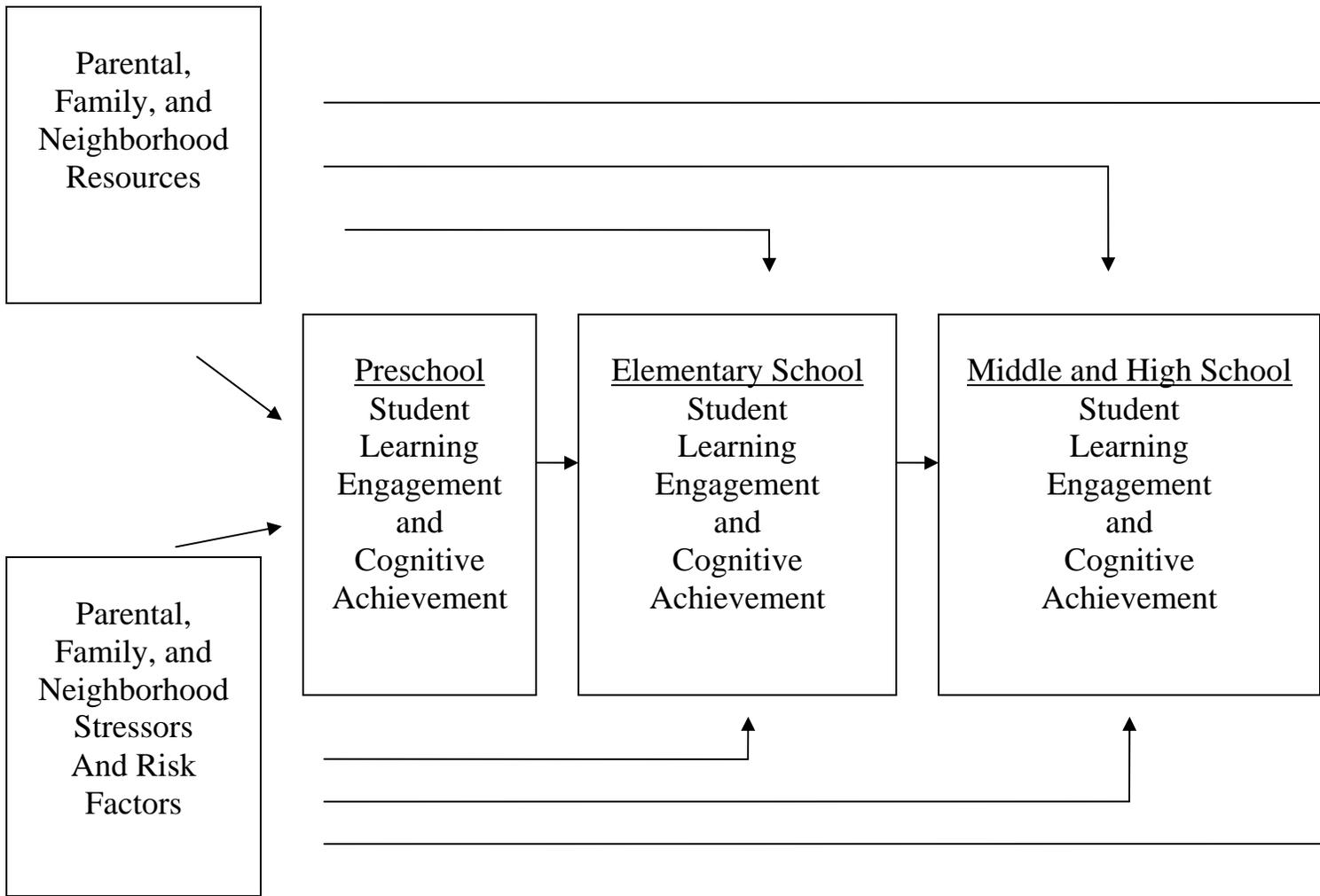


Figure 1. Model of the Academic Achievement Process

Figure 2. Predicted Vocabulary, Whites and Blacks, by Black SES
(Source: Farkas and Beron, 2004)

