
WORKING PAPER

The Need For Adequate Resources For At-Risk Children

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August 2006

EPI Working Paper No. 277

**Economic
Policy
Institute**

THE NEED FOR ADEQUATE RESOURCES FOR AT-RISK CHILDREN*

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Introduction

This report intends to provide policymakers and educational scholars with a model for determining the components and costs of an adequate education for at-risk students. While any child can have risk factors, the children most likely to be at-risk for academic failure are poor children and it is their performance, or lack of performance, that drives the achievement gap and inspires the vast majority of educational reforms that broadly speak of improving the nation's educational outcomes. This report construes adequacy as the elimination of the achievement gap between poor and non-poor students. The source of the achievement gap, and the focus of adequacy, is primarily the low achievement outcomes among our nation's poorest children.

Though most empirical inquiry into the sources of the gap are confined to schools, this report looks directly at all of the factors that place students at-risk for academic failure, how those factors actually operate in their lives to depress their academic opportunities and outcomes, and how the absence of developmentally appropriate supports throughout the lives of many poor children impede their ability to access an adequate education. This report begins with a simple needs assessment: what do non-poor children typically have access to in their total lives, that poor children lack, that drives the achievement gap and has implications for adequacy?

Although at-risk children are present in every school, some schools have disproportionate numbers of children with extreme needs and it is the performance of these schools that in large part drives the achievement gap. Therefore, the needs assessment of this report moves beyond the individual student level to the school level: what are the typical circumstances in high-

* This paper is the first part of a two part project. The second part, "Modeling an Adequate High-Poverty School System," by Whitney C. Allgood and Richard Rothstein, will be published later.

poverty schools that impede their ability to promote resilient academic outcomes among their students? As such, this report is more precisely a proposed model for identifying the components and costs of an adequate education in high-poverty schools, where adequacy is construed as promoting achievement outcomes in these schools that effectively eliminate the achievement gap.

Part I of this report is in five sections. The first summarizes the evolution of adequacy as a legal foundation for challenges to state school finance systems in general, as well as its more recent invocation in cases alleging that specific groups of students in a state are being denied access to an adequate education.

The second section takes an in-depth look at what it means to be at-risk for academic failure. The purpose of this section is to begin understanding student need. The only way to begin identifying the components of an adequate education for high-poverty schools is to understand the total range of circumstances that place poor students at-risk for academic failure.

The third section turns our attention to schools. It examines the achievement gap and reviews evidence on sources of the gap. This discussion includes a review and summary of what is known about the relationship between school inputs and outcomes and the identification of state policy priorities that appear to affect achievement, especially for disadvantaged students. This section then looks at schools that have been recognized for promoting resilient academic outcomes among at-risk students. The purpose of this section is twofold. First, it continues a needs assessment by identifying characteristics of high-risk schools that may mitigate their ability to provide an adequate education. Second, it begins to provide clues about educational programs and school characteristics that policymakers should consider when developing an adequate educational program for at-risk students.

The fourth section pulls the findings of sections two and three together into a conceptual framework that identifies the necessary characteristics of an adequate educational program for at-risk students. The analysis works backwards from the needs of at-risk students, through the characteristics of the schools they typically attend, to characteristics of schools believed to be effective in promoting resilient academic outcomes among at-risk students. This process also identifies large-scale interventions (or school inputs amenable to large-scale implementation) that research suggests promote achievement among disadvantaged students. Four broad constructs emerge as starting points for identifying components of an adequate education; those constructs inform the selection of seven interventions which comprise the components of an adequate educational program for at-risk students.

The fifth section looks at the empirical evidence available on each of the seven interventions. Some of these interventions have substantial empirical evidence of effectiveness; research shows that they can be instrumental in promoting resilient academic outcomes in disadvantaged students. These include reduced class size, smaller schools, early childhood education and intervention, and before and after-school programs with one-on-one tutoring.* The other three interventions have suggestive but empirically limited evidence of effectiveness; these include increasing the supply of quality teachers to schools serving large concentrations of at-risk students, extending the school year through summer school or year-round schooling, and providing health services at the school site through school-based clinics.

Following Part I of this report, Part II assigns costs to each of these interventions and

* In an initial review of the literature, compelling evidence was found for one-on-one tutoring, but only suggestive and limited evidence on before and after school programming in terms of actual effectiveness (demonstration of need, however, for such programs is very compelling). However, research suggests that pull-out programs, even for one-on-one tutoring, can be less effective than mainstreamed or add-on programs. Therefore, in this report, the one-on-one tutoring component has been placed in the before-and-after school program component, thus combining these two interventions into one.

models a process for determining their costs.

Educational Adequacy

During the last thirty years, state courts have responded to claims that some or all students were not receiving equitable shares of educational resources. Plaintiffs in equity-based challenges to state school finance systems argued that student access to educational resources and opportunities was over-reliant on the ability of local communities to fund education. The goal of these challenges was to improve the quality and quantity of inputs in the affected schools or districts. The legacy of these challenges has been the concept of wealth neutrality: students' access to educational resources should not be a function of the wealth of the community in which they reside. But gross inequities in school resources persist and are highly correlated at the individual and community levels with race and income. Student outcomes are also highly correlated with race and income so that poor and minority students perform well below white middle class students on almost all outcome measures. Poor and minority students who attend schools with high concentrations of poor and minority students perform especially poorly.

Also during the last 30 years, and coincident with school finance equity litigation, legal theorists and activists have gradually embraced a new concept which they hope will provide all students, regardless of race, income or residence, an equal educational opportunity, as evidenced by a closing of the gap in school outcomes. This new concept, educational adequacy, includes the notion that ensuring equal opportunity to achieve a common level of outcomes may require that some students receive a larger quantity or different quality of educational resources than others (Minorini & Sugarman, 1999b). Adequacy advocates do not assert that individual students have legally enforceable rights to particular outcomes but that school districts must have adequate resources, given their circumstances and the particular needs of their students, “to be

able to offer an educational program that reasonably promises to teach at least most of them to reasonably high standards” (Minorini & Sugarman, 1999a, p.63), irrespective of their socioeconomic status.

“Reasonably high standards” was sometimes construed as a high minimum level of education (Clune, 1994; Minorini & Sugarman, 1999b), and plaintiffs often pointed to educational clauses of state constitutions which guarantee all students in a state some substantive level of education. In the last ten years, additionally, many states have delineated very high standards which they expect all students to meet. In some states these standards equate the minimum requirements for high school graduation with eligibility for admission to academic colleges. Partly prodded by federal law, states have implemented testing systems to monitor student progress in meeting these standards and, prodded by federal law, states separately report results for minority and for disadvantaged children. As a result, plaintiffs now have access to evidence that identifiable groups of students or schools routinely fail to meet the new high standards.

Adequacy-based challenges to state school finance systems, in contrast to equity-based challenges, now include evidence of inadequate and inequitably distributed student outcomes and assert that funding must be provided to close the gap in achievement. Although equity-based challenges had also aimed to improve outcomes for disadvantaged students, the earlier challenges assumed that more equitable inputs would themselves ensure equality.

Adequacy-based challenges explicitly acknowledge that student, school, and district capacities to translate educational resources into outcomes vary in systematic ways. Funding either a “high minimum” or “high standards” education requires accounting for varying needs of different students, variations in costs faced by schools and districts, and the effects of school

composition on student achievement. Therefore, an adequate educational program requires that some students, schools and districts need more educational resources than others if all students in a state are to have a reasonable opportunity to achieve reasonably high standards.

Finally, adequacy-based challenges to school finance systems promote the idea that the manner in which a state funds education should be tightly coupled with an appraisal of educational goals and student need relative to those goals. Judges ruling in favor of plaintiffs in adequacy-based claims usually assume that a sound school funding system begins with legislators deciding what resources and funds are actually necessary to ensure that all students in a state can achieve adequate outcomes. In fact, this rarely is the process by which states determine school funding levels (Minorini & Sugarman, 1999a).

Accurately determining the amount of resources required and how those resources should be spent to achieve adequate educational outcomes is a process that neither scholars nor policymakers have yet to master, despite great and ongoing effort. As of now, our collective knowledge of productivity in education is far behind our knowledge of productivity in many other fields. Determining the resources necessary to fund an adequate education, how those resources should vary for different types of students, and what they should be used to purchase, requires many subtle judgments. However, neither our lack of definitive knowledge about education productivity nor the necessity of making such judgments negate the need to make careful decisions about the quality and quantity of educational resources allocated in a state. Courts may be more satisfied if state legislators can show that they “engaged in a process that reasonably related the funding of schools to what had been fairly determined to be their students’ actual needs” (Minorini & Sugarman, 1999b, p.193).

Adequacy-based challenges to school finance systems have been successful in a dozen

states and are pending in several others. Some plaintiffs (e.g., in Kentucky and Massachusetts) have argued that all districts in a state have failed to provide an adequate education. Others have focused on the inability of specific districts to provide an adequate education either because of the extreme needs of their student populations, or because of their inability to raise adequate school resources locally either because of these districts' low wealth or high cost of living and doing business (Berne & Steifel, 1999). Recently, several state high courts have addressed inadequate educational programming and funds specific to at-risk students. Among these are North Carolina (Hoke County Board of Education et al. v. The State of North Carolina, 2000), New York (Campaign for Fiscal Equity v. New York, 2001), New Jersey (Abbott v. Burke, 1985; 1990; 1994; 1997; 1998; 2000; 2002) and Wyoming (Campbell County v. State of Wyoming, 2001).

In North Carolina, plaintiffs accused the state of failure to connect funding allotments rationally to the actual costs of providing students with the resources needed, given student and district characteristics and the state's constitutional provision for education.

In New York, the Campaign for Fiscal Equity alleged that the city of New York was unable to provide its students with a constitutionally required "sound basic education" as a result of the state's inequitable funding system and its failure to account for the extraordinary needs of the city's student population and for the city's unique competing demands for resources.

The fight to ensure students in urban, high-poverty schools an adequate education began in the early 1980's in New Jersey, leaving a legacy of ten state Supreme Court decisions to date, as well as many efforts by multiple parties to adequately define and implement "adequate" educational funding systems and platforms of services.* A seminal decision came in 1990 (Abbott v. Burke II), when the court ruled that the state funding formula was both unequal and

* See <http://www.edlawcenter.org> for a complete listing of Abbott decisions, 1985 to 2003.

inadequate, denying students in urban districts the constitutionally guaranteed thorough and efficient education. The court ordered the state to equalize funding between suburban and urban districts for regular education and to provide supplemental education programs to urban district in an effort to eliminate the effects of disadvantage as much as possible.

In Wyoming, following thirty years of intermittent challenges to the inequity and inadequacy of the state school financing system, a group of districts along with the Wyoming Education Association alleged that the legislature's school funding formula was still inadequate to meet the needs of specific groups of students and districts, including economically disadvantaged youth (EDY) and limited English speaking students (LES).

All four state courts held that at-risk students require additional resources, or an "expanded platform of services", to be assured of an opportunity to receive an adequate education and that such resources, if sufficient and applied to effective programs, could ensure such an opportunity and lead to increased student outcomes. In general the courts deferred to their respective legislatures to develop the components of the expanded platform of services, assign costs, and develop a formula for funding the services. However, in New Jersey the court finally took the task upon itself. In May 1998, the New Jersey Supreme Court (*Abbott v. Burke V*) ordered an unprecedented package of programs for poor, urban students, to include full day kindergarten and preschool for 3 and 4 year olds; whole school reform; increased social services and security; technology education, after-school and summer-school programs; school-to-work-programming; and a facilities program to correct code violations, eliminate overcrowding and provide adequate space.

Acknowledging the problems inherent in developing a formula to capture the cost of adequacy for at risk students, and noting that "the record contains no evidence of any effort to

determine either the actual expenditures of Wyoming districts [on at risk students] or the costs schools should incur when dealing with at-risk students appropriately,” the Wyoming court directed the state to fund the actual and necessary costs of EDY and LES by directly reimbursing districts for such costs, subject to state oversight. The court noted that it did not foreclose the possibility that the state might soon develop an accurate formula with which to distribute adequate funds in lieu of reimbursement, but that the problems associated with developing such a formula, not the least of which is the fact that there has been no attempt to determine exactly what programs or services would need to be funded, led the court to believe that until such work was done, direct reimbursement was the only option for ensuring at-risk students in Wyoming access to an adequate educational program.

While adequacy for at-risk students has only recently made an appearance in courtrooms, some educational scholars have long contended that “the problem” in American education is less about low average achievement for all students and more about low average achievement among certain groups of students located in certain schools and districts. As Clune (1995) noted, 90% of the nation’s poor student outcomes can be found in just 10% of the nation’s schools, namely schools serving large concentrations of poor students. Thus, the problem of adequacy really has been a problem of high poverty schools - at least until 1995, when higher standards began to be implemented that made the achievement of all students seem insufficient.

But suspicion that improving average outcomes for all American children requires targeting resources to high-poverty schools still does not tell us how much more money needs to go to these schools and what it should buy. As the Wyoming court pointed out, there is little known about how much is currently spent on at-risk students and a great deal of work yet to be done on determining how much should be spent.

While the process modeled here (or the products of this process) may not be the best or only process for determining the components and costs of an adequate education for at-risk students, the following pages attempt to provide a starting point. At present, it is necessary to make judgments for which a solid research base is not yet available. This report attempts to make such judgments as transparent as possible. While it provides an estimate of costs, it also separately identifies the costs for each so that policymakers can make their own judgments about which interventions are most necessary, or which appear to offer the greatest benefit at the least cost. All the interventions proposed here have the potential to meet real and urgent needs among at-risk students. As long as these needs continue to go unmet, these students will, on average, continue to be the least likely to meet state educational goals.

If adequacy only leads to the identification of a level or a series of levels of educational resources deemed adequate without identifying what those resources should be used to buy, we will have more money spent on education but no more knowledge about how that money does or does not translate into educational outcomes. The process outlined in this report lends itself to policy actions that can significantly enhance our knowledge of how to use educational funds to purchase resources most likely to lead to enhanced student outcomes. This work aims to provide state policymakers with a more realistic view of the needs of at-risk students, relative not only to state educational goals but to the needs of more advantaged students. The proposals in this report are intended to fulfill an obligation to provide at-risk children with a quality of life during their formative years that will enhance their chances of becoming healthy, productive, and engaged citizens.

Understanding Risk

There are many individual background factors that place students at-risk for academic failure, and students from any family type with any level of income can have one or more of these individual risk factors. However, some students are in greater danger for being “at risk”; students who are poor, non-white, who speak English as a second language, and who are living with a single mother who has low educational attainment are particularly at-risk for academic failure. Each of these risk factors is negatively correlated with achievement so that a poor, Hispanic child who speaks English as a second language and lives with a single mother has four factors that place her at risk for academic failure, each making its own contribution.

Of the above factors, though, poverty is the most powerful. Poverty does not predict a child’s race, language or her mother’s marital status or level of education, but a child’s race, language and her mother’s marital status or level of education predict poverty. Therefore, once any of the other three factors are in place, poverty becomes a greater likelihood in the child’s life. And perhaps most importantly, once poverty is a factor, a stream of other risk factors is invited into the child’s life. This is in large part because poverty directly affects the family’s ability to purchase services or assets that promote child development as well as the family’s ability to select itself out of living conditions that can have deleterious effects on child development.

One way to look at poverty, then, is that it diminishes parental capacity to invest in the well-being of their children. It also, however, diminishes parental capacity to protect children from other risks that affect development. Brooks-Gunn and Duncan (1997) call these pathways through which poverty operates to place children at-risk by undermining their cognitive

development, thus their potential for doing well in school, which runs over into their potential for later earnings. These pathways include health and health access, family and home environment, and residence.

As the following sections will show, some of these pathways are fairly simple and direct; the technology for preventing or remediating their effects is known, available and sometimes even inexpensive. In other instances, however, the pathways are not simple but extremely complex and the precise relationship between all of the implied variables is either difficult to discern or not stable across all situations. As such, the technology for preventing or remediating the effects of poverty is uncertain and/or expensive.

Sometimes we have good ideas about how to attack the problem, but no research has been conducted to show that there is one best way. And one thing that will certainly stand out is that most of these pathways have little or nothing to do with what we commonly think of as within the purview of schools.

Beyond the scope of poverty's effects on children's lifetime achievement prospects, there is another reason to focus on it in this report. It is the single indicator that consistently separates those children who don't tend to do well in school from children most likely to do well in school. Again, this is not deterministic; some poor children do extremely well in school and some well-off children don't do well. There has been a lot of focus on the black-white achievement gap, and for good reason. It is helpful to know why it is that black students, even middle class black students, do not perform as well in school as white students. But even in understanding the color-gap, economic issues surely come into play. Black children are not only more likely to be poor than white children, they are more likely to have families who have had far fewer years of

non-poor life in which to build up the kinds of capital students need to be able to draw on in order to do well in school. Thus, if you take a black middle class child today and compare his scores to a white middle class child, you aren't just getting a measure of each child's achievement at this moment that is influenced by each child's family capital at this moment – there is a generational aspect to what is being measured.

The elimination of poverty today, then, would not eliminate the achievement gap and it would still certainly be observable along racial lines. More importantly, if measures of how long the family had been non-poor were included in the analysis, we would likely see that those students who had been non-poor the longest would have higher scores than those who were recently non-poor. To the extent that the elimination of poverty in this country was stable over several generations, we would probably observe a gradual shrinking of the achievement gap. There will be no quick fixes; there will probably be no certain or complete fixes. There can, however, be progress, to the extent that all of the real sources of the achievement gap are identified, accepted, and given political priority.

As the previous discussion makes clear, this report construes adequacy for at-risk students as the elimination of the achievement gap between poor and non-poor students (more specifically, as later sections will elaborate, as the elimination of the achievement gap between high and low-poverty schools). Based on that construction, two assumptions guide this endeavor to understand risk. First, it assumes that a sizable portion of what all children learn in school has nothing to do with what schools do or do not do, but is a product of the human, physical and social capital on which each child has to draw, the vast majority of which is developed outside of school and which begins

affecting the child's development (or ability to learn) as early as the prenatal period. Thus this report assumes that any effort to close the achievement gap will have to begin with a comprehensive inventory of all the factors that place poor students at-risk for academic failure no matter how distant from school's traditional scope they appear to be. This is not to say that schools don't matter. In fact, the following pages will show that schools do matter very much and that high-poverty schools, in fact, add a layer of risk for underachievement not only to the at-risk students they serve, but to all students they serve. Therefore, this report does not reject the notion that traditional inputs in high-poverty schools have to be examined and perhaps expanded, but it does reject the notion that such efforts will be sufficient to close the gap.

This first "assumption" however is not really an assumption; there is a plethora of research supporting it and this report makes no claim to be the first to use it as a mechanism for thinking about how schools should change to better meet the needs of students when so much of what students need to learn does not start at age five or exist exclusively within the classroom (for example, see Traub, 2000). The Coleman report (Coleman et al., 1966) most prominently promoted the idea that variations in family background and the backgrounds of other students in a school are the primary determinants of variations in student performance between schools. Since that time, those who have sought to understand the relationship between school inputs and school outcomes have had little basis for denying that student achievement is significantly influenced by factors that have little or nothing to do with traditional school inputs and that schools, as we traditionally organize and conceptualize them, have limited power to overcome or undo the effects of family background. The real source of the debate among

those engaged in this line of study (commonly known as educational production-function research^{*}) is how much power do schools have? How much does money matter in schools? And to the extent that money does matter, where is it best spent? But even those questions and the entire debate are constrained by the focus on traditional school inputs like class size (or pupil teacher-ratio), teacher quality, teacher experience, teacher possession of an advanced degree, per pupil expenditures on instruction, and per pupil expenditures on administration. While we know that smaller classes can have a positive effect on achievement in certain circumstances and that high-quality teachers can improve student achievement, how much more? Are small classes and high-quality teachers in every high-poverty school sufficient to close the achievement gap? They may be a good starting point, but they are probably not sufficient.

Second, the following pages assume that middle class students' academic advantage is found primarily in their access to human, physical and social capital, the vast majority of which is developed outside of school and which begins affecting their development as early as the prenatal period. It may be that schools serving middle class students are more likely to provide adequate (or even more than adequate) resources and to be more effectively organized for learning than schools serving predominantly poor students. To the extent that middle class schools have more resources than high-poverty schools and the lack of resources in high poverty schools prevents them from providing an adequate education, then such schools should be provided more resources. But many others have aptly inventoried resource shortages in high-poverty schools and pointed out

^{*}For the relationship between school inputs and student achievement, see Hanushek 1986; 1996; Greenwald and Hedges, 1996; Ferguson and Ladd, 1996; Jaggia and Kelley-Hawke, 1999. For the relationship between school inputs and future earnings see Card and Krueger, 1992.

that middle class schools are less likely to suffer from such resource shortages, all to limited avail.

If middle class students tend to come school more prepared to learn than poor children, why is that? What are middle class parents buying and doing that gives their children an academic advantage that poor parents aren't buying and doing? How much of it is amenable to social policy intervention that might be effectively implemented through or in conjunction with school?

This inquiry, then, is more interested in the differences in poor and non-poor children's lives out of school and how those differences translate into different rates of and potential for learning. It asks how high-poverty schools can be effectively organized and adequately "stocked" with programs and resources most likely to promote resilient academic outcomes among their students (outcomes beyond what we would typically observe or expect based on individual and school risk factors). Therefore, the fact that middle class schools have more of any resource than high-poverty schools is of little concern in the context of this report. Schools may not be doing the job that every American wants them to be doing or doing it as well as we might want, but children in *all* schools are learning. It may not be the only problem, but the main problem is that some schools have more ground to cover than other schools. How can we help high-poverty schools compete with low-poverty schools? Where are the leverage points? If a large portion of what children learn is not a product of school experiences, how will high-poverty schools have to change so that their students have access to the capital that middle-class students have access to at home and in their communities? When we have answered that question, we will be on our way to achieving adequacy.

Poverty

According to the US Census Bureau, the poverty rate in 2002 for children under the age of 18 was 16.7%, or 12.1 million children (Proctor & Dalakar, 2002). Understanding the prevalence of poverty is important, but perhaps even more important for policymakers is identifying groups who are at the greatest risk for being poor. Hispanics and blacks are more than twice as likely as whites and Asians to live in poverty (21.8% to 24.1% and 8% to 10% respectively). For every 100 individuals living in central cities almost 17 are poor; in rural areas about 14 out of 100 are poor. In the suburbs, however, less than nine of every 100 individuals are poor. Thus, the poverty rate almost doubles between the suburbs and central cities and increases by over 60% from suburbs to rural areas. Children who live in homes with married parents are significantly less likely to be poor than those living with only a mother serving as head of household; the respective poverty rates are 5.3% and 26.5%. Finally, over 40% of the total poverty population is actually living in severe poverty, which is defined by the US Census Bureau as having total family income below 50% of the poverty threshold, which for a family of four in 2002 was \$18,392 (Proctor & Dalakar, 2002).

Child poverty rates also vary greatly across states, which is of interest here because the vast majority (over 90%) of educational funding comes from state and local governments. Based on three year averages (2000-02), all but two states (Minnesota and New Hampshire) had child poverty rates in excess of 10%. The District of Columbia had the highest child poverty rate with over 30% of its children living at or below the poverty line, while over one-quarter of the children in New Mexico, Louisiana and Mississippi live in poverty.

Place of residence, race, or living in a single-family home headed by a mother are not

deterministic in terms of income or academic achievement; in fact, no “risk factor” (any variable that, when present, increases the likelihood that a child will be poor and thus at-risk for academic failure) is deterministic. These factors are of interest mainly because they give us a sense of who is most likely to be poor so that we can optimize our targeting of resources. Additionally, there are data that some of these variables alone are related to academic achievement. For example, controlling for family income and other relevant variables, black children are still less likely to perform well on various measures of academic achievement than white children (Jencks & Phillips, 1998).

So, some children are more likely than others to be poor, and the factors correlated with low-income often are also individually correlated, above and beyond the effects of income, with lower academic achievement. Therefore, we say that many of these children have multiple risks for low achievement. Factors that place children at-risk of being poor at some point in their lives, and thus of academic failure, include living in a home headed by a single parent (especially if that parent is a mother who gave birth as a teen), having parents with low educational attainment, and coming from a family who has recently moved to the United States (USDOE, 2000).

From the additive perspective of risk, then, one would say that a low-income black child who moved with her mother (who gave birth at fifteen and does not have a high school diploma) and siblings to an inner-city neighborhood in Baltimore from Haiti has six individual risk factors, each with its own effect on her chances for doing well in school. This child is less likely to do well in school and to graduate. She is also at-risk for other factors that place her long-term educational and earnings potential at-risk, like giving birth as a teen, using drugs, poor health, and involvement in criminal activity (as both a perpetrator and victim).

While each of these risk factors is important, none are as ominous for predicting a child's lifetime opportunities and outcomes as poverty. The effect of poverty on children is pervasive, touching almost every aspect of their lives and extending well into adulthood. Poor children are more likely to become seriously ill, have unstable or inadequate housing, be classified as learning disabled, and become teen parents (Haveman & Wolfe, 1994; USDOE, 2000). Because teen parents with low educational attainment stand a great chance of being poor themselves, the cycle of risk will likely be passed onto their children.

Pathways Through Which Poverty Operates to Place Children at Risk for Academic Failure

While being poor increases the likelihood that a child will fail in school, being poor in and of itself does not cause academic underachievement. Rather, poverty affects an individual's general living conditions and life experiences in a manner that frequently, but not always, places that individual at a distinct cognitive, social, and sometimes physical and emotional, disadvantage when it comes to meeting the challenges of school life. The living conditions and life experiences of poor children are the result of choices made not just by their parents but by society as a whole, as well as a reflection of how the choices made by poor parents are constrained by factors not always within their control (e.g., childcare opportunities, neighborhood conditions, housing stability, health care).

Haveman & Wolfe (1994) take an investment perspective in their analysis of the environmental attributes that influence children's educational attainment and other outcomes. This perspective holds that choices are made by parents and by society about how much and how to invest in the lives of children. While some of these choices are the result of free will, others are the result of constrained resources, which include limited knowledge regarding which

investments are the most beneficial or cost-effective (Haveman & Wolfe, 1994). Just as most parents have a limited amount of financial capital on which to draw when investing in their children's immediate and long-term well-being, society also has finite resources. And just as most parents have a limited amount of knowledge about the most effective or cost-effective investments, so too does society. Of course, while parents' resources vary greatly from one family to the next, society's resources are more stable, although resources do vary across place and time.

One way to think about the concept of adequacy for at-risk children is to understand that some parents, for a variety of reasons, invest less in the well-being of their children than others. Some of this variation is the result of choices made by parents and some is the result of constrained resources. While the educational community has generally and for a rather long time embraced the position that all children can achieve high educational standards, this position has recently achieved a salience heretofore unseen, largely as a result of increasingly higher state standards, tougher accountability systems, and adequacy-based judicial activity. As a result, state legislatures are being asked to develop educational programs that are adequate, given the special needs of some children and the outcomes expected of all children. States are not only being asked to invest in programs that ensure an adequate education for all, but to invest differentially based on the greater needs of some children, needs that are frequently the result of their parents' opportunities or choices.

In effect, the investment states make in providing at-risk students with an adequate educational opportunity will have to alter or ameliorate the impact of poor children's general life experiences and living conditions because these are the broad pathways through which poverty operates to place these children at-risk for academic failure. But states' ability to make wise

choices regarding these investments is largely contingent upon society's collective knowledge of the specific pathways through which poverty operates, not to mention state capacity to fund such investments, which tends to decline as the percentage of children in the state living in poverty increases (Rothstein, 2000). This report provides a more detailed examination of these pathways, considered under three broad headings: Health and Health Access, Family and Home Environment, and Residence.

Health and Health Access

This section looks at research on the relationship between various childhood health problems and cognitive development and academic achievement, shows that poor children are more likely than non-poor children to suffer from health problems, and examines the state of health care access for poor children relative to non-poor children. The gap in childhood mortality rates between poor and non-poor children is clear evidence that poor children disproportionately suffer from health problems; however, even this rate probably understates the true size of the gap. Not all ill children die, so child mortality rates are only partly useful in understanding wealth-based discrepancies in child health. Poor children are also less likely than non-poor children to seek medical attention for illness, preventive care or well-being check-ups, thus further disguising the full magnitude of the gap (Egbuono & Starfield, 1982). However, there remains plentiful evidence illustrating that of all the ways in which poverty can impair a child's ability to do well in school, the toll it takes on health may be the most significant

In fact, the association between poor health and being poor "is among the most robust findings of social epidemiology" (Geronimus, 2000, p.2). Poor children are less likely than non-poor children to receive even the most basic health care, like immunizations (Haveman & Wolfe

1994) and more likely to suffer from serious illnesses (NCES, 2000) and to die during childhood (Lewit, Terman & Behrman, 1997). Children without regular medical care are also more likely to contract minor illnesses that keep them out of school. Thus the income-based achievement gap partly reflects income-based health discrepancies in poor children, with some of that effect resulting from the fact that poor children simply miss more school than non-poor children (Starfield, 1997). Despite the existence of federal programs to make medical care coverage available to low-income children, poor children are still much less likely to have coverage than non-poor children (Bhandari & Gifford, 2003).

Low birth weight, elevated blood lead levels, anemia, recurrent ear infections, hearing loss, and growth stunting are all poverty-related health factors that research has shown negatively affect cognitive development (Brooks-Gunn & Duncan, 1997). A 1990 analysis indicated that low birth weight, elevated blood lead levels, recurrent ear infections and hearing loss contributed to differences in IQ scores between poor and non-poor four year olds with results suggesting that “the cumulative health disadvantage experienced by poor children on these four health measures may have accounted for as much as 13-to-20% of the difference between the poor and non-poor four-year-olds during the '70s and '80s” (Brooks-Gunn & Duncan, 1997, p.64). Inadequate nutrition during the prenatal period is implicated in many of these health factors, specifically, low birth weight, which increases the likelihood of serious illnesses and death during the early years and is later associated with serious physical disabilities, grade repetition, learning disabilities, and below average I.Q.. (Brooks-Gunn & Duncan, 1997).

Malnutrition in young children can depress the immune system, which can lead to recurrent ear infections, hearing loss and growth stunting (low height for age); growth stunting is associated with short-term memory loss (Lewit & Kerrebrock, 1997). Inadequate nutrition can

also impede brain development. During the first two years of life, the brain grows to 80% of its adult size. Therefore, inadequate nutrition during these years has been of great concern. However, recent research indicates that improvement in the diet after two years of age can restore near normal mental development among children receiving inadequate nutrition during the first two years. At the same time, malnutrition after two years of age can be just as damaging as before two years of age (Lewit & Kerrebrock, 1997).

Poor children are at greater risk for being hungry than non-poor children. One report found that 13% of households below the poverty line experience hunger compared to 1% of households at 85% or more of the poverty line (Barton, 2003). If children stay hungry, or have access to an inadequate diet, learning can suffer.

Lead exposure is associated with stunted growth, hearing loss, vitamin D metabolism changes, impaired blood production, toxic effects on the kidneys and decreased IQ scores. Blood lead levels are highest among poor, black children living in central cities (Brooks-Gunn & Duncan, 1997).

While many children suffer from asthma, and the incidence of asthma is increasing across all segments of the population, it appears to limit school participation more for poor than non-poor children. For older children, asthma attacks may be embarrassing; for younger children who don't know how to treat them or have access to an inhaler, they can be scary and even life threatening.

There are, then, a range of childhood health problems that poor children are more likely to experience than non-poor children, all of them easily addressed to the extent that the "technology" for doing so is available. We can treat the symptoms of asthma, correct vision problems, and insure an adequate diet rather easily, and perhaps inexpensively relative to other

educational interventions that seek to close the gap with higher price tags and less certain results. Getting low-income mothers to avoid drinking and smoking may be more difficult in terms of implementing effective programs, but certainly not impossible, as many policy efforts to reduce unhealthy behavior or promote more healthy behavior in targeted populations (or the population as a whole) have shown.

While it would be nice to believe that appropriating funds for needed programs and establishing programs to carry them out is sufficient for ending childhood health problems associated with poverty, evidence suggests totally eradicating problems that have some basis in human choice is not as simple as funding and implementing programs. For example, even basic healthcare that is available to every child at no cost to the parents, like immunizations, is more likely to be missed by poor and black or Hispanic children. One report found that more than 25% of black children and close to thirty percent of Hispanic children had not had their full series of immunizations by two years of age, placing these children at greater risk for a variety of illnesses and death (Annie E. Casey Foundation, 2000).

Therefore, understanding health issues in poor children requires understanding issues of health care access. Access to health care is construed here as low-income children who actually have health care coverage, but even that is insufficient. It is also necessary to look at characteristics of health care access that vary with location and type of health care available that are related to ability or willingness to take advantage of health services.

As a family's income goes up, so too does the likelihood of coverage, with a greater proportion of coverage for more well-off families coming through private sources. Nearly 90% of children from families with incomes of 250% or above the federal poverty threshold had coverage through private sources, with the vast majority being through

employers. Over 62% of children in families with incomes below 100% of the poverty threshold had government health insurance. In 2001, Medicaid, SCHIP and other state-based health insurance programs covered 28% of all children under six years of age, 21.2% of children 6-15 years old, and 15% of 16-18 year olds, while 22% of poor children remained without coverage of any sort (compared to 12.1% of all children without coverage). Overall, about 1 in four poor or near-poor families had uninsured children (Bhandari & Gifford, 2003). In one poll, over 40% of uninsured parents reported that they delayed seeking medical care for their children because they could not afford it. Many of the children who remained uninsured might be eligible for coverage but for a variety of reasons, including lack of knowledge, their parents do not apply for it (Annie E. Casey Foundation, 2000).

Health care coverage statistics grow dimmer for children residing in central cities. Just under 15% of all children in central cities had no health insurance in 2001, compared to 10.6% of children in the suburbs and 11.8% of children outside of metropolitan areas (Bhandari & Gifford, 2003). The health burden absorbed by the urban poor is significantly larger than that absorbed by non-poor individuals living in non-urban areas (Geronimus, 2000). The reasons for this disproportionate health burden among poor urban residents include lack of access to healthcare coverage and facilities, reluctance to access health care even when coverage exists, and sociocultural environmental attributes that influence health at the community level (Geronimus, 2000). Urban children are more likely than their suburban and rural counterparts to receive medical care from clinics or emergency rooms and less likely to have Medicaid or health insurance; not

surprisingly, they are more likely to be absent from school and to have behavior problems while in school (Lippman, Burns and McArthur, 1996).

Differences in coverage are also correlated with race. Hispanic children were the least likely to be without coverage in 2001, with 24.9% going without health insurance in 2001. American Indians and Native Alaskans were close behind. A little over 14% of black children had no coverage in 2001, while 11.4% of white children had no coverage. The high incidence of Hispanic children without coverage is most likely related to the discrepancy in coverage between foreign-born and native children's rates of coverage. Almost two in five foreign born children lacked health insurance in 2001. Among foreign born children, of those who were citizens, 15.9% had coverage while 41.6% of non-citizens were without coverage (Bhandari & Gifford, 2003).

Health care coverage rates also varied dramatically across states, with the highest rate of coverage observed in Rhode Island (93.3%) and the lowest in Texas (77.7%). Older children are at greater risk than younger children for being without coverage; only 10.7% of children under six were without coverage in 2001 compared to 15.8% of those 15-18 years old (Bhandari & Gifford, 2003).

Even when coverage exists, poor children are less likely to utilize preventive or illness-related health services (Cunningham & Hahn, 1994). The reasons for this reluctance to use health services, even when coverage exists, might be related to out-of-pocket costs, lack of access to healthcare providers in low-income neighborhoods, lack of transportation, the amount of time involved in accessing health services, or the amount of time parents spend with their children (Cunningham & Hahn, 1994). For example, when parents are not around their children as much, they may be less aware of or bothered by illness-related symptoms (like wheezing).

While efforts have been and are continuing to be made to reduce the difficulty associated with getting government funded health care coverage, difficulties persist, thus further reducing the likelihood that the most disadvantaged children will have coverage. Many poor parents attempt to get coverage for their children but fail to do so because they do not complete the process, which they find confusing, complicated or just too time consuming (Annie E. Casey Foundation, 2000). Consider the following summary of applying for Medicaid:

Applying for Medicaid has usually meant going to a public agency during work hours, filling out a 15-to-30 page application as often as every six months, and submitting numerous documents such as pay stubs for eight consecutive weeks and actual Social Security cards, not just Social Security numbers. Small fluctuations in income often mean periodic interruptions in coverage and the hassle of reapplying. These eligibility requirements, with their historical links to welfare eligibility, made little sense for a health care program intended to reach as many children as possible (Annie E. Casey Foundation, 2000, p.11)

In the last few years, the federal government has encouraged states in a number of ways to expand enrollment and simplify the process of enrolling for government-based health care, as well as to beef up outreach efforts. States have complied; some assume that any child eligible for FRPL or Food Stamps is also eligible for government health care coverage. But too many low-income parents obviously still do not enroll because they don't know they're eligible, don't know where or how to apply, are intimidated or turned off by the difficulty of applying, or are afraid of being treated disrespectfully at public agencies (Annie E. Casey Foundation, 2000).

Poor parents, especially those who are working, have many barriers to health care coverage and health care that middle-class working parents are less likely to experience. Consider that over 80% of people earning over \$75,000 a year have health care coverage through their employers; such coverage reduces the time these parents have to spend applying for coverage alone. It is very likely that most of these parents also have paid sick leave; therefore, when their children are sick, they do not suffer a direct income loss by staying home.

Additionally, their employers frequently have a benefits specialist on staff who can help them navigate the intricacies of their coverage.

Only 26% of workers earning less than \$25,000 a year have insurance through their employers. The working poor in rural areas are the least likely to have health care coverage through their employers. For workers who do not have paid leave, the loss of total income resulting from applying for health care coverage, attending to sick children who are out of school, or being sick themselves can be significant (Annie E. Casey Foundation, 2000).

Income-based discrepancies in health care coverage and type of coverage (i.e., how one gets it, what it covers, local providers, covered services, etc.) no doubt influence income-based discrepancies in health for all populations; in fact, children, especially young children, may experience the least of the brunt as most parents will make sacrifices to get their children to the doctor that they won't make to get themselves there. As long as income-based discrepancies in health care coverage and access persist, so too will income-based discrepancies in health and in achievement.

Family and Home Environment

Differences in home environment between lower and higher income children also account for a substantial portion of the effects of income on cognitive development in pre-school children and achievement scores in elementary school children (Brooks-Gunn & Duncan, 1997).*

* This report focuses on the relationship between income and academic achievement; however, many studies also look at the broader relationship between socioeconomic status (SES) and achievement relevant factors. SES is usually measured as a composite score that includes factors like family reports of income, parental education and occupation. Just as race/ethnicity is correlated with income, it is also correlated with SES. Lee and Burkham (2002) analyzed data from the Early Childhood Longitudinal Study-Kindergarten, looking at the relationship between both race/ethnicity and SES on children's readiness for school and access to school resources at the start of their education. They find a significant inverse relationship between SES and achievement status in kindergarten; when race/ethnicity is added, a larger

Home environment factors that vary across income levels and are associated with cognitive development and achievement test scores include number of siblings, family structure, opportunities for learning (access to books, games and computers), the warmth of mother-child interactions, the physical condition of the home, and mobility (Brook-Gunn & Duncan, 1997; Lee & Burkham, 2002). The provision of learning experiences in the home has been shown to account for up to half of the effect of poverty on the IQ scores of five year-olds (Brooks-Gunn & Duncan, 1997), while Lee and Burkham (2002) find that when SES is used instead of simply income, demographic variables play a less weighty role in explaining achievement differentials. In other words, the combined effect of family income, parental education and parental occupation remain large even after controlling for home environment factors like those mentioned above, though each of these factors does contribute to achievement differentials observed in kindergarteners (Lee & Burkham, 2002).

In fact, we are forced to infer more than we know about the relationship between home environment and academic achievement. The best predictors of children at-risk for underachievement are family income or SES. We can then look at poor children's health and health care access relative to middle class children and see that poor children suffer from a wide variety of health problems that research has shown affect their ability to do well in school. It is harder to look inside the homes of poor and non-poor children and distill evidence regarding differences in what happens there that causally drive achievement gaps.

A common theory is that higher-income or higher-SES children have greater access to home-based learning opportunities from birth. Parents who have more education, more disposable income, a greater understanding of the value of home-based learning activities and a

achievement gap is observed. But their analyses show that SES plays a much larger role in achievement gaps at school entry than race/ethnicity. Note that any reference to findings by Lee and Burkham (2002) in this report are not strictly income-based, but SES-based.

greater ability to work with their children on cognitive skills at home are more likely to prepare their children well for academic demands. Efforts to explain the sources of the achievement gap, then, often entail observing the homes of children: Do they have access to a computer? How many books do they have? How many manipulative toys do they have? How many hours of television are they watching? How many siblings do they have? Is there mother at home or at work? Are both parents at home? When their parents talk with them, how do they talk? Do they ask questions? How many words a day do these children hear? How many words have they acquired by two or three years of age? And the list goes on.

Almost all of this research reveals predictable patterns. As SES goes up, so too does access to environmental factors that promote cognitive development and support academic achievement. Some research supports this, but most of it is descriptive. It tells us a lot about differences in access to activities believed to promote cognitive development. Less of it shows real or significant links, or even attempts to do so, between the activities or variables and actual achievement.

At the same time, the whole source of the achievement gap is not known; in the absence of concrete knowledge, theory is useful for designing interventions. As stated earlier, this report's conceptual framework for identifying necessary interventions to ensure an adequate education for poor children is based partly on need: What types of support for learning do non-poor children have that poor children are less likely to have? How can schools be designed to ensure poor children have access to similar support?

Access to home-based learning opportunities & parent-child interactions

In general, child adjustment and achievement are facilitated by certain parent practices and low-income is associated with lower-quality parent-child interactions (Brooks-Gunn & Duncan, 1997). Improved parent-child interactions may be one pathway for improving the outcomes of poor children.

Research into the relationship between social class (SES) and cognitive development during the early childhood years has shown that while no differences in cognitive functioning are apparent at six months, by two years of age, SES-based differences in cognitive functioning are observed, with a large part of the difference attributable to verbal skills; these differences and their relationship to verbal skills persist throughout childhood and adolescence (Ramey, Ramey & Lanzi, 2001).

Interestingly, SES-related differences in the intellectual performance of older children are also largest in language skills (Ramey et al., 2001). Based on these findings, researchers have sought to determine the source of these differences and identify the extent to which such differences are the result of environmental factors. This research has examined the social situations of children in the early years because language is acquired, at least initially, in social situations and has focused on the quality of mother-child interactions because children typically spend the first few years of life at home, usually with their mothers (Ramey et al., 2001).

Substantial qualitative and quantitative differences in interactions between middle and lower class mothers and their children are implicated. Specifically, middle class mothers use more effective teaching strategies, a more elaborated speech code characterized by greater flexibility and longer more complex sentences, more adjectives, and fewer personal referents when speaking to their children. These socioeconomic differences in mother-child interactions emerge when infants are as young as twelve weeks old with middle class mothers using more

vocalizations with their infants, being more likely to respond to their infants' vocalizations with their own vocalizations, and being warmer, more involved and less punitive. Additionally, longitudinal research has shown that verbal responsiveness and involvement from mother-to-infant is important to subsequent intellectual status (Ramey et al., 2001).

Children are more prepared for school and do better in school when they have larger vocabularies, have had greater access to books, have been included in adult conversations, and have been presented with “critical thinking” questions and prompts when listening to books being read or enjoined in conversations. Children whose parents have been talking with and responding to them long before they were verbal are also in a much better position to take advantage of school learning opportunities than children whose parents did less of this when they were infants. Middle class parents are much more likely than lower class parents to do these things from birth through adolescence.

Closing the achievement gap, then, will require acknowledging these differences, their impact, and designing interventions that seek to educate poor parents about the importance of these activities and support them in pursuing them with their children. Such interventions should probably begin before children are even born so that parents have sufficient time to internalize the importance of the activities and prepare to use them with their infants and toddlers.

Parent physical and mental health

While poor children are at greater risk for health problems than non-poor children, they are also at greater risk for living with parents who have serious or chronic physical and mental health problems. Poor parental health has implications for children as it can lead to irritability and depression, both of which are associated with negative parent-child interactions and less

provision of learning experiences in the home. Parental mental health accounts for some of the effects of poverty on children's health and behavioral outcomes (Brooks-Gunn & Duncan, 1997). Obviously, parents who are suffering from physical or mental health problems of their own are less able to attend to the various needs of their children; while they may meet basic needs, they are certainly less likely to have the energy to attend to long conversations about world events, reading, floor time with educational toys, homework support, enrollment in extracurricular or enrichment activities, or trips to museums. As long as poor parents are more likely than non-poor parents to suffer from frequent or chronic illnesses, the children of poor parents will be at a distinct disadvantage when it comes to school outcomes.

As with other indicators of risk, poor adult health is most severe in impoverished urban areas. Young to middle age residents of impoverished urban areas have high rates of mortality to which deaths from chronic disease contribute heavily (Geronimus, 2000). Thus, children living in these areas are not only more likely to witness deaths and the effects of chronic illness on the adults around them, they are more likely to have a parent who suffers from chronic illness or dies.

Certain racial groups are also much more likely to suffer from chronic diseases, some of which lead to death, than others. For example, the prevalence of diabetes among blacks is 70% higher than it is among Hispanics and almost twice as high as it is among whites. Black adults are also significantly more likely than whites to die from heart disease. The proportion of blacks and other minorities who suffer from AIDS far outpaces their proportion of the general population (Annie E. Casey Foundation, 2000).

Not only are poor children less likely to have health care coverage than non-poor children, their parents are even less likely to have coverage. Among adults age 18 to 64 living in

poverty, about 42% were without coverage in 2002 , meaning they were almost twice as likely as their children to be without coverage (Mills & Bhandari, 2003; Bhandari & Gifford, 2003). Lack of health care coverage and access to health care in certain communities with large poverty concentrations has the same implications for adults as it does for children – perhaps worse. It is quite likely that poor parents are less willing to seek medical treatment for their own conditions than they are for their children, and government-based health insurance is far more accessible for poor children than for adults.

Many health programs target young children and adolescents, which is logical to the extent that such a focus is aimed at the prevention of behaviors and illnesses that can have long-term consequences for individuals and society. Such a focus can come at the expense of adults in impoverished urban communities who are “critical to the vitality of families and communities” (Geronimus, 2000, p.7). Geronimus’ (2000) argument for improved health services and access to services in impoverished urban areas is based not only on the immediate benefits it would have on children’s home lives, but also the benefits it could bestow on the community:

Improving adult health in impoverished urban areas would reap advantages for residents of all ages. Some examples are straightforward, such as the importance of maternal health to infant health. In addition, high levels of health induced disability among working age African-American men and women contribute to their relatively low rates of participation in the labor force and thereby their ability to support families economically. Meanwhile, extensive and competing obligations to families and larger social networks as well as to paid jobs lead to stress related diseases, particularly among women. More speculative pervasive uncertainty regarding health among young adult and middle-aged members of a community shapes the expectations of youths and may influence the timing of childbearing towards earlier ages or the propensity of some youths to engage in risk taking behaviors (Geronimus, 2000, p.7-8).

Improving the health of poor children is a worthy and important goal, especially to the extent that it increases their ability to do well in school and access other long-term educational and economic opportunities, which it likely will. However, construing the problem of poverty and its health impacts on children as the only avenue for eliminating poverty- and health-based achievement gaps is inadequate. Healthy children who live with chronically ill adults at home or

are surrounded by them in their communities are probably only marginally better positioned to do well in school than non-healthy poor children surrounded by chronically ill adults. In addition to the effects chronic illness may have on the quality of parent-child interactions and the ability of parents to expose their children to a variety of enrichment opportunities conducive to achievement, it certainly has effects on the ability of these adults to sustain employment. If the goal is to eliminate the achievement gap between poor and non-poor children, then the gap in adult health care and health care coverage between poor and non-poor parents will also have to be targeted.

Residence

Poverty imposes many limits on parents when it comes to investing in their children's well-being. Perhaps the most significant limitation on poor parents is their residence, which also makes a contribution to school outcomes. The relationship between residence and school outcomes is based partially on composition effects at the neighborhood and school level, but is also driven by community-level risk factors only remotely related to composition (e.g., access to community services). The effects of residence on children's achievement are in large part social capital effects, though residence is not the only avenue through which social capital affects school outcomes. This section, therefore, includes a discussion of social capital and the ways it operates to place some children at a distinct academic advantage and a discussion of why poor children tend to have less access to social capital at home and in their communities than non-poor children.

As discussed above, when poor parents are resigned to live in older or inferior housing, their children are also more likely to suffer from illnesses with environmental sources that can

affect their school outcomes (e.g., asthma and lead exposure). When parents have a difficult time finding or maintaining suitable housing, other achievement effects are introduced; children who move frequently do not do as well in school as those who move less, and students attending schools with high rates of mobility tend to perform less well on standardized tests than those who attend schools with less mobility. Finally, poor parents are more likely to live in areas where their children attend school with large concentrations of other poor children, exposing their children to another level of risk for academic failure. Each of these issues is examined in the following pages, illustrating how residence is another pathway through which poverty operates to put poor children at an academic disadvantage relative to more well-off children.

Housing access for low-income families

Income-based differences in access to housing and housing quality influence the achievement gap in a number of ways. Poor families are likely to have to spend a larger portion of their income on housing than non-poor families and to live in substandard housing. The accepted standard for affordable housing is that it should consume no more than 30% of a family's income. Housing cost burdens can range from moderate (over 30% of family income to housing) to severe (over 50%) (CBPP, 2003). Of the nation's 20 million lowest-income households, 15 million have a moderate housing burden or live in substandard housing. An estimated 5.5 million low-income households have a severe housing burden or live in substandard housing, according to 1999 data (JCHS, 2002). Housing costs have increased faster than income since 1999, so housing affordability problems are likely worse (CBPP, May 2003).

To put these numbers in perspective, a full-time, year-round minimum wage worker cannot afford to pay fair market rent in any jurisdiction in the country without

incurring a moderate housing burden to do so. In fact, the combined earnings of two full-time minimum wage workers are insufficient in many places. For example, in FY 2002, at the national median fair market rent, a modest two bedroom unit would require a wage of \$14.44 per hour, which is nearly three times the federal minimum wage (\$5.15 an hour or \$10,712 a year). In FY 2001, according to the Bureau of Labor Statistics, over 2.2 million workers earned the federal minimum wage or less, and over 60% of these were heads of households (CDF, October 2002).

While middle-class families may choose to spend more than 30% of their income on housing, they likely do so to purchase higher-quality housing in neighborhoods having community attributes that are more conducive to their children's development and academic progress. Poor parents paying more than 30% of their income on housing may not have the benefit of a better house or neighborhood to offset the expense.

When families assume a larger housing burden, they have less left over for food, clothing, transportation, child care, medical care, not to mention enrichment opportunities for their children like summer vacations, weekend excursions, extracurricular activities, books and educational games -- all things which middle class families, who no doubt make sacrifices to afford these things to the extent that they value them, have an easier time purchasing and which are at least partially responsible for the higher achievement outcomes seen in children from middle class families. Children residing in substandard housing are more likely to suffer from conditions that research has shown lead to a range of learning disorders and disabilities, as well as increasing the likelihood of missing or dropping out of school and exhibiting aggressive and anti-social behaviors in school. Incidents of asthma and lead poisoning are much higher among children living in

substandard housing. Finally, when parents are having a hard time making rent payments, they are more likely to have to move frequently, and children who move frequently are less likely to do well in school than children who have more stable housing arrangements. The Children's Defense Fund's Community Monitoring Project found that when former welfare recipients could not pay their rent, they were more than twice as likely to change schools in the prior six months compared to comparable families with less housing need (CDF, October 2002).

In order to offset housing burdens, poor families may move into homes that are too small for their family's needs (sometimes more than one family or extended families occupy the same unit). There has been controversy recently over the amount of homework being assigned in schools. The intent of homework is to accelerate student mastery of school content, which in turn should lead to higher achievement on standardized assessments. If, in fact, homework does accelerate learning and increase average test scores, it may add to income-based performance differences on standardized tests to the extent that more educated parents are more able to support their children in completing homework. Assuming, as well, that homework completion is more likely when students have access to a quiet and otherwise suitable place to do homework, middle class students may again be advantaged as they are more likely to live in housing that is not substandard or overcrowded.

Government efforts to expand housing to low-income families

In FY 2003, the President proposed spending over \$31 billion on Department of Housing and Urban Development projects designed to promote home ownership among low-income and minority families, expand the number of families served by rental

subsidy programs, and facilitate community housing and development programs (HUD, 2003).^{*} The federal government seeks to ensure affordable rental housing for low-income families in four ways: Section 8 vouchers, public housing, incentives to increase development of moderate income rental housing in underserved areas via lower mortgage rates, and the provision of tax credits to developers who rehabilitate or build affordable rental housing. Vouchers and public assistance housing provide direct support to low-income families in finding currently available affordable housing.

Less than 40% of all eligible low-income households are currently being served by assisted housing programs, and applicants to these programs wait an average of 16 months to 2 years for help, with waiting lists in some large cities of up to ten years. Over 40% of the units in public housing projects are occupied by families with children (CDF, 2003).

In 2001, 1.56 million households used Section 8 Vouchers, and one million of these were households with children (CDF, 2003). Section 8 vouchers are portable, meaning they can be used to get families out of high-poverty, high-crime neighborhoods and out of housing projects into privately owned housing units. There are long and growing waiting lists for vouchers, and many agencies have actually stopped taking applications because of the backlog (CBPP, May 2003).

A 2002 report by the US General Accounting Office found that vouchers are more cost-effective than federal programs that build affordable housing for low-income

^{*} HUD programs seek to create new homeownership opportunities, particularly for minorities; increase the supply of affordable housing, provide more protections for vulnerable populations, such as homeless individuals and people with disabilities; emphasize community renewal and neighborhood development; and rally “the President’s armies of compassion to better serve the less fortunate.” OMB (2003) Fiscal Year 2003 Budget Summary. Available online: <http://www.omb.gov>

households. A growing but not conclusive body of research suggests that housing vouchers promote more positive outcomes for children and help families leave welfare and succeed in the workplace by enabling families to move out of high-poverty neighborhoods with more jobs, lower crime, and better schools. Some studies have shown that using vouchers to move from high to low poverty neighborhoods can contribute to improved educational outcomes for children. They can also eliminate need for frequent moves, which research shows can undermine school performance, reduce skill development, and increase the risk that students will drop out (CBPP, May 2003). Later this report looks at some of this evidence in-depth.

Neighborhoods

Government efforts to move low-income families out of high-poverty neighborhoods is based in large part on research indicating that in neighborhoods where 40% or more of the residents are poor, a level of social dysfunction emerges that places all the residents at greater risk for a variety of poor outcomes (Khadurri, 2001). Other terminology is often used; high-poverty neighborhoods are sometimes defined as “ghettos”, “slums” or underclass neighborhoods. Moving to Opportunity, a Department of Housing and Urban Development demonstration project, seeks to move poor families out of high poverty neighborhoods into neighborhoods with less than 10% poverty concentration, a threshold chosen due to its approximation to the national poverty rate (Khadurri, 2001).

Most research indicates that the relative affluence of the neighborhood in which children reside has a number of effects on a variety of children’s outcomes in addition to the effects of family income (Brooks-Gunn & Duncan, 1997; Haveman & Wolfe, 1994). Living in

neighborhoods with concentrated poverty is associated with high crime rates, high levels of drug use, a large proportion of out-of-work adults (who might also be drug users or criminals), less provision of learning experiences in the home, decreased cognitive development in pre-schoolers, more negative parent-practices, and decreased rates of high school graduation (Brooks-Gunn & Duncan, 1997; Haveman & Wolfe, 1994). Children living in these neighborhoods also have limited access to community services and facilities (e.g., nutritional, family planning, social services, health and recreational) (Haveman & Wolfe 1994) that might increase their resilience in the face of daily exposure to neighborhood risk factors. Frequently such neighborhoods are found in large cities (with populations over 250,000) (Lippman et al. 1996).

However, some of this research is contestable on the grounds that it does not sufficiently control for family background characteristics or for the endogeneity of location (Ellen and Turner, 1997). In their review of the research on neighborhood effects, Ellen and Turner (1997) find that neighborhood effects are generally much smaller than those of observed family characteristics such as income, SES and educational attainment. Recent studies that have done the best job of controlling for unobserved family traits like parenting skills or values find no independent neighborhood effects, casting doubt upon the robustness of earlier studies (Ellen & Turner, 1997). Generally they find that existing evidence is inconclusive on which neighborhood conditions matter most, how neighborhood characteristics influence individual behavior, and whether neighborhood effects differ for families with different characteristics.

One educational production function study claims to control for individual family background in identifying the relationship between school inputs and student performance on the 1992 Massachusetts Educational Assessment Program (MEAP). However, a close reading of

this study shows that the researchers were really controlling for community-level factors: the percentage of professionals and managers, the percentage of single mothers, the percentage of rental units and the crime rate (Jaggia & Kelly-Hawke, 1999). The researchers found that students in 4th, 8th and 12th grades all performed significantly better on the 1992 MEAP if they lived in communities with more professionals and managers, fewer rental units and less crime. Student achievement was also significantly related to the percentage of single mothers in the community for 4th and 8th graders. As Ellen and Turner (1997) note generally about research seeking to understand neighborhood effects, one problem with this study is that it may grant too much power to community effects on MEAP performance without sufficiently controlling for individual background effects. Another problem, of course, is that the researchers are calling the community effects individual background effects.

Ellen and Turner (1997) identify six mechanisms by which neighborhoods do influence individual outcomes, similar to a list provided in earlier work by Jencks and Mayer (1990): the quality of social services; socialization by adults; peer influences; social networks; exposure to crime and violence; physical distance and isolation. The extent to which every low-income neighborhood suffers, for example, from poor quality of social services may vary, and some families may be more vulnerable than others to some neighborhood influences. These are areas research has yet to fully explore (Ellen and Turner, 1997).

Ellen and Turner's (1997) review finds as well that children at different stages are differentially exposed to neighborhood effects. For example, there is scant evidence that infants and pre-schoolers are placed at greater risk by living in poor neighborhoods once family resources and support are controlled. Only one study has been done that looks exclusively at elementary school children and finds little effect, while several have looked at elementary and

high school combined, consistently finding modest but significant effects.

The most thoroughly researched age group is adolescents, where neighborhood effects are consistently observed across a broad range of outcomes from educational attainment to teen pregnancy and involvement in crime. However, the research has yet to elucidate which neighborhood characteristics matter the most and for whom. Some research finds that black teenagers are more exposed to the effects of living in high-poverty neighborhoods while other research finds that black teenagers are the least likely to be positively affected by having affluent neighbors (Ellen & Turner, 1997).

In general, it appears that our understanding of neighborhood effects is complicated by our inability to fully control for family background characteristics, our lack of knowledge regarding the mechanisms through which neighborhoods operate to exert their effects, the extent to which the location of the neighborhood complicates our observation of neighborhood effects (when it is not controlled, which it rarely is), and the fact that individuals are assumed to have some choice in neighborhoods that might serve as a proxy for their likelihood to engage in certain risk-taking behaviors in the first place (Ellen & Turner, 1997; Evans, Oates & Schwab, 1992). Finally, in research that does rigorously control for family characteristics, neighborhood effects always diminish significantly and are generally overwhelmed by family effects.

It seems, however, that choice might be an overestimated concern; for poor families, choices of residence are certainly curtailed. It also seems that the issue of family effects vs. neighborhood effects could be problematic to the extent that neighborhoods have effects on observable family characteristics like income, access to quality services or networking among adults. In fully controlling for observable family characteristics, one may also parse out neighborhood effects on family characteristics that in turn effect individual behaviors and

outcomes.

In sum, there is compelling evidence that adolescents in particular are excessively influenced by peers and less influenced by family and other adults at school and in the community (Ellen and Turner, 1997). The bulk of the evidence on neighborhood effects also indicates that a number of teenage outcomes directly and indirectly associated with school achievement and attainment are negatively affected in high-poverty neighborhoods. While moving these students out of the neighborhood may or may not be effective to the extent that they may still choose to seek out peers who engage in anti-academic or otherwise risky behavior, we should not close the door on the possibility that some or many of the teenagers in high-poverty neighborhoods would benefit from greater access to adults who are willing and able to support them in academic pursuits or engage them in various enrichment activities. We still know little about the extent to which such efforts might promote academic resiliency either because the efforts have not been made or have not been carefully studied.

Urbanicity

In 1999, children attending school in central city districts were twice as likely as their suburban counterparts to be poor (USDOE, 2003).^{*} While the total poverty rate in 2002 was 12.1%, almost 40% of all people living in poverty resided in central cities whereas less than 30% of the total population lived in central cities. It is true that poverty is dispersed across all locations, and poverty concentration in central cities is actually shrinking, but all children living in central cities are more at-risk for exposure to the effects of concentrated poverty and poor, minority children are most at-risk (Proctor & Dalaker, 2003). One study found that poor blacks were eight times as likely and poor Hispanics six times as likely as poor whites to live in high-

^{*} On average across all school districts in 1999, 16% of school age children were poor (USDOE, 2003).

poverty neighborhoods (Duncan & Ludwig, 2000).*

Children living in cities with populations over 250,000 are more likely to have a number of individual level risk factors beyond poverty; they are also more likely to be recent immigrants, and to speak English as a second language (Lippman et al., 1996; USDOE, 2003). In fact, over one-quarter of children living in large cities have multiple individual risks for academic failure (USDOE, 2000) on top of the risk exposure that accompanies concentrated poverty at the neighborhood level. Therefore, the fact that children living in central cities have lower educational outcomes is partly attributable to the fact that these children are more likely to have other individual-level risk factors or to reside in neighborhoods that expose them to multiple risks. However, the urban context in and of itself has a separate and identifiable impact on some student outcomes (Lippman, et al., 1996; USDOE, 2000).

In one of the most comprehensive studies of the relationship between school setting and student outcomes, Lippman, Burns and McArthur (1996) sought to determine how much of the variation in a number of factors (student background, school experiences, and academic outcomes) was explained by poverty concentration across school settings. Their research examined outcomes through 1990 of students attending public schools primarily in the 1980's. They found that urban high poverty schools had a higher concentration of poverty on average (69%) than either suburban high poverty (60%) or rural high poverty (61%) schools. Urban students were less likely to complete high school, more likely to be absent, less likely to be employed full time or attend college four years after high school, and more likely to live in poverty and be unemployed later in life (Lippman, et al., 1996).

* Based on 1990 census data which defines a high-poverty urban census tract as one where more than 40% of residents are living at or below poverty. Recent evidence suggests that poverty is becoming less concentrated in central urban areas, though urban areas are still more likely to have high-poverty census tracts (Kingsley and Pettit, 2003).

Lippman, et al. (1996) found that, even after controlling for student background factors like race and family income, 8th grade students in urban schools scored lower on achievement tests than their peers in suburban and rural schools, but found no significant differences in achievement at the 10th grade level. The inability to detect a significant difference in achievement at the 10th grade level may be partially attributable to the fact that urban students are more likely to drop out of school; thus, the lowest scoring students may have exited the system by this time.

All children who reside in high-poverty neighborhoods are at-risk for academic failure due to a variety of poverty-related factors. Students living and attending schools in urban areas are at risk for depressed academic outcomes partially as a result of the fact that urban students are more likely to have individual-level risk factors and reside in neighborhoods with multiple community-level risk factors, but student achievement in all urban schools is lower on average than student achievement in non-urban schools, even for students with similar family background characteristics. Thus, even urban students who aren't poor and who don't live in high-poverty neighborhoods don't perform as well as their peers in non-urban schools. This may be due to the generally higher concentration of poor students in urban schools and the subsequent inadequacy of available school resources to meet the needs not just of the poor students but of all students (Lippman et al., 1996; USDOE, 2000).

School composition

Where a child lives is a strong determinant for where that child will attend school. Because poor children frequently live in neighborhoods with other poor children, they are likely to attend schools with other poor children. The economic and racial characteristics of those with

whom children attend school affects educational achievement and attainment with the effects being stronger for African American children and children from low-SES families (Abt Associates, 1993; Anderson et al., 1992; Coleman et al., 1966; Haveman & Wolfe, 1994; Kennedy, Jung & Orland, 1986; Lippman et al., 1996; Myers, 1985; Pelavin & Kane, 1990).

In their assessment of the Chapter One Compensatory Educational Services Program, Kennedy et al. (1986) found that though the relationship between family poverty status and student achievement existed, it was not as strong as the relationship between school poverty concentrations and school achievement averages. Furthermore, they found that the relationship is not limited to the poor students in a school. In fact, non-poor students attending higher-poverty schools were more likely to do poorly than poor students attending low-poverty schools (Kennedy et al., 1986).

Using NELS:88 data, Pelavin & Kane (1990) found a negative effect of poverty concentration on individual student achievement after controlling for both family income status and prior achievement. They found that each 10% increase in school poverty concentration resulted in a small but significant decrease in math achievement for the average student (Pelavin & Kane, 1990).

In a review of the research on the effects of school poverty concentration, Jencks and Mayer (1990) found, after controlling for family background, that school level socioeconomic status (SES, a composite indicator that includes parent education, income and occupational status) affects students' chances of graduating as well as how much they learn.

Data from The National Assessment of Educational Progress (NAEP) also confirms that school poverty concentration is related to student performance. While the NAEP does not control for individual background factors, its data do indicate that non-

poor children in high-poverty schools are at greater risk for falling behind in school than their peers in low-poverty schools (USDOE, 2003).

Average Mathematics scale score for 4 th , 8 th and 12 th graders by school FRPL eligibility: NAEP 2000*			
Percent of Students in School Eligible for FRPL	Grade 4	Grade 8	Grade 12
0-10	243	291	311
11-25	234	285	303
26-50	228	273	297
51-75	218	261	280
76-100	207	248	276

Twelfth grade students in the highest poverty schools (51% and above) are performing below 8th grade students in schools with less than 25% FRPL eligibility. Twelfth grade students in schools with between 26 and 50% FRPL eligibility are only outperforming 8th graders in the lowest poverty schools by six points. Interestingly, from 4th to 12th grade, students in the lowest poverty schools gain less than students in the highest poverty schools over the same span (69 points v. 70 points). This observation implies that even in schools with the highest concentrations of poverty, learning is occurring at a pace that exceeds that observed in the lowest poverty schools. However, the gap in math performance between low and high poverty schools observed in 4th grade does not change much at 12th grade; in 4th grade, there is a 36 point difference between the lowest and highest poverty schools and at 12th grade there is a 35 point difference. The good news is students in all schools are learning, and it looks like they are doing so at comparable rates; the bad news is that students in high poverty schools are not learning enough to close the gap in math performance initially observed in 4th grade.

* Taken from Appendix 1, Supplemental Table 11-2, p.111. USDOE (2003) The Condition of Education 2003

The NAEP does collect data on individual background factors that might influence achievement. This data indicates that the difference in achievement by school level poverty exists whether or not the students were personally eligible for FRPL. As the poverty concentration of the school increases, math performance for non-FRPL eligible students steadily declines (from 244 to 212 at 4th grade). For eligible students, performance also declines, but not as sharply (from 218 at 11-25% FRPL eligibility to 204 at over 75% FRPL eligibility). Thus, while non-eligible students outperform their FRPL eligible peers, they post a larger performance decline than their eligible peers with each incremental increase in poverty concentration in addition to performing below their peers at schools with lower poverty concentrations (USDOE, 2003). It may be that even non-poor children attending high-poverty schools are more likely to have one or more other risk factors or that they were more likely to be poor during their pre-school years. In any case, these children are at greater risk for school failure than their peers in low-poverty schools.

NAEP assessment results in Geography and History show similar patterns. Students in low-poverty schools outperform students in higher poverty schools at all three grade levels (USDOE, 2003).*

School level data collected by the NAEP sheds further light on the source of the performance gap observed between low and high poverty schools. Higher poverty schools had higher rates of absenteeism, reported less parental involvement, and were

* pp. 34-35, USDOE (2003) The Condition of Education 2003. Geography and History assessments were administered in 1994 and 2001. In addition to school level variations in performance, students whose parents had higher levels of education scored higher than their peers whose parents had less education on both assessments.

less likely to rate their students as having a “very positive” attitude toward achievement than low poverty schools (USDOE, 2003).

In sum, research indicates that school economic and socio-economic composition affect student outcomes for both poor and non-poor students and the effect holds even after controlling for individual student family background and prior achievement. The implication is that for those students who attend schools with high concentrations of other poor or disadvantaged students, another layer of risk for academic failure is introduced not only to the students with individual risk factors, but to all students in the school.

Mobility

When students move frequently, they are at greater risk for falling behind in school, and when children attend schools with high rates of mobility, they are also at-risk for not doing as well in school because of the stress that high rates of student turnover place on teachers to balance coverage of material with meeting the needs of new students who might not be in the same place as current students, not to mention the increase in time spent on administrative tasks that accompanies student turnover (Kerbow, 1996). High rates of mobility at the neighborhood level certainly influence the extent to which parents and their children can build relationships with neighbors, other parents, community agencies, or otherwise build networks of support.

In sum, poverty operates through a number of pathways, many of which overlap, to impair the cognitive development and depress the educational outcomes of children. Brooks-Gunn's and Duncan's (1997) review of the relationship between childhood poverty and child outcomes also indicated that poverty's most pronounced and long-term effects occurred during

the pre-and early school years, when access to basic health services, positive parent-child interactions, safe housing conditions, and home-based learning opportunities play an especially important role. For children experiencing poverty during these years, especially long-term poverty, the likelihood of impaired cognitive development and failure to complete high school is substantially increased (Brooks-Gunn and Duncan, 1997).

While adolescents living in poverty or in high poverty areas are as exposed to risk as young children, maybe more so, income effects on achievement for adolescents are slight once prior achievement is taken into account. Family income in early childhood has large and sustained effects on achievement throughout a child's school career (Brooks-Gunn & Duncan, 1997).

Research on the effects of neighborhood composition is not terribly helpful in understanding how composition effects are related to individual behaviors and outcomes. However, the larger point of this section is to show that people in poverty tend to concentrate in certain areas where their children attend similar schools. Children who live in high-poverty neighborhoods and attend high-poverty schools are more at-risk for academic failure than poor children who live in low-poverty neighborhoods and attend low-poverty schools. There is evidence that moving poor children out of high-poverty neighborhoods can lead to better school outcomes, as well as improvement in a number of other outcomes. Apparently, residence matters and is one of the pathways through which poverty operates to place children at-risk for academic failure. When these children attend the same schools in large numbers, the schools are more at-risk for being overwhelmed by the many needs that poor children have relative to non-poor children – whether they be limited English proficiency, lack of health care, inadequate support for learning at home, or hunger. Furthermore, research indicates that when such students

attend schools together in large enough numbers, the achievement outcomes of all students suffer and provide a substantial source of the achievement gap between poor and non-poor children.

Composition effects, however, or the way concentrated poverty operates to place children at further risk for academic failure, are hard to nail down in empirical research. Qualitative research has sought to bridge the gap to some extent, but our full understanding of the mechanisms through which concentrated poverty operates to put children at-risk for depressed outcomes is not completely clear. Theory is useful in illuminating this black box, so the following pages will summarize what is known about the role of social capital or social support in learning.

The Role of Social Capital or Social Support in Explaining the Achievement Gap

There are three types of capital which contribute to a child's school outcomes: human, physical and social. This previous section discussed ways in which poverty operates to reduce the human and physical capital on which children have to draw when seeking to realize their cognitive potential. Certainly some children are born with the potential to "grow smarter" over time than others, but environmental factors can also affect cognitive trajectories. For example, inadequate nutrition, exposure to lead, and prenatal alcohol consumption can permanently alter a child's cognitive trajectory – or the extent to which he can "grow smarter" in school. Children who have inadequate housing, or do not have a computer, books or educational games have less physical capital on which to draw in developing their human capital than children who do have these things. The technology for preventing or correcting these capital deficiencies is readily known and available, and sometimes inexpensive. However, we have also seen that among the

pathways through which poverty operates to place some children at a disadvantage in school, some are more complex; the technology for addressing them is neither certain nor cheap, and results may not be observable for a long time. Many of these pathways are related to the social capital available to children. As with other forms of capital, access to social capital is often related to income and other family and community factors associated with income.

We have seen, for example, that neighborhood and school composition influence achievement. Students who move a lot tend to do less well in school, and children attending schools with high rates of mobility are at-risk for academic failure. Certain groups of students are most at-risk for living in “high-risk” neighborhoods and attending “high-risk” schools – poor and minority students. When researchers discuss these phenomena, they look for theories that can help explain them and inform the development of interventions most likely to offset negative effects. A common theory that has been used is that of social capital. Unlike physical or human capital, social capital does not exist at the individual level, but is inherent in relations among people that are built on trust, shared values, and the sharing of information. Social capital is one resource on which children can draw as they seek to increase their own human capital, which can be understood as their full intellectual potential (Coleman, 1987; 1988). In high-poverty neighborhoods and schools, or in neighborhoods or schools with high rates of mobility, relations characterized by high degrees of social capital are harder to forge. To the extent that they do not exist, it is one less form of capital on which these children have to draw as they seek to increase their human capital.

Social capital also exists at the family level. A family's social capital is not necessarily related to the other forms of capital that comprise its background, including human and financial capital. A family's human capital is usually understood as the amount of education the parents have obtained, and the parents of poor children are less likely to be well-educated. A family's financial background is understood as the amount of physical capital (adequate housing, opportunities for travel or participation in various enrichment activities like trips to a museum or the zoo) it has access to based on its wealth. Obviously, families can have high human and financial capital without having high family social capital; even so, the children in these families have access to two forms of capital to which poor children have less access.

Family social capital consists of the norms, social networks, and relationships between adults and children within a family. Common indicators of low family social capital include single parent homes, number of siblings, no maternal expectations that a child will attend college, and mother's absence from the home during early childhood. Coleman (1988) and others (e.g., Smith, Beaulieu & Israel, 1992) have found that the effects of low family social capital on dropping out in particular are significant. As these indicators of low social capital are concentrated in a family, the dropout rate rises considerably (Coleman, 1987; 1988; Smith et al., 1992). While not all poor families have low family social capital, to the extent that they do, their children are at greater risk for school failure (or failure to complete school, which are certainly related).

Social capital also exists outside the family and consists of "the social relationships that exist among parents, in the closure exhibited by this structure of relations, and in the parents' relations with the institutions of the community" (Coleman,

1988). Smith et al. (1992) found that even in families with high social capital, a lack of social capital in the community can have a sharp negative influence on students' rate of school completion.

There is evidence that middle class parents are more likely than working class parents to have social relationships with other parents and to have comfortable access to other community institutions that serve as further forms of social capital on which their children can draw.

If part of the achievement gap observed between poor and non-poor students is a function of access to social capital, then creating social capital in schools requires identifying the tangible aspects of social capital that are missing and determining how they can be created. Coleman (1988) identified several tangible indicators of social capital which act as resources on which individuals can draw to achieve various goals. For example, one indicator of social capital is the degree to which people help each other because they trust one another enough to ask for help and because there is an expectation that obligations will be met and repaid. Another indicator is the extent to which people share information for the purpose of informing and inspiring action. Finally, effective norms for behavior and sanctions for failing to behave in certain ways are also indicators of social capital.

Coleman also identified two forms of social structure that are especially important in generating social capital. The first of these is closure, or intergenerational closure. Although a group might have a set of norms to which they wish to see their group committed, if there is no closure of information networks within the structure, the norms will never be realized. If a working mother expects that her child will come home from

school each day and immediately finish her homework, but fails to follow-up on that expectation to ensure it is done or done well, closure is missing. If the child's teacher, in turn, fails to follow-up with the parent of this child to let her know, preferably earlier versus later, that homework obligations are either not being met or being inadequately met, another form of closure is missing. If an adult in the neighborhood sees a neighbor's child skipping school but does not call the neighbor to let her know, closure is missing.

Another form of social structure that supports the generation of social capital is appropriable social organization. With appropriable social organization, an organization established for one set of purposes can also be used for others. For example, while schools are presumably established to attend to the academic needs of children, their ability to serve other functions for children facilitates social capital. Churches are established primarily as places for worship; when they offer after-school programs and tutoring to children, they are increasing their members' access to social capital.

Not all social structures generate social capital. The degree to which capital is generated is positively related to the degree to which interactions reflect trust, an open exchange of information, and an acceptance of and commitment to the norms of the organization. Therefore, even if the teacher calls the parent about missing or poor quality homework, if the teacher and the parent do not trust one another, do not openly exchange information, or do not share the same acceptance of or commitment to the norm of homework, social capital is not generated. If the adult who sees the child skipping school does call his mother, but she responds with apathy or is defensive, social capital is not generated. Only social interactions that facilitate productive activity constitute social capital (Smith et al., 1992)

Coleman (1987) defines the outcomes of formal education as a complementary interaction between two sets of inputs that have traditionally come from two different sources. The first set of inputs comes from the home and includes attitude, effort, and conception of self. The inputs that have traditionally been provided by the school include opportunities, demands, and rewards. School is a “constructed institution, a result of public policy designed to complement the nonstructured, spontaneous institution of the family . . . this implies that schools, to be effective, must change as families change, must be adjusted to the conditions of the institution they complement” (Coleman, 1987, p.35-36). In other words, schools serving children who have less family social capital on which to draw have to change to provide more of the inputs usually provided at home. Providing more opportunities, demands and rewards might be helpful, but will not be sufficient to close the social capital gaps experienced by these children which contribute to the overall achievement gap. Coleman suggests that in trying to determine what the

provision of such resources might look like, schools should examine the characteristics of the institutions which have traditionally provided them. These characteristics include “attention, personal interest and intensity of involvement, some persistence and continuity over time, and a certain degree of intimacy” (Coleman, 1987, p.38).

Based on this theory, several school reform or restructuring efforts have been promulgated. Smaller schools are intended to provide students greater attention, opportunities for involvement and intimacy. Looping, creating a sequence where teachers keep the same group of children for several years, is based partially on the concept of increasing student access to social capital through persistence and continuity over time. Finally, reduced class sizes are also intended to increase teacher attention to individual students, the intensity of involvement a teacher has with her students, as well as the overall intimacy of the classroom.

Other social capital theorists focus their attention on the needs of specific populations; some point to evidence that black students are particularly at-risk for being influenced by negative peer behaviors or neighborhood activities that can even outweigh the contributions of families with high levels of social capital. Some theorists claim that social capital for black students has more refined or intensive components due to the fact that the dominant culture of schools is foreign to and often at odds with African-American culture. Still others take a community level approach focusing on communities that have too few or inadequate social institutions to fill the gap in social capital needed by poor children if they are to do well in school.

Research into the factors which affect the achievement of African-American students has shown that negative peer influences and neighborhood characteristics such

as high crime, extreme mobility and unemployment can offset and even undermine the best efforts of schools and families (Gonzales, Friedman & Mason., 1996; Kahne & Bailey, 1997). This research confirms *social disorganization theory*, which suggests that “low income multiethnic communities produce deleterious effects because they are plagued with higher crime rates, lack opportunities for prosocial friendship networks, and are unable to supervise and control teenage peer groups” (Gonzales, et al. 1996, p.3). To use Coleman’s social capital theory, the ability of residents in these communities to trust each other, establish intergenerational closure through the sharing of information or create effective norms or sanctions is seriously diminished.

Some theorists who recognize the above problems take their conceptualization of it one step further; they are concerned that the social capital of schools is dominated by the influences of white middle class cultural capital and that minority children, especially those from disadvantaged backgrounds, are systematically denied access to the social capital that does exist within the school (Stanton-Salazar & Dornbusch, 1995; Stanton-Salazar, 1997).

Stanton-Salazar and Dornbusch (1995) believe that there are institutional and ideological forces which make accessing the social capital and institutional support necessary for academic success particularly problematic for working-class minority youth. They also contend that minority socialization is distinct from that of white, middle class Americans because minority students have to “learn to participate in multiple and often conflicting and contradictory social systems and contexts” (1995, p.2). The responsibility for learning how to manage these contradictory and competing contexts

falls back on the students because schools are not strategically and explicitly guiding them through the process (Stanton-Salazar & Dornbusch, 1995; Stanton-Salazar, 1997).

Like Coleman, Stanton-Salazar and Dornbusch believe that “for all children and youths, healthy human development, general well-being, school success, and economic and social integration in society depend upon regular and unobstructed opportunities for constructing instrumental relationships with institutional agents across key social spheres” (1995, p.6). They define institutional or school social capital as instrumental or supportive relationships with school personnel. These relationships and the networks they form function primarily as “conduits” for the transmission of the effects of general background characteristics and as lifelines to resources necessary for healthy development and academic success.

The construction of relationships between students and school personnel that are based on interpersonal trust, solidarity, and shared meaning is problematized by “hierarchical relations of power and institutional ‘barriers,’ and . . . institutionalized dependency” (1995, p.17). Working-class minority youth are more dependent on school personnel and support precisely because they often lack such support in their homes and communities. At the same time, they often have ambivalent feelings about the school, the people who work there and the value of succeeding within its framework (see Delpit, 1995; Ladson-Billings, 1994, Ogbu & Simmons, 1994;). Without feelings of trust and solidarity, the relationships necessary for generating or accessing social capital never form. Even when students, teachers and other school personnel have the best intentions in forging the types of relationships which support the generation of social capital, they

are constrained by the fact that schools are not arranged to support such relationships over the long term.

Beyond institutional practices and structures that problematize minority youth's access to the social capital generated by close relationships with school personnel, these youth experience borders and barriers specific to their identity that impede relationship building. If schools are in fact dominated by the cultural values and practices of the dominant group, minority youth must find a way to access a different sociocultural world. This requires crossing borders, or "real or perceived lines that demarcate one world or setting from another" (Stanton-Salazar & Dornbusch, 1995, p.22). The barriers faced by minority youth include sociocultural barriers (stigmatization of cultural values or practices), socioeconomic barriers, linguistic barriers, and "structural features in school environments that prevent, impede, or discourage students from engaging fully in learning – social or academic" (Wehlage, 1993, p.59) These can include a lack of tutors, tutoring time, counselors, or inadequate second language training.

Others are concerned with the plight of declining social capital in rural communities as a result of the relocation of industry to other areas of the country (or world), reduced access to various social agencies and their services, and/or the consolidation of smaller schools into larger schools in larger jurisdictions; therefore, they co-opt social capital as a means to -- and reason for -- building community where it is being diminished. Others see the same effects and their implications in inner cities, where the nation's poorest and most unskilled and uneducated become concentrated. There is a large body of research and writing on why and how schools should either replace the social capital of these communities or, at the very least, attempt to buffer

children from the oppressive effects of living in these communities (e.g., Wang, Haertel & Walberg, 1997; 1998; Boyd, 1998; Gonzales et al., 1996; Kahne & Bailey, 1996; Meier, 1996).

Communities bereft of access to institutional supports are commonly characterized by residents who have disproportionate physical and mental health needs, as documented above. Some schools have been trying to deal with this problem within the traditional structure by increasing the array of services offered at the school site. This is evidenced in the breadth and variety of school programs created to meet the special needs of individual students, but is also evidenced by the changing composition of school faculties. In 1950, teachers comprised 70% of all school employees. By 1986, teachers occupied only 52% of school positions (Wang et al., 1998). Even though these new support positions are intended to increase schools' responsiveness to the individual needs of students, they often constitute more of the same educational interventions that schools use for all students, which, as Coleman (1988) suggests, are not going to bridge the gap between inadequate family and community social capital and successful educational outcomes.

Thus there has been a wave of interest in collaborative or coordinated services as the means to redress the declining social capital of America's families and communities and meet the comprehensive needs of students (Boyd, 1998; Wang et al., 1997; 1998). The coordinated or collaborative services model "combines bureaucratic and professional elements with a central emphasis on devising ways for service agencies – usually including schools – to cooperate in mounting a coordinated and comprehensive, rather than fragmented and piecemeal, approach to serving the needs of at-risk children and

families” (Boyd, 1998, p.5). Services at such a school might include a clinic, family social workers, child care, health care enrollment offices, or adult education classes.

Although schools do not have to be the hub for coordinated services, their status as “enduring institutions that play a critical role in communities” (Wang et al., 1998, p.4) and as the institutions where the human capital of the next generation of Americans is either created or left untapped implicitly nominates them as major players in the coordinated services movement. Furthermore, public schools are among the few surviving community institutions in many poor neighborhoods (Crowson & Boyd, 1993).

Crowson & Boyd (1993), contend that the pressure for coordinated services comes not only from social capital theorists, but from three other intellectual perspectives that are related to the developing framework of this report. The first perspective they call “the new ecology of schooling” (p.144) which is based in an appreciation of the ecological relationship between schools, families and neighborhoods, which holds that the developmental processes and outcomes of children are intricately connected to and influenced by the environmental context of their lives.

The second intellectual perspective which supports the call for coordinated services is the investment perspective (Crowson & Boyd, 1993). The concept of education as an investment for children, families and the nation as a whole is not new. However, the idea that if educational investments in at-risk youth are not matched by community based investments (e.g., “improved housing, health, nutrition, recreation, family stability, and community development services”) then they will fail to pay off is relatively new (Crowson & Boyd, 1993, p.146).

The third perspective is based in the recognition of healthy child development as a process that requires both education and nurturing (Crowson & Boyd, 1993). This perspective emphasizes that “successful development cuts across home and school, does not separate academic from moral, social, and emotional development, and ideally incorporates all the resources of the school (including parents) into a common blending of care and education” (Crowson & Boyd, 1993, p.147).

There is a plethora of examples of schools that have managed to successfully serve extremely disadvantaged youths (e.g., see Meier, 1996; Edmonds, 1979; Levine & Lezotte, 1990), and evidence that school can make a difference in children’s lives (Mortimore, Sammons, Stoll, Lewis & Ecob, 1988). Much of this research suggests that schools which manage to succeed with students who come from families and/or communities with weak capital are schools which are organized around the goal of meeting individual student needs and anchored in a strong academic focus (e.g., Shouse, 1996). The exact form of that organization may vary from school-to-school, but the assumption that schools can create capital where it does not exist or tap into existing, but latent, capital, is often a basic belief and is rooted in a desire for increased equity and social justice (Elmore, 1994). If adequacy for at-risk students in high-poverty settings is going to be realized, schools will have to be organized to ensure that such students have access to social capital that is more equivalent to the access observed in middle-class neighborhoods and schools. Where social capital cannot be replaced, interventions which seek to foster student resiliency in the face of inadequate capital are necessary.

FRPL Receipt as a Trigger for Expanded Services for At-Risk Students

Research indicates that at-risk children frequently attend schools together and that schools with large concentrations of poor children add another layer of risk for academic failure to all children in the school. Previous (but limited) research on this issue (see Lippman et al., 1996) suggests that schools where 40% or more of the student population is eligible for FRPL should receive the resources necessary to provide all students access to an expanded platform of services. However, this decision does come with caveats.

There is some controversy surrounding the use of FRPL as an indicator of poverty concentration in a school (e.g., see Lippman et al., 1996). The threshold for FRPL, 185% of the poverty line, means that a good number of students on FRPL are not living in poverty; however the vast majority of students eligible for FRPL are actually living at or below 130% of the poverty threshold. Using FRPL measures to design policy interventions for disadvantaged students requires the assumption that the educational needs of students living 185% above the poverty line are equivalent to the needs of students living at, or well below, the poverty line. One way to deal with this problem is to get a breakdown at the school level of those students receiving free lunch (whose family incomes are below 130% of poverty) and those students receiving reduced price lunch (whose family incomes are between 130% and 185% of poverty).

It is also possible that FRPL overstates real student need. A recent study found widespread FRPL participation by ineligible students (Davis, 2003). It may understate the percentage of students in a school from economically disadvantaged families in middle and secondary schools since older students are less likely to enroll in the program even when eligible. According to the USDOE (1994), while 44%, 23% and 30% of students in urban, suburban and rural schools respectively were eligible for FRPL as of 1990, 38% of urban students, 16% of

suburban students and 28% of rural students actually received FRPL (Lippman et al., 1996). On average, five percent of eligible students, then, do not receive FRPL, with eligible urban and suburban students less likely to enroll than eligible rural students. If there are systematic differences in the propensity of eligible students to receive FRPL, then some schools will consistently have less resources and services than the needs of their at-risk students demand.

Data on FRPL enrollment also vary across sources. For example, according to the Department of Agriculture's Food and Nutritional Services Program, in fiscal year 2002, 48.3% of the student population received free lunch and 9.4% received reduced price lunches, for a total of 57.7% of the student population receiving free or reduced price lunches (FRPL).^{*} These numbers may be slightly inflated to the extent that they include summer FRPL eligibility; in the summer months, the vast majority of lunches served are FRPL meals. FNS data on FRPL receipt show a fairly stable picture over the last several years. NCES data indicate that in 1999-2000, 57% of all students enrolled in public schools attended schools where 30% or more of the student population was eligible for FRPL. Thirty-five percent attended schools where more than half of the student population was eligible for FRPL.[†]

The NCES Common Core of Data also provides an estimate of FRPL prevalence and patterns. Looking specifically at academic year 2000-2001 and focusing on elementary schools, 42% of all elementary school students received free or reduced price lunches. Just over 50% of

* Annual Summary of Food and Nutrition Service Programs, available online: <http://www.fns.usda.gov/pd/annual.htm>. Students receiving free lunch must have family incomes at or below 130% of the poverty level; students receiving reduced price lunches must have family income between 130% and 185% of the poverty level and cannot pay more than forty cents per meal. From July 2003 to June 2004, 130% of the poverty level for a family of four is \$23,920 and 185% of the poverty level for a family of four is \$34,040. See National School Lunch Program Fact Sheet. Available online:

† Table 101, p. 125, "Selected Characteristics of students, teachers, parent participation, and programs and services in traditional public and charter elementary and secondary schools: 1999-2000". U.S. Department of Education, National Center for Education Statistics. *Digest of Education Statistics, 2002*, NCES 2003-060, by Thomas D. Snyder, Project Director and Charlene M. Hoffman, Production Manager. Washington, DC: 2003.

all elementary school students attended schools where 40% or more of the student population received FRPL; 41% attended schools where over 50% of the enrolled students received FRPL.

Use of FRPL receipt at the school level is, at the present time, the best indicator of school-level risk for inadequate educational outcomes. As discussed earlier, in those schools where 40% or more of the students receive FRPL, educational outcomes are not only below average, but lower than expected on the basis of individual risk factors alone. It is in these schools that student need for expanded services is greatest, that interventions are likely to be most effective, and that added investments will be most cost-effective.

However, as the purpose of this report is to assign costs to an adequate educational program for at-risk students, other decisions and assumptions are also needed. This report uses Common Core of Data estimates of FRPL receipt at the elementary level as the basis for calculating total costs of offering an adequate program at every school where more than 40% of the student population receives FRPL.* This results in an estimate that 42% of all schools currently serve such student populations and would require an expanded platform of services in order to offer an adequate program that has the best chances of closing the gap in achievement between poor and non-poor students. To the extent that the data provided by the Department of Agriculture is more accurate, this understates the prevalence of such schools.

Note that recent data from NCES does not provide breakouts at 40% FRPL; instead it tells us that 57% of students attend schools where more than 30% of the enrolled students are enrolled in FRPL and 35% of all students attend schools where more than 50% of enrolled students receive FRPL. If these numbers are averaged and one assumes that the average is a decent estimate of the percentage of schools where more than 40% of the students receive FRPL,

* Neighborhoods with concentration of poverty at 40% or above are also widely considered as high-poverty neighborhoods where a range of well-being indicators begin to notably decline (Khadurri, 2001).

you get 46% of all schools, or 5% less than the estimate of 51%, which is based solely on elementary school data.

Basing our estimate on elementary school data of FRPL concentrations has conceptual strengths and weaknesses. To the extent that risk is understated by FRPL enrollment at middle and high schools because older eligible students are less likely to enroll, using elementary data makes sense. While it is true that families don't suddenly get less poor just because their children grow older, it is likely true that, especially among families who bear children at a very young age, their financial position is likely to improve over the years as they mature, have more flexibility for taking jobs (i.e., not having to stay at home to care for small children or incur the costs of child care), or gain more marketable skills. It is reasonable to assume, then, that as children grow older and get more dependent and their parents grow older and acquire more experience, skills and flexibility, such children are more likely to move further out of poverty with each year of schooling. While this might not apply for all poor children, especially those with many younger siblings, it certainly applies for some.

However, data are also provided here that show that poverty during early childhood can have long-term impacts on children that income relief will not necessarily eliminate. Therefore, it is likely that even for adolescents whose families have moved out of poverty, the cognitive, physical and/or socio-emotional effects of early risk exposure still influence their academic achievement in middle and high school.

Elementary schools are smaller on average than middle and high schools. Often, middle schools are fed by two or three elementary schools and high schools are fed by even more. If a high school is fed by five elementary schools, two of which have FRPL concentrations of 40%, two of which have FRPL concentrations of 20% and one of which has no FRPL, the high school

will have 24% of its students eligible for FRPL (assuming that the percent of students eligible from each elementary school has remained stable over the years). To this extent, using the elementary school data overstates the need for expanded services at the high school.

On the other hand, research indicates that all students who attend schools where more than 40% of students are enrolled in FRPL are at-risk for academic failure; therefore, for all students attending these elementary schools, there is risk for academic underachievement. This would raise the percentage of “at-risk” students at the above high school considerably. Furthermore, for those students also at-risk due to poverty in early childhood, as earlier argued, their needs for expanded services do not necessarily end at the end of 3rd or 4th grade. To cut off services to these children would certainly leave many of them hanging – perhaps better off than they would have been without intensive programming in the early years, but not adequate to close the gap. It should also be noted that smaller high schools are proposed in the model here. Assuming that massive busing in middle and high school did not disrupt demographic patterns, these high schools would look demographically similar to the elementary schools that fed them, of which there would be fewer.

In the end, the estimate of FRPL concentration at the elementary level is used to calculate total costs for offering an adequate program to at-risk students across the country.

Where Risk and Schools Meet

How Powerful Are Schools to Close the Achievement Gap?

The previous chapter examined the evidence behind a well-known truth: poor children suffer from a wide range of barriers to school success that non-poor children are less likely to experience and if they do are more likely to have access to resources that enable them to effectively cope. Poor children begin school at a disadvantage, and though they make progress, they never fully recover from the effects of risk exposure. If this knowledge about the achievement gap and its sources is not new, then why does the gap persist and sometimes widen throughout school?

One continuing source of the gap may be that more advantaged students attending low-poverty schools are simply learning at a faster rate than their less advantaged peers in low-poverty schools. In order for the gap to close, either the rate of learning observed among more advantaged students needs to slow down or the rate of learning observed among at-risk students needs to speed up or some combination of the two.

Beyond the fact that the gap cannot be fully blamed on schools because not all learning takes place in schools, there are other reasons to be more rigorous in analysis of the gap's tenacity. For example, in many cases students do not stop being poor or otherwise at risk as they grow older, thus it is unlikely to expect the gap to diminish over time unless sources of the gap observed at the time of school entry are targeted. We have also seen that even if early grade interventions successfully close the basic skills gap, the gap may reappear later. This may in part be because the effects of poverty in early childhood can be persistent and even cumulative, meaning they reside within the student and even compound over time.

It may also be that the type of instruction that fosters achievement gains in the early

years, pronounced attention to basic skills, is inadequate in the later years. As children grow older, tests become more concerned with assessing their ability to understand abstract relations, infer meaning and identify conceptual connections. While middle class children are more prepared for such assessments, in large part because of the ways their parents interact with them at home, poor children are less prepared for this leap, and schools may be less prepared to help them.

Additionally, small children are more likely than older children to have health coverage, are more likely than older children to have adult supervision throughout the day and evenings, are more likely to receive free and reduced price meals, and are generally more supported by society than adolescents. As children grow older and are deemed more independent, perhaps seen as more difficult or less pleasant to be around, are more influenced by peer pressure and other community risk factors, their actual exposure to risk may increase. While early interventions are vitally important for long-term achievement prospects, withdrawing support from disadvantaged students as they grow older leaves them stranded; risks for academic failure remain, in some ways may have increased, but support for being resilient in the face of such risks is harder to access.

Thus, while it is helpful to know that the achievement gap remains or widens over the course of schooling, it is not helpful to assume that schools are the culprit. Older students, just like younger students, require comprehensive and perhaps more refined support for learning as they grow older.

A popular and intuitively logical argument is that if high-poverty schools simply spent more money on instructional programs than low-poverty schools, the gap would close. In general, research that seeks to establish a relationship between school resources and school

outcomes, also known as educational production function research, is contentious, difficult, and marked by mixed findings (Rice, 2001). Some say that there is no production function for education because educational outcomes cannot be systematically related to school inputs while others say that a systematic relation exists even though attempts to specify it so far have led to mixed or conflicting results. Still others argue that the concept of a production function elevates the values for efficiency and high standardized test scores above other values related to education like liberty, equity, civic responsibility and tolerance (Rice, 2001). There is also the consideration that even if an educational production function exists, it may vary across students and context. Most estimates of a school production function do not measure separate effects for low and high SES students. If these studies focus on populations with larger proportions of more advantaged students, smaller effects might be produced if it is true that disadvantaged students are more reliant on school contributions than less advantaged students. To the extent that there are significant differences in the student characteristics across studies, then this might be the source of inconsistent findings rather than an inconsistency in how effectively schools utilize resources (Grissmer, Flanagan, Kawata & Willimason, 2000).

Efforts to understand the relationship between school inputs and student outcomes can take place at different levels of aggregation. Generally it is assumed that analyses at the individual, school or district levels trump state-level analyses, which are often criticized as having an upward bias. However, no one has yet identified a credible source of bias in state-level analyses (Grissmer et al., 2000). The body of non-experimental studies of the relationship between school resources and student outcomes done at classroom, school and district levels is generally inconsistent, leading many to claim that this is evidence that schools do not systematically make effective use of resources. Others claim that the evidence may not point as

much to inconsistencies in schools' use of resources as to inconsistencies in measurements of the relationship between school resources and outcomes (Grissmer et al., 2000; Ferguson and Ladd, 1996). There is also the chance that analyses done below the state level may be biased downward. Typically, these studies have smaller sample sizes, making it harder to achieve statistical significance and making estimates more sensitive to minor variations that might be less pronounced with larger sample sizes. Grissmer et al. (2000) suggest that one source of this downward bias might be a missing variable for years of schooling since school entry. Another source of bias might be the use of pretest scores as controls, which may not fully capture a child's existing capacity for achievement. For example, the effects of pre-kindergarten may not be evident on a pretest given in 4th grade but show up later. Class size studies have shown that fewer years of small classes (1-2) have a smaller and more short-lived effect than more years (3-4) (Grissmer et al., 2000).

Grissmer et al. (2000) claim that any theory about the effects of school resources on students outcomes, no matter the level of analysis or estimation model, has to account for three things: 1) the inconsistent pattern of results in nonexperimental measurements^{*}; 2) the results of experimental data which tend to show effects for key resources like class size and pre-kindergarten on outcomes[†]; and 3) the pattern of national score gains and expenditure growth from 1970 to 1996.

Depending on whose analysis you use, the level of per pupil expenditures doubled or rose

* Non-experimental studies or reviews of studies that focus on the relationship between classroom, school or district expenditures and students outcomes include the following: Coleman et al. ,1966; Hanushek, 1986; 1999; Hedges et al., 1994; Krueger, 1999; Greenwald et al., 1996; Ferguson, 1991; Ferguson and Ladd, 1996.

† For example, the Tennessee STAR class size experiment (Finn and Achilles, 1990; Mosteller, 1995); the quasi-experimental Wisconsin Student Achievement Guarantee in Education study (Molnar et al., 1999); pre-school experiments (Barnett, 1995; Karoly et al., 1998). In later sections, we will provide detailed coverage of these studies and their results.

about 35% between the late 1960s and the early 1990s.* From the early 1970s to 1992, NAEP math, reading and science gains were observed for 9 and 13 year olds while math and reading gains were observed for 17 year olds. If the data are disaggregated by race or income, substantial gains occurred over this period for blacks, Hispanics and low-SES whites while NAEP data show no or minor gains for non-disadvantaged white students – the majority of US students (Grissmer et al., 2000). During this time, then, the gap narrowed but did not close.

Analysis of the cause of these gains suggests that family characteristics could explain the smaller white score gains (for example, fewer children and higher parental education) and some, but not the majority, of the large minority gains (Grissmer, Nataral-Kirby, Berends & Williamson, 1994; Cook and Evans, 1997). Grissmer, Flanagan and Williamson (1998) suggest that the timing and regional pattern of black score gains in the '70s and '80s are consistent with two explanations – changes in schooling and changes in attitudes and motivation of black parents and students and their teachers. During this period, for example, pupil-teacher ratio fell by about eight students per teacher. Thus, school inputs, some tangible and some less tangible, did contribute to the narrowing of the gap.

More recently Grissmer et al. (2000) analyzed NAEP data from 1990 to 1996 to estimate the effects of varying levels and uses of per-pupil expenditures on student achievement across states. Because about two-thirds of the variation in per-pupil funding is not within states but between states, they wanted to see if significant inequalities between states affected student outcomes, particularly for disadvantaged students. They found that during this time period all public school students in all states showed statistically significant math gains. Students in Northern rural states had the highest average scores while students in Southern rural states had

* According to Hanushek (1996), real school spending doubled over this period; according to Rothstein and Miles (1995), it rose about 60%.

the lowest, a difference explained mainly by family characteristics. Northern rural states also have among the highest levels of parental education and income while Southern rural states have among the lowest levels of each. The strongest family predictors of test scores are parental education, family income and race/ethnicity, followed by family size, the age of the mother at child's birth, and mobility.

Grissmer et al. (2000) found statistically significant achievement differences among students with similar family characteristics across states, differences which were at least partly related to state educational system variables. Lower-pupil-teacher ratios, higher public pre-kindergarten participation rates, lower teacher turnover and higher levels of teacher-reported adequacy of resources for teaching all contribute to higher NAEP scores in states with disproportionate numbers of disadvantaged students.

The cost-effectiveness of resources changed by a factor of 25 depending on the program or policy, which types of students or grades were targeted, and the current program levels. Grissmer et al. (2000) found that the most cost-effective policies were those that provided teachers with more discretionary resources, lowered pupil-teacher ratios to below the national average in states with higher proportions of low-SES students, and expanded public pre-kindergarten enrollment. They concluded that improving the working conditions of teachers by lowering the pupil-teacher ratio, providing them with more discretionary resources and improving student readiness for school through expanded pre-kindergarten can produce significant achievement score gains even in the absence of increasing the overall quality of the teaching force. No positive effect for higher teacher salaries or the percentage of teachers in a state with master's degrees was found.

Grissmer et al. (2000) suggest two hypotheses are implied by their results, each worthy of

further study. The first is that schooling variables in one grade appear to affect achievement in all later grades, rendering pretest scores that do not adequately control for previous school experiences invalid controls. This hypothesis is supported by experimental findings on class size which show that two students with similar pretest scores and schooling condition in grade X can end up with very different post-test scores that appear to be influenced by class size in earlier years. This makes class size resemble a human capital input that can effect outputs over all future periods and suggests that models that specify the effects of capital investments in all previous years of schooling more appropriate for understanding the relationship between school inputs and outcomes. If this hypothesis holds true, it should also change the way we think about educational “interventions.” Instead of assuming, for example, that small class sizes are an intervention that should have immediate effects, we should think of them as an investment for some students that, when implemented consistently over several years, have the power to increase their human capital and thus their ability to do well in all future years of schooling.

A second hypothesis is that resource substitutions occur between families and schools that affect achievement. Students who come from families with higher levels of resources may be more immune to changing school conditions. As the resources at their schools go up, the parents may contribute less to learning at home, and as the resources go down, the parents may pick up the slack. This may be why it is harder to detect school effects for students from families with higher resources; these students are less dependent on schools. At the same time, it is generally easier to detect schooling effects for children whose families have lower resources, perhaps supporting the hypothesis that these students are more dependent on school inputs and that their families are less able to provide substitute resources when school resources decline (Grissmer et al., 2000).

Biddle (1997) looked at state child poverty rates and found that in those states with higher rates of child poverty, school funding and state average math outcomes are lower. According to Biddle (1997), state educational funding levels and rates of child poverty predict 55% of the variance in state differences in achievement. Therefore, in those states with higher average proportions of poor children, the states tend to spend less on education and achievement tends to be lower.

A more recent effort to illuminate the relationship between state spending on a range of programs and a variety of child outcomes found that more money can make a difference. Harknett, Garfinkel, Bainbridge, Smeeding, Folbre and McLanahan (2003) examined the relationship between state spending in education and other areas on a range of child outcomes using 1996 data. While the researchers do not look at money spent per poor child or expenditures per child in high poverty schools, they do control for many variables that might mediate the relationship between spending and outcomes, including parental investments in children, parents' education, family structure, and racial and ethnic composition at the state level. They found wide variation across states in both spending and child outcomes. For most indicators of child outcomes*, the same states appear in the bottom and top groupings repeatedly with a similar pattern identified by Grissmer et al. (2000). Southern rural states have higher proportions of poor children, spend less on them and have lower outcomes while Northern rural states have smaller proportions of poor children, spend more and have higher outcomes.

Harknett et al. (2003) found that an extra \$1,000 expenditure on education was associated with a 10% reduction in low math and reading scores (4th and 8th grade NAEP), a 15% reduction

* Child outcomes included in the analysis were infant mortality, low birthweight, child death rate, percent of 4th and 8th graders with low math and reading scores on the NAEP and percent of 8th graders with low writing scores on the NAEP, high school drop out rate, idleness rate, teen birth rate, property crime arrest rate, violent crime arrest rate, and child poverty rate. Data sources for outcomes include Kids Count and National Center for Education Statistics.

in the high school dropout rate, and a 10% reduction in the teen birth rate. When the researchers tested the effect of aggregate public expenditure on standardized test scores, they found a weaker effect than for education investments alone. Using a different model that does not include education expenditures, however, they found states with more extensive welfare provisions tend to have better math outcomes, especially in the 8th grade, than states with minimal welfare provisions. They found that Medicaid expenditures were negatively related to child death rates but not to low birth weight; a \$100 increase in Medicaid expenditures was associated with a 1.9 percentage point decrease in the child death rate. Low birth weight, however, was negatively related to AFDC.

In sum, these researchers found a relationship between spending and about half of the outcomes they examined with the strongest relationships found between Medicaid expenditures (on child death rates) and education expenditures (on test scores, high school completion, and teen birth rates).

All studies that seek to understand the relationship between school inputs use at least one of the following as a principal indicator of school input (or expenditure): teacher-pupil ratio; teacher education; teacher experience; teacher salary; per pupil expenditure; administrative inputs, and facilities (Jaggia & Kelly-Hawke, 1999). Aside from controlling for family or community background variables, it is rare that any study assumes any other effects on achievement. This is because the vast majority of what is spent on education is spent on instructional programs, and the vast majority of instructional spending goes to purchase teachers. Thus, this research seriously limits us when we seek to identify how schools can be more effectively organized or stocked to increase achievement because it does not ask “what if” but only “what is?” The Harknett et al. (2003) study is especially helpful in the context of adequacy

for at-risk students because it shows that states that spend more to improve a range of child outcomes experience achievement effects. It is precisely this type of study that is more necessary if we are ever to close the gap. The results of production-function research are frequently interpreted to mean that spending more on schools will be unproductive because schools cannot be relied upon to make effective use of those extra resources or, perhaps more accurately, “increasing school inputs alone will not improve student performance” (Jaggia & Kelly-Hawke 1999). In fact, the results of this research would more productively be used to encourage policymakers and researchers to expand their focus to understanding other socioeconomic factors that do play a key role in explaining student performance and the implied policy leverage points.

Until this happens, a good deal of money and time is being wasted that amounts in large part to a false commitment to, and promotion of a false hope for, raising the achievement of disadvantaged students. Consider Title I, on which the federal government spent over \$10 billion in 2002. Title I is a program designed to improve the outcomes among the most disadvantaged student populations; in fact, it claims to be committed to closing the achievement gap between disadvantaged and advantaged students. Funds are targeted to the highest poverty schools, though they are widely dispersed across most schools, where they can be used to purchase targeted services or whole-school programs. While \$10 billion is a lot of money, Title I funding accounts for less than 3% of all elementary and secondary education revenues.

As of August, 2002, 14.9 million children received Title I assistance, with the vast majority of funds going to children in pre-school thru grade six (77%). This pattern reinforces the claim that as at-risk children move into adolescence, they are less likely to receive extra support for learning. Ninety-six percent of the highest poverty schools

(schools where 75% or more of the student population is eligible for FRPL) receive Title I assistance with 46% of all Title I funds going to these schools. Twenty-seven percent of Title I funds flow to schools with 50-74% of students eligible for FRPL, and the remaining 27% goes to schools with less than 50% of the student population eligible for FRPL. In fact, while the highest-poverty schools are more likely to receive Title I assistance, the amount they receive per poor child is considerably lower than the amount per poor child in low-poverty schools, \$475 and \$771 respectively (USDOE, 2001). Title I funds largely serve to close the funding gap between Title I and non-Title I schools but do not provide Title I schools with a higher level of resources to meet the greater needs of large concentrations of poor students. Before Title I funds, Title I elementary schools spent \$196 less per pupil than non Title I schools. On average, these schools received \$273 per pupil in Title I funds, enough to raise their spending \$77 per pupil above non-Title I schools. However, in the highest poverty schools (75% and above), Title I funds did not even close the funding gap; spending on school personnel in these schools remained lower than in non-poverty schools even after Title I funds were added (USDOE, 2001).

Based on 1997-98 data, about 77% of Title I funds were spent on instruction, which includes teachers, teacher aides, instructional materials, technology for instruction, districtwide instructional programs, and services for private school students. About 12% was used to purchase instructional support in the form of professional development, parent involvement programs, guidance counselors, psychologists and social workers. Finally, about 12% was used to pay for district and school administration expense associated with Title I (USDOE, 2001).

Determining the impact of Title I funds on closing the achievement gap is complicated because it is difficult to disentangle Title I effects from the impact of other federal, state and local efforts to improve school performance. Disentangling these effects is not necessary because long-term NAEP trend data indicate a widening achievement gap between high-and low-poverty schools from the later 1980s to 1999. Students in high-poverty schools have shown reading and mathematics gains from 1992 to 1999, but the achievement gap as measured by NAEP scores remains substantial, equal to several grade levels (USDOE, 2001).

Schools do not exist in a vacuum, and they are particularly exposed to the effects of their state's holistic approach to caring for poor children, as well as to the relative proportion of poor children they are required to educate. This lends further credence to the argument presented here: achieving adequacy will require a comprehensive approach to addressing the pathways through which poverty operates to place students at-risk for school failure. While it would be nice to believe that spending an extra \$400 - \$800 per poor child each year will be sufficient to make –up the difference between resources available to poor versus non-poor students that affect learning, the available evidence suggests it is not sufficient. It may be that the reason much of the research on the relationship between educational spending and outcomes is characterized by inconsistent results is that the relationship itself is inconsistent. It may also be that when such research focuses too tightly on school spending it omits other variables that matter more than school-level spending for outcomes, especially as the needs of a student population rise and spread beyond school.

While it is not the case that money can't matter in education, it may often be the case that it doesn't. Perhaps the wrong resources are being purchased given the needs of the student

population. Perhaps all the right resources are in place but the school is ineffectively managed and organized. Perhaps the focus on school spending, teacher quality and instructional programming needs to expand to include other potential leverage points for increasing achievement in high-poverty schools where money might make a difference.

Evidence presented in this section shows that the gap has narrowed in the past; that school resources played a part in this narrowing, especially for minority and disadvantaged students; that learning is occurring in all schools serving all types of students; that large gaps in the rate and absolute levels of learning remain; that Title I funds are not currently sufficient to help high-poverty schools offer an expanded platform of programs and services more in-line with the greater needs of the students they serve; and that some instructional inputs are effective and cost-effective, especially when targeted to the right types of students and grade levels.

We have also begun to see, from an examination of Title I funding, that high-poverty schools are typically not able to offer the same quality and quantity of resources as low-poverty schools. As mentioned earlier, we should be less concerned with this gap as a source of inequity than as a sustainer of inadequacy.

How Prepared are High-Poverty Schools to Provide an Adequate Education?

How prepared are high poverty schools to provide their students with an equal opportunity to access an adequate education? Do they typically have access to even the most basic resources we believe are necessary to provide an education for even advantaged students? There is a relationship between funding and student poverty levels. If high-poverty schools serve students with greater needs and they also have access to less, equal or just a little more

resources, then obviously these schools are not able to offer programs sufficient to meet the needs of these students.

Reporting on resources in the context of adequacy is problematic because we still have no real notion of adequacy. What is an adequate class size? What is an adequate number of computers per student? What is an adequate teacher? What is an adequate level of funding? In the absence of answers to these important questions, we are left to compare resource levels in high-poverty schools to either national averages or levels found in low-poverty schools. At the same time, research reviewed in the previous section indicated that some inputs do appear to make a difference -- namely teacher stability, adequacy of teacher resources, access to pre-kindergarten, and small classes.

Teacher turnover

Research suggests that high-performing schools are characterized by stability and cohesiveness among employees (Coleman & Hoffer, 1987) as are successful school-reform efforts (Fullan, 1991). Many efforts to reform schools fail in large part because of high teacher turnover (Huberman & Miles, 1984). It is difficult to make any school change, be it the adoption of a new curriculum or a new style of school decision making, in the context of high-employee turnover. Teacher turnover also drains schools of precious resources that could be used to purchase other services or to develop or refine best practices. Teacher turnover most certainly disrupts the development of school-level social capital.

Teacher turnover is higher in high-poverty schools than in low-poverty schools (Ingersoll, 2001; USDOE, 2000) and is frequently a response to unsatisfactory school-level working conditions (Ingersoll, 2001; NCES, 1997) as well as inadequate compensation

(Hanushek et al., 1998; Ingersoll, 2001; NCES, 1997). In 1997-98, the average teacher salary in high-poverty schools (75% or greater FRPL) was \$35,821 compared to \$40,803 in the lowest poverty schools (5% or less FRPL). Teachers in the lowest poverty schools also had approximately 2.3 years more experience on average than those in the highest poverty schools (Chambers, Lieberman, Parrish, Kaleba & Van Campen, 2000). Administrators in high-poverty schools are more than twice as likely than those in low-poverty schools to report having difficulty hiring teachers (24% and 10% respectively) (Lippman et al., 1996).

A recent study of novice teacher (five years' experience or less) attrition in four Midwestern states compared observed attrition rates in urban districts (where the percent of students on FRPL was three times as large as that in non-urban districts) with state-level rates (Theobald & Michael, 2002). The study sampled over 3,000 teachers whose first position was in an urban district and found that they were significantly more likely to move out of their districts than novice teachers hired by non-urban districts but not more likely to leave teaching. In urban districts, about 60% of the novice teachers left or moved within five years of being hired while about 50% of novice teachers in non-urban districts left or moved (Theobald & Michael, 2002).

Teacher resources

Lippman et al. (1996) found that teachers in high poverty schools were the least likely to report having adequate resources for teaching. As evidence in the previous section established, high-poverty schools may spend more per pupil on average (after Title I funds are added) than low-poverty schools, but not enough to offset the greater needs of the students. Anecdotal reports of teachers coming out of pocket to purchase supplies for their students abound. It is also popular to hear teachers lament the difficult and time consuming procurement process in public

schools, even for resources schools traditionally provide (e.g., copy paper).

Resources for teaching include a wide range of things: computers, educational software, access to AV equipment, textbooks, supplementary reading materials, educational manipulatives, paper, scissors, glue, crayons, bulletin board materials, or field trip funds. In higher-SES schools, parents are more likely to be involved not just in their children's learning and school activities, but in efforts to reduce resource differentials through PTA fundraisers and informal contributions to classrooms. These contributions can come in the form of volunteer time (covering the class while the teacher administers one-on-one assessments or assisting with a special project), but they can also come in the form of real resources (the father who volunteers to mount a TV on the wall or the mother who brings in a year's supply of crayons). A good portion of what many schools spend for teacher resources is "off the books"; PTA fundraising money, which in high-SES schools can be substantial, is specifically directed at providing teachers with supplies that they might otherwise not get or have to wait long periods to get. When parents are not involved in PTA, then that is another source of teacher support diminished. If funds raised by parents in a district were pooled and redistributed across schools in the district with some attention to student need, one source of this resource gap could be addressed. Political difficulties with such initiatives, however, make their implementation unlikely.*

Teachers in high-poverty schools are more likely to report that lack of parent involvement is a real problem (Barton, 2003; Lippman et al., 1996). As family income goes up,

* Parents in the Santa-Monica-Malibu Unified School District raise in excess of \$4 million a year for their schools. Some of the schools receive \$1 million a year while others receive less than \$30,000, a difference that can translate into around \$1,000 per year differences in per pupil funding from school-to-school in the same district. The Superintendent of this district has proposed pooling 15% of school donations into an "equity fund" that would generate about \$400,000 per year and redistributing the funds to all 16 schools in the district based on a weighted student formula that provides more funding to poor and low-performing children. About 28% of students in the district are poor. Parents in the district are unhappy with the proposal and threaten that if it is accepted school giving will decline. Many districts consider ways to redistribute school donations but "most of them back off, finding such policies too much of a political risk" (Scoon Reid, March 3, 2004, Education Week).

so too do parental reports of volunteering at school, and attending school meetings, class events, and teacher-parent conferences. When teachers in high-poverty schools report inadequate parent support, they may be referring primarily to parent support of student learning, but the ramifications of withdrawn parental support extend further than parent failure to attend meetings and functions or help children with homework. Lack of parent support can translate into real lost resources at the classroom level, and is most likely to be lost in those classrooms where teacher and student need is highest.

Teachers in high-poverty schools are also more likely to report having no control over the curriculum and a lack of administrative support (Lippman et al., 1996). It is hard to know for sure what these teachers mean or whether this perceived lack of control and support is real or just a function of the greater need and resource constraints observed in high-poverty schools. Especially recently, these schools are more likely to be ordered to adopt curricula and instructional practices, sometimes highly prescriptive at the classroom level (Erlichson and Goertz, 2002). In any case, to the extent that these teachers perceive a lack of control and support, they are more likely to leave or become apathetic.

Teacher reports of lack of administrative support may also be a function of school safety, which teachers in high-poverty schools are more likely to identify as a problem (Lippman, 1996). High-poverty schools are more likely to report school crimes than low-poverty schools (USDOE, 2003). Although it may be unfair to blame administrators for the prevalence of crime or unsafe working conditions in high-poverty schools, it is an easy place to lay the blame since traditionally it is the job of school administrators to ensure a safe and orderly environment.

High-poverty schools are much more likely to be staffed by teachers teaching outside their certification field (NCTAF, 1996). In an analysis of the 1993-94 Schools and Staffing

Survey, Ingersoll (1999) found that 13% of secondary classes in low-poverty schools (less than 10% poverty) are taught by teachers lacking certification in their fields, while 27% of classes in high-poverty (more than 75% poverty) schools are taught by teachers without certification in their fields. We have already seen that high-poverty schools are more likely to be staffed by teachers with fewer years' of experience. It may be that new teachers and teachers teaching outside their field need more administrative support and do not feel they are receiving it.

High-poverty schools are more likely than low-poverty schools to have inadequate buildings as well. They are more likely to use temporary buildings, to have one or more features of their building rated inadequate (e.g., inadequate facilities, structural problems) and to have environmental inadequacies related to building conditions (e.g., poor heating, lighting or ventilation) (USDOE, 2003). Whether or not there is a relationship between the adequacy of a school building and the learning that occurs within it is unknown, but for teachers working in inadequate facilities, their perception of the adequacy of resources for teaching may be negatively affected.

Students from well-off families are significantly more likely to have access to a computer and the internet at home than students from poor families (USDOE, 2000) and students attending high-poverty schools are much less likely to report having been assigned to use the internet for research than students in low-poverty schools (Barton, 2003). This may be a function of the number of computers available in high-poverty schools and/or access to the internet in such schools. It is much more difficult and expensive to wire old buildings for internet access, many of which are found in high-poverty urban areas. This may also be a function of teacher knowledge of computers or how to use or direct students in using the internet or a function of academic press – the extent to which teachers hold all students to high learning standards and

provide them opportunities to pursue challenging assignments.

Pre-kindergarten

As of October 2001, approximately 64% of all 3, 4 and 5 year olds were enrolled in some form of preprimary education (7.6 million out of 11.8 million). Of those enrolled, 63% were enrolled in public programs. Head Start enrollment for October 2001 was just over 900,000, with 54% of its enrollment made up of four year olds, 35% made up of three year olds and the rest comprised of students over four or under three. Four year olds are more likely than three year olds to be enrolled in school (66% vs. 39%) with about half of each enrolled in full-day programs (USDOE, 2003). Forty-one states fund public pre-kindergarten programs, but only one state is implementing a universal program for all four-year olds. Funding per enrolled child ranges from a low of \$986 to a high of \$7,845 (Kagan & Rigby, 2003).

Despite the fact that pre-kindergarten is among the most well-researched, empirically supported and cost-effective ways to ensure that poor children are ready to meet the demands of school, it appears that a substantial portion of poor children do not have access to it.

Class size

High-poverty schools have larger average enrollments than low-poverty schools (Lippman et al., 1996; USDOE, 2000). Chambers et al. (2000) found that the highest-poverty schools had smaller class sizes than the lowest poverty schools (20.6 and 23.0 respectively), but this figure includes special education classes. High-poverty schools tend to enroll more special education students than low-poverty schools, which may account for this finding. Research on class size suggests that the optimal class size for disadvantaged elementary students is

somewhere between 13 and 17 (Glass and Smith, 1978; Mosteller, 1995; Slavin, 1989).

Therefore, even though high-poverty schools may have smaller class sizes than low-poverty schools, the average class size is still above the optimal limit identified by research.

Popular Suggestions for Improving the Performance of High-Poverty Schools

There is a lot of talk about what is wrong with schools and how they need to change in order to close the achievement gap. A good deal of this talk is focused less on specific interventions to be implemented and more on characteristics to be fostered. In theory, these discussions are not concerned with money or productivity. Instead they are broadly concerned with the culture of schools and the objectives that drive the work of school professionals. As such, these discussions range around ways to change the organization of schooling to be more effective for all students.

There are those who believe that schools are not supportive enough of students – that students do not have opportunities to build meaningful relationships with school personnel in ways that improve or fully tap their academic potential. These people believe that schools need to be arranged differently so as to promote the building of such relationships (smaller total size as well as classrooms size) and that school personnel need to be better trained in fostering these relationships with all types of students (culturally aware and sensitive to varying needs and backgrounds of students). These people often discuss the importance of reaching out to parents and the community to improve social support networks both at school and in the students' neighborhoods. And more recently they discuss the need to extend the scope of services offered at the school site so that all student needs are addressed (e.g., before and after-school programs, on-site

counseling and social work services, clinics, etc). Few proponents of increasing the social support in schools claim that teachers and principals currently do not care enough about students, but many claim that they are not very effective in demonstrating that care in ways that are meaningful to all students or that have an effect on learning.

There are others who believe that the real culprit in school underachievement is a lack of academic stringency. These people believe that poor students are too often relegated to low-track classrooms or to schools where teachers are ill-prepared to provide rigorous training in core academic competencies. They believe that a culture of low expectations pervades high-poverty schools and that we should expect the same high standards of all students regardless of their background.

Many of these people believe that schools do not provide academically oriented environments in part because the people who staff them are inadequate. School leaders and teachers need to be of a higher-quality, more and better training, and to be held accountable. Basically, the belief is that schools are plagued by a general lack of professionalism. The fixes for this problem are many: more training, better preparation, higher pay, greater control of hiring and firing, accountability for results, more resources to get the job done, greater control of school decision making, etc.

Many believe that when schools are held to high uniform standards for all students, held publicly accountable for the results and threatened with sanctions in the form of lost revenues, they will become more academically focused institutions. This, in fact, is the presumption that drives standards-based reform with accountability and that is enforced by No Child Left Behind. In fact, No Child Left behind seems also to be driven by a third assumption about how schools can improve to better meet the needs of all

students since it provides that students attending chronically inadequate schools be given vouchers to use at other schools. This provision is based on the assumption that public schools will never be able to close the gap because they are managed by a mammoth, change-resistant special interest-beholden bureaucracy that if not unwilling is at least incapable of changing in ways that will truly support the achievement of high standards for all students. These people believe that only when schools are threatened by competition and the potential loss of funds will they begin to seriously look for ways to adapt to meet the needs of all students. Some within this camp believe that we should not ask public schools to do it alone, that opening up the market to others will provide the diversity of services and room for innovation necessary to meet all the needs of our diverse populations of students. For this latter group, it is less about scaring public schools into change than it is about relieving public schools of the whole burden. In any event, proponents of choice believe that opening the educational system up to new, smaller, more client-driven programs is necessary in order to maximize the potential of all students.

This report is not itself concerned with choice as an option for closing the achievement gap. Poor students are not going to stop having specific needs that will have to be met in order to close the achievement gap just because they have access to a wider array of schools. However, to the extent that some of these schools more effectively meet the needs of these students, we may have more information about how to close the gap. To the extent that opening the system disperses poor children across settings that are less concentrated, then one level of risk has been removed. At this time, there is very

little evidence about whether choice will lead to either more effective schools or less concentrated school settings.

In terms of standards-based reform with accountability, that is now the present condition in all schools. So far, there is no credible evidence supporting its ability to close the achievement gap. Furthermore, aside from its contention that high standards for all will be the lever by which the achievement gap will close, it is in no way based on an honest consideration of the factors that drive the achievement gap. Absent such consideration, its prospects for success are dim.

So, that leaves us to consider the other two broad options for improving schools in ways that will most effectively narrow the achievement gap: schools are either going to have to be more supportive of the students and their full range of needs or they are going to have to hold all students to higher standards and push them until they get there, or some combination of the two. The first is about providing students with social support for learning and the second is about academic press. Both reform streams have at least one thing in common: in order for the characteristics they promote to be effectively fostered in schools, school personnel will have to embrace them and know how to facilitate them, which implies a need for professionalism. For simplicity sake, then, three broad reform categories are considered here: social support (SS), academic press (AP) and professionalism (P).

Chapter two discussed the concept of social capital and commonly considered methods for increasing school-level social capital or social support. In this chapter we see that academic press has emerged as another construct to consider when thinking about how high-poverty schools can effectively raise the achievement of their students.

Academic press is based on a shared value at the school level for academic excellence as well as conformity to specified academic standards. At the teacher level, it is manifested as teacher belief that students can achieve high standards and a willingness to push students ever higher in their learning.

School-level academic press, which is a collective value for academic excellence and a shared commitment to holding all students to high academic standards, has also been linked to greater student effort, more time on academic tasks and higher student performance (Lee & Smith, 1999). The lack of academic press in a school, or lowered collective expectations for student achievement of high academic standards, is often found in schools with large concentrations of disadvantaged students and allows teachers to “reduce the pressure on students, whose social disadvantage is seen as a major barrier to their success in school (Lakebrink, 1989; Lambert & McCombs, 1998; Miller & Shouten, 1989; Wehlage, 1989)” (Lee & Smith, 1999, p. 913).

How do we make schools more supportive? How do we create schools that effectively press students on to higher and higher levels of achievement? In the 1970s a wave of research sought to identify the characteristics most frequently associated with high-performing schools. Effective schools research (ESR) was based largely on identifying characteristics of schools that appeared to be effective in promoting resilient academic outcomes among disadvantaged and minority students (Edmonds, 1979). By the early '80s, the number of individual effective schools studies available naturally led to a body of work concerned specifically with reviewing ESR. These reviews distilled the ESR findings into “simple recipes for school reform” and “lists of ingredients” all schools should seek to adopt (Purkey and Smith, 1983; pp.429 & 440).

As valuable as ESR has been in terms of the contribution it has made to our understanding of the characteristics all schools should aspire to possess, it does have weaknesses. Effective schools studies frequently limit their observations to “successful” schools. Critics claim that the characteristics found in successful schools may also be evident in less successful schools, but because researchers failed to conduct a true comparative study, the most that can reasonably be concluded from their studies is that successful schools possess these characteristics.

Another criticism of ESR is that it produces rather simplistic lists of characteristics based on the assumption that once schools are made aware of the key factors for success, they can simply decide to adopt and implement them. This assumption rests further on the implicit assumption that schools that do not do so simply lack the will to change their practices toward the greater benefit of their students (Purkey & Smith, 1983). In fact, these schools may have insufficient capacity to change.

A final issue for ESR is that, while few may dispute the desirability of fostering in all schools those characteristics identified by ESR as critical for high levels of academic achievement for all students, many would dispute the extent to which we know how to foster such characteristics in all schools.

The following is a list of the school characteristics commonly cited by ESR:

- high expectations for all children (AP)
- monitoring of student progress and the use of information to improve teaching (AP , P)
- maintenance of an academic emphasis and the guarantee of student opportunity to learn content (AP, SS)
- use of materials at the appropriate level of mastery (AP, P)
- focus on praise over criticism (SS, P)

- assurance of adequate time-on-task through teacher planning and classroom management (AP, P)
- strong programs in the early grades with longer instructional days and a strict basic skills curriculum (AP, P)
- a safe and orderly environment (SS, P)
- strong instructionally-oriented principals (AP, P)
- an understanding of the cultural differences and needs of the student population (SS, P) (Mortimore, 1993; Neufeld et al., 1983; Purkey and Smith, 1983; also see NCSDPI, 1997; TEA, 1996).

A glance at the above characteristics suggests that each falls into one or two of the developing options for reforming high-poverty schools, indicated in parentheses beside each. Out of all ten, only two could plausibly be facilitated without the direct and concerted efforts of school professionals. Teachers and principals would have to embrace the characteristics as valuable and worthy of their time and attention and then would have to know how to foster or promote them in their daily actions. In those schools where teachers and principals either did not embrace the characteristics or were unsure how to promote them, professional development would be necessary as a first step.

Two recent studies have attempted to understand the role of social support and academic press in promoting achievement among poor and minority students in concentrated settings by comparing levels of social support and academic press across schools. Borman & Rachuba (2000) looked at the effect of various school and classroom characteristics on the outcomes of

low-SES minority students attending high-poverty schools* and found that none of the effective schools indicators included in its analysis were associated with resilient academic outcomes (Borman & Rachuba, 2000).[†] This study was based on data from Prospects: The Congressionally Mandated Study of Educational Growth and Opportunity and included a final sample of 925 low-SES students attending high-poverty schools in a 3rd grade cohort and their scores on the Comprehensive Test of Basic Skills, 4th Edition Total Math in the 6th grade. Borman & Rachuba (2000) found that 521 of these students performed above expectation on math and 404 performed below. They then tested a series of models designed to discern what individual and school level characteristics were most associated with resilient 6th grade math outcomes. The individual characteristics associated with resilient math outcomes in the 6th grade were greater engagement in academic activities, an internal locus of control, efficaciousness in math, a more positive outlook toward school, and more positive self-esteem. They were unable to find peer-group effects, but this is most likely due to the fact that all students in the sample attended schools with similar demographic characteristics. They were also unable to distinguish an effect for school level resources, which included class size, teacher experience, and the overall availability of instructional supplies. Again, this may be due to the fact that there were only small differences across schools on these indicators. Borman & Rachuba (2000) did find that a more supportive school environment -- as indicated by principal reports of behavioral problems at the school, student reports of positive interactions with their teachers, and parent reports of opportunities for involvement at school -- was associated with

* The mean FRPL enrollment in this sample of schools was about 65% (Borman & Rachuba, 2000)

[†] The indicators of effective schools' characteristics included in this study were: teacher reports of proportion of classroom time devoted to academic activities rather than non instructional tasks; the extent to which teachers consulted with other classroom teachers, compensatory teachers or special education teachers regarding students' progress and the extent to which they shared information about student progress with other teachers; and teacher reports of clear school goals and strong principal leadership (Borman & Rachuba, 2000).

resilient academic outcomes.

The Borman & Rachuba (2000) study is of limited use primarily because the sample size is so small and homogeneous. Notably, the individual and school-level characteristics associated with learning are not technically easily to scale up across all high-poverty schools and the study does not provide enough information about the schools to identify the causal mechanisms by which those characteristics worked to effect achievement. How would high-poverty schools proceed to increase student engagement, or promote self-efficacy or a positive self-esteem in their students? How can principals in high-poverty schools most effectively control student behavior? What specifically were teachers in the more effective schools doing that led their students to report more positive interactions with them? In what ways were these more effective schools providing opportunities for parent involvement that seemed to make a difference in parent propensity to get involved? How, specifically, did that greater involvement translate to higher student outcomes?

Using a much larger sample size, Lee and Smith (1999) sought to determine the extent to which academic press and social support affected the math and reading achievement of 30,000 6th - 8th graders in 304 Chicago public schools. Data for this study were drawn from 97 survey reports collected by The Consortium for Chicago Schools Research. On average, 82.6% of the students in the sampled schools were on free or reduced price lunch. The surveys included student-reported measures of the social support they received from teachers, peers, their parents and their neighborhoods that is directed at academic activities.* The two measures of academic

* “The measure of teacher support ‘gauges whether students perceive that their classroom teachers give them individual attention and show personal concern for them’ ... The measure of support from parents ‘gauges student views of their parents’ support for their school work’ ... The measure of support from peers asks students whether ‘their classmates treat each other with respect, work well together, and help each other learn’ ... The measure of support from the community ‘assesses whether students trust and rely on neighbors and community members and whether they know and care about each other’ ...” (Lee & Smith, 1999, p.921).

press were taken from teacher and student responses on two measures. The first “gauges the extent to which teachers feel their school’s goals and actions are focused on improving student learning” and the second “gauges whether students feel their teachers challenge them to reach ever higher levels of academic performance” (Lee & Smith, 1999, p. 921). The outcome measure was learning over the 96-97 year in reading and math, as indicated by performance on standardized tests.

Lee & Smith (1999) found that both school size and socioeconomic composition affected learning. The analyses consistently indicated that students in larger schools learned less over the course of the year and that as the proportion of low-income students in a school went up, the amount of learning that took place over the year went down. This latter effect was twice as large for reading as for math. Once school size, socioeconomic composition and academic press were taken into account, Lee & Smith (1999) found little effect on learning due to racial composition.

Relative to academic press, Lee and Smith (1999) found that schools with high academic press tended to be smaller and more integrated. Students attending schools with high academic press learned more over the year in math and reading than students in schools with low academic press. The effects for social support mirrored those for academic press, but the magnitude of the effects was smaller; thus social support, as reported by students, was related to learning in math and reading over the year (Lee & Smith, 1999).

Finally, Lee & Smith (1999) found that students with high levels of social support learn even more in schools with high levels of academic press. Conversely, students with low social support learn less in schools with low academic press; there is evidence that this relationship is magnified for math in both large and small schools relative to medium sized schools (Lee & Smith, 1999).

According to this study's findings, the relationship between social support and learning is contingent on the type of school students attend. Students with high social support learn more if they attend schools with high academic press. A student with low social support who attends a school with low academic press actually loses ground (Lee and Smith, 1999).

These findings indicate that reforms built exclusively on the foundation of increasing social support in schools are misdirected. The effects of social support are negligible without concomitant academic press. On the other hand, they also warn that students with low social support who attend high academic press schools are at great risk of being left behind and that schools with a strong academic press can be inequitable places. Finally, the results of this analysis suggest that it may be easier to provide both academic press and social support in smaller versus larger schools and in more integrated (less concentrated) schools (Lee and Smith, 1999). The authors do not test for separate social support effects but bundle them together. In fact, of the four measures of social support, only two are school specific, thus within the direct control of schools to affect. When students have low social support from their parents and community, how powerful are schools to provide the needed social support to achieve high academic goals?

More recently there have been efforts to create reform packages that are often based in large part on promoting social support and academic press in schools but that also focus on the process involved. These whole school reform models assume that there are specific characteristics associated with more effective schools but acknowledge that identifying them is insufficient; schools have to be organized to promote them and school personnel have to internalize them and be trained to ensure their promotion. Whole-school reform is becoming a centerpiece in the discussion of how to improve outcomes in high-poverty schools.

In 1998, New Jersey courts ordered thirty poor, urban districts to adopt a whole school reform model for implementation in their schools by 2000-01 (the fifth in a series of decisions on *Abbott v. Burke*) (Erlichson & Goertz, 2002). The 2001 re-authorization of the Elementary and Secondary Education Act, *No Child Left Behind*, requires “failing” schools to adopt “scientifically research based” reform programs and specifically mentions whole school reform models as acceptable options. Any Title I school with 50% or more of the population eligible for FRPL can use Title I funds to purchase whole-school reform program instead of targeted services.

Whole school reform models are distinguished by their emphasis on the school as the unit of improvement and their “emphasis on addressing multiple aspects of school operations in coordinated fashion, including decision making, resource allocation, classroom organization, curriculum, parental involvement and student support” (Bifulco, 2002, p.12). Barnett (1996) reviewed three popular whole school reform models, Success for All, the School Development Program, and Accelerated Schools, and found that while all three could be implemented without incurring substantially more costs the evidence on their ability to increase disadvantaged students’ outcomes was still ambiguous.

Bifulco (2002) reviewed more recent evidence on the effects of the above programs and found that the evidence is still inadequate for drawing conclusions about their consistent ability to promote higher achievement in low-performing schools across a broad range of contexts. The strongest evidence for effectiveness is found for Success for All, a program that uses a specific curriculum, highly prescribed instructional practices and highly trained (usually certified teachers) tutors for one-on-one support. A program with similar evidence of effectiveness that uses strategies similar to those used by Success for All is Direct Instruction, but it is not strictly a

whole-school reform (see also Herman & Stringfield, 1999 and Slavin & Fashola, 1998).

Slavin and Fashola (1998) reviewed the evidence on a number of whole school reforms and found that Success for All (a reading program designed for the early school years), its partner Roots and Wings (focus on math, science and social studies) and Direct Instruction (aka DISTAR) were the three most promising (not proven).

All of these programs have the following in common: the use of highly trained tutors, a focus on basic skills, implementation in the early grades, and highly scripted or prescribed instructional techniques (Bifulco, 2002; Slavin & Fashola, 1998).

In their review of the evidence, Slavin & Fashola (1998) find that one positive attribute of whole-school reform models is that their developers have thought through an overall plan and know how to coordinate the components and how to phase them in over time. They also find that for schools serving large numbers of at-risk students the best approaches will employ “one-on-one assistance targeted to the unique needs of the student” (p.34). While tutoring programs that employ certified teachers as tutors have demonstrated the strongest results, others that use paraprofessionals, volunteers and cross-age tutors have also been effective. They also note that any approach should have elements designed to engage parents (Slavin & Fashola, 1998).

Bifulco (2002) warns that even the most successful whole school reform models, like Success for All, “cannot be expected to enable students in many troubled, urban schools to achieve up to the levels increasingly demanded in the current policy environment. Even in the pilot Success for All sites, where program developers found substantial, positive impacts on reading performance, students remained below grade level and fell further below grade level as they moved thorough elementary school (Venezky, 1994)”(p.31).

Erlichson and Goertz (2002) followed the phase-in of whole school reform in the thirty

Abbott districts and found that a system wide lack of capacity to support the reforms was a key problem. In those schools where “model implementation” seems to be proceeding, they are typically located in supportive district contexts. They found that the actual model chosen (the School Development Program the most popular, followed by SFA/Roots & Wings and then Coalition of Essential Schools) was less important than the context in which the choice (or forced adoption from a list of choices) occurred. Those schools that reported collaborating on the choice over which model to adopt also seem to be having more success in implementation. Finally, while many schools reported choosing a model because it did not mandate a curriculum or a particular way of “doing things” they soon found that such models offered few specific guidelines or strategies for solving real problems. Less prescriptive or “process” models propose methods for identifying school needs, investigating alternate solutions, and analyzing data, but seem to overwhelm school personnel who later ask for more prescription.

The upshot seems to be that whole school reform is one tool for increasing the ability of high-poverty schools to promote higher achievement, but its effects are still inconsistent and even when positive, not highly generalizable to all school contexts. Of all the whole school reform models available, the evidence is strongest for those that offer one-on-one tutoring and highly prescribed instruction with a focus on basic skills in the early grades. To the extent that these practices, when effectively implemented, increase student achievement in high-poverty elementary schools, their adoption is worthy of consideration. However, there is no evidence to suggest that even under the best implementation circumstances they will be sufficient to close the achievement gap between high- and low-poverty schools. The largest observed effects have not been sufficient to even temporarily close the gap and they have waned over time.

A Conceptual Framework for Identifying the Components of an Adequate Education for At-Risk Students

The research reviewed in Chapters Two and Three provides the foundation for the conceptual framework used here to identify the interventions suggested as most likely to ensure an adequate education for at-risk students.

This report has shown that family income is currently the most reliable and accessible predictor of individual risk for academic failure. The effects of low family income on children are pervasive, additive, cumulative, and begin as early as the prenatal period. Poverty-related risk factors in early childhood not only place children at-risk for academic failure, with skills deficits apparent at the time of school entry, but often do so by irrevocably impairing cognitive development. In order to prevent the effects of such risk factors on cognitive development and academic achievement, interventions will have to begin as early as the prenatal period and extend to multiple aspects of the child's life beyond school. In order to significantly affect the achievement gap, such interventions will have to seek to not only prevent or undo the effects of risk exposure, but ensure to the greatest extent possible that those resources that support cognitive development and academic achievement that are typically available to middle class children are also available to poor children.

Based on their examination of the pathways through which poverty operates to put children at risk for depressed cognitive and schooling outcomes, Brooks-Gunn & Duncan (1997) identified several early intervention programs. First, they suggest that nutritional programs that specifically target undernourished expectant mothers and poor children may have positive effects on the physical and cognitive outcomes of poor children. They also suggest that lead abatement

and parent education programs targeted to poor families in inner cities may improve cognitive outcomes for their children. Finally, noting that approximately half of the effects of family income on cognitive ability are mediated by home environment (including learning experiences in the home), they suggest that interventions focused on improving parent skills in providing such experiences may improve the cognitive outcomes of their children (Brooks-Gunn & Duncan, 1997). As Brooks-Gunn & Duncan (1997) suggest, any program that seeks to ensure at-risk students an adequate education will have to begin in early childhood and seek to address the needs of the whole child. Such programming will also have to target the home lives of these children, especially as pertains to their physical safety and the quality of parent-child interactions.

Research reviewed in Chapter Two also indicates that the only way to meet the needs of at-risk children is to ensure, to the extent possible, that their parents' needs are met, especially as pertains to their parents' physical and mental health. Family access to health care services in high-poverty schools is one possible means for ensuring that at-risk children and their parents have easy and affordable access to preventive and illness-related health services.

At-risk children frequently live in neighborhoods that expose them to a wide range of risks and provide few means of escaping exposure to or overcoming the effects of these risks. These same children also live in single-parent homes where the parent is working, thus creating a need for childcare during non-school hours. These findings imply the need for extending the time that schools are open to these children, guaranteeing access to a safe and stimulating environment during those hours when schools are typically closed.

Social capital deficits at the home, school, and neighborhood levels contribute to the achievement gap. Ensuring at-risk students access to social capital will require increasing the

likelihood that these children can build sustained and intense relationships with adults who are capable of facilitating their physical, emotional, social and academic growth. Providing these students such opportunities will require providing them more access to school through before and after school programming and summer programs and reducing the number of students in a classroom or school for which each adult is responsible.

Finally, at-risk children begin school with notable skills deficits relative to children with no risk factors and the more risk factors a child has, the larger those deficits are. Extensive early intervention and education programs are needed to close this skills gap, so that at-risk children can enter school with academic potential that is comparable to that of middle class children. If, however, early intervention and education programs succeed only in narrowing the skills gap, at-risk children will require more intense services during their school years in addition to early intervention programs.

Chapter Two also illustrated that risk is not a random phenomenon; not only are some children more likely to be poor, they are more likely to attend schools with other poor children. When large concentrations of at-risk students attend school together, they and all other students at the school are exposed to another layer of academic risk. This review of social capital described some of the mechanisms through which composition effects disrupt the development of social capital, which in turn prohibits the development of students' individual human capital. The accumulated evidence suggests that efforts to close the achievement gap should begin in schools where students are most likely to fail and least likely to find resources for coping effectively with risk exposure at home, in their communities and at school. Therefore, this report has concluded that schools where more than 40% of the student population is on free or reduced price lunch should be the starting place for implementing the expanded platform of services

recommended in this report.

Evidence in Chapter Three provided further evidence of the difficult position of high-poverty schools. Outcome data show clearly that a large source of the achievement gap is found in these schools. The good news is that students in all high schools, high-poverty schools included, are learning and the gap has narrowed in the past as a result of educational and social policy priorities, suggesting that it can happen again. The bad news is that students in low-poverty schools are so far ahead that high-poverty schools have been unable to catch-up. Evidence on inputs demonstrated that they are ill-positioned to change this fact. The funding gap between high- and low-poverty schools is barely closed.

While many have ideas about how high-poverty schools should go about improving student achievement, relatively few have been able to consistently guide them toward that goal. In part this is because of the narrow focus many studies take while trying to understand the relationship between school inputs and outcomes. It is widely accepted that a sizable portion of what students learn has little to do with what schools contribute, yet researchers continue to focus on how effectively schools utilize resources to purchase the same array of services. Interestingly, a glance back at Chapter Two shows that of all the recommendations that emerged from the in-depth review of the sources of underachievement among poor and at-risk students, only two suggest traditional school interventions – pre-kindergarten and smaller class sizes. These same interventions show up in Chapter Three as ones that research has shown to be both effective and cost-effective for raising the achievement of disadvantaged students. Pre-kindergarten access for every at-risk child, while gaining momentum, has not been achieved. While high-poverty schools do have smaller class sizes than low-poverty schools, they are still not within the optimal range identified by sound research.

It appears that money might make a difference. High-poverty schools may be spending a little more per student than low-poverty schools, but it's hard to imagine that any reasonable person could expect an extra few hundred dollars per student per year to be sufficient to close the achievement gap. It is not enough to curtail teacher mobility in high-poverty schools, which is higher than in low-poverty schools and which research suggests is a contributor to underachievement in high-poverty schools. A few hundred dollars per student per year isn't enough to offer pre-kindergarten to all low-income students who need it, another intervention that research suggests would help close the gap. It is not enough to provide teachers with adequate resources for teaching or to buy class sizes small enough to make a consistent and long-term difference in achievement.

It may be that if all poor students came to school more ready to learn, and if teachers in high-poverty schools had adequate resources for teaching and small enough class sizes to make a real difference, the teacher mobility problem would gradually straighten itself out. It may also be that if the mobility problem straightened itself out by virtue of these things, it would be a lot easier for high-poverty schools to promote the characteristics that research suggests are common in effective schools. Certainly social capital is difficult to generate in schools with high levels of teacher turnover. Simply achieving consensus and a collective commitment to any set of standards or processes would be difficult, let alone meaningful, long-lasting relationships built on shared expectations, shared norms for behavior, and trust.

If teachers had adequate resources for teaching, students more prepared to learn, and class sizes small enough to provide students with individual attention on a regular basis, maybe it would be easier for them to hold high expectations for all students. Research in Chapter Three indicated that effective schools hold all students to high standards, but warned that academic

press without concomitant social support toward academic success could actually exacerbate achievement differentials between more and less advantaged students.

While money may not buy all of the resources necessary to close the achievement gap, it might buy some key resources that increase the likelihood that other school characteristics associated with resilient academic outcomes will flourish. It is doubtful that any of these individual interventions could make more than a small dent in the achievement gap, but together they might do a lot more than they were individually designed to accomplish.

Five broad constructs emerged from this report's effort to understand the sources of the achievement gap and high-poverty schools' current potential for addressing them. High-poverty schools will be most likely to provide at-risk students a more equal opportunity to access an adequate education and to thereby close the achievement gap when they are characterized by the following:

High Levels of Academic Press: At-risk students need to be held to high academic expectations, exposed to coursework and teaching practices that facilitate their mastery of high level learning standards, have their progress toward meeting such standards monitored, and receive regular feedback about their progress. While achieving high levels of academic press in high-risk schools may require several organizational changes, the one that stands out most clearly and is most readily remedied by policy action is the need for a high quality and stable teaching staff. Schools with inadequately qualified teachers or high levels of turnover among existing teachers will have a hard time promoting an environment characterized by high levels of academic press.

High Levels of Social Support for Learning or Access to Social Capital: At-risk students who do well in school often report having positive relationships with their teachers and others

who encourage them to do well in school. At-risk students are also less likely to have home or community-based supports for learning or access to adults who support their academic growth. Schools should seek to promote positive teacher-student relationships at the school level and provide students with greater access to adults who will support and encourage them in their academic growth. While encouraging parent involvement is one means for increasing support for learning, schools should be organized so that student success is not contingent upon such involvement. Furthermore, as schools become more hospitable and supportive to students, parents and other stakeholders will be more likely to become involved. There are a number of ways that schools might change in order to increase social support for learning. For one thing, attracting and retaining highly qualified teachers may create greater school capacity and will for change toward a more supportive climate. Scaling schools down so that teachers and students have greater access to one another will also facilitate relationship building. Methods for scaling schools down include reducing class size, reducing school size, and creating opportunities for one-on-one instruction or support. Providing students with out-of-school opportunities to work with teachers or other adults on both academic and extracurricular pursuits will also promote relationship building. One method for creating such opportunities is to extend school hours during the school year (e.g. through before and after school programs) or to extend school operations throughout the year (e.g. summer school).

Attention to the Gap: At-risk students have skills deficits at the time of school entry that place them at further risk for academic failure. Schools should have early intervention and education programs that seek to eliminate this gap as early as possible and ensure these students an equal opportunity to access an adequate education from kindergarten on. Because research indicates that the effects of poverty on cognitive development are particularly strong during the first five

years of life, and can actually change (retard) a child's developmental trajectory, such programs may need to begin as early as infancy.

Promotion of Student Engagement in the Life of the School: Schools need to provide students plentiful opportunities to become involved in school life. All of these opportunities need not be academically oriented, but should expose students to a range of activities that will nurture their social, intellectual, physical and emotional development. Above all, these activities should be appealing and accessible to students, expose them to multiple ways of expressing themselves, and should deepen their connections with adults and other students who will provide them general support and encouragement for learning and self-improvement. Because at-risk students frequently reside in communities where they are exposed to risks to their physical, social and emotional well-being, and because they often have limited access to safe havens during non-school hours, it is especially important that schools in such communities open their doors to these students and provide activities that are appealing to them.

Attention to the Needs of the Whole Student: At-risk students have a wide range of needs that are not traditionally addressed by schools but that nonetheless affect their ability to do well in school. They are at greater risk for a variety of physical and mental health problems, as well as for living with parents who suffer from physical or mental health problems, and they are less likely to have access to services which address these needs or help them to cope with the effects. Schools will have to attend to these needs if they are to offer at-risk students a more equal opportunity to access an adequate education. One means for doing so is the provision of a wide range of health services at the school site.

These constructs direct this report's discussion of interventions that hold the greatest promise for getting at the source of the achievement gap and not its symptoms. In other words,

attention is not focused on interventions that claim to increase test scores but on investments that develop student capacity to learn by either getting them off to the right start or providing them a higher intensity of services later on to make up for a bad start. Finally, none of these interventions alone are sufficient to close the achievement gap, no matter how powerful its effects.

The next chapter reviews the evidence on the following seven interventions:

- 1) Small schools
- 2) Reduced class size
- 3) One-on-one tutoring in the context of before and after-school programming
- 4) Early childhood intervention and education
- 5) Efforts to increase the supply and retention of high-quality teachers to high-poverty schools
- 6) Summer school
- 7) School-based access to health services for students and their immediate families.

The next chapter looks at what is known about the relative effectiveness of each of the above interventions.

Potentially Important Interventions or Resources Not Discussed Here

Grissmer et al. (2000) argued that increasing teacher resources for teaching is a necessary step in raising the achievement in high-poverty schools. While such resources are important, they are probably less important than building schools that comprehensively address the needs of at-risk students which, in and of itself, provides

teachers greater resources. If such a program still left teachers in high-poverty schools strapped for teaching resources, then sufficient funding to remedy the problem is necessary. However, the cost impact of ensuring that all teachers have access to such resources is slight in comparison to what is currently spent on education and what is suggested in this report.

Professional development that seeks to engage teachers and other stakeholders in high-poverty schools in the selection or development and implementation of services is probably necessary. Such professional development should not require more resources, though it may.

There is evidence that ensuring adequate housing for low-income families and providing those so motivated opportunities to move into low-poverty neighborhoods are worthwhile interventions that hold promise for raising academic outcomes among poor children. These issues are not addressed directly in the program for an adequate education for at-risk students, described in this report; however, schools do need to organize and extend their scope in ways that provide protective mechanisms for students who have inadequate housing and who live in high-poverty neighborhoods. Namely, the identification of before-and-after school programs and extended year or summer school programs as necessary interventions is intended in part to offset or protect students from the risks associated with living in inadequate housing and high-poverty neighborhoods. However, to the extent that poor children are not resigned to deleterious housing and neighborhood conditions in the first place, providing an adequate education to these students will be that much easier and presumably less expensive.

Finally, it is vitally important that any change in the array of services offered in high-poverty schools should be rigorously and longitudinally studied to discern effects and identify implementation issues. Funding an adequate education should include funding the research that is necessary to design and identify the most effective and cost-effective interventions for all students.

Intervention Literature Review

This section provides a summary of the evidence on each of the seven interventions suggested by the report's conceptual framework. This section will define each intervention, to include variations in its conceptualization and implementation; it will review what is known about its effectiveness, trying as much as possible to focus on effects found among at-risk students in high-poverty settings; it will note strengths and weaknesses of the existing research; and it will discuss implications. Where evidence is available, it will also discuss where the average high-poverty school currently stands in relation to the suggested intervention.

Small Schools

Research on school size is particularly helpful in the context of this report as it frequently seeks to discern differential effects of school size across populations of students. School size research also examines effects on variables that are believed to moderate achievement like student engagement, school safety and teacher collaborative behaviors. Some have been concerned that small schools are cost-prohibitive or not as cost-effective as other interventions where similar achievement effects can be found with

a smaller investment. Still others ask if negative externalities might accompany small schools.

While research has not identified an optimal school size, it has allowed for informed judgments to be made regarding upper limits (Howley, 2001). In high school, informed consensus holds that the upper limit ranges between 600 and 1,000 students (e.g., Cotton, 1996; Howley, 2001; NASBE, 2000; Irshmer, 1999; Raywid, 1999), while in elementary school the upper limit ranges between 200 and 500 students, depending on grade span served (e.g., Cotton, 1996; Howley, 1997; Howley, 2001; Lawton, 1999; Meier, 1996; Wasley, Fine, King, Powell, Holland, Gladden & Mosak, 2000).

Smallness has been identified as one factor associated with more effective schools (e.g., Boyer, 1983; Goodlad, 1984; Husen, 1985; Newmann & Wehlage, 1995) and recent reviews of the school size literature have found that small schools do promote enhanced academic outcomes, especially for disadvantaged students, as well as other positive outcomes (Cotton 1996; Flaxman, Schwartz, Weiler & Lahey, 1998; Howley 2001).

Some have found more equitable distributions in student achievement across students from all backgrounds in smaller schools no matter the affluence of the community, suggesting that all schools should be small in order to maximize equitable distributions in student outcomes (Lee & Smith, 1995; Bickel & Howley, 2000; Howley & Bickel, 1999). Others have found a relationship between school size and socioeconomic composition so that as the level of poverty in a school increases, the effect of smallness on achievement levels, achievement equity, extracurricular participation and dropout rates also increases (Howely, 2001), which suggests that each incremental increase in poverty concentration should be accompanied by an

incremental decrease in the size of the school in order to maximize school effectiveness. In studies of the effects of school size on achievement that control for the socioeconomic composition of the school, smaller schools outperform larger schools in terms of both achievement and cost-effectiveness (Fowler, 1992; Fowler & Walberg, 1991; Walberg, 1989; Walberg & Fowler, 1987).

Other positive outcomes associated with small schools include increased levels of extracurricular participation (Cotton 1996; Flaxman et al. 1998; Holland & Andre, 1987; Howley 2001); lower dropout rates (Cotton 1996; Flaxman et al. 1998; Fetler, 1989; Wasley et al. 2000); better attendance (Cotton 1996; Flaxman et al. 1998; Wasley et al. 2000); greater retention (Flaxman et al. 1998); and better student behavior, attitudes and engagement (Cotton 1996; Flaxman et al. 1998). Smaller schools have also been associated with students' increased feelings of belongingness, a better academic and general self-concept, and better outcomes on various college-related variables like college entrance exam scores, acceptance rates, attendance, GPA, and completion (Cotton, 1996). Teachers in small schools appear to have more positive attitudes and a greater willingness to collaborate with their peers (Cotton, 1996).

There is no reliable relationship between school size and curriculum quality. Large jumps in school size are required to affect curriculum variety and even when variety does increase, it increases in small relative increments and consists mainly of lower level courses in non-core areas with only 5%-12% of students in larger schools enrolling in these additional courses (Cotton, 1996). Monk (1987) found high schools with at least 400 students are capable of providing curricula of comparable quality to those of larger schools.

While larger schools have often been built on the assumption that they are more cost-effective, Cotton (1996) found no evidence of a strong or systematic relationship between school

size and cost favoring larger schools. Steifel, Iatarola, Frachter & Berne, (1998) looked at the effects of school size on school costs and performance in New York City high schools and found that smaller schools have somewhat higher costs per student but also much higher graduation rates and lower dropout rates, thus producing the lowest cost per graduate in the New York City system (Steifel et al. 1998).

As of 2001-02, the average elementary school had 441 students, the average middle school had 612 students, and the average high school had 753 students (Hoffman, 2003). For purposes of this report, it would be best to know how much schools with 40% or greater FRPL differ from these averages, which are all within the acceptable size range. In fact, there is no relationship between school size and FRPL concentration, but this is likely a result of the fact that rural schools, which tend to be smaller and of which there are proportionally more, have high FRPL enrollments (USDOE, 2003).

There is, however, a good deal of evidence that schools in central cities and urban fringes of large MSAs are larger, as are schools in large districts, which are often in large MSAs (USDOE, 2003). Central city schools account for 15.7% of all students enrolled in K-12 education but just 11.7% of schools, indicating that central city schools are larger (NCES, 2003). In fact, while a little over 30% of all high schools have more than 900 students, 44.2% of central city and 37.2% of urban fringe high schools have over 900 students (NCES, 2003).

Central city schools are more likely to be in one of the 100 largest US school districts, which serve over 25% of all students but make up less than 1% of all US school districts (Young, 2003). Only two percent of districts have more than 25,000 students but serve 33% of all students (Hoffman, 2003). The 100 largest districts (NYC is the largest with over 1 million students, followed by LAUSD with close to 800, 000) have at least 45,000 students and 25 have

over 100,000. These districts serve a much larger concentration of poor students than other districts on average (53% FRPL compared to 39% FRPL in all districts) and have a larger average school size (708 in large districts compared to 504 in all districts) with eleven of the 100 largest districts having an average school size of over 1,000 (Young, 2003). High schools with higher average proportions of minority students and LEP students also tend to be larger. The larger a school is, the more likely that it will have larger class sizes and be overcrowded (USDOE, 2000).

This review suggests that small schools can be beneficial for at-risk students in terms of both achievement and other desirable student outcomes related to achievement. Small schools appear to be particularly effective in the promotion of student engagement and student access to social capital. There is no evidence that curriculum quality suffers in small schools as long as schools enroll approximately 400 or more students, especially at the high school level. Furthermore, there is no compelling evidence that the increase in costs associated with small schools outweighs the benefits, especially when costs are considered in relation to potential small school effects on dropout and graduation rates. In terms of size, research and informed consensus indicate that elementary and middle schools should enroll between 300 and 500 students while high schools should enroll no more than 1,000 students.

Students living in central cities, a larger proportion of whom are poor, minority and LEP, have a greater chance of attending a larger school than research recommends as being within optimal limits for all students. Large schools are more likely to have lower pupil-teacher ratios and to be overcrowded. A range of indicators indirectly related to student achievement decline as school size increases, several of which have potential implications for attracting and retaining teachers (e.g., safety, student engagement) and building social capital at the school level.

While if all high-poverty schools became small tomorrow achievement would not naturally increase, achieving the type of school environment necessary to promote higher achievement among at-risk students will be facilitated when the schools they attend are smaller. Principally, small schools are one means for facilitating the development of much needed social capital. Ensuring that high-poverty schools, especially those in central cities, do not grow larger than the upper limits suggested by research may be another way of improving the working conditions of teachers in high-poverty schools, which may make attracting and retaining high-quality teachers in these schools easier.

Reduced Class Size

The effects of reduced class size are presumed to affect achievement by fostering other classroom-level traits that positively influence achievement; small classes should allow for more individualized attention, time on task, fewer behavior problems and greater teacher satisfaction. Since disadvantaged students are arguably in greater need of individualized attention and time on task and more likely to engage in disruptive classroom behaviors, the effects of small classes might be stronger when targeted to these students. Additionally, since teacher turnover in high-poverty schools is a problem presumed to be partly related to lack of resources for teaching, it might follow that providing them more time to work with students would increase their satisfaction with and commitment to working in high-poverty schools as well as their effectiveness with students. Thus, smaller classes should increase achievement in high-poverty schools by allowing for more individualized attention, more time on task, better relationships between students and teachers, and a greater sense of efficacy on the part of teachers to the extent that they feel they have adequate time to get to know and work with their students, which

may lead to less turnover.

Three comprehensive reviews of the relationship between class size and student achievement were completed prior to 1990 that established the foundation for current class-size reforms and evaluations. All three found effects for classes smaller than 20 students (Glass and Smith, 1978; Robinson and Wittebols, 1986; Slavin, 1989). A more recent review of statewide class size studies also found effects for classes smaller than 20 students (Finn, 1998).

Project Prime Time, initiated in Indiana in 1984, reduced class sizes in grades 1 through 3 to an average of 18 students, or 24 if an aide was present in the classroom. The intervention took place over three years, with class size reductions occurring first in grade one, then in grades one and two and finally in all grades one-through-three. The results for achievement were mixed, but Prime Time evaluations found that students in smaller classes spent more time on task, received more individualized instruction, and were better behaved. Teachers of smaller classes also reported greater satisfaction (Finn, 1998).

Beginning in 1985, the state of Tennessee initiated Project STAR, the only large scale controlled study of reduced class size effects (Finn, 1998; Finn & Achilles, 1990). Project STAR has been praised by many for its scope and rigor (e.g., see Grissmer et al., 2000; Mosteller 1995; Krueger 2000). Conducted in 79 elementary schools across the state, Project STAR lasted four years, obtaining data on over 7500 students in over 300 classrooms. Among participating schools, kindergarten students were randomly assigned to one of three class types. Small classes enrolled between 13 and 17 students; regular classes enrolled 22 to 26 students; and regular classes with aides enrolled 22 to 26 students. Teachers were randomly assigned to class types and received no special training regarding instruction or how to utilize aides. Students remained in the same class types until grade three and teachers were randomly assigned to class types each

year. At the end of each school year, students took the Stanford Achievement Test as well as curriculum-based tests aligned with the state's curriculum.

Data from STAR were used to conduct four cross sectional analyses at the end of each school year with consistent findings over all four years of analysis. First, differences among the class types were all highly statistically significant for all achievement measures, and the significance was always attributed to the superior performance of students in small classes (13-to-17) and never to regular classes with full time aides. Second, the results were not contingent upon school location or student gender. Third, in each year some of the benefits of small classes were greater for minority students and for students attending inner-city schools. Finn and Achilles (1990) found that the effect of small classes on the achievement of minority students was almost twice as large as the effect for white students, resulting in a considerable reduction of the achievement gap between the two groups.

Due to the positive results of STAR, Tennessee initiated The Lasting Benefits Study in an effort to see how long small class benefits would persist. All students who participated in STAR were returned to regular-sized class in the fourth grade, but Lasting Benefits tracked a significant portion of these students. Students who had attended small classes in grades K-3 had higher achievement in later grades in all academic areas compared to students who had attended regular classes and regular classes with aides (Finn, Fulton, Zaharias & Nye, 1989). Later follow-ups indicate that these effects persist, though they do get smaller, through at least grade ten (Finn, 1998).

Based on the findings of STAR and Lasting Benefits, in 1990 Tennessee implemented Project Challenge in 17 of the state's poorest districts. In each of these districts, class sizes of 15 were introduced into all elementary schools. Project Challenge is not a controlled experiment,

but an effort to target small classes to the neediest districts and monitor the achievement outcomes of these districts relative to previous district outcomes. Tennessee has 138 school districts and each year the districts are ranked according to performance on statewide achievement tests. Among the 17 districts participating in Project Challenge, their mean ranking in second grade reading progressed steadily each year from 99 in 1990 to 78 in 1993. In second grade math, the mean ranking of the 17 participating districts moved from 85 in 1990 to 57 in 1993. Each additional year in a small class setting was accompanied by further improvement in reading and math scores (Finn, 1998).

Two smaller class size studies were initiated in North Carolina in 1991. In each, class sizes of 15 were introduced in the primary grades with matched comparison groups utilized in both studies. Both studies found positive achievement effects for students attending smaller classes in the early grades (Finn, 1998).

The results of statewide class size studies suggest that small classes in the elementary grades are effective in increasing achievement, especially when targeted to schools or districts with large proportions of poor and/or minority students. There is further evidence from these studies that effects can carry over into later years, especially when students have had several years of reduced class size experience (Finn, 1998). Class sizes should be kept below 20 students, perhaps even lower, but the evidence is still not clear on what is, or if there is, an optimal class size for at-risk students in high-poverty schools.

Several production function studies have estimated the relationship of class size (or more frequently, teacher/pupil ratio) to student achievement. These studies, however, frequently have characteristics that may reduce their ability to detect a class size effect. As Finn (1998) notes, most of these studies do not focus on the elementary grades or even provide separate effects for

elementary grades, yet research indicates that class size effects are most likely to be detected in the elementary grades. They also typically include schools and districts where classrooms are all within the normal range, 22-to-40 students. Therefore, the best such studies can do is identify whether or not there is a significant achievement difference between class sizes that fall within a normal range despite the fact that previous research indicates small class effects are not realized until class sizes get to at least below 20 students. Finally, most production-function analyses use school or district wide teacher/pupil ratios as their measure for class size. Using teacher/pupil ratio “obfuscates the workload faced by a teacher in one classroom, the amount of attention the teacher gives to any one pupil, and dynamics of a small or large class that may impact on pupil participation”, all interactions that “may be especially important for students at risk” (Finn 1998, p.5). Furthermore, smaller teacher/pupil ratios are frequently observed in districts and schools serving large concentrations of at-risk students because of Title I , special education and remedial education programs, while actual class sizes in these same districts and schools are frequently larger, a point later discussed in greater detail.

Hanushek’s multiple reviews of education production function literature (1986, 1996) consistently conclude that there is no systematic relationship between class size and student achievement. However, others have found, even in analyses of the studies reviewed by Hanushek, that there is a systematic relationship between class size and student achievement (e.g. see Hedges, Laine and Greenwald 1994; Krueger 2000). In one investigation by Hanushek, Kain and Rivkin (1998) of the determinants of differences in student achievement in over 3000 Texas schools, the authors found statistically significant effects for class size on both reading and math achievement outcomes in the fourth and fifth grades, but no effects in the 6th grade. Hanushek et al. (1998) found that, in general, class size effects were largest for low- income

students.

Ferguson (1991) investigated the contribution of various district level educational inputs to student outcomes in 900 Texas school districts and found the district wide average number of students per teacher to be an important district-level predictor of student achievement after controlling for community background factors. Specifically, reducing the number of students per teacher to eighteen (which, according to Ferguson, would indicate an average class size of approximately 20) was identified as an effective means of increasing student performance in the primary grades. Below 18 students per teacher, variations in class size have no influence on test scores (Ferguson, 1991).

Ferguson and Ladd's (1996) production function analysis of Alabama school districts used average class size, not teacher/pupil ratios, in their models. They found that smaller average class sizes in grades 4, 8 and 9 were related to increased student performance on achievement tests in each grade.

Grissmer et al. (2000) found wide variations in NAEP scores (1990-1996) for students with similar family background characteristics across states that were partly attributable to differences in teacher/pupil ratios. They further found that one of the most cost-effective steps a state with disproportionate percentages of low-SES students might take to increase student performance on the NAEP would be to lower teacher/pupil ratios in the lower grades to below the national average.

NCES (2000) identified reduced class sizes as a high quality indicator of school effectiveness, suggesting that class size effects are realized via changes in teachers' instructional behavior and increased student engagement. This review of the literature on class size indicates that there is solid empirical evidence of a relationship between smaller classes (less than 20

students) and student achievement in the primary grades for students at-risk of academic failure. Class size reduction has also been found to be cost-effective relative to other measures when targeted to the right students (low-income, minority, and or English as a Second Language students) in the right grades (K through 3).

Class size is not the same as teacher/pupil ratio, which is a ratio of all students in a school relative to the number of professional educators employed and which will always be smaller than average class sizes. While teacher/pupil ratio will always overstate actual class sizes, in high-poverty schools it may present a larger overstatement. Special education and English as a second language (ESL) classes, for example, are smaller than regular classes and the teachers of these classes are included in counts of teacher/pupil ratio. Also, many high-poverty schools have teachers who specialize in remedial education services, frequently by pulling individual or small groups of students out of their regular classrooms to provide targeted assistance, often resulting in these students missing core content coverage (Chambers et al., 2000). At-risk students are also more likely to be identified as needing special education services and LEP students are more likely to be poor. Even when students do have IEPs or receive ESL services, they often do so for only a portion of the day or may even be mainstreamed for the entire day receiving supplemental services in class by a visiting teacher. Therefore, schools having large proportions of students with IEPs or who receive ESL or remedial (or compensatory) services will have lower teacher/pupil ratios but not necessarily smaller class sizes. High-poverty schools tend to have both of more of these students. Attempts to identify average class sizes and the extent to which classrooms in high-poverty schools do or do not deviate from the average (as well as the optimum) will result mainly in data on teacher/pupil ratios. Thus, a caution is needed: even though it appears that high-poverty schools have smaller average class sizes because they have

lower pupil/teacher ratios than low-poverty schools, this is not necessarily the case.

The average teacher/pupil ratio in all schools in all locations is a little over 16; this average jumps to over 17 in central city schools (NCES, 2003). Both of these numbers, if used to infer class size, are within the optimal range. How much they actually indicate about average class size cannot be determined, but central city schools probably have larger average class sizes. Larger schools also have higher teacher/pupil ratios; elementary schools with over 1,000 students have a teacher/pupil ratio of 18.1, and those with over 1,500 students have a ratio of 20.5 students per teacher (NCES, 2003).^{*} Secondary schools with over 1,500 students have an average of 18.9 students per teacher. The 100 largest school districts have about one student more per teacher than in all other districts (Hoffman, 2003). If average class sizes are usually larger than teacher/pupil ratios by two students, then central city and large schools probably have class sizes that are larger than research recommends for disadvantaged elementary school students. To the extent that disadvantaged secondary students might also benefit from class sizes below 20, those attending central city and large schools are not in optimal class sizes.

A recent investigation of how Title I schools (and schools receiving other smaller streams of federal funding) use federal funding shows that the highest poverty schools report having more teachers than low-poverty schools, resulting in smaller average class sizes.[†] The average class size in schools with 75% or greater FRPL concentration is 21.1 compared to 22.9 in schools with 35% or less FRPL concentration, with these counts including self-contained special education classrooms (Chambers et al., 2000). The data also reveal another important trade-off high-poverty schools make to hire more personnel – they tend to pay less and have teachers with

^{*} Table 65, p.77, includes special education, kindergarten and some nursery school.

[†] Data were collected from a national sample of 180 districts and 720 schools within those districts. At the district and school levels, questionnaires on the uses of funds were administered. Teachers also completed surveys. The authors use the term “class size” when reporting these numbers. (Chambers et al., 2000)

fewer years of experience. The average teacher salary in the highest poverty schools is a little over \$35,000 per year while it is over \$40,000 in low-poverty schools. Additionally, teachers in low-poverty schools have over 2 more years' experience than those in the highest poverty schools (Chambers et al., 2000).

Any reading of the available data suggests that average class sizes in high-poverty schools are perhaps slightly larger than research recommends is best in order to promote higher levels of achievement among these students. Another point worthy of consideration is that the research is fairly clear on the fact that evidence is strongest for disadvantaged students, yet universal class size reduction policies are more popular now than ever and class size in all schools has steadily declined over the last few decades. Class size reduction initiatives are expensive and can have negative implications for teacher quality. There is very little reason to believe that universal reductions in class size will lead to significantly better achievement for all students. Therefore, it makes sense to target such initiatives to the schools where they are most needed and where the largest effects are likely to be observed. However, class size reduction initiatives even in high-poverty schools should not come at the expense of attracting and retaining high-quality teachers, which may require offering teachers in high-poverty schools higher average compensation than is offered in other schools. On the other hand, ensuring that high-poverty schools maintain class sizes that facilitate student engagement and achievement may be another means for stemming teacher turnover in high-poverty schools.

Before and After School Programming (BASP) with One-on-One Tutoring

This section combines the evidence on two often distinct interventions with different evidence of effectiveness into one suggested intervention. One-on-one tutoring

is a single intervention that is sometimes conducted during school hours and other times in the context of after-school programming that may or may not be at the school site or offered through the school. The evidence of effectiveness for one-on-one tutoring is much stronger than that available for before and after school programming in part because there is less variation between tutoring programs than between after-school programs and in part because one-on-one tutoring is a more popular intervention to implement and thus more likely to be studied. Furthermore, one-on-one tutoring programs are usually designed to directly effect achievement or skill acquisition, which is easier to measure, while after-school programs are designed to affect a wide range of outcomes, some having little to do with achievement, and many of which are harder to measure.

There is general consensus that pull-out programs, like tutoring during the school day, can be more disruptive and stigmatizing than helpful. By the same token, providing intense one-on-one services during the course of the school day without removing students from the classroom can also be disruptive and difficult to manage, especially for younger students whose ability to not be distracted by what the rest of the class is doing is arguably less developed than that of older students. There is also a general consensus that while current after-school programs might not be producing the strongest effects, after-school programming for high-risk populations, especially those living in high-poverty neighborhoods, is an important protective measure against exposure to too much unsupervised free time and risk for involvement in harmful behaviors. Furthermore, to the extent that after-school programming promotes student engagement in school, exposure to extracurricular activities, increased access to positive adult role models, and

other conditions that facilitate the development of social capital, it is worthy of further consideration.

On another level, however, tutoring and after-school programs are not that different, especially to the extent that they provide students greater access to adults who are supportive of their academic and social development. In one way, they can each be conceptualized as mentoring programs, especially if they seek to foster long-term relationships between students and adults. Mentoring programs, which are rarely school-based or directed, have been identified as effective means for increasing student achievement as well as promoting student self-concept and feelings of belonging (Redd, Brooks & McGarvey, 2002; Tierney, Grossman & Resch, 1995).

Based on evidence regarding pathways through which poverty operates to place students at-risk, tutoring and after-school programming are complimentary methods for increasing student access to supportive adults who are interested and invested in their general well-being and capable of assisting them in their academic endeavors. The offering of a safe place for students to be during non-school hours where academic and extracurricular activities are offered and students are encouraged to participate is warranted based on student need alone; providing one-on-one academic tutoring within the program is just a further measure to ensure that the time students spend in these programs is directly related to what they are doing in school and most likely to enhance their achievement in school. Combining the interventions is also an effective way of responding to the need for equal levels of academic press and social support in high-poverty schools. To the extent that after-school programs offer academic enrichment opportunities and one-on-one tutoring in academic subject areas, they signal a school's

commitment to academic excellence and allow the schools to reasonably raise the level of academic expectations for all students. To the extent that these programs also ensure student opportunity to master academic content, engage in other enriching activities and build relationships with supportive adults, they increase social support for learning and facilitate the development of school-level capital.

Therefore, evidence is explored below on each intervention to identify the sources of strongest effects and emerging best practices; this evidence is then used to conceptualize a school-based program that combines the best of both interventions.

One-on-One Tutoring

The evidence on one-on-one tutoring programs is based almost exclusively on programs aimed at increasing the reading skills of at-risk elementary school students. One-on-one tutoring programs vary along a number of dimensions, with little consensus regarding the extent to which these variations affect outcomes. They can employ certified teachers, paid paraprofessionals, adult volunteers or even peers. Some tutoring programs are based on tightly scripted programs that require intense training and monitoring and use specified resources, while others simply seek to provide struggling students with extra time on-task with adult supervision, support and encouragement. Some programs occur within the school day; others take place during non-school hours. Most expose tutees to at least one hour of tutoring per week and last for at least half of the school year, while others provide less (or more) intense services.

Despite these variations and the limitations they might impose, the evidence for one-on-one tutoring is strong. Programs with different traits and levels of intensity have been shown to be highly effective not only in increasing student skills and general achievement, but in

preventing special education placement (Baker, Gersten & Keating, 2000). It is assumed here that the positive effects found for one-on-one tutoring at the elementary school level can also be realized in middle and high school and in subjects other than reading. At the same time, because reading ability is integral to academic success at every level, if the effects of one-on-one tutoring were limited to reading its inclusion is still justified. For that matter, if one-on-one tutoring is only effective, or most effective, for elementary school students, its inclusion as a component of an adequate educational program is still warranted to the extent that it decreases the likelihood that at-risk elementary school students will be retained, placed in special education, or otherwise placed at greater risk for academic failure early in their school careers.

Extensive investigation of one-on-one tutoring effects has led to a series of literature reviews which summarize the evidence and identify best practices. Most evidence suggests that one-on-one tutoring is most effective when conducted by certified teachers (Wasik & Slavin, 1993). But there is also evidence that trained and supported paraprofessionals are effective tutors (Wasik & Slavin, 1993) as are adult volunteers, (Herman & Stringfield, 1997; Topping, 1998; Wasik, 1997; 1998) college students, (Topping, 1998) and peers or cross-age tutors, especially in highly structured programs (Herman & Stringfield, 1997; Topping & Ehly, 1998).

Several evaluations of individual programs using adult-volunteers or peer tutors to tutor elementary school students at-risk for reading failure have demonstrated positive effects of tutored students (compared to controls) on various measures of reading or literacy growth (Baker et al, 2000; Invernizzi, Juel & Rosemary, December 1997/January 1997; Taylor, Hanson, Justice-Swanson & Watts ,1997).

According to Herman & Stringfield's (1997) review of ten promising programs for disadvantaged students, "the most frequently proven effective supplementary / remedial models

involve one-to-one tutoring” (p.116). They also conclude that one-on-one tutoring is a cost-effective intervention, a finding replicated by Topping (1998).

Before and After School Programs (BASPs)

How students spend their out-of-school time affects their academic success. Time spent in structured activities, religious activities and with adults is positively related to a variety of outcomes while hanging out with friends is consistently related to negative ones (Jordan & Nettles, 1999). For example, disadvantaged children whose out-of-school time includes 20-30 hours of constructive learning activities each week seem to do better in school than those whose time does not include activities like discussions with knowledgeable adults or peers, reading, writing, homework, hobbies, chores and problem solving games (Clark, 1988), yet students in high-poverty schools spend more time in unstructured activities like TV watching than their peer in low-poverty schools (Lippman et al., 1996). Tenth graders who spend one to four hours each week in school-sponsored activities seem significantly less likely than those who spend no time engaged in such activities to drop out of school, become teen parents, smoke or be arrested (Zill, Nord & Loomis, 1995), yet high-poverty schools offer fewer school-sponsored activities, like sports programs, than low-poverty schools (Lippman et al., 1996).

It is also important that students, especially at-risk students, have access to adult supervision and positive adult interaction when not in school (Quinn, 1999). Children and adolescents need adult supervision and contact not only for what it provides, but also for what it might prevent. Students without adult supervision are at significantly greater risk for truancy, stress, poor grades, risk-taking behaviors, and substance use (NIOOST 2000). If students are going to become perpetrators or victims of crime, they are most likely to do so in the first few

hours after school; the juvenile crime rate triples between the hours of 3:00 and 6:00 pm (NIOOST 2000).

Adolescents from low-income families or residing in low-income neighborhoods are less likely than others to have access to opportunities for constructive use of out-of-school time and adult supervision and contact outside of school (e.g., Jordan & Nettles, 1999; Quinn 1999). To the extent that students are more likely to complete homework when adults are available to supervise and support them in doing so, high-poverty schools may unwittingly exacerbate income or SES-based achievement differentials by assigning more homework. Over the last twenty years, homework time for elementary students has gone up nearly 50 percent (Rothstein, May 23, 2001). Parents who have less time, and less education themselves, are not as able to assist their children in completing this homework. As evidence suggests that poor students are less likely than middle-class students to get adequate support for homework at home, increasing the homework load in high-poverty schools without ensuring that students have the requisite support for completing it may be more harmful than helpful. Lee & Smith (1999) found that schools with high levels of academic press (increased homework is one indicator of increased academic press) without equal levels of social support could lead to even greater inequity in outcomes. Thus, while assigning more homework in high-poverty schools might be a valid means of increasing academic press^{*}, it is not likely to be effective in raising achievement if unaccompanied by efforts to ensure students adequate opportunities for completing it.

Students in high-poverty schools are more likely than those in low-poverty schools to live

* Findings from the 1999 NAEP indicate that 17 year olds who spent more than two hours daily doing homework had higher average reading scores than those who spent less than one hour per day or who did none (USDOE, 2000). However, this relationship does not control for family background or prior achievement so tells us little about the power of homework to raise achievement for poor students in high-poverty schools. It is logical that if these students did more homework in an appropriate environment with adult supervision and support, their achievement would improve. But assigning more homework to students who do not have these facilitating factors is unlikely to make much difference and might do more harm than good.

in single-parent households where the parent is working (Lippman et al., 1996), and poor children are more likely than their more affluent peers to be without supervision in the after-school hours (Halpern 1999). Poor parents are frequently interested in after-school programs but cannot pay the fees required by most programs. Programs that offer free or subsidized care exist, but only serve a fraction of eligible children (Halpern, 1999). Child care expenses are often the 2nd or 3rd largest item in a low-income working family's budget. When parents are unable to secure adequate child care or remain for long periods of time on waiting lists for child care or child care subsidies they tend to cut back work hours or not work at all, are more likely to receive public assistance, go into debt, lose their health insurance, and declare bankruptcy. Therefore, limited access to affordable childcare options has implications for multiple factors affecting children's educational outcomes.*

To the extent that the achievement gap is driven by systematic variations in home and community-based access to support for learning and other activities that are complimentary to academic achievement and sound development, then efforts to reduce the gap will have to target the sources of this variation and seek to remedy them. Evidence on the effects of before-and-after school programs (BASPs) on educational outcomes is of limited scope and rigor (Schwartz 1996; Herman & Stringfield 1997; Dryfoos 1999). While it seems logical that ensuring at-risk students access to good programs would at the very least reduce the likelihood of their involvement in risky behaviors, it has so far been difficult to determine how effective they can be.

In general, assessments of BASPs are based on expert opinion instead of formal evaluation (Dryfoos 1999). Where formal evaluations of specific programs have been attempted, they are frequently plagued by methodological flaws, several of which are related to the fact that

* Based on testimony provided to the Congressional Children's Caucus in 1999 by Emil Parker, Assistant Secretary for Policy and External Affairs in the Administration of Children and Families.

attendance in such programs is voluntary (Dryfoos,1999; Herman & Stringfield 1997). In fact, voluntary attendance is an issue that might consistently plague BASPs. As long as more motivated students are more likely to enroll in and regularly attend such programs, effects will be biased and limited. However, if access to such programs in high-poverty schools became the norm and programs were explicitly designed to attract and retain students, self-selection bias would decrease. There is little doubt that the key difficulty will be, especially for older students, designing salient and attractive programs that are also effective.

Two recent surveys of personnel in Title I schools and districts provides insight into the prevalence and use of BASPs in high-poverty schools. The first survey (Chambers et al., 2000) looked at use of Title I funds in the 1997-98 school year and found that about 63% of Title I schools offered extended instructional hours after school, before school or on the weekends, with after-school hours being most popular and weekend programs only offered in a small percentage of schools (2% in elementary schools and 14% in secondary schools). Secondary schools (79%) and the highest poverty schools (74%) were more likely than elementary (54%) or low-poverty schools (36%) to extend instructional time.* On average, these programs added an extra 116 hours of instructional time to the school year; only 7% of students in these schools were served (14% of students in high-poverty schools were served and 5% of students in low-poverty schools). It is not known if students were not served due to insufficient funding to meet demand or insufficient demand.

The second survey, including over 1,000 Title I schools and their use of resources in the 199-2000 school year, found that 69% of the schools offered before-or-after school programs, with higher poverty schools still more likely than lower poverty schools to offer extended hours. These programs were generally offered eight hours per week over seven months of the year with

* High poverty schools $\geq 75\%$ and Low-poverty $< 35\%$ (Chambers et al., 2000).

the highest poverty schools offering significantly more hours of before-or-after school programming than the lower poverty schools in the survey (279 hours compared to 184 hours). Over-all, BASPs served about one-fifth of the students in Title I schools, but higher poverty schools generally reported more student participation than lower poverty schools (26% and 18% respectively)(USDOE, August 2002). Thus, many high-poverty schools are offering BASPs, and the trend is growing, but only a fraction of the students are participating or being served. Very little is known about the content, goals or quality of these programs.

Before-and-after school programs are most often targeted to adolescents, and thus the majority of the research is based on these programs. Many do not have increased achievement outcomes as their main goal, instead seeking to reduce teen pregnancy or substance abuse or just provide a safe haven during non-school hours. There is limited evidence that participation in targeted after-school prevention programs can reduce high-risk behaviors among adolescents (Quinn,1999).

In some cases BASPs are conceptualized and implemented less as distinct programs and more as extensions of the regular school day, as in Title I schools. While extending the instructional day is a promising method for improving the academic performance of at-risk students (Herman & Stringfield 1997; USDOE, 1999), it may be that when BASPs are designed as simple school-day extensions, attracting students is difficult. Evidence from high quality after school programs indicate that regular student attendance does lead to better performance on measures of social and emotional adjustment, school conduct, grades, attendance, homework completion, achievement test scores, and peer relations (NIOOST 2000). This evidence further indicates that there are differences in outcomes related to patterns of attendance such that students who only attend high-quality programs sporadically do better than those who do not

attend at all but not as well as those who regularly attend. The effects of formal after-school programs are evident after controlling for mother's education, race and income and stronger than those observed among students in maternal care or other informal arrangements (Baker & Witt 1995; Posner & Vandell, 1994).

There are limited but related data on non school-based after-school program effects. Such programs are commonly called youth development programs and can be sponsored by a variety of organizations. Little systematic analysis of youth development program effectiveness has been conducted primarily due to lack of funding but also due to many of the same methodological problems that plague research on school-based after-school programs. However, the few outcome evaluations that have been conducted demonstrate that those programs that focus on academics, involve parents, and include social support have positive effects on both academic (achievement, high school completion, post-secondary school attendance and completion) and non-academic outcomes (academic self-concept, achievement motivation, school engagement, educational expectations, teen pregnancy rates and alcohol use), with stronger effects found for non-academic outcomes (Redd et al., 2002; Quinn, 1999).

Another set of programs similar to youth development programs have demonstrated stronger evidence of effectiveness for increasing student performance on a variety of academic measures. Mentoring programs seek to match high-risk adolescents with mentors who are dedicated to long-term relationships, with the best programs providing intensive case management. Participation in high-quality mentoring programs can influence achievement and attainment among teens (Redd et al., 2002).

The available evidence on BASPs and similar non-school-based programs is too limited to conclude that such programs are effective large-scale interventions as they are currently

designed and implemented; however, it is sufficient to suggest that efforts to identify best practices (especially in relation to attracting students to the programs), implement programs in high-need areas and rigorously study implementation and outcomes over the long-term should be encouraged (ERIC, 1998). The evidence of need for such programs in high-poverty areas and among at-risk students is also compelling. If empirically supported interventions, like one-on-one tutoring, were offered in the context of BASPs, the effectiveness of such programs might improve. As programs with sound evidence of effectiveness are implemented and publicized, student participation might also increase.

Implications for Designing Effective BASPs with One-on-One Tutoring

The central question at this stage is less whether BASPs should be implemented in high-poverty schools, but how to design and implement them in ways most likely to attract students and effectively increase their engagement and achievement. While the evidence on BASP effectiveness is limited, the evidence on tutoring is fairly solid. This combined intervention is categorized here as “proven” instead of “promising” based on the observed power of tutoring to affect achievement and the documented need among high-poverty communities for structured after-school options for students, but this is to some extent a judgment call.

BASPs should be located at the school site to increase student access and foster continuity between school and BASP programming and goals. Offering the programs at the school site also ensures access to the facilities and other resources necessary to offer a wide array of activities (Halpern, Cohen & Deich, 2000). Offering programs at the school site should also facilitate student engagement in school life (access to sports, drama club, service clubs, etc) and provide greater opportunities for students and school staff to develop relationships. Finally, for

working parents of younger children, school-based programs would ensure access to child care, thus reducing the likelihood that such parents will have to take measures that effectively reduce their income or increase their reliance on public assistance. Simply guaranteeing student access to high-quality child care in the non-school hours may make a singular and significant contribution to the achievement gap to the extent that it affects family income and reduces family reliance on other forms of child care that may increase risk exposure (e.g., leaving children at home alone or in the care of older siblings).

But effective BASPs should be more than child care; they should explicitly focus a portion of their time and resources on academic activities that are aligned with school curricula and goals and responsive to student need in relation to those goals (ERIC 1998; Fashola, 1998; Quinn 1999). Providing one-on-one tutoring is one way to meet this criteria. If BASPs were conceived as part of a total school program and BASP employees were integrated as part of the school faculty, achieving continuity and alignment should be easier. While it is not necessary that all BASP staff be full time staff or that school staff also assume BASP positions, there is nothing to prevent such crossover. Ideally, a BASP coordinator would be employed who may also coordinate the tutoring program and whose responsibilities should include working with the school leadership team to ensure alignment between school and program goals and practices. The program should be less an extension of the school day than a unique elaboration of the total school program as well as an integrating force that brings together the academic and extracurricular lives of students.

It is important that BASPs, even those with an academic focus, not be simple reiterations of school-day activities (Quinn 1999). They should offer students the opportunity to choose from a variety of enrichment and recreational opportunities not typically available to students during

the school day (Halpern, 1999; Quinn 1999). Staff should possess an adequate level of literacy to help children with learning, be diverse enough in their own interests and talents to develop and lead students in enrichment and recreational activities, and be trained to support school/BASP alignment and to be responsive to student needs (ERIC 1998; Fashola & Slavin 1997; Halpern, 1999). In general, there should be at least one staff member for every 10-to-15 students (Dryfoos 1999; Halpern, 1999; NIOOST 2000) and enough tutors to provide between one and two hours of tutoring each week to each participating student.

While research and common sense suggest that certified teachers are the most effective tutors, research also shows that trained paraprofessionals, volunteers with varying amounts of training and even peers are all effective tutors. For peer tutoring, both tutors and tutees benefit from tutoring. However, the model described here is based on schools where most if not all of the students are at-risk for academic failure; all students at such schools are in need of one-on-one tutoring time, not only for the academic benefits, but for the increased access to adults and the social support for learning they offer. Part of the causal theory that motivated this investigation into tutoring effects draws on at-risk students' lack of access to adult-directed learning activities and support for learning. Thus, the use of trained adult tutors is suggested.

The amount of training necessary for tutors is less clear, although it appears that at least two hours of training each year, coupled with access to a manual and a coordinator, is important. Neither the amount of coordination necessary between the tutor and the regular classroom teacher nor the most effective tutoring materials are precisely identified by research, though coordination and access to relevant materials are certainly necessary. Again, assuming that the tutoring program and its staff are fully integrated into the school program, achieving such coordination and ensuring access to relevant materials will be more likely.

Finally, BASPs should be designed to foster the creation of school-based social capital. This implies that every effort should be made to recruit and retain teams of individuals who are invested in student and program success. How this might be achieved is potentially best decided at school and community levels; however, without adequate resources for attracting and retaining such people, turnover will certainly denigrate program quality. Social capital is a product of long-term relationships based on trust and shared values and norms for behavior. If BASPs are not explicitly designed to minimize turnover, the production of valuable social capital will be compromised, as will program effectiveness.

Early Childhood Programs (ECPs)

The evidence in support of early childhood programs for disadvantaged children is extensive, and much of it is of very high-quality. The good news is that access to publicly funded early childhood programs is higher now than ever; the bad news is that ECPs are still not funded sufficiently to provide access to all disadvantaged children nor to provide the high-quality programming the research supports (Barnett, Robin, Hustedt & Schulman, 2004).

ECPs vary along a number of dimensions, and evaluations of ECPs provide valuable insights regarding how such variations can and do affect outcomes. ECPs can begin as early as infancy, or as late as four years of age. Some provide center-based care, while others provide home-based care, and others provide a combination. Some ECPs focus services exclusively on children, while others seek to address the needs of parents and children. Some ECPs discontinue services prior to school entry, while others provide transitional services through the elementary years.

There is a demarcation in the ECP evaluation literature between model programs and

large-scale publicly funded programs. Model programs are those developed to study the effects of exemplary ECPs, while large scale public ECPs are sponsored and funded by localities, states, or the federal government (e.g., Head Start). Model programs are generally of higher quality than large-scale public programs, employing more highly qualified staff, closer supervision by child development experts, lower staff-to-child ratios and smaller group sizes. Accordingly, model programs cost more to operate (Barnett, 1995). Almost all model ECPs provide classroom services, but vary in the range of other services offered as well as the age of onset and duration (Barnett, 1995). None of the large-scale public programs begin services before the age of three years, and most serve children beginning at age four for one year in a part-day program. Studies of large-scale programs do not generally include detailed program descriptions. Head Start, for example, has a broader mission than most programs, offering health, nutrition and parent-focused services in addition to the core educational program. Head Start programs also tend to have larger group sizes, pay teachers less and frequently only offer classes for part of the year. Only recently have Head Start pre-school teachers been required to have even a two year degree (Barnett et al., 2004). There are typically 15-20 students in a classroom with one teacher and an aide, but there is a lot of variation here as well (Barnett, 1995). The quality of the research design varies widely across studies of large-scale programs, while model programs typically have high-quality research designs (Barnett, 1995).

Generally speaking, research indicates that despite the variation in ECPs, early interventions for at-risk children are effective and have the potential to be highly effective even over the long-term, with model programs demonstrating the largest and most sustained effects. However, pre-school attendance has been generally associated with more positive outcomes for disadvantaged children, regardless of program type or intensity. For example, state-level

differences in NAEP performance from 1990 to 1996 between students with similar backgrounds were driven partly by different rates of participation in pre-school across states, leading Grissmer et al. (2000) to recommend expansion of pre-school access in states with high proportions of disadvantaged children. There is widespread agreement that any effort to narrow the achievement gap will require ensuring that poor and at-risk children are better prepared for school.

High-quality reviews of the long-term effects of ECPs on the cognitive and social outcomes of low-income children have been conducted by Barnett (1995; 1998), Karoly, Rydell, Hoube, Everingham, Kilburn & Greenwood (1998) and Ramey et al. (2001). These reviews include studies of specific ECPs, many of very high-quality, and their effects on participating children, usually compared to a control group. There is overlap in the evaluations considered in these reviews, though each provides a slightly different analysis of the evidence. A summation of the general findings is provided here.

Model ECPs generally demonstrate IQ gains at some point during or after program participation with effects often sustained until five years of age. The largest and most persistent effects are found among programs enrolling infants in full-day educational childcare (Barnett, 1995; Karoly et al., 1998; Ramey et al., 2001). Several model programs produced statistically significant achievement effects beyond the third grade. Large-scale programs produced more erratic and less sustained effects, though some did produce statistically significant achievement effects after third grade (Barnett, 1995; Karoly et al., 1998; Ramey et al., 2001).

Long term results from three model ECPs show that at fifteen years of age, treatment groups from all three programs outscored controls on tests of cognitive ability, but the only significant differences were found in two programs. Achievement test data are available for two

programs, and in both cases the treatment groups performed significantly better. Therefore, the limited available data indicate that ECPs can have lasting impacts on both cognitive and school achievement outcomes (Barnett, 1995; Karoly et al., 1998; Ramey et al., 2001).

Most studies of model and large-scale programs found reduced rates of retention and special education placement for treatment groups (Barnett, 1995; Karoly et al., 1998; Ramey et al., 2001). Among those studies which collected data on high school graduation rates, all found positive effects on high school graduation for ECP participation (Barnett, 1995; Karoly et al., 1998; Ramey et al., 2001). Other long-term follow-up studies of disadvantaged children who participated in model ECPs find associations between participation and more employment, higher earnings, more stable home lives, and more responsible citizenship as adults (Barnett, 1995). Recent evaluations of long-term effects of participation in large scale ECPs provide evidence that participants have higher levels of school attainment, higher earnings, lower rates of juvenile and adult criminal activity, and lower special education placement and retention rates (Garces, Thomas & Currie, 2001; Reynolds, Temple, Robertson & Mann, 2001).

Barnett (1995) investigated the extent to which ECP studies compared program effects across different types of programs or between programs with different characteristics. With a few exceptions that are noted below, the studies did not pursue such questions. One model program study compared ECP effects with those of community childcare. This study found that comparison group children who attended community ECPs that met federal guidelines had higher IQ's than the comparison groups attending no ECP. However, children attending the model ECPs performed twice as well at school entry as the community childcare participants on cognitive tests (Barnett, 1995).

Several of the large-scale studies compared Head Start participants with children

participating in other ECPs, usually public preschools. These studies found smaller effects for Head Start participants; however Barnett (1995) notes that Head Start students are more disadvantaged than the general student population so comparisons could be tainted by preexisting differences between the populations. Another study randomly assigned students to Head Start and a model program and found larger long-term achievement gains for the model program participants. Therefore, some type of pre-school experience is better than none, but the largest and most durable effects tend to be found through participation in high-quality, model ECPs (Barnett, 1995).

While Barnett (1995) does not find conclusive evidence regarding the relationship between age of entry into ECPs and long-term outcomes, Barnett (1995) notes that the studies examining the issue of age at entry did not look at the differences between beginning in infancy versus age three or four, but typically only looked at differences in one year, usually between 3 and 4 years old. He refers to brain development research which shows that “the same effects on brain development can produce different effects on cognitive and social development depending on the age at which they occur” (p.44) and notes that programs that begin in infancy and continue through kindergarten may be most likely to produce persistent IQ effects as well as larger effects on achievement.

Ramey et al. (2001) find support for what they term the “intensity of treatment hypothesis” which states that “more intense treatments produce larger intellectual benefits for high-risk children” (Ramey et al., 2001, p.104). The program that provided the largest IQ boost at age three, the Milwaukee Project, was also the most intensive program. This combined home-visiting and center-based program targeted urban African-American mothers with IQ’s below 75. Services began when infants were between three and six months of age with many home visits

provided during the first four months and then up to six years of full-day year-round center-based care for children and up to two years of vocational and social education for the mothers (Ramey et al., 2001).

Some programs provide additional or transitional services for school-age children, two of which provide information on the effects of extended elementary programs. The Abecedarian Project randomly assigned half of the program and control group students to a special school-age program that began at age five and lasted for the first three years of school. This school age program consisted of biweekly home visits by teachers who provided individualized support, learning activities and family support. By adolescence, significant effects on IQ, achievement, and school progress were produced by the ECP alone. The school age program was largely ineffective, and as an add-on had no effects on IQ and mixed effects on school success and achievement (Barnett, 1995).

The Chicago Parent Child Study II found enriched elementary services substantially added on to the ECP effects, with the size of effects increasing in direct proportion to the number of years with enhanced elementary services. However, unlike the Abecedarian Project elementary services, the CPC elementary services were more extensive than home-based supplemental support. The CPC elementary program included substantial changes to the entire elementary school program to include smaller class sizes, extra classroom and support staff and an emphasis on parent involvement. Barnett (1995) concludes that for school age services to have any effect, they must be more than add-ons and must significantly change the learning environment.

Barnett (1995) finds no solid evidence that elementary school enrichment programs are effective. However, drawing on the fact that low-income students typically attend poorer quality

schools and the findings from CPS II of greater effects with substantive changes to the entire elementary school program, he notes that “improvements in elementary education for children who attend poor quality schools would be expected to contribute independently to child development, including IQ, achievement, and school success . . .” (p.44).

Two-generational programs target both parents and children by providing developmentally appropriate ECPs for children along with programs for parents that include training in parenting skills, adult education, literacy and job skills (St. Pierre, Layzer and Barnes, 1995). These programs typically employ case managers to coordinate services, ensure family enrollment in appropriate services, and provide some counseling and crisis intervention. They also provide ancillary services such as transportation, meals and childcare.

Two-generation programs vary in the age of children served and the duration and intensity of services offered. Some of the programs provide center-based services while others provide home-based services. Six two-generational programs have been or are being evaluated using high quality randomized experimental studies, with most now having data on children through their fifth birthday. On the whole, there have been small or no effects on child development while several have had positive effects on parenting skills and other adult outcomes. Overall, programs that specifically target children appear more effective than those that have a dual focus on parents and children; in turn, parenting programs that focus on parents and not on both parent and children are also more effective. St. Pierrre et al. (1995) conclude that direct interventions targeted to the population of interest have the strongest evidence of effectiveness.

Ramey et al.’s (2001) review led them to identify the following as “empirically established general principles of early intervention” (p.109-110):

1. Interventions that begin earlier and last longer provide the better benefits;
2. More intensive programs, as indexed by number of hours per week, number of weeks per year, etc. produce larger effects;
3. Programs that provide direct contact and intervention with children and that seek to alter their daily learning experiences produce better effects;
4. Programs that provide more services and more access to services produce better effects;
5. Children at the greatest risk appear to benefit the most from programs;
6. The effects of programs will diminish over time in the absence of continued supports; and
7. Programs that are culturally relevant and congruent with children's cultural background are more likely to achieve the desired effects.

The National Institute for Early Education Research has established benchmarks to guide states in developing pre-school programs (which are distinct from a broader definition of ECPs because they serve only 3 and 4 year olds in center-based settings) and to evaluate the access and quality of state-funded pre-schools (Barnett et al., 2004). Forty states funded 45 state pre-school programs in 2001-02, enrolling 700,000 three and four year old children. At a minimum, these programs had to be state-funded, focus on the individual child, serve at least 3 and 4 year olds, provide group learning at least two days a week, and not be designed primarily for children with disabilities in order to be included in NIEER's study of state pre-school programs. The following is a list of NIEER benchmarks with the number of existing state pre-school programs (out of 38 that provided data) that currently meet the benchmark:

<u>Benchmark</u>	<u>Number of States Meeting</u>
Assistant Teacher has CDA or equivalent	10
Comprehensive Curriculum Standards	12
At least one meal provided	18
Vision, hearing, health screening/referral	18

Teacher has BA	21
At least 15 hours/year in-service	22
Specialized training in ECE	29
Staff/child ratio of 1:10 or better	30
At least 1 family support service	31
Maximum class size less than or equal to 20	31

While no state met all ten benchmarks, three met 9 out of 10 – Arkansas, Illinois and the New Jersey Abbott districts (the thirty largest and most disadvantaged districts in the state). New Jersey has the highest standards and is requiring the Abbott Districts to provide free pre-school beginning at age three to all of their children. Georgia and Oklahoma sought universal access and enrolled more than half of the four year olds in their states. The rest of the states enrolled less than 20% of 4 year olds, with most enrolling less than 10%.

Total spending on state pre-school programs in 2001-02 was \$2.4 billion, with ten states accounting for 83% of all funding. The limited access observed in state programs is at least partly a result of limited funding; however, most states are spending too little to ensure quality programming. On average, states spent \$3,455 per child on pre-school programs while Head Start spent an average of \$6,934 (serving 900,000 students in 2001-02). Thus, on average twice as much is being spent on Head Start than on state funded pre-school even though Head Start program standards fall far short of what research suggests for effective early intervention programming so is not considered a real benchmark against which pre-school programs should be compared (Barnett et al., 2004).

Out of a total population of 7.9 million three and four year olds in October 2001, 4.13 million, or 52.2%, were enrolled in some form of pre-school programming, with 1.6 million of those in either Head Start or state-funded pre-school. Four year olds are more likely than three year olds to participate in pre-schools (66% and 39% respectively) (NCES, 2003). A little over

16% of all children under the age of 19 live in poverty, leading to a conservative estimate of 1.5 million three and four year olds living in poverty and suggesting that current access for impoverished children is about equal to need. On the other hand, young children are more likely to be poor than older children, and rates of child poverty vary greatly across states with some states having rates of child poverty exceeding 25% (Proctor & Dalaker, 2002). Some of the states with the highest levels of child poverty, like Mississippi, do not offer any state pre-school program, while others with high child poverty rates offer programs serving a small fraction of eligible children (for example, between 1-9% served in New Mexico, Louisiana and Alabama). Furthermore, existing pre-school programs, whether they be Head Start or state-sponsored, by and large do not meet the criteria that research suggests are minimally necessary in order to achieve significant and lasting effects.

When evidence on pathways through which poverty operates to place children at-risk for academic failure is combined with evidence on the effects of high-quality ECPs to ameliorate the effects of early risk exposure are combined, several implications emerge for designing ECPs for poor children in high-poverty neighborhoods.* First, interventions will have to occur before children reach the age of three as many of the factors that affect their cognitive development and place them at-risk for school failure occur as early as the prenatal period and, when not prevented, can induce irrevocable cognitive damage. Therefore, expectant mothers in these neighborhoods should have access to programs that promote and provide for adequate nutrition in the expectant mother and the child. Early intervention programs should also facilitate the use of positive parenting practices during the early stages of the child's life, provide access to and education in using books and toys that stimulate cognitive development, ensure safe home

* While research suggests that all poor children should have access to high-quality pre-school programming, the concern here is only with children and families living in high-poverty areas where the children are zoned to attend schools with FRPL eligibility of 40% or higher.

conditions and educate parents on the dangers and implications of lead exposure, and ensure access to preventive and illness-related health services and facilitate appropriate use. Ramey et al. (2001) also recommend that the most effective programs will provide young children with “supplementary developmental priming mechanisms” that research indicates can alter the course of cognitive development and prepare them to be successful in school.

While the above services could be center-based, home visitations by trained professionals would probably be necessary in regular intervals, especially during the early years when children are most likely to spend the majority of their time at home with parents. The evidence on nurse home visiting programs alone is inconsistent (Montgomery, Phillips & Mercikel, 2000) but there is evidence that such programs, especially in combination with center-based care and in the context of sustained interventions throughout the early years, can be effective (Barnett, 1995; Karoly et al., 1998; Ramey et al., 2001).

As the children grow older, access to center-based care as well as continued access to parenting supports are necessary, culminating in full-day, year-round center-based care for three and four year olds that are modeled as closely as possible on those high-quality model ECPs that have demonstrated the most significant and lasting effects or that, at a minimum, meet NAEYC or NIEER benchmarks for quality programming.

Intensive services are needed in these early years not only because research suggests they are necessary in order to ensure that at-risk children have the same opportunity to access an adequate education as advantaged children, but because doing so may lead to reduced costs later. Investment in high-quality ECPs have been shown to register real, inflation adjusted returns as high as 12% and combined private and public returns of 16% (Barnett et al., 2004).

This report outlines a comprehensive and intensive prenatal to grade 12 program to

ensure adequacy for students in high-poverty schools based on current needs and conditions. The implementations of high-quality early intervention programs that prevent the onset, or even the bulk of the onset, of the cognitive gap between more and less advantaged students at the time of school entry will mean that high-poverty schools as they currently exist are better able to provide an effective education with little expansion to current programming. This is not to say that poor children in high-poverty schools will not continue to be exposed to risk factors that negatively affect their academic achievement, but to the extent that they are more cognitively, socially and emotionally prepared to be resilient in the face of these risks, the job of schools is made that much easier. Comprehensive, high-quality early intervention programs beginning in the prenatal period have the potential for eliminating a large portion of the achievement gap. It is not known how much impact they might make, or how much savings might accrue to society as a result of their implementation, because they have never been implemented on a large scale. The trend toward greater pre-school access across the states is promising, but current programs are insufficient in their scope and quality to substantially affect the achievement gap. Furthermore, and perhaps more troubling, if the current programs are not of adequate quality they are less likely to produce the desired effects, diminishing their cost-effectiveness and their long-term political viability.

Increasing the Supply of Quality Teachers to High-Poverty Schools

Certainly, teacher quality affects the quality of education. In terms of school inputs, there is general consensus that the quality of the classroom teacher is the most important determinant of student achievement. What constitutes teacher quality is at best partially understood, the rest remaining in the “black box” of school effects that stymie our best efforts to create high-quality

learning environments for all populations of students. One way to move around the problem of defining quality teachers is to proceed on the rational assumption of most labor-economists that if we increase the compensation of teachers in high-poverty schools, teachers of higher quality will move to these schools. Yet there have been few sustained or well-monitored efforts to affect teacher supply in high-poverty schools, using this or any other strategy (Allgood & Rice, 2002). Compensation-based strategies may employ bonuses, higher-starting salaries, or other economic benefits like student loan forgiveness or help getting a house. Most of these strategies result in relatively small increases in compensation, arguably not sufficient to offset the range of costs that accompany working in high-poverty schools. In the end, very little is known about the relative promise of any policy for attracting and retaining high-quality teachers in high-poverty schools. Thus, knowing that quality teachers matter is not the same as knowing how to increase the supply of such teachers.

To further complicate the matter, knowing that teacher quality affects educational outcomes is not the same as knowing precisely what teacher attributes matter, matter most, or matter contingent upon other school, classroom, or student traits (Rice, 2001). Rice (2001) recently analyzed the available literature on teacher quality for the purpose of identifying those teacher attributes that research suggests have the most direct and consistent effect on student outcomes and found that while numerous studies have examined the relationship between various teacher attributes and desired educational outcomes, they also vary widely in terms of the teacher characteristics examined, the educational outcome of interest, the methodology employed, and the findings reported.

Rice (2001) identified four reliable indicators of teacher quality, or indicators which are backed by empirical evidence demonstrating a positive effect on student outcomes. First, the

most effective teachers are those who are certified in the subject area to which they are assigned to teach (i.e. teachers teaching out of their certified fields are less effective than those teaching in their certified fields). Second, effective teachers have taken coursework in the subject area in which they teach (particularly for secondary teachers in math and science), as well as coursework in pedagogy (for teachers across all grade levels). Third, the more effective teachers are those who earn higher scores on literacy tests. Finally, teachers who have at least five years of experience are more effective than those with fewer years of experience (Rice, 2001; see also Allgood & Rice, 2002).

What is perhaps most notable about Rice's (2001) findings is that typical teacher salary schedules do not reward teachers for any of the above attributes, except years of service. Most salary schedules also reward teachers for obtaining advanced degrees. Research, however, provides no clear or consistent evidence that advanced degrees promote higher levels of student achievement. And after about five years' experience, there is no evidence that teacher quality continues to improve.

In terms of the current quality of teaching in high-poverty schools, Rice's (2001) findings on the attributes that matter most are both revealing and troubling. Assignment matters, while earlier sections of this report have shown that at-risk students are among those students most likely to have teachers teaching outside of their certified field. Teachers' performance on literacy assessments is predictive of their effectiveness, while we have seen that high-minority and low-income schools and districts often employ teachers with below average scores on such assessments. Finally, teacher effectiveness is enhanced by experience only up to the fifth (or so) year of teaching, but high-poverty schools frequently have a hard time retaining teachers and thus are disproportionately staffed by beginning teachers.

Therefore, while efforts to increase the supply of quality teachers to high risk schools cannot be pointed to as “empirically supported”, there is further support for the claim that the current supply of teachers in many high-risk schools is inadequate, to the extent that these teachers frequently do not possess the attributes that research suggests promote student achievement.

Another way of approaching the problem of how to increase the supply of quality teachers to high-poverty schools, though, is to ask what is known about how and why teachers supply themselves to certain schools or districts and what teachers report motivates them to stay in a district/school, move from one district or school to another, or leave teaching altogether. As teacher turnover appears to have a negative influence on achievement (Grissmer et al., 2000), it is important to isolate the reasons for teacher turnover in order to identify effective methods for limiting it. There is a good deal of research that directly or indirectly addresses such questions.

Analyses by Ferguson (1991) and Hanushek, Kain & Rivkin. (1999) of the relationship between student achievement and various district-level resource measures in Texas indicate that higher-quality teachers prefer to work with higher-achieving, non-minority and non-poor students. Ferguson (1991) found that teachers are attracted to higher salaries when all other factors (e.g., district SES and achievement) are equal and that the most highly-qualified teachers tend to supply themselves to districts with the fewest poor, minority and low-achieving students and suggests that improving the supply of quality teachers to districts serving large groups of poor, minority, and low-achieving students will require state-enforced salary differentials that provide teachers in these districts with higher pay.

In their analysis of the relationship between state-level NAEP scores and state-resources, Grissmer, et al.. (2000) found that in those states where teachers reported receiving the highest

levels of adequate resources for teaching, such as supplies and instructional materials, NAEP scores were higher. They also found higher NAEP scores in states with lower rates of teacher turnover (indicated by higher proportions of teachers with two or more years' experience), but were unable to detect a state-level relationship between teacher salary or degree and student achievement (Grissmer et al., 2000).

Grissmer et al. (2000) suggest that improving teachers' working conditions is the best method for realizing significant productivity gains from the current teaching force and caution that the current emphasis on salary hikes for teachers may come at the expense of providing teachers with the working conditions that could make them more productive. The types of improvements identified by Grissmer, et al.. (2000) include the provision of adequate resources for teaching, the expansion of public pre-kindergarten access to low-SES students, and targeted class size reductions in low-SES states. Thus, Ferguson (1991) suggests that student achievement will increase when teacher quality is more evenly distributed across districts with varying demographics and proposes a compensation system that rewards teachers for choosing to teach in districts with large groups of poor, minority and low-achieving students to realize this distribution. Grissmer et al. (2000) suggest that student achievement will increase when teachers, especially those working with low-SES students, have improved working conditions and adequate resources for teaching and propose that states, especially states with low-SES student populations, provide an expanded platform of services to more adequately meet student need.

National data on teacher turnover and supply patterns suggests that while Ferguson's (1991) proposal might have some short-term effect on teacher supply in hard-to-staff districts, Grissmer et al.'s (2000) could be essential for long-term changes in teacher supply patterns (and

by implication, student achievement). The most current and comprehensive data on teacher supply / movement patterns and preferences comes from the national Schools and Staffing Survey (SASS) and its Teacher Follow-Up Survey (TFS).

Ingersoll's (2001) analysis of data from the 1990-91 SASS and TFS administrations indicates that high-poverty public schools have higher relative rates of teacher turnover and that retirement-related turnover is relatively minor compared to that related to teacher job satisfaction and the pursuit of better jobs or careers. Thus the "teacher supply" problem is less a problem of an aging teacher population and more a problem of a dissatisfied teacher population, which is actually a demand problem (Ingersoll, 2001). The implication, therefore, resembles Grissmer et al.'s (2000) recommendation: improving job satisfaction by improving working conditions for the current population of teachers is more important than attracting new teachers to the field.

According to Ingersoll's (2001) analysis, among those teachers leaving schools or the profession, the most significant school-level factors associated with turnover include inadequate support from the administration, student discipline problems, limited faculty input in decision making, and to a lesser extent, salary. Ingersoll (2001) suggests that enhancing teacher supply requires decreasing demand by improving the organizational conditions that cause low retention. Efforts to improve organizational conditions should be directed toward four areas: 1) revising the compensation structure; 2) providing greater administrative support, especially for new teachers; 3) reducing the degree of conflict and strife within the school; and 4) increasing teacher input into and influence over school practices (Ingersoll, 2001).

Results from an NCES (1997) analysis of TFS 1994-95 data also highlight the role of working conditions in teacher supply patterns and preferences. Among teachers who moved from one school to another in 1995 and reported dissatisfaction as the reason for moving, the top

five reasons were inadequate support from administration, lack of support and recognition from administration, student discipline problems, poor student motivation to learn, and lack of influence over school practices and problems. This analysis also showed that teachers working in schools with large concentrations of minority students (over 50%) were almost twice as likely to change schools than teachers working in schools with small concentrations of minority students (less than 5%) (NCES, 1997). Interestingly, when teachers were asked to identify the policies most likely to affect retention, they identified the following (in order of preference): 1) increased salaries and benefits; 2) dealing more effectively with student discipline problems and making schools safer; and 3) reducing class size (NCES, 1997).

Perhaps it is only natural that when asked to identify the action that would encourage a teacher to stay in a school, teachers first suggest higher pay, although it is not the reason they cite for leaving a school or the profession altogether. Increased personal income is a powerful motivator for all people in all professions. However, focusing on school resources and conditions that matter to teachers, it is clear that working in schools where resources are adequate (meaning adequate to produce learning given student need) and students are motivated and engaged, attracts teachers. These responses can be seen as proxies for feelings of efficacy among teachers. It is easier for everybody to get up and go to work each morning if they believe that they have the power and resources to satisfy the objectives of their job. For teachers, many of whom select the profession out of a sincere desire to “make a difference” in the lives of children whom they teach, ensuring that schools are organized to support their ability to do so, and thus their sense of efficacy, may be more important than in other professional sectors.

Furthermore, teachers are constrained by the same myopia that all of us are – the tendency to see things as they are and not how they might be. Teachers claim that working

conditions influence how they supply themselves to school, but they may see inadequate working conditions as an intransigent fact of life in high-poverty schools because significantly improving them requires educational and social policy actions too complex and expensive to ever be implemented. What if teachers in high-poverty schools had students who had access to a school-based clinic? What if all their students received early intervention services from the prenatal period on that not only improved their cognitive functioning and readiness to learn, but reduced behavioral problems? What if teachers in high-poverty schools knew their students had access to an after-school program where one-on-one tutoring was available? What if this program was coordinated with the school program and teachers had input in programming decisions? What if teachers in high-poverty schools had no more than 15 or 16 students in their classrooms, giving them ample time to provide each student with individual attention? What if high-poverty schools were small enough to facilitate teacher cohesiveness and collaboration and reduce isolation and the anxiety that might accompany it? When teachers are asked to identify the factors that might induce them to stay in a high-poverty school and they cite working conditions, does it occur to them that the improvements mentioned above are even possible? If they were possible, how might their responses, and more importantly, their decisions to stay or leave change?

If teachers don't think of such options, for whatever reason, and the options are not suggested, we are in effect asking teachers in high-poverty schools to deal daily with problems that seem insurmountable and can be overwhelming. Lately, we are even threatening them that if they can't deal with these problems *and* ensure ever higher levels of achievement among their students, their schools will be publicly sanctioned and perhaps lose funds (and in some places, teachers will lose compensation). On top of that, teachers in high-poverty schools do not receive compensation that is even equal to that received in low-poverty schools, much less enough to

induce them to stay and stick it out. Lippman et al. (1996) found that average teacher salaries in schools with more than 21% poverty concentration was \$1,500 below the national average and \$4,800 lower than the average in schools with the lowest poverty concentration. Chambers et al. (2000) also found that the average teacher salary in the highest poverty schools (75% and above) was \$5,000 lower than the average teacher salary in schools with the lowest poverty concentration (35% and lower).

Correcting these salary gaps may be a first step in improving the supply of teachers to high-poverty schools. But in the absence of real changes in the working conditions in these schools it probably isn't sufficient as teachers will, when all other things are equal, supply themselves to schools where achievement is higher and students are more motivated and engaged. It seems that adequacy of resources and working conditions will have to be improved in order to ever affect change in teacher quality in high-poverty schools. Some say that offering higher beginning salaries in high-poverty schools, or frontloading salaries, may attract higher-quality beginning teachers, but there is no guarantee that such a policy will keep these teachers without other improvements in the working conditions in these schools.

The initial focus should be on improving the working conditions in high-poverty schools by providing an expanded platform of services that adequately meets the needs of students in these schools and supports their academic achievement. To the extent that students in high-poverty schools come to school more prepared to learn and able and willing to engage, teaching these students will be that much easier. To the extent that teachers in high-poverty schools know that the many problems faced by these students are being addressed through provision at the school site of health care or before-and-after school programming with one-on-one tutoring, they may feel more strongly that they are not only more able to make a difference in the lives of

these children, but that they are part of an organization that is also sincerely seeking to make a difference in the lives of these children. It is impossible to say if the implementation of such programs and services will be sufficient to increase the supply of quality teachers to high-poverty schools and induce them to stay, but it probably has more potential than the largest suggested salary increase or one-time bonus.

Many believe that policies should be enacted to limit the ability of teachers to transfer out of high-poverty schools as they acquire seniority, that ensure that newly hired teachers are evenly distributed across schools in a district according to their qualifications, and that congruence between certification / preparation and teaching assignment is achieved equally in all schools. While it cannot be said for sure that such policies will be unnecessary, the best course is to allow the market to work first. If the conditions of high-poverty schools were improved in ways suggested in this report, such actions may be unnecessary and if they were enacted might have harmful effects. Attracting the best teachers to high-poverty schools will not become any easier if such teachers are then denied the right to transfer out over time, because teachers have genuine reasons for wanting to transfer that sometimes have nothing to do with school conditions or compensation and more to do with other factors in their life. For example, most young, single teachers working in high-poverty inner-city schools eventually get married and have children. They may want to move to the suburbs where they can purchase larger houses for less money, just like people in all other professions often choose to do. Denying teachers these options or assigning teachers to specific schools against their wishes may very likely lead them to leave teaching altogether. If such policies were in place, it may dissuade many high-quality candidates from even choosing teaching as a career.

Finally, improved working conditions in high-poverty schools will not only increase the

supply of teachers to these schools, but the quality of the supply. Therefore, there is no reason to recommend an explicit policy for targeting certain types of teachers. However, the evidence on reliable indicators of teacher quality reviewed here suggests that high-poverty schools, like all schools, should seek to employ teachers with above-average verbal skills and who have certification /preparation in the areas where they will be assigned. These schools should also explore various methods for limiting teacher turnover, perhaps through mentoring programs and more intense professional development offerings. Finally, these schools should seek teachers who are qualified to teach higher-level courses at the secondary level, especially in math and science, and who believe that at-risk students have the right to take and the ability to master the content of such courses. But these suggestions apply to all schools; ensuring high-quality teachers in every school requires paying attention to what we do know about teacher quality and designing recruiting and development systems that promote teacher quality everywhere.

Effecting teacher supply and turnover in high-poverty schools will no doubt require more money, and some of that money may have to go toward raising teacher salaries in these schools to at least equal what is paid in other schools. It may require paying a little more to induce high-quality teachers to work in these schools, especially in the absence of significant improvements in the working conditions in these schools. Sometimes it takes more money to purchase the same level and quality of resources in different schools with different characteristics in different locations. High-poverty schools are often located in urban areas where the cost of living is higher. Increased competition from the private sector in some areas may also require higher teacher salaries to attract the same quality of teacher. Some say that poor working conditions in high-poverty schools require paying teachers more to work in them. This seems backward. Teachers are not the only ones affected by poor working conditions; students, too, are affected,

as are their academic and lifetime outcomes. Working conditions in high-poverty schools should be improved first so that students in these schools have a more equal opportunity to access an adequate education. Doing so may actually increase the observed “effectiveness” or “quality” of the current supply of teachers in these schools – that is the teachers working in high-poverty schools may be more able than we can commonly give them credit for being. If the lack of quality teachers in high-poverty schools is largely a function of inexperience or turnover, and improved working conditions induce teachers to remain in these schools, then the seeming crisis of teacher-quality in high-poverty schools may be proven incorrect.

Extending Time in School Through Summer or Year-Round Schooling

There has been a rising call for school districts to revise school calendars to be more consistent with the varying needs of students and general changes in society that make the traditional school-year calendar less convenient than it once was for many American families (National Education Commission on Time and Learning 1994). More children today live in homes where both parents work or in single-parent homes where the parent works than ever. Advocates for calendar revision also point to studies of summer learning stagnation or loss, especially among poor and special needs students, as evidence of the need to revisit the traditional calendar. Summer learning loss is anecdotally supported by teachers who claim to spend the first month or two of each school year reviewing the content and skills taught in the preceding year.

The evidence on summer learning loss is strong and long-standing, with studies of the influence of summer breaks on achievement dating back to 1906 (Cooper, Nye, Charlton & Greathouse, 1996). Besides its general contribution, that average learning rates slow over the

summer months relative to rates observed over the school year, this body of evidence makes two other significant contributions: 1) it provides evidence that schools are effective in promoting achievement for all students, regardless of students' family background or school resources and characteristics, and 2) it provides the seeds of evidence that summer learning rates, while slower on average than those observed during the school year, vary systematically as a function of family background and neighborhood context. This latter finding has now been verified through direct studies of variations in summer learning across socioeconomic lines.

Several studies have shown that inner-city and/or low-income children experience no growth in reading skills over the summer and actually lose ground in math skills. This research additionally shows that summer skills stagnation or declines are not observed among children living in the suburbs or from middle-class homes (Hayes & Grether, 1969; Heyns, 1978; Murnane, 1975).

Murnane (1975) found that while reading and math skills for all students improved over the school year, the summer losses in math observed among inner-city children were equal to approximately half of the math gains made over the school year, essentially wiping out half of a year's worth of instruction for these students. Hayes and Grether (1969) found that while the word knowledge of children living in the inner-city neighborhoods declined over the summer, the word knowledge of children living in middle class neighborhoods increased. When these differences were observed over several summers, "the sum of the differences ... was so great that it accounted for more than half of the difference in word knowledge skills between older ghetto children and older middle class children" (Murnane, 1975, p.88).

Heyns (1978) confirmed and expanded on these findings in a two-year investigation of socioeconomic differences in the seasonal learning rates of approximately 4800 sixth and

seventh grade students in Atlanta Public Schools. Heyns (1978) found that all student groups learned more over the school year, no group maintained a summer learning rate equal to that observed during the school year, and socioeconomic differentials in learning were consistently exacerbated during the summer months (Heyns, 1978).

The only students to demonstrate improved achievement over the summer months were those from high-income families, with high-income white students more likely to post gains than high-income blacks. At the same time, all students from low-income families lost ground over the summer. Heyns (1978) found that the “most dramatic socioeconomic differential implies that between half and two-thirds of the annual learning gap among children accrues during the summer” (p.49).

Cooper et al. (1996) reviewed research on the general effects of summer vacation on student retention and acquisition of academic skills, as well as differential effects for subject matter and for students with varying characteristics. Unlike Heyns (1978), their review of the literature suggested that, on average, all students show little or no academic growth over the summer, but that some lose between one and three months of learning on average. Computation and spelling skills suffer the greatest losses, leading them to conclude that factual and procedural knowledge is more prone to decay than conceptual understanding. They did, however, find that summer vacation increases differences between advantaged and less advantaged children in reading, with detrimental effects increasing in line with grade level up to the 7th and 8th grades. Little evidence was found that gender, race or intelligence have an impact on summer break learning when income is controlled, but special education students generally experienced summer losses.

Utilizing data from the Beginning School Study (BSS), Alexander, Entwistle and Olson

(2001) studied seasonal learning patterns over the entire elementary school career of a large, representative sample of urban, low-income students. BSS is an ongoing panel study monitoring the academic and personal development of a representative, random sample of children (N=790) who began first grade in the fall of 1982 in 20 Baltimore public schools. Achievement data for this study span five years, from the fall of 1982 through the spring of 1987. Tests were administered twice each year, in the fall and in the spring, providing up to ten data points for BSS students across five school years and four summers. The time span of the study predates the proliferation of summer school programs, thus few BSS students were involved in summer school (Alexander et al. 2001).

Looking at spring-to-spring scores, lower SES students lag behind their upper-SES peers in first grade by about .7sd in both math and reading; after five years of schooling, these students lag behind by .9sd in both areas. Looking at spring-to-fall versus fall-to-spring gains, winter gains exceed summer gains for both student groups by a large margin and summer gains for higher-SES students exceed those for lower-SES students, many of whom actually lose ground over the summer months. Thus, all students make greater gains over the school year than during the summer in math and reading, but more advantaged students gain more over the summer than less advantaged students. Reading gains over the summer months significantly outpace math gains, and school year gains for 1st and 2nd grades are generally larger than school year gains in later years (also see Entwistle & Alexander 1989; 1992), providing support for the notion that the early years of schooling are foundational (Alexander et al. 2001) and earlier findings that math skills are more prone to decay over the summer than reading (Cooper et al., 1996).

Alexander et al. (2001) found that school-year gains among this sample are not differentiated by student SES. The only exception to this general finding is that in the early

years, school year gains for lower- and middle SES students sometimes outpace those of higher-SES students. For low-SES students, the summer months are associated with stagnation in reading skills and deterioration in math skills, with math losses especially large over the first two summers of schooling. Upper-SES students experience learning growth in both domains over the summers, although they experience more growth in reading than in math (Alexander et al. 2001).

Family income and parental education are not the only factors that drive differences in summer learning rates; neighborhoods matter as well. Children's summer gains over the first three years of schooling, with family income and parental education controlled, have been found to be positively related to neighborhood SES (the percent of families in the neighborhood living above the poverty line) (Entwistle, Alexander & Olson, 2000). While family background variables are the most significant predictors of student achievement in the early years, neighborhood socioeconomic composition also affects student achievement during this time, having stronger effects during the summer months when children are out of school and arguably more exposed to neighborhood influences (Entwistle et al., 2000).

Knowing that low-income or otherwise disadvantaged students experience skills stagnation or losses over the summer months is not the same as knowing how much summer or extended year schooling can prevent such loss or stagnation or, more importantly, how much they can promote a narrowing of the gap. While it is logical to assume, especially in the face of solid evidence that "time in school" does accelerate the learning rates of all students, that extended schooling can at least maintain school year learning rates (or ensure levels achieved at the end of one school year are not lost before the beginning of the next school year), there is very little empirical evidence to support such an assumption; however, the limited available evidence

is based on extremely poor quality data and tells us virtually nothing about the potential for high-quality summer or extended year programming targeted to high-poverty schools to narrow the achievement gap.

Heyns (1978), for example, examined the effects of Atlanta's large summer school program (which enrolled nearly half of the city's sixth grade students) on achievement. The programs were targeted to schools in poor black areas, and low-income and minority students were most likely to attend. Heyns (1978) found that summer school had a very modest effect on achievement, and that when student SES was controlled, the effects were not significant. The good news from this study is that no net loss occurred; the bad news is that summer school actually increased the inequality of outcomes associated with family background as the gains that were observed were concentrated among students from the most affluent families.

There are many problems with this study that impede its usefulness for inferring the potential for summer school to narrow the achievement gap. Although disadvantaged students were most likely to participate in summer school, they were not required to participate, so self-selection was a problem. It is likely that higher achieving or exceptionally motivated disadvantaged students chose to participate. Furthermore, all students could participate, including high-SES white students. Since all students learn more while in school, the fact that more advantaged students enrolled in summer school and thus also experienced the benefits, isolating the capacity for summer school to narrow achievement differentials between more and less advantaged students is problematic. Finally, the summer program was not designed to make up failing work or permit acceleration, and there were few curriculum requirements. Because attendance was not even routinely taken, it is impossible to determine how much participation patterns might have influenced outcomes. The curriculum was primarily devoted to skills not

afforded during the year, like typing, library skills, and recreational programs. From school to school there was considerable variation in length of time, intensity of instruction and effectiveness (Heyns, 1978).

Heyns (1978) also looked at summer activities that tended to influence summer learning rates and found reading was the only activity that affected achievement over the summer for all students groups. Low-income children attending summer school consistently read more books during the summer than low-income children who did not attend summer school, while high-income children read about the same amount whether or not they attended summer school. Thus, even though the summer school programs did not focus on basic skill acceleration, participating children were more likely to read more if in summer school. In this way, summer school participation is apparently more important for disadvantaged than advantaged children, who read about the same no matter what.

Over the last several years, the popularity of summer school programs has increased as a result of higher demands for student learning (as measured by standardized test scores) and accountability, and in response to the call for an end to social promotion. Most summer school programs today, however, are intended to provide remediation to struggling students and not enrichment opportunities. The evidence on these programs is generally weak owing to issues of self-selection, variations in program focus and quality, and different attendance patterns that are rarely well-documented much less studied. Furthermore, the effects of these programs are frequently measured in terms of promotion rates and not achievement outcomes.

A few years ago more than 300,000 New York City students enrolled in summer programs; 2/3 of these students enrolled as a condition of advancement to the next grade, while the other 1/3 enrolled voluntarily for enrichment classes (Johnston, September 6, 2000). Midway

through the summer, the attendance rate was 77% at the primary level and 55% for high schoolers who had to attend to avoid retention. By the end of the summer, 63% of students who attended summer school regularly were promoted while 33% were retained (Johnston, September 6, 2000).

In Chicago, where failing students in 3rd, 6th and 8th grades are required to attend summer school classes, summer school appeared to be more helpful for gaining promotion. Eighty-three percent of the city's 3rd graders attended summer school and met the criteria for promotion (nearly double the rate for that grade in each of the preceding three years). For 6th graders, the promotion rate was 75% and for 8th graders, 71%. Overall, Chicago schools reported that they held back no more than 10% of students in all three grades (Johnston, September 6, 2000).

In New Orleans, summer school failed to help hundreds of students pass the re-administration of an exam required for advancement from 8th to 9th grade. Eighty percent of the students who attended four weeks of summer school to boost their performance on the language arts portion of the exam failed to pass it on a second try; 86% of the students who retook the math test failed. While officials did not provide attendance data, local media reported that hundreds of 8th graders who failed the first administration of the exam never attended summer school (Johnston, September 6, 2000).

In the summer of 1999, Boston Public Schools initiated a \$21 million transitional program for low-performing 3rd, 6th and 9th graders at-risk for retention that has summer school as one component. Students in these grades are given up to 15 months of extra instructional time through longer class periods in English and Math, specialized teaching (to possibly include after school tutoring), and up to two years of summer school. Students who participate in the program

but still do not pass promotion exams are promoted, but continue to participate in the program. Students who participate in the program and do pass the exams may or may not continue in the program, depending on resource availability at their school (Johnston, October 4, 2000).

At the end of the second year, analyses indicated that 72% of the nearly 7,000 transition program students in all three grades passed the city's English/Language Arts exam (which is required for promotion). At the same time, non-program students (students not deemed in need of the extra help provided by the program), passed the exam at the exact same rate. Ninth grade transition program students actually surpassed non-program students on the reading test while math results were more mixed. For 9th grade math, 46% of program students passed the test compared to 55% of their non-program peers (Johnston, October 4, 2000).

Some researchers claim that summer programs like those profiled above, which are frequently one-time efforts to either increase standardized test scores or avoid retention, are "too little, too late" and should be replaced by more comprehensive and consistent efforts to mitigate against summer learning loss (Johnston, September 6, 2000), a claim consistent with the general review of the literature in this report on sources of academic risk in poor children, evidence on schools' power to affect learning (at a minimum, facilitate acquisition of basic skills) among at-risk children most notably during the early years, and evidence on seasonal variations in learning rates.

Entwistle et al. (2000) are careful to point out that there is a distinction between summer school in general and summer school as a means to close the achievement gap: "Summer schools with good programs and facilities on average can improve students' performance, but the few careful evaluations that have focused on attending summer school for the purpose of closing the achievement gap between social groups find just the opposite. Summer school increases the

gap” (Entwistle et al. 2000, p.24). They attribute this result to the Matthew Effect – unto those who are well-off, more shall be given. When add-on services are provided across the board, those students who already possess a “learning advantage” are further advantaged; those who are not at an advantage may and often do benefit from the add-on services, but not enough to close the gap (Entwistle et al., 2000). Of course, this report seeks to identify components of an adequate education in high-poverty schools, not all schools. Too often, however, in order to sell a policy and the costs accompanying its implementation to politicians and their constituents, we agree to “universal” implementation – just as we are doing with class size and pre-school. Whatever power summer school may have to close the achievement gap will never be realized if it is universally offered.

Summer school is not the only method for extending the school year or limiting the amount of time that students spend away from school. Year-round schooling is another option. In fact, year round schooling may be a more promising method for targeting the sources of the achievement gap in high-poverty areas because, for one thing, it ensures attendance. If all high-poverty schools adopted an extended school year, instead of simply offering optional summer school, all zoned students would have to attend. The downside of year-round schooling is that it may result in simply adding “more of the same” instead of actually expanding the quality and scope of educational and enrichment programming. Of course, more of the same is not necessarily a bad thing since disadvantaged students are learning in schools as they are currently organized and run. At the same time, selling year round schooling to the public might be easier if parents and students believe that the opportunities provided in the extended school year will include more than extra math classes. Furthermore, the relatively accelerated summer learning rates of advantaged children are not likely the result of spending more time on math; these

children are doing something else during the summer, whether at home or on vacation with their parents, at camp, or in their neighborhoods, that helps them to, at a minimum, retain the skills and capacities acquired over the previous school year and in many cases extend those skills and capacities. Extended year programming that holds the most promise for narrowing the achievement gap duplicate the out-of-school experiences of advantaged students that contribute to their learning as much as possible.

At present, year round education (YRE) is another advancing trend in school reform finding its way into school districts across the country irrespective of student need. While YRE involves a substantial change to the traditional school calendar, it does not actually lead to more hours or days of school per year; its main contribution is that it eliminates the long summer break which takes such a toll on skills for many students and arguably diminishes teacher capacity to make the most of the time they have with students. It is commonly noted that teachers spend a fair amount of the beginning of each school year reviewing skills taught the previous year; proponents of YRE claim that this is valuable time lost, especially for disadvantaged students who lose more over the summer, thus requiring more review time at the beginning of each year. YRE may be one means for solving the problem of summer learning loss without incurring the costs of more time in school. While this may be true, and certainly makes sense, it is doubtful that YRE alone without extended time in school, even if targeted only to high-poverty schools, will close the achievement gap, though it may narrow it.

Frequently districts offer year-round programming in a few schools, providing opportunities for researchers to draw comparisons between the performance of students enrolled in YRE with those attending school on traditional calendars. Davies & Kerry (1999) reviewed this research and found that changing the school year calendar so that smaller breaks are

scattered throughout the school year leads to more continuous learning, which benefits all students to a degree, but with the largest benefits accruing to disadvantaged students (Davis & Kerry, 1999). Davies & Kerry also suggest that schools offer enrichment or revision opportunities in reading and math during a portion of all school-year breaks to further alleviate skills deterioration and its implications for lost time for instruction in new skills when school resumes.

The literature reviewed here provides evidence that all children learn more while in school than they do when not in school. It also shows that while advantaged students are more likely to continue learning when not in school, disadvantaged students are more likely to lose ground, thus exacerbating the achievement gap and undoing much of the progress made toward closing it over the school year. Evidence that disadvantaged children learn more than advantaged children while in school during the first two years of school highlights the importance of exposing disadvantaged children to high-quality schooling in the early years as a means of closing the skills gap sooner rather than later. This evidence is further bolstered by the findings that the learning rates for disadvantaged children take a harder hit over the summer in the first two years of schooling than they do in later years. YRE is a promising method for limiting the amount of skill loss when disadvantaged children are not in school and ensuring that when they return to school teachers can move more quickly to new skills, but is probably not sufficient to close the gap as much as to limit how much it widens during vacation intervals.

While evidence on the effectiveness of summer school as a means for accelerating learning levels or rates (or preventing stagnation or decline) among disadvantaged students is elusive, it is not based on very good data and really tells us nothing about the potential for extended time in school for disadvantaged students to narrow the gap. The evidence on

socioeconomic variations in summer learning, however, is solid and compelling and when added to evidence that schools do contribute to the learning outcomes of all students, in spite of the effects of family background and varying school characteristics, a compelling argument for extending the time that disadvantaged students spend in school is advanced, as is the argument for experimenting more widely with it and carefully studying the results.

The evidence presented on YRE is indicative of the need to provide students with a more stable flow of instruction. While the time that at-risk students spend out-of-school, in any increment, is time where their risk exposure increases, it seems logical that the longer such intervals are, the more likely it is that students will suffer learning losses and become disengaged from school. Thus, limiting the duration and frequency of out-of-school intervals appears to be one promising method for combating the effects of summer learning loss among at-risk students.

The question that still remains, however, is how to design summer or extended school year programs to both attract at-risk students and foster achievement. Perhaps the first research-based recommendation is that summer school programs should be made available only to at-risk students, especially if the point of such programs is to close the achievement gap (Entwistle et al., 2000; Alexander et al., 2001). Not only should summer school programs be targeted to high-poverty schools, they should have a strong academic focus, with special emphasis on reading and math, and provide enrichment opportunities that attempt to address the “unique contribution that parents and neighborhoods make when school is cut off” and make summer school fun and appealing (Alexander et al. 2001, p.184).

Entwistle et al. (2000) suggest that determining the content of summer programs so that they are most likely to boost the achievement of disadvantaged students requires knowing the kinds of summer learning experiences they lack relative to their more advantaged peers.

Evidence suggests that higher-SES peers take more trips (overnight and day trips to parks, museums, science centers, plays,) read more, and have greater access to enrichment opportunities (i.e., dance, music, art, drama, etc), and recreational opportunities (i.e. team sports as well as other-individual recreational activities such as swimming, boating, tennis, golf, etc). Thus, in addition to providing academic content, summer school programs for low-income children should provide access to similar activities. Recall that Coleman (1987; 1988) argued that as social capital at home and in the community declines schools have to expand to fill the gaps not by offering more of the same inputs, but by offering the types of inputs that other capital producing institutions traditionally provide, to include opportunities to engage in enriching activities with supportive adults and where long-term relationships with those adults can be built and sustained.

In-line with the argument that extending the school year should be conceptualized as a means for increasing access to social capital through engaging, adult-directed enrichment and academic activities, summer school programs should not be one-shot efforts where students are singled out to attend either because of low-test scores or risk for retention, a context in which opportunities for appealing enrichment activities and developing positive relationships with adults are likely constrained at best. As long as summer school is designed and publicized as a remedial measure for struggling students at-risk for retention, it holds slim promise for closing the achievement gap, much less ensuring adequate participation to make a difference. Obviously, summer school has to be appealing to students. Perhaps the provision of enrichment activities, such as those suggested by Entwistle et al. (2000), is one means for attracting disadvantaged students. Once students are there, these programs must provide them with incentives to engage in the programs and activities offered. Community, parent and student involvement in designing

summer school programs is clearly one avenue for developing attractive summer or extended year programs.

Still, the term “summer school” carries a stigma that may be hard to overcome no matter how enriching, rewarding or effective the programming is. Making summer school attendance compulsory may ensure attendance and even marginally improve achievement, but in addition to being a tough political sell, it will not erase the stigma associated with summer school and holds limited promise for truly engaging students and increasing their access to social capital. Casting summer school as an “intervention” only “poor kids” need will not make it popular among its targeted constituents. High-poverty schools should conceive of, and promote, summer school as an extension of access to school-based programming that includes attention to academics but differentiates itself by devoting a significant portion of the time to enrichment and recreational activities that will be appealing to students (and enlists their and their parents’ support in developing those activities) and complementary to their overall academic, social and emotional development. At its core, extending the school year in high-poverty schools should be about providing at-risk students opportunities for growth in a wide range of areas, not punishment for the fact that they have fewer opportunities for such growth at home and thus drag down the overall performance of schools and districts. This is a very important distinction, and making it is the first step to designing effective extensions to the regular academic year in high-poverty schools.

School-Based Clinics

Of all the interventions proposed in this report, evidence on the effectiveness of school-based clinics, as academic or health interventions, is the weakest. However, the relationship between income and health, and the impacts of poor health on both achievement and life time

earnings, is supported by perhaps the most robust evidence of any reviewed in this report, or social sciences in general (Geronimus, 2000). It is unfortunate that, given this latter fact, we know so little about the potential of school-based access to comprehensive health services to improve the health and educational outcomes of the nation's poorest children. Until the health care gap between poor and non-poor children is closed, the achievement gap will certainly remain.

Low-income children often do not receive the preventive or illness-related health care that they need for normative physical, emotional and cognitive development at the same time that they are also more likely to be exposed to environmental factors that place them at greater risk for a variety of health problems – many of which have serious implications for normative cognitive development (Brooks-Gunn & Duncan, 1997; Cunningham & Hahn, 1995; Haveman & Wolfe, 1994).

The reasons poor children do not receive adequate health care are many, some the result of parental choice but many more the result of constraints on choices (leading to difficult trade-offs) or lack of choice that are less often experienced by middle-class parents. For many poor parents, spending time and money on preventive care is a luxury; in fact, seeking treatment for annoying but seemingly non-threatening problems, like toothaches and ear infections, is also a luxury. Yet children who have recurring untreated ear infections are at greater risk for hearing loss. Untreated toothaches can impair a child's ability to attend well in school.

Poor children are more likely to live in single-parent homes where the parent works. Parents of poor children are more likely to work in low-paying jobs where wages are paid by the hour, paid leave is not an option and health care coverage is not a benefit. Taking time off of work to get children to the doctor forces a harder trade-off when income and job security are at-

risk, when health coverage is not available to help with costs, and when the most accessible physician may be at public clinics where wait times can be extremely long. In the face of such obstacles, poor families are much more likely to use emergency rooms for routine medical care when problems become unbearable, where costs are exorbitant. When poor families can't pay emergency room bills, tax payers absorb them.

Even when coverage exists, poor children are less likely to utilize health services (Cunningham & Hahn, 1995). Health care coverage does not reimburse income lost when parents have to take sick children to the doctor, nor does it cover the cost of transportation or parking, which in some locations can be a barrier to access. Health care providers frequently don't establish offices in poor, urban neighborhoods. Constrained state and local revenues, in combination with shifting policy priorities, has led in some places to the closure of public health clinics and hospitals. Failure to utilize health coverage to access health care may also be a function of the amount of time that parents spend with their children, monitoring their children's general health or keeping track of their children's "well-child" visits and immunization records (Cunningham & Hahn, 1995). It may also be a function of the parent's physical or mental ability to keep up with the child's health needs; poor parents are more likely than non-poor parents to suffer from physical and mental health conditions that impair their ability to meet their children's developmental needs (Brooks-Gunn & Duncan, 1997).

Taking all of the above into account, it is not surprising to find that poor children are more likely to suffer from easily treatable diseases and conditions that impair their ability to do as well in school than non-poor children. It is surprising that we expect to close the achievement gap without attending to these issues.

Chapter Two provided an in-depth review of the disparity in health care coverage, access

and well-being observed between poor and non-poor children and reviewed what is known about the relationship between poor health and cognitive development and academic achievement. Poor maternal health (or health habits) during the prenatal period can lead to depressed cognitive functioning and other health problems for the children. Lack of adequate care and exposure to environmental risks during the early years can also alter cognitive trajectories and otherwise inhibit poor children's ability to prepare for school. Once school starts, even for those children who do not suffer from depressed cognitive functioning, the demands of school combined with the effects of untreated illnesses or diseases can work together to deplete their ability to attend well to instruction, can spark behavior problems and lead to higher rates of absenteeism and over-referral to special education (which is a lot more costly than regular education and in many cases unnecessary). In the end, the fact that poor children are less likely to do well in school as a result of these problems is arguably less important than the fact that they are more likely to suffer from serious illnesses and to die during childhood than their non-poor peers (USDOE, 2000; Lewit & Kerrebrock, 1997).

There is little reason for American children to suffer health problems due to inadequate access to routine medical attention, much less to suffer permanent cognitive impairments or life threatening illnesses. When American children are compared to children from other developed nations on a number of academic and health measures, middle class white and most Asian students fare well. On the other hand, African-American and Hispanic children, who are disproportionately more likely to be poor do not fare as well (Deutsch, 2000).

According to Deutsch (2000), children's health and school reform are common causes, with school readiness being the "quintessential issue around which health and education blur and blend" (2000, p.10). Deutsch (2000) argues that the best way to improve health and education

outcomes for poor children is to provide early and sustained contact not only with the children, but their families.

If poor children had access at the school site to medical professionals who scheduled routine visits with the children, conducted basic health screenings, ensured proper and timely immunizations, maintained medical records and alerted parents to necessary next steps, it is entirely possible that the current disproportionate health burden carried by poor children could be reduced to normal levels.

If the parents of poor children also had access to health services at the school site, there is further potential for improving their children's educational outcomes, to the extent that healthier parents are better able to provide developmentally nurturing environments. As Geronimus (2000) argues, improving health services and access to services in impoverished urban areas could have long-term and comprehensive effects on the entire community.

So, what kinds of services should be offered at a school-based clinic and to whom? First of all, because so many of the health and academic problems from which poor children suffer begin long before school entry and as early as the prenatal period, school-based clinics would serve all expecting mothers and newborns within the school attendance zones. While most services would be offered at the school site, perhaps in conjunction with or through the ECP, home visits should also be conducted to facilitate developmentally appropriate parenting practices and assess homes for risks about which the parents may otherwise not be aware. The primary goal of these early interventions would be to ensure proper nutrition, safe physical environments and developmentally appropriate parenting practices.

Consider the impact that home visits might make on reductions in lead exposure and related complications alone. Lead exposure, which is associated with stunted growth, hearing

loss, vitamin D metabolism changes, impaired blood production, toxic effects on the kidneys and decreased IQ scores (Brooks-Gunn & Duncan, 1997), is significantly higher among poor children who have been observed with dangerously high lead levels in their blood at five times the rate of non-poor children (GAO, 1999). Blood lead levels are highest among poor, black children living in central cities (Brooks-Gunn & Duncan, 1997).

Deteriorating lead-based house paint is a primary source of lead for young children, and children living in buildings constructed prior to 1978 are more likely to be exposed. Crawling and toddling babies in these buildings may pick up pieces of paint flecks off the floor or peel them from the wall and then place them in their mouths. Center-based physicians can ask parents if their children are exposed to lead, but trained home-visiting nurses can see for themselves, advise parents on precautions, and alert local authorities of dangerous buildings.

The effects on achievement of lead exposure and poisoning among poor, urban children are probably significant. Knowing children have been exposed is not going to undo damage. Prescient physicians can inquire about risks, but have to rely on parent reports. Home visits could go directly to the source. Targeting such home visits would not be difficult, either; visiting recent immigrants who are pregnant or have small children and residents of buildings constructed prior to 1978 who are pregnant or have small children would be a good start. Parents could be warned of risks and educated on how to avoid exposure, but the promotion of awareness throughout the community could have much more far ranging positive implications as the pressure to ensure adequate housing for poor families would certainly mount.

In fact, comprehensive clinics in high-poverty schools could be catalysts for a good deal of improvement in these neighborhoods. Case managers or social workers working in conjunction with or through the clinic and the ECP might facilitate access to other services and

agencies which could support families. There is the potential for reducing incidents of child abuse and neglect and for engaging parents early in the total life of the school, perhaps making them more likely to stay in the community so that relationships started early with school and clinic personnel could be sustained throughout the child's early school years. Parents so engaged early on might be more involved later in the children's education both at home and at school as volunteers. There is the potential for general community development, especially in extremely impoverished and isolated areas. If every high-poverty school in every high-poverty neighborhood had a fully functioning clinic that met the needs of all children and their immediate families, such communities might become more attractive to businesses, increasing access to employment.

So, the first line of prevention in school-based clinics would be to ensure every poor child the healthiest possible start through prenatal care, home-visits and access to immunizations and well-baby visits, while also providing parental support and access to medical care. This step alone might lead to a cascade of community benefits, but even with a better early start and healthier, supported parents, poor children will still be more likely (at least for the immediate future) to have other health problems that are easily identified and treated but when untreated interfere with learning and lead to higher long-term public costs.

Adequate vision screening has the potential for enhancing the school performance of low-income children and reducing the disproportionate rate of special education placements among these students. If access to an optometrist were available at the school site and the importance of correcting vision problems, even those that don't appear to affect children generally, were promoted at school, more poor children would be more likely to get a proper diagnosis, be prescribed glasses, and perhaps more likely to wear their glasses as the proportion of their school

mates were also wearing them rose.

Ear infections are easily treatable with antibiotics, but they have to be diagnosed first, requiring a trip to the doctor and then to the pharmacy where the antibiotics have to be purchased, another expense poor parents are less able to incur. While ear aches are uncomfortable, sometimes severely so, they aren't always severe enough to justify a lost school day. If parents could send their children to school with a note referring them to the clinic for an aching ear, a doctor could in minutes detect an ear infection and prescribe an antibiotic, sending the child back to class.

While untreated cavities and toothaches might not be a significant cause of lower achievement among poor children, toothaches in particular may contribute, especially if they are severe or chronic enough to inhibit paying attention in school. If children had access to a dentist at the school site, a quick trip down the hall could identify the source of the problem and prescribe or administer any necessary treatment. School-based access to dentists and regular dental visits in high-poverty schools might significantly reduce the incidence of cavities and toothaches among poor children.

There are a number of techniques and medications for preventing or treating asthma attacks, some of which are expensive and time-consuming. For young children or those with severe cases of asthma, air compressors (nebulizers) might be necessary. These machines emit a medicinal mist that is breathed in by the child which contain albuterol or a steroid or both, with treatments taking up to fifteen minutes and sometimes having to be administered multiple times per day. Neither the machine nor the medicines are cheap, and the more severe the asthma, the more treatments are necessary. In those cases where asthma is identified early, parents have to be persuaded that it is in the best interest of their children's long-term health and breathing ease

to administer regular treatments, even if they are not observing any breathing problems. It may be that middle-class parents are more likely follow such advice in part because they are more able to afford the costs associated with preventive treatments, have the time to administer them or are more able to appreciate the implications for children's health if they do not take preventive measures.

Catching asthma early and responding in kind, however, holds the potential for limiting the implications of asthma in several ways. Not only may it prevent future complications from the disease, it may prepare children to be more aware of their limitations, and self-sufficient and responsive to attacks as they get older. If parents acknowledge and accept the disease early, children will accept it as well, learn how to deal with it, and perhaps be less embarrassed by having to use an inhaler in school or sit out of PE on some days. Asthma among poor, black children in dense urban areas is a serious problem; the magnitude of the effect it is having on their achievement is hard to know, but promoting awareness and ensuring access to treatment within schools that serve these children could have a substantial impact on their health, school attendance, and achievement.

Malnutrition in young children can depress the immune system, leading to recurrent ear infections, hearing loss and growth stunting (low height for age), which is associated with short-term memory loss (Lewit & Kerrebrock, 1997). Inadequate nutrition can impede brain development during the first two years of life, but proper nutrition after two years of age can restore near normal mental development. Malnutrition after two years of age, however, can be just as damaging to brain development (Lewit & Kerrebrock, 1997). While clinics are not the place to offer meals, children who have easier access to routine care are more likely to be identified as suffering from vitamin or mineral deficiencies. Supplements can be provided

through the clinic, and doctors at the school site can keep school administrators aware of the magnitude of the problem within their school. If administration is aware that under nutrition is an issue, efforts can be made to promote breakfast and snack programs, organize bus schedules so that more children have access to breakfasts, or even set aside time at the beginning of each day, perhaps during morning announcements, to provide a nutritious desk snack (a banana or granola bar and a carton of milk). Neither the costs of ensuring that all children have a light but nutritious snack at the beginning of the school day nor the time that it would take to administer them are large enough to offset the potential benefits in terms of behavior, achievement, and adequate physical development.

Recently the federal government and states have made extensive efforts to ensure that more children have access to health care coverage. Many of the costs associated with operating school-based clinics, in fact, could be reimbursed through publicly funded health care. At the same time, states have reported difficulty promoting coverage; many poor parents are still reluctant to apply. School-based clinics might be a vehicle for improving health care coverage by offering promotional services at the school site or even access to applications and support in completing them. Some states already assume that any child eligible for FRPL or Food Stamps is also eligible for government health care coverage.

The idea that certain communities and their residents are in need of improved access to a variety of health and social services is not new. This idea led to the creation of settlement houses in the early 1900s, comprehensive community initiatives to provide a range of services to residents of poor communities, and has more recently spawned interest in coordinated or collaborative services, often at the school site and sometimes called "full service schools" (Crowson & Boyd, 1993; Boyd, 1998; Wang et al., 1997; 1998; Dryfoos, 1999). Schools are

often selected as the sites for collaborative service models because of their “status as enduring institutions that play a critical role in communities” (Wang, Haertel, & Walberg, 1998, p.4) and because, in many poor neighborhoods, schools are one of the few remaining community institutions (Crowson & Boyd, 1993).

Collaborative service models situated in schools seek to combine quality education with comprehensive support services that meet the needs of all community residents and are built upon the understanding that no single intervention will change the lives of disadvantaged youths and their families but that the cumulative impact of coordinated, quality interventions may (Boyd, 1998). There is very little empirical support for the effectiveness of collaborative services model, or even for best practices (Crowson & Boyd, 1993; Boyd, 1998; Wang et al., 1998). However, there is “plenty of information available on both risk factors and effective interventions to guide action” (Wang et al., 1998, p. 4).

The Settlement House initiative combines quality educational programming with an array of health, mental health, social services, and recreational services at the school site. Among other components, each site includes a primary and dental health clinic (Dryfoos, 1999). Comparative evaluations of a Settlement House model in New York City found that the reading and math performance of Settlement House students improved, as well as attendance rates, student behavior and parent involvement (Dryfoos, 1999).

But this evidence is not based on the results of a high-quality experiment. Randomized trials with control and treatment groups, control for intervening variables, and replication of results are all necessary in order to say with confidence that collaborative services models or school-based clinics are proven, effective academic interventions.

The lack of such evidence is no reason not to provide comprehensive health services in

high-poverty schools to students and their families. Easily identifiable, preventable and treatable health problems disproportionately affect poor children, leading them to miss more school, be less engaged while there, hinder their capacity to access the material presented in school, and in worst case scenarios, irrevocably diminish their cognitive capacity. This is one area where we don't have to rely on the results of social science research to justify an intervention. Medical science has done a good portion of the work for us. The fact that there is a dearth of evidence supporting the implementation of full-service school-based clinics in high-poverty schools is simply evidence that they do not exist, have not existed long enough to gather good data, are have been implemented so crudely that studying them is problematic. Closing the achievement gap will require closing the health gap, and providing full-service clinics in high-poverty schools could go a long way in narrowing both.

This research was funded by The William and Flora Hewlett Foundation. We thank them for their support.

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