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Poverty, Inequality, and Children's Early Cognitive Skills

By

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Poverty, Inequality, and Children's Early Cognitive Skills

By

Kendralin Jennifer Freeman
M.A., Emory University, 2008
B.A., Case Western Reserve University, 2002

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An Abstract of
A dissertation submitted to the Faculty of the
James T. Laney School of Graduate Studies of Emory University
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Abstract

Poverty, Inequality, and Children's Early Cognitive Skills
By Kendralin Jennifer Freeman

Many consider the United States to be a land of opportunity in which anyone who tries hard enough will achieve economic success. A good education is often seen as the key to achieving this success. Yet, all children do not share the same economic and educational starting lines. In 2008, nearly 20% of children in the United States reside in families living with incomes below the poverty line. At the same time, poor children enter the education system less prepared than their better off counterparts. This project investigates one explanation of unequal "starting lines" by analyzing the impact of poverty on early childhood cognitive skills. Research suggests that childhood poverty impacts cognitive skills through a variety of mechanisms (e.g., health status, family processes, neighborhood impacts). I use path-analytic structural equation modeling to test many of these mechanisms simultaneously in order to assess their relative impact on the cognitive skill growth of children in very early childhood. I also investigate how this aggregate pattern differs within and between racial/ethnic groups. To accomplish these analyses, I use the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) which is a nationally representative data set of children born in 2001 that assesses child development over the first five years of life. Results from this study suggest that income poverty is an incomplete way to conceptualize, theorize, and measure poverty. Cognitive skill growth varies according to the level of poverty experienced and the aspect of poverty captured by the measure. Additionally, social systems surrounding children are critical in mediating the relationship between poverty and cognitive skills, particularly parental mental and physical health as well as infant health problems. Finally, social systems operate differently within racial groups, at least in the creation of a skill gap between poor and non-poor children. By addressing the link between poverty and cognitive skill growth, this project informs policy initiatives that move toward eradicating the gap between the poor and non-poor such that all children enter formal education at the same cognitive starting line.

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CHAPTER ONE: INTRODUCTION

Many consider the United States to be a fairly open society, a land of opportunity in which anyone who tries hard enough can succeed. We believe that the first step to achieving economic success is getting a good education (Eckholm 2008). Yet, we do not all share the same economic and educational starting lines. Indeed, 22% (13 million) of American children live below the poverty line and 43% (5.6 million) of these poor children live in extreme poverty (50% of the poverty line or below) (Children's Defense Fund 2008). When considering specific locales, regions, and ethnicities, these percentages grow even higher (Lichter and Johnson 2007). At the same time, poor children enter the education system less prepared than their better off counterparts (Duncan and Brooks-Gunn 1997a; Guo 1998). How does being born into poverty inhibit children's learning, and how might this process unfold differently for different subgroups?

The existing literature offers several clues. When comparing kindergartners living below the poverty line to those living above 400% of the poverty line, poor children are 30 times more likely to experience food insecurity and three times more likely to be chronically absent from school (Romero and Lee 2008). Nineteen percent of poor children lack health insurance compared to 11% of all children, and this rate spikes to 30% of poor children in states such as Florida (Fass and Cauthen 2007). Children born into households with annual incomes below $15,000 are 22 times more likely to be abused or neglected than those born into households with annual incomes of $30,000 or higher (Children's Defense Fund 2008). Poor children hear fewer words from their parents than their more advantaged peers (Bloom and Markson 1998) and they are 1.5

times less likely to be read to on a daily basis (Burns, Griffin, and Snow 1999). Poor children are 1.3 times more likely to exhibit developmental delays, 1.4 times more likely to be diagnosed with a learning disorder, and 2 times more likely to repeat a grade (Palloni 2006). Many, if not most, of these consequences impact not only poor children specifically (living below the poverty line) but low-income children (living at or below twice the poverty line) more generally (Gershoff et al. 2007).

The combination of these unmet needs leads to dire consequences in the future. For instance, the poor have a higher likelihood of being arrested, charged, convicted, and sentenced to longer terms than wealthier offenders (Reiman 2006). In addition, once under the purview of the criminal justice system, the needs of poor youth frequently remain unmet. A full two-thirds of incarcerated, poor youth suffer from mental illness and one-fourth of these disorders are classified as clinically severe (Solomon et al. 2008). Even if poor children do avoid the "poverty to prison pipeline," they are still less likely to graduate from high school and go on to college, and are even less likely to graduate from college (Reiman 2006). In an age when education is increasingly important for obtaining a good job, it seems that U.S. society provides its poor children with few opportunities for even the most marginal economic success (Massey 2007).

Despite growing scholarship exploring the sources of poverty, the average American citizen remains apathetic about finding a solution (Rank 2005). We tend to ignore the reality of poverty, thereby (perhaps unconsciously) endorsing the impoverishment of one-fifth of our nation's children. By not taking further action, we signal to these children that they are not worth our attention and are inconsequential to our nation. In this study, I aim to expose the harsh reality imposed on the poor children

of this nation and highlight some of the ways in which poverty works to reproduce social inequality. While much of the sociological research on poverty in the U.S. focuses on its causes (e.g., Rank 2005; Wilson 1987, 1996), this study addresses three main questions concerning the *consequences* of poverty for disparities in young children's cognitive outcomes.

First, in order to effectively explore *how* poverty works to reproduce social inequality, researchers need to identify a functional definition of poverty. While the United States government has defined poverty since the 1960s by using a formula determining the amount of food necessary to live and multiplying it by three, researchers find this definition problematic in many different ways (Iceland 2006). Recent research alters this definition to include elements of timing, duration, and degree (e.g., Pagini et al. 1997; Wagmiller et al. 2006; Teachman et al. 2007) while other research advocates for supplementing the traditional definition of poverty with additional measures of wealth and hardship (e.g., Axinn et al. 1997; Maurin 2002). Findings from these studies suggest that a dichotomous measure at one point in time is insufficient to capture the broad impact of poverty on educational and economic outcomes, particularly in early childhood. To that end, I first ask the question: *How do different conceptualizations of poverty alter the composition of "the poor" and the size of the cognitive skill gap at 9 and 24 months of age?*

Second, using information garnered from the first question, I fuse lines of research from several disciplines to begin unraveling the mediating mechanisms between poverty and learning, specifically those that operate within individual and familial spheres. Past studies have addressed various potential explanations for the poverty gap in

cognitive skills including family structure, home effects, neighborhood effects, subcultural impacts, and material hardship. However, few studies examine these processes simultaneously, investigating how they matter relative to one another. Broadly placing my research in Bronfenbrenner's (1986) framework, I examine how conditions specific to the child, the child's interactions with his or her primary caregiver, and parental work conditions may impact cognitive skill growth in very early childhood. Toward this end, I ask the question: *What are the primary determinants of the cognitive skill gap between poor children and their advantaged counterparts during very early childhood?*

Finally, poverty is closely related to race in the United States. Given the racialized history of the U.S., it is important to engage the subject of race in a critical and thoughtful manner. Particular populations in the United States are at higher risk for poverty than other groups of children. This is especially true for young children: In 2008, 42% of Black children under the age of three, 33% of Hispanic children under the age of three, and 41% of American Indian children under the age of three live in families with incomes below the federal poverty line (Wright and Chau 2009). Compared to other racial groups (12% White, 11% Asian, 20% Other), these percentages mark severe disadvantage. Additionally, the racial achievement gap in later years is well documented in sociological literature (Magnuson and Waldfogel 2008; Reardon and Galindo 2009). What remains unclear is how the intersection of race and class uniquely shapes cognitive skill growth for young children within and across racial groups. The final section of this study explores the specific poverty experience for each racial group by asking, *how does poverty inhibit cognitive skills differently across race/ethnic groups?*

Together, these three questions address the distinct disadvantages faced by young children living in poor households. More broadly speaking, these questions speak to issues of equity in education. Indeed, large disparities in cognitive skills along economic lines exist before children even enter formal schooling (Brooks-Gunn, Duncan, and Maritato 1997). Such disparities then persist as children progress through school, despite the fact that schools tend to equalize them (Duncan, Brooks-Gunn, and Smith 1998; Downey, von Hippel, and Broh 2004). Given this information, this study serves to initiate movement toward improving the experiences of economically disadvantaged children prior to school entry in order to combat the long-term impact of poverty in early childhood on educational outcomes. Further, this work provides specific recommendations for ameliorating the consequences of poverty rather than simply demonstrating the empirical reality of the cognitive skill gap between poor and non-poor children. By unraveling the mechanisms through which poverty produces the skill gap, this study points policy makers and researchers alike to the most prominent issues facing poor families with regard to the cognitive skill growth of their children.

I first review the relevant literature, focusing on what research has demonstrated about cognitive skill growth in poor families, the explanations for why poverty leads to skill disparities, and a brief exploration into how the aforementioned explanations may be racially specific (Chapter Two). In Chapter Three, I review the data and methodology I use to address my research questions. Chapters Four through Six present my findings. In Chapter Four, I examine multiple conceptualizations of poverty in relation to the emergence of the cognitive skill gap. I then highlight how this gap emerges both for the national sample of children (Chapter Five) and for specific racial and ethnic groups

(Chapter Six). Chapter Seven presents my conclusions with a summary of findings, implications for future research, and policy recommendations.

CHAPTER TWO: LITERATURE REVIEW

In this chapter, I review literature on the three key issues that this study addresses. I begin by explaining how researchers conceptualize poverty, highlighting questions about the substantive value, validity, and reliability of the traditionally defined poverty measure. I then turn to the mechanisms through which poverty shapes cognitive skill development, using an approach that emphasizes the multiple social spheres that influence young children, from their own health to the health and working conditions of their parents to the parenting practices utilized in their households. Finally, I explore the racially specific pathways through which poverty might impact children, questioning whether the processes mentioned above work in a similar manner for poor children of any racial/ethnic identity.

CONCEPTUALIZING POVERTY

Conceptualizing Poverty Traditionally

Almost one-fifth of American children live "in poverty" at any particular point in time (CDF 2008). However, what individuals, researchers, and policy-makers *mean* when they invoke the term poverty varies with context. For instance, although Census estimates of the number of people living in poverty have remained relatively stable over the past 35 years, when viewed through a life course lens, chances for any individual experiencing acute poverty have increased in the past two decades (Sandoval, Rank, and Hirschl 2009). If viewed as a question of resources rather than income, estimates for those experiencing poverty also shift radically, particularly with the recent housing crisis. Subsequently, focusing on different conceptualizations of poverty may lead to varying empirical conclusions not because of a lack of "true" poverty but perhaps because

researchers have only been measuring one *aspect* of the total poverty experience (Hagenaars 1991; Betson and Warlick 1998). Below, I review the history of the traditional definition of poverty as well as more recent definitions that researchers invoke to more accurately capture the full experience of poverty. I specifically focus on research that evaluates the impact of poverty on children's outcomes.

Most conceptualizations of poverty rely on the federal government's annual estimation of the poverty threshold. The poverty threshold is an income level adjusted for multiple factors (e.g., household size, number of children, number of elderly, and inflation) that marks the point below which a household is considered "poor." It stems from a 1965 estimate of how much food was necessary to maintain health, multiplied by the proportion of a low-income family's total income that should be used to purchase food (Orshansky 1965; Iceland 2006; Rank 2005). The estimate is annually indexed to inflation by the Census Bureau. However, while the poverty threshold is used to estimate *the number* of people living in poverty each year, it is not this monetary amount that determines eligibility for federal aid programs. Eligibility for federal assistance is determined by poverty guidelines.

The Department of Health and Human Services (DHHS) sets the poverty guidelines each year to aid in determining which families are eligible for financial assistance or certain government programs. Poverty guidelines are similar but not identical to poverty thresholds. They are based on the previous year's poverty threshold (e.g., the poverty guidelines in 2007 are equivalent to the poverty thresholds in 2006) and they vary by family size, but do not take into account many of the other characteristics that comprise the poverty threshold (e.g., the number elderly people or children in the

home). Neither the poverty threshold nor the poverty guidelines vary from state-to-state (with the exception of Alaska and Hawaii) or across locales (e.g., rural vs. urban). The poverty threshold provided by the DHHS is an absolute measure of poverty, one that does not vary across social characteristics such as family structure, state, and time. Some researchers critique the poverty threshold because it fails to establish a level at which "a certain material level purchases an essential bundle of goods necessary for well-being" as it uses an outdated methodology that accounts only for the price of food (Brady 2003: 721). Despite this potentially serious shortfall, the dichotomous "poverty line" measure is the one that most researchers use to establish poverty status (Brady 2003).[1]

Critiquing Traditional Conceptualizations of Poverty

Despite the use of the poverty line measure in many sociological studies, some researchers periodically criticize this measure for not accurately capturing the experience of poverty or only capturing a limited aspect of poverty. Indeed, while the study of poverty in sociology has uncovered many significant findings, recent research suggests that the *measurement of poverty* itself has not received the criticism that it deserves and imply that the measure is both unreliable and invalid as an estimate of the experience of "poverty" (Brady 2003).

Webster's dictionary defines poverty as "the state or condition of having little or no money, goods, or means of support." A valid measure of poverty would capture exactly what it means to have "too little" as well as expand the traditional measure from its monetary nature to also capture "goods" and "resources." Many researchers note the limited capacity of the poverty line to accomplish these tasks as it fails to acknowledge

[1] Because the measures share many of the same problems and are very similar in monetary values, I use the terms poverty threshold and poverty guidelines interchangeably.

the varying conditions experienced by families living in poverty and instead assumes a common, shared experience. In other words, by using only one threshold to designate whether an individual or family is poor, poverty cannot adequately depict the difference between a family living close to the poverty line and one living far below it, missing many distinctions within the group "poor" itself (Wilson 1991).

Researchers also question the validity of the "poverty line" methodology because it ignores additional sources of resources, such as public assistance (income), cash assistance from relatives (income), or community assistance from neighborhood sources (social support) (Lichter 1997; Betson and Warlick 1998). While these critiques have been relatively long standing, some social scientists have responded not by pushing for a change in the policy arena at the federal level but rather by using a more gradational approach of the traditional threshold measure in their research (e.g., Sandoval, Rank, and Hirschl 2009) or the even more flexible income-to-needs ratio. Some child development scholars show that using an income-to-needs ratio results in a linear effect for poverty; in other words, as disadvantage increases, so do the consequences associated with poverty. This substantiates the claim that defining poverty as a one-time dichotomous marker is insufficient to understanding the depth of need at the lowest end of the income distribution (Peters and Mullis 1997).

In addition to questioning the validity of the poverty line, researchers also question its *reliability*. The current method of measurement which has remained constant in methodology since the 1960s fails to capture the shifting demographic and economic trends in the United States. Because of the inflexibility of the measure, shifts in the social structure do not correspond to changes in the social construction of poverty. This

results in an arbitrary measure that misses the changing consumption patterns of families, family structures, work patterns of the poor, and rising income inequality in the United States over the past 35 years (Wilson 1991; Iceland 2004; Lichter and Campbell 2005). By not addressing these structural shifts, the "poverty line" methodology fails to capture differences in the extent of poverty across geographic regions, and amongst different demographic groups (Brady 2003). These shifts in demographic patterns are frequently cited as causes and correlates of poverty but still are not considered in the calculation of the measure itself (Citro and Michael 1995). Advanced democracies other than the United States have begun to respond to these critiques and now many use a measure that is more *relative* than absolute. That is, "poverty as a social condition must be defined in reference to the period in which an individual lives" (Rosenfield 2010:103), incorporating standards of living from that nation, locale, and culture. While the policy adjustments needed to acclimate to an alternative measure of poverty would be expansive, a definition that incorporates some or all of these changes would more accurately capture the experience of the poor in the United States. When researchers do invoke alternative measures of poverty, they demonstrate distinctly different results than when using the more conventional measure of poverty.

Alternative Conceptualizations of Poverty

The critiques outlined above suggest that researchers should utilize alternative measures of poverty instead of, or in addition to, the dichotomous poverty line provided by the U.S. government. Recent work provides many alternative suggestions (see Blank 2008) but seems to coalesce around a select few, particularly with regard to investigating the impact of poverty on outcomes in childhood. Below I briefly review the literature that expands

the "poverty line" conceptualization to address some of the validity and reliability issues described above. I focus on two main expansions: (1) using the traditional measure in a more specific way by adding elements of timing, duration, and degree and (2) incorporating additional elements beyond income (e.g., assets/wealth and hardship).

Expanding the Poverty Threshold. Using a poor/non-poor dichotomy holds benefits for researchers because of its simplicity, policy relevance, and potential for testing for non-linear effects. However, as extensive longitudinal datasets have become more widely available, researchers have the potential to test not only for the impact of current poverty but also for the impact of the *duration* and *timing* of poverty spells. For instance, research demonstrates that being poor long-term (duration) negatively impacts educational attainment and employment status in early adulthood to a greater extent than short poverty spells (Wagmiller et al. 2006). Additionally, poverty during early childhood (timing) critically undermines the life chances of young children up to 20 years later (Entwisle, Alexander, and Olson 2005). The above studies demonstrate the validity of measuring the timing and duration of poverty while still utilizing the traditional "poverty line" to categorize who is and is not poor.

Other researchers critique this choice and opt to use a continuous measure of poverty while invoking timing and duration (see Peters and Mullis 1997 or Pagini et al. 1997 for a comparison of methods). Scholars construct a continuous measurement of poverty by using an *income-to-needs* ratio that determines the depth of poverty (see Hanson, McLanahan, and Thomson 1997). This ratio still utilizes the traditional poverty threshold measure but is a way of capturing the *degree* of hardship experienced by families. The income-to-needs (I2N) ratio simply takes a family's income and divides it

by the DHHS poverty line for a family of that size. An I2N ratio of 1 would mean the family lives exactly at the poverty line; an I2N ration below 1 indicates living below the poverty line; and an I2N ratio above 1 indicates living above the federal poverty guidelines. This ratio can be constructed at multiple points in time to capture timing and duration as well (Iceland 2006). However, to accurately calculate an I2N ratio for any large dataset, researchers need an exact measure of income. Exact income is frequently not available in large datasets concerned with maintaining confidentiality. However, if the data are available to construct an I2N ratio for multiple time points, this measure provides significantly more information than a simple dichotomous measure (Iceland 2006).

Using measures that capture timing, duration, and depth of poverty have proved useful in recent research (see Duncan and Brooks-Gunn 1997b for extensive work utilizing I2N ratios across time). In a recent review of research, Iceland and Bauman (2007) conclude that all types of income poverty increase the risk of material hardship but when depth, duration, and timing of poverty are also accounted for, the patterns are clearer and more severe. Although accounting for time, duration, and degree increases the validity of the poverty measure, these measures still stem from an unaltered definition of poverty created 50 years ago and, therefore, do not account accurately capture the substantive specifics of the poverty experience. Other scholars call for constructing a measure of poverty that includes additional elements of hardship beyond income to account for this problem.

Material Hardship. Research adjusts for these limitations by measuring the day-to-day lack of resources that accompany income poverty, frequently labeled material

hardship. Mirowsky and Ross (1999:549) define material hardship as "a lack of money needed to meet family needs for food, clothing, shelter, and medical needs." While they emphasize the link between money and resources, most scholars prefer to capture the lack of resources independently from income poverty to parcel out which aspect of poverty is most detrimental to outcomes. Typically measures of material hardship include experiences such as residential instability, food insecurity, lack of healthcare, inability to pay bills, etc. (see Gershoff et al. 2007; Iceland 2006; Nolan and Whelan 1997).

Material hardship, like traditional income poverty, has a negative association with educational and economic outcomes. For instance, lack of home and car ownership slow adolescent educational achievement to a greater degree than parental attitudes and expectations of the child (Axinn et al. 1997). Other research reveals that young children who experience food insecurity have a much higher rate of anxiety, depression, and chronic illness (Weinreb et al. 2002). Subsequently, children suffering from severe emotional and behavioral disorders are quickly outpaced by their mentally healthy peers in cognitive, behavioral, and health outcomes (Ashiabi and O'Neal 2008).

Residential instability has a similar effect on cognitive outcomes. Residential mobility, for poor households, stems not from choice but from the social and economic crises facing poor parents (Schafft 2006). Researchers have amply demonstrated the association between residential mobility and slowed academic performance/low educational attainment, particularly for poor children (Hagan, MacMillan, and Wheaton 1996; Teachman et al. 1997). When children are relocated or when they live in a transitional neighborhood, they experience much higher rates of depression (perhaps due to the lack of social ties) and, depression hinders cognitive skill growth (Matheson et al.

2006). Although very young children may not externalize depressive symptoms, this reality may impact their parents and their parents' ability to act as caregivers.

Material hardship also negatively impacts health outcomes in infants, which leads to slower growth in cognitive skills. One of the most prominent lines of research in this tradition explains that material hardship (specifically, unmet health care needs, food insecurity, and toxic living conditions) negatively impacts the overall health status of poor people in general, and poor children more specifically (Matheson et al. 2006). Severe health problems can slow both the development and potential of young children, thereby widening the cognitive skill gap between poor and non-poor children. While some research is moving toward using a more relative measure of poverty, like material hardship, few sociological projects investigate the relationship between income poverty and material hardship, highlighting the families affected by one or both and the resulting impact on children's cognitive skill growth.

Asset Poverty. Instead of focusing on the day-to-day stressors that frequently accompany income poverty, other researchers emphasize the lack of information we have about the long-term aspect of poverty caused by a lack of assets or wealth. While income traditionally has been the key focus of poverty research, the distribution of wealth is even more unequal in the United States (Wolff 2002). The idea of asset poverty was developed, in sociology, by Oliver and Shapiro (1997) in their work on racial disparities in wealth and the importance of expanding the focus of economic inequality beyond income. Assets in this case involve wealth measures like home ownership, stock and bonds, retirement plans and other not easily liquidated funds, along with debts. Research defines *asset poverty,* as opposed to simply wealth or assets, as "the extent to which

American households have [or do not have] a stock of assets sufficient to sustain a basic needs level of consumption for a temporary period, should other sources income – e.g., earnings – be unavailable" (Haveman and Wolff 2005:145). This form of poverty does not replace income poverty; rather, it complements it, capturing an additional aspect of poverty by emphasizing the lack of a safety net. Scholars argue that incorporating asset poverty in addition to income poverty captures the nature of persistent, structural poverty as opposed to the more transitory form highlighted by income poverty (Carter and Barret 2006). As research begins to utilize this additional measure of poverty, differential outcomes between the poor and non-poor become even clearer.

For example, some research suggests that wealth trumps both race and income in explaining gaps in educational outcomes between black and white children (U.S. Census Bureau 2003; Shapiro 2004). Johnson (2007) finds that 26% of white children and 52% of black children live in asset poverty (or wealth poverty) but that all parents express a desire for their children to attend "good" schools. However, only those families who are "asset rich" are able to choose which schools their children will attend. These parents have a stronger internal locus of control than asset poor parents of similar incomes. In this case, research suggests that differential attitudes between the poor and non-poor do not account for achievement gaps. Instead the crucial explanation invokes a lack of wealth that could influence the neighborhood families reside in. When selecting only families that have controlled substantial levels of wealth for generations, this pattern is even more prominent. For poor and middle-class parents, the choice of school (an important determinant in future occupational outcomes) is not even an option. Instead, they are "stuck" wherever they are forced to live (Johnson 2007). Similarly, in a sample

of "low-income" children, Axinn et al. (1997) find that wealth matters significantly for educational attainment above and beyond income inequality. Interestingly, wealth matters the most for the highest income group – that is, the positive impact of wealth is much stronger for those who also have a higher level of income. Besides varying by income level, the degree of asset poverty varies across race and family structure as well (Haveman and Wolff 2001).

In sum, the income poverty threshold seems to be a weak measure when utilized alone. Research suggests many ways of more meaningfully understanding poverty by incorporating the variability within poverty, the long-term aspect (time/duration), a safety net aspect (wealth), and the day-to-day stressors (material hardship). Few studies, however, assess how these different conceptualizations of poverty play out in predicting outcomes in very young children. How, in particular, does the duration and degree of poverty, and the material hardship that accompanies it, affect young children's learning? Chapter Four explores the answers to these questions.

THE IMPACT OF POVERTY ON COGNITIVE SKILLS

My approach to explaining *how* poverty impacts cognitive skills follows the ecological systems framework outlined by Urie Bronfenbrenner (1986). Bronfenbrenner suggests that children do not develop in isolated social spheres but instead are impacted by factors representing many different "levels" of their environment - even levels of which the children themselves may be unaware (e.g., government policies). As children interact more outside of their immediate home environment, more proximate social systems may have less impact on developmental outcomes. Figure 2-1 presents a general depiction of Bronfenbrenner's (1986) conceptualization of human development. By rooting my

questions and literature review in this tradition that emphasizes the various influences that different level of social systems have on cognitive skill growth/academic achievement, I can investigate the simultaneous pressures that poverty places on children. As Figure 2-1 demonstrates, Bronfenbrenner's approach allows for multiple social systems to influence a child's development. In this study, however, I mainly highlight the influential processes in a child's immediate environment, consisting of the child (microsystem), the home environment (mesosystem), and the parents' work conditions (exosystem).

Microsystem

Infant Health. Health disparities between the poor and the non-poor are a prominent consequence stemming from poverty that impacts both the likelihood of adult poverty and child development. Research demonstrates that a major consequence of living in poverty, especially for children, is poor physical health (Rank 2005). Specifically, poor children are: 1.5 to three times more likely to die during childhood than non-poor children, 2.7 times more likely to suffer from stunted growth, three to four times more likely to have an iron deficiency, and one to two times more likely to suffer from partial or complete deafness, blindness, serious physical or mental disabilities (Patel 2001).

While past research demonstrates that physical and mental health status correlates negatively with labor market outcomes in adults (and therefore likelihood of poverty status as an adult), investigations into the relationship between health and cognitive outcomes for young children are relatively recent (with an exception for studies examining the impact of a mother's pre-natal health on child outcomes). Poor physical

and mental health may contribute to low cognitive and educational outcomes in two main ways. First, poor physical health very early in life can permanently stunt mental capacity leading to lower achievement in school and in the labor market (Palloni 2006). Miller and Korenman (1994), for example, demonstrate that the negative effect of low birth weight on cognitive scores at age seven is significant and strong, even controlling for social class. Second, health status may indirectly inhibit growth in cognitive and educational skills. Scholars find that health status at age seven positively predicts non-cognitive traits that are important for success in school, including sociability (Palloni 2006) and organization (Dunifon, Duncan, and Brooks-Gunn 2004). It remains to be seen how much of the relationship between poverty and early cognitive/educational skills can be explained by this health mechanism once other pathways are simultaneously investigated and if health mediates the relationship between family processes, neighborhood context, and wider societal forces and cognitive development as well.

Mesosystem

Family Factors. Scholars and pundits alike often invoke personal responsibility as a key factor in producing individual level poverty. These explanations are used for various purposes to explain both poverty as a condition and outcomes that are a result of poverty. For instance, one line of thought posits that those in poverty possess different cultural values than the mainstream of society. As a result, poor workers have a lower likelihood of success in conventional occupational and social situations. Correspondingly, the poor maintain a system of values that keeps them poor and jobless, further isolating themselves from wider society (Lewis 1965). More generally, this family of explanations attributes the responsibility for individual level outcomes solely to

the individual, i.e., an individual is unemployed because of his tendency to be lazy or his lack of dedication to education (e.g., Hernnstein and Murray 1994). Recent research suggests that individual level processes such as single motherhood and oppositional values do play at least a small part in explaining the educational gap between the poor and non-poor (MacLeod 1995; Bankston and Caldas 1998). Therefore if these differences in value systems do exist, they may inhibit cognitive skill growth in children through a parental lack of investment in the child's cognitive development.

Other scholars have criticized this tradition for its neglect of structural influence. Instead of laying responsibility for low educational outcomes on individuals, these scholars speak of differential *access* to types of capital that impact the formation and social reproduction of inequality. This explanation, while still ostensibly using families as the focal point, engages material hardship instead of culture as the primary explanation for poverty. Drawing on the class reproduction paradigm that emphasizes the role of capital differences in reproducing the social order (Bourdieu 1973; Lamont and Lareau 1988), these studies suggest that cultural capital plays an important role in parenting practices which then impact how children learn and behave in school (Lareau 1987, 2003). More specifically with regard to poverty and cognitive skills, some studies suggest that cultural capital disparities that disproportionately impact the poor, such as knowledge of how to positively structure interactions with authority figures, operate to slow cognitive skill growth (Smith, Brooks-Gunn, and Klebanov 1997).

Whether stemming from oppositional values or from capital deficit, research demonstrates that parenting styles do impact the development of young children. Parental warmth and home learning environment promote the cognitive skill growth of

young children (Duncan, Brooks-Gunn, and Klebanov 1994). Additionally, in some studies, parenting variables completely explain the skill gap between poor and non-poor children (Guo and Harris 2000). However, the mediating impact of parenting practices, as a function of cultural capital or value difference, on the relationship between poverty and cognitive skills have yet to be investigated in very early childhood.

Parental Health. Next, the mental and physical health of parents may impact the cognitive skill growth of their children. Research stemming from the family stress model posits significant relationships between economic hardship, emotional well-being of caregivers, parenting practices and child adjustment, suggesting that parental health may have an indirect impact on child outcomes (Conger et al. 1992). In other words, parents living in poverty are at a higher risk for emotional distress and this distress frequently translates to less positive parenting as parents attempt to cope with the economic pressure (Conger et al. 2002). The family stress model focuses less on educational outcomes and more on behavioral outcomes as it demonstrates that parental mental health increases positive parenting practices which promotes positive behavioral outcomes in children (Mistry et al. 2008).

While this literature may not focus directly on the cognitive skills of children, it does establish the link between health and parenting practices. For instance, research suggests that living in a neighborhood with a high concentration of low-income residents negatively impacts the mental health of mothers which subsequently negatively impacts parental warmth and engagement with their children (Klebanov, Brooks-Gunn, and Duncan 1994). Accordingly, parental mental and physical health indirectly impacts cognitive skills of children because a decrease in positive parenting experiences could

lead to depressed cognitive skills in young children. Additionally, children in families with depressed caregivers who demonstrate less engaged parenting skills are rated lower by elementary school teachers, particularly with regard to social skills, and they exhibit more behavioral problems (Mistry et al. 2002). Research has yet to demonstrate adequately if parental mental health and physical health are directly or indirectly influential for the cognitive skill growth of very young children or if this explanation maintains substantive value once other possible explanations are included in the same model.

Exosystem

Parental Job Characteristics. While children do not directly experience their parents' work environment, research suggests that these work settings directly impact parents and parenting styles thereby filtering through the family to impact the children in the household (Kohn 1969; Kohn et al. 1990). For instance, Lareau (2002) suggests that middle-class parents establish a culture of work that takes place not only during the typical "work day" but also at home and sometimes throughout weekends. Because middle and upper-class parents are more likely to bring their work home with them, their children perceive that learning (as their "job") should take place outside of the school environment as well. This may have a direct impact on very young children as they may model their approach to cognitive activities (e.g., playing with puzzles, picking up books) after what they see their parents do on a daily basis.

In another study, Kohn and colleagues (1990) explored the role of pressures in the work place upon the psychological functioning of adults in different social classes in the United States, Japan, and Poland. They found that men who have more control over their

work environment are much more likely to encourage their children to be self-directed. Additionally, men in occupations that are self-directed (managers) experience a much lower sense of distress than those in manual occupations. These results suggest that pressure in the workplace and a lack of control over working conditions may influence not only parenting style but also the psychological functioning of parents in the home, which may then impact young children's cognitive skill growth.

While social psychologists have long established links between personality characteristics, value systems, and job conditions (Kohn and Schooler 1982; Kohn 1969), they only recently have begun to explore the link between job conditions, values, and their impact on children. For instance, Parcel and Menaghan (1994) found that mothers' job complexity impacts the cognitive skills of their six-year old children as well as their own cognitive skills. Therefore cognitive skills gained in complex, autonomous jobs, not just jobs with authority, may indirectly promote children's cognitive skills as well.

Other researchers directly test the link between value differences and parent styles. Luster, Rhoades, and Haas (1989) demonstrate that parents with a greater sense of autonomy are more likely to interact in educational activities with their children. Luster and colleagues do not specifically invoke parental job characteristics but test the link between parenting values and parenting behaviors. For instance, mothers with high levels of self-direction (possibly due to autonomous job conditions) read to their children more than mothers with low levels of self-direction. Other research of family dynamics demonstrates that these differences in parenting behaviors then differentially impact cognitive skill growth (e.g., Guo and Harris 2000). Because of the complexity of this process, the research on this topic is often inadequate and fails to demonstrate the link

between job characteristics, parenting practices, and a child's cognitive skill growth (Duncan and Magnuson 2003). Additionally, this mechanism predicting cognitive skill development is rarely invoked simultaneously with other mechanisms predicting skill growth.

It is critical to note that the majority of this literature focuses on low-income families or families facing economic hardship, not just families residing below the poverty line. This is because research suggests that it is the more *relative* measure of poverty, explained above using material hardship, that negatively impacts parental health, rather than a solely income-based measure. That is, as the degree of hardship experienced by families rises, many of the negative sides of these mechanisms also increase (e.g., less parental interaction, mental illness). Although the relationship between economic hardship and these mechanisms seems clear when each mechanism is assessed alone, the question remains, how do these mechanisms mediate the relationship between poverty and cognitive skills when entered in a model simultaneously?

Together, these four sets of mechanisms – infant health factors, , positive parenting practices, parental health factors, parental work environment – may have a significant role in explaining the relationship between poverty and cognitive skill gains in early childhood. This study is unique in that is does not over-emphasize one set of explanatory processes over another. Instead, my study examines the impacts of multiple social systems on children's cognitive skill growth and explores in detail the process behind the relationship between poverty and cognitive skills. By revealing the many social/environmental determinants of the economic gap in learning, this study not only reveals how policies might mitigate the gap but also counters essentialist claims that

disparities in cognitive ability or "intelligence" are genetically determined (e.g., Herrnstein and Murray 1994). Each mechanism, in addition to the material hardship conceptualization explained in the poverty section above, is modeled in Figure 2-2, depicting how I model the emergence of the cognitive skill gap in Chapter Five.

THE RACIALIZED IMPACT OF POVERTY ON CHILDHOOD OUTCOMES

Levels of Poverty by Race

Although child poverty is high for all racial groups in the U.S., children of color are much more likely to grow up in an impoverished or low-income home than white children (U.S. Census Bureau 2007). As mentioned in Chapter One, 22% of children under the age of five live with families residing below the poverty line (NCCP 2010). However, this number differs drastically when disaggregated by race. Figure 2-3 below shows that American Indian, Black, and Hispanic children are particularly at risk. Indeed, while only 12% of white children and 13% of Asian children live below the poverty line, this rate triples for Hispanic, Black, and Native American children. Astonishingly, 40% of black and American Indian children are poor.

The risk extends beyond the traditional definition of poverty. Asset deprivation is particularly high for African-American and Latino families due both to historical legacies (i.e., slavery) and contemporary reverse transfers of wealth (Johnson 2006; Chiteji and Hamilton 2006). Additionally, public policy has differentially impacted who can accumulate assets over the course of time which influences the distribution of poverty across race (Shapiro and Johnson 2003). However, if researchers focus solely on income poverty, these racially charged consequences may not be initially obvious. Because poverty is racialized in the United States, it is critical to investigate if and how poverty

impacts cognitive skill growth differently for children in different racial groups. Below I briefly review research suggesting that poverty operates in a racialized way to produce cognitive skill gaps between poor and non-poor children within racial groups.

Variation in Mechanisms by Race

Microsystem and Mesosystem. Research suggests conflicting conclusions regarding the racially specific impact of poverty on cognitive skills, particularly when looking at family-level processes (mesosystem). One of the theories that invokes racially specific mechanisms focuses on the different forms of family prevalent in specific racial groups. For instance, children raised in single-parent households perform lower in schooling and plateau at lower levels of educational attainment (McLanahan and Sandefur 1994). While families living below the poverty line are more likely to be single-parent households, this is particularly true of African-American families. Often single-parent households share other factors that negatively impact children's outcomes, such as low educational attainment, low occupational prestige, and inadequate health care which put children even more at risk for lower cognitive outcomes (Farkas 2006). Additionally, infant and parental health factors also differ across racial lines. For instance, the American Indian community exhibits high infant mortality, child death rates that are almost double the U.S. rate (AECF 2003), and the highest adult suicide rates among any racial/ethnic group in the United States – suicide is the second leading cause of young death (Borowsky et al. 1999). This evidence suggests that infant health and parental mental health may be more significant predictors of the cognitive skill gap between poor and non-poor children in the American Indian community than in other communities. The above research suggests that family factors and health factors may

play out differently across racial groups to explain the emergence of the cognitive skill gap between poor and non-poor children.

The above factors are, on the surface, external to parenting practices. Research also suggests that parenting practices differ by racial group. For instance, some scholars find that while parental involvement partially mediates math and reading achievement gaps between poor and non-poor children in elementary school, differences remain between racial groups (Cooper et al. 2010). This study suggests that poverty is differently related to parental involvement and that parental involvement is also related to achievement differently across racial groups. For example, poverty is negatively related to parental participation in organized activities but only for Hispanic and White children, not for Asian and Black children. Parental participation in organized activities, however, is positively related to math achievement for all racial groups except Black children. The authors suggest that scholars continue to develop racially specific models conceptualizing how poverty works among subsets of the population. In contrast, Lareau's (2002) qualitative work does not show parenting style differences across race but rather suggests these differences are mainly class specific.

Additionally, some sociologists suggest that people of color, particularly African-Americans, operate under a different set of values due to the vestiges of slavery and racial oppression inflicted upon them by the U.S. government and other social institutions. This theory posits that black students disengage from the educational process because they fail to see any benefit to buying into the system and achieving in a world already biased against them (Fordham and Ogbu 1986). While recent literature provides quantitative evidence to the contrary (e.g., Ainsworth and Downey 1998), it is possible that African-

American parents and parents who have been similarly oppressed by the racist policies of the United States utilize a different parenting style than parents who do not share this history of oppression. This theory paralles Lewis's (1965) model, as mentioned above, which invokes a similar explanation for the majority of poor families: the poor participate in a "culture of poverty" that influences their behaviors and expectations and they pass these values and behaviors to their children starting with how they parent. When invoking both of these theories together, it may be plausible that parenting styles have a larger impact (whether positive or negative) for different racial groups.

Exosystem and Beyond. Poverty may operate differently across racial groups because different races experience different aspects of poverty. Mainly, poor Latinos, American Indians, and African-Americans are more likely to live in hyper-segregated communities (Wilson 1987). Segregation often impacts people of color as an additional disadvantage because of the hyper-concentration of poverty experienced by people of color. In the last thirty years, while all racial groups and regions have experienced income stagnation and higher levels of racial isolation, this is particularly true for African-Americans living in poverty (Massey and Fischer 2000). Poor African-Americans live predominantly in urban areas which were the areas hardest hit by deindustrialization and, in many cases, have yet to recover. While poverty has negative consequences of its own (see introduction), hyper-segregation of neighborhoods with a high percentage of poor residents doubly disadvantages poor families, particularly African-American families (Massey and Fischer 2000:688): "What really differentiates the experience of different racial and ethnic groups is … the degree of racial/ethnic segregation." While Massey and colleagues argue for a race-based/segregation-centered

argument, some scholars disagree and place social class at the forefront (see Wilson 1991, 1996). This project does not side with either the race-centered or class-centered approach; instead, the take-away point from this discussion is that segregation and poverty are highly related and that segregation causes additional disadvantage for specific race groups.

These negative impacts of segregation, combined with poverty, are particularly relevant for children and youth. Growing up in an impoverished family is highly correlated with isolating neighborhood conditions (Wilson 1991), particularly segregation. Children of color who grow up poor and in highly segregated conditions experience long lasting negative consequences, including low educational attainment and poor performance for those children who do attend college (Massey et al. 2003; Charles, Dinwiddle, and Massey 2004). Conversely, white children in wealthy neighborhoods benefit from the resource rich environment, evidenced by high achievement, college enrollment, and later economic success (Johnson 2006). In Chapter Six, I explore the possibilities of racially specific patterns to the mediating processes detailed in Chapter Five.

RESEARCH QUESTIONS

Although researchers have spent decades trying to uncover ways to mitigate the problem of childhood poverty, exploring its causes and consequences, answers to three questions remain unclear. Additionally, in an age of recession and increasing wealth and income inequality, questions regarding the well-being of our nation's children are only more important, particularly during early childhood. Recent research suggests that the non-school environment is the crucial space where achievement gaps are created and

maintained (Downey et al. 2004). This is particularly obvious when faced with the race and class gaps in school readiness prior to entry into formal education. If poor children continue to enter schooling cognitively behind their non-poor peers, they will continue to exhibit lower educational and occupational outcomes, despite the school system's best efforts. Without an adequate safety net or resources to build on, these children will go on to struggle with uneven employment, higher rates of arrest and incarceration, significantly more health problems, and other severe consequences of early childhood poverty. This study builds on the work presented above to address three questions still unclear in the literature.

1. *How do different conceptualizations of poverty alter the composition of "the poor" and the size of the cognitive skill gap at 9 and 24 months of age?* Defining poverty using the traditional threshold measurement established in the 1960s stills holds some relevance for researchers and policymakers. However, researchers argue that this out-dated measure fails to capture the reality of "being poor" in the United States in the current era. They recommend additional elements including the timing and duration of poverty, a more continuous conceptualization, and a measure of wealth poverty. Some also advocate for using a measure of relative poverty capturing the experience of hardship rather than a dichotomous measure of poverty status. Although more than two-thirds of recent studies still rely on the outdated poverty threshold measure of poverty (Brady 2003), this study contributes to the literature advising the academy and policy makers to adjust their conceptualization of poverty and the impact it has on children by laying out the differences in various outcomes as the measure of poverty shifts. By comparing who "counts" as poor for each of these conceptualizations and then

charting the cognitive skill gap over the first two years of life based on the most appropriate conceptualizations, this question will assess what each measure allows us to learn about the relationship between economic hardship and cognitive skill growth.

2. *What are the primary determinants of the cognitive skill gap between poor children and their advantaged counterparts during very early childhood?* This question expands upon the ample literature documenting the lower cognitive skills exhibited by children who experienced poverty in childhood. First, it explores the early *emergence* of the cognitive skill gap instead of assessing the growth or stagnation of it at a later point in childhood. Second, I structure my analysis to assess how the many explanations provided by research reviewed above directly and indirectly produce this gap. Prior research has explored many possible mechanisms that are reviewed above. By looking at them in tandem with one another, this project will better inform policy initiatives aimed at reducing the impact of poverty in early childhood.
3. *How does poverty inhibit cognitive skills differently across race/ethnic groups?* The evidence is unclear on how poverty functions within different demographic groups, including race. However, given the historical and contemporary racialized structure of the United States, it is important to understand how the structural condition of poverty functions differently under different conditions. The answers to this question will contribute to the on-going debate regarding the importance of context in understanding the impact of poverty.

In this study, I provide policy makers and educators with three sources of information allowing for the development of more contextual policies aimed at preventing a cognitive skill gap due to poverty and therefore leveling the educational playing field prior to entry into formal schooling. Together, the answers to these questions begin to illuminate the heavy price paid by children living in poverty, even as early as 2 years of age. I turn now to the specifics of my research design.

CHAPTER TWO: TABLES AND FIGURES

Figure 2-1. Ecological Systems Framework.

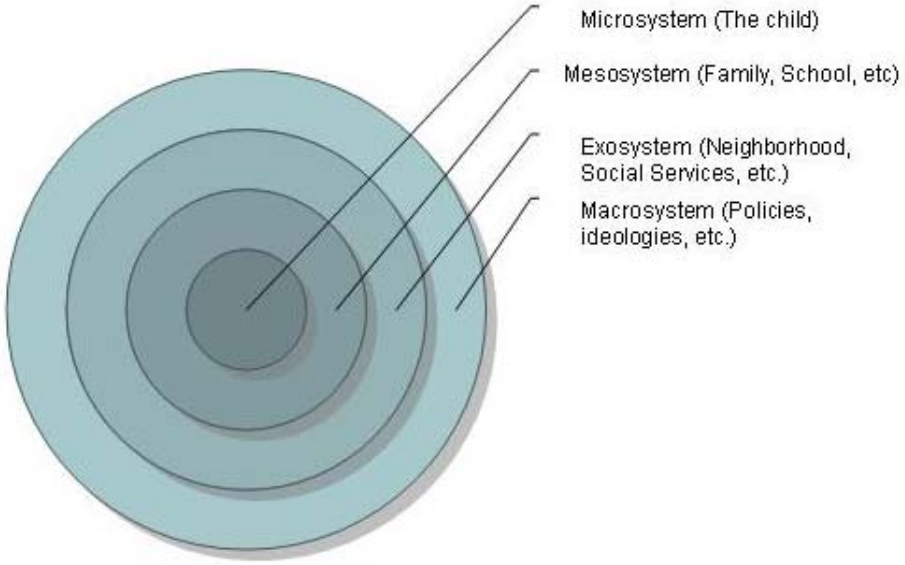


Figure 2-2. Conceptual Model Predicting Skill Growth.

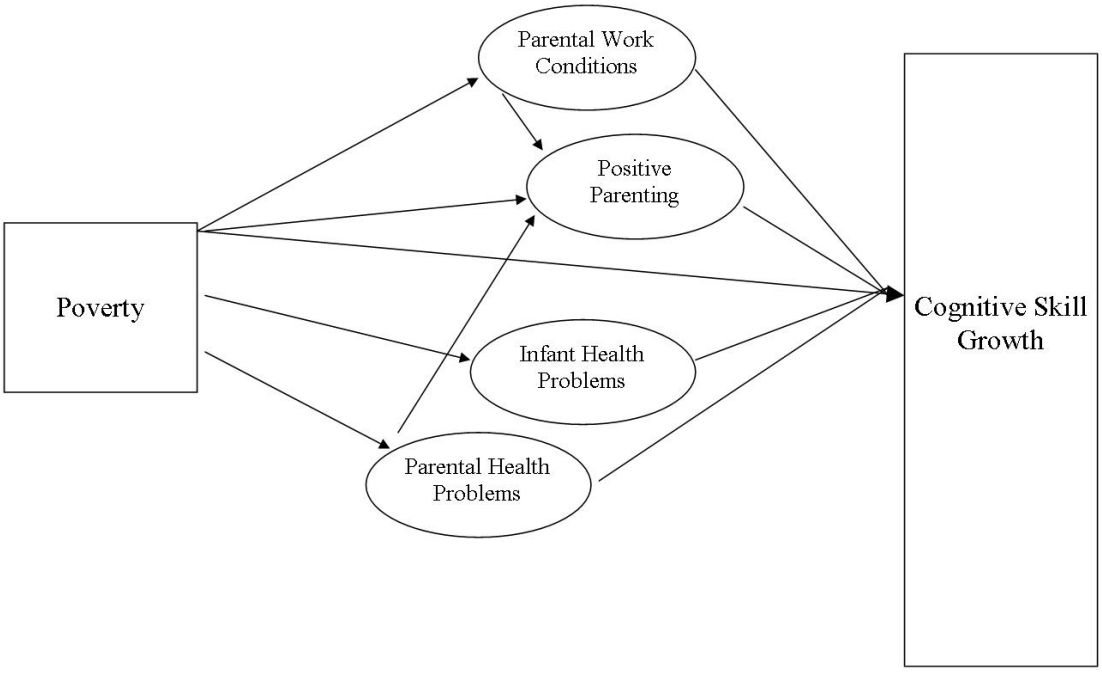
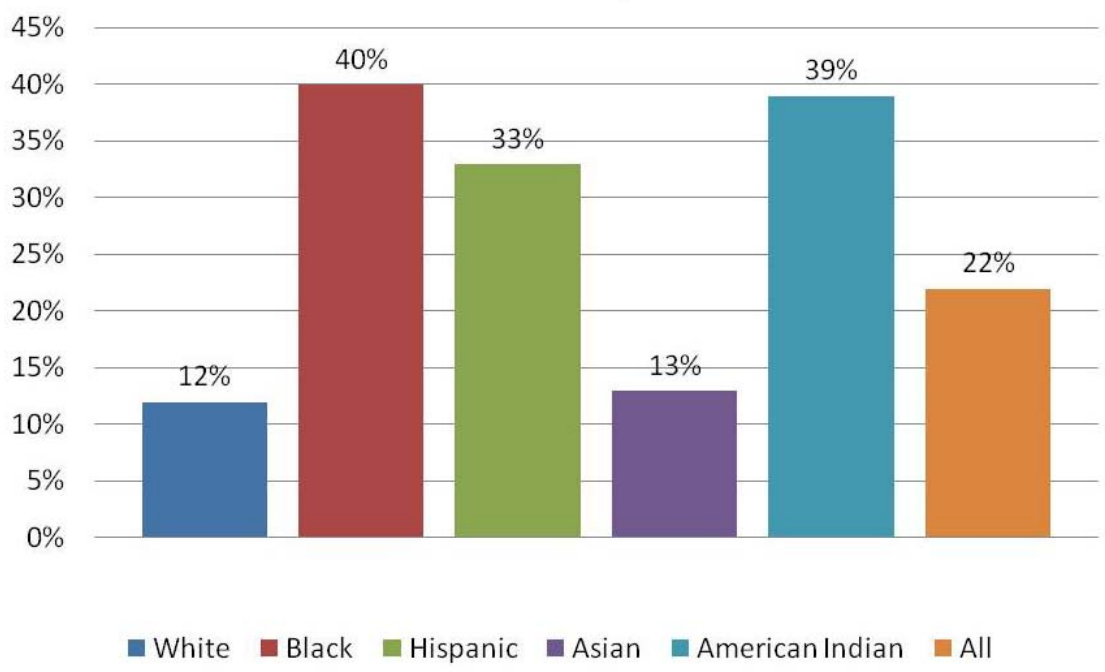


Figure 2-3. Young Children in Poor Family by Race 2008.



CHAPTER THREE: DATA AND METHODOLOGY

The aims of this project require two distinct methodological choices, one contrasting definitions of poverty and the other assessing how poverty produces cognitive skill gaps. This chapter explains these choices by first presenting general information about my data source and variables that remain constant across chapters. Then I describe my analytic strategies for each of three subsequent analysis chapters. Because of the complex methodology employed in these chapters, not every variable is explained in detail in the text. However, descriptions and summary statistics for all variables are presented in Table 3-1.

DATA

This study draws on data from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) collected by the National Center for Educational Statistics (NCES). The ECLS-B is a mixed method study that focuses on the early childhood experiences of a nationally representative sample of 10,688 children from birth to kindergarten (Snow et al. 2007). This longitudinal study includes four rounds of data: at 9 months, 2 years, Preschool age, and at entry into kindergarten.

The restricted-use ECLS-B data provide the highest quality, most generalizable, and most recent information available on young children and their early cognitive skills. In addition to the recent, representative, and longitudinal nature of the data, ECLS-B is particularly well-suited for this study because of its multi-dimensional nature. The survey followed the same group of children over the first five years of life, collecting data on many social systems of their lives, including "health care, nutrition, and physical well-being; their home learning experiences; … and how their early experiences relate to their

later development, learning, and experiences in school" (Snow et al. 2007: 3). This is critical to my study as I model processes occurring within multiple social systems of young children, specifically health of both child and family, home environment, and employment conditions of parents. Data on all of these social arenas are readily available through multiple measures in ECLS-B. Because of the sensitive nature of the data, all but the first wave of data are restricted by NCES. As a result, reported sample sizes in the results will be rounded to the nearest 50 as required by Institute of Education Sciences (IES) confidentiality standards (IES 2007).

Sample

My analyses use the two earliest waves of available data from ECLS-B, at nine and 24 months of age. Following some attrition at wave two, I end up with a sample of 8,900 children who took the cognitive assessments at both time points (approximately 83% of the original sample).

This sample is not, in reality, representative of all children born in 2001 in the United States. NCES acknowledges that their sampling procedures leave out several population groups, including children born to mothers under the age of 15 and infants who died before 9 months of age (Nord et al. 2005). Additionally, ECLS-B oversampled specific populations of children, including several racial/ethnic groups (American Indian, Chinese, Other Asian/Pacific Islander), low birth weight children, and twins (Nord et al. 2005). While NCES includes several weights to account for these sampling decisions, this study's primary aim is not to generate specific population estimates but rather to examine relationships between variables. Therefore, I do not use weights in the

following analyses (see Winship and Radbill 1994 for a similar explanation of weights and regression analysis).

While ECLS-B covers birth through kindergarten entry, I only use the first two waves for two main reasons. First, accelerated development in early childhood necessitates frequent change in tests of cognitive skill development. As a result, the second wave of data is the only wave that can be modeled longitudinally with the initial wave of data collection. The preschool and kindergarten waves utilize a different, age-appropriate measurement of cognitive skill development and therefore cannot be directly compared to the first two years of cognitive skill growth. Second, one of the goals of this project is to assess the development of the cognitive skill gap *prior* to entry to formal schooling. At preschool age, many of the children sampled will begin attending a formal schooling program, making it increasingly difficult to separate the influence of non-school factors (my focus) from that of schooling. While the question of early childhood formal education programs is a critical and substantively interesting question, it is beyond the scope of the current study.

Missing Data

Researchers must be especially conscious of missing data when using secondary datasets. There are several ways to handle missing data, but many researchers use the widely accepted multiple imputation procedure to handle missing data. I utilize STATA to impute missing values and generate five data sets with no missing data. The regression procedures used in Chapter Four draw on and combine the five imputed datasets while the structural equation modeling procedures in Chapters Five and Six, as well as the summary statistics presented in Table 3-1 below, use the first imputed dataset of the five.

KEY VARIABLES

Cognitive Skill Growth

To measure children's cognitive skill growth, I use scores from two assessments of the Bayley's Short Form-Revised (BSF-R) constructed using Item Response Theory (IRT). The BSF-R is a subset of the Bayley's Scales of Infant Development (BSID) developed specifically for ECLS-B (Snow et al. 2007). Items for the BSF-R were chosen from the BSID-II in order to fully represent the different branches of the mental scale on the full BSID-II (e.g., memory, means-end behavior, explorative competence, communication). Items were only selected for the final assessment if they held strong psychometric properties in the reliability measures of the original BSID-II (Nord et al. 2006).

IRT is a maximum likelihood procedure that estimates the probability of an individual answering a particular question on a battery of tests correctly based on prior ability and the difficulty of the question. For example, in the ECLS-B assessment of cognitive development, an examiner determines whether or not a child is able to complete a task correctly. Depending on the child's performance, the difficulty of the task, and the discrimination power of the task, the examiner will present the child with another set of tasks until the child's ceiling score has been reached.

In the ECLS-B data collection, the items selected into the BSF-R were scaled such that every child received a core set of items in his or her BSF-R assessment; however, children at the extremes of the score distribution received additional items to more accurately assess their level of development (Nord et al. 2006). To better grasp the types of items asked of children at this early age, Figure 3-1 provides examples of items generally used in the BSID-II at 18 months of age. Used alone, an IRT score for the

BSF-R is simply a measure of cognitive skills. However, the tests used at nine and 24 months are placed on the same metric scale, allowing me to estimate *gains* in skills by controlling for the cognitive skill score at nine months when predicting cognitive skill score at 24 months.

Poverty

Degree of Poverty

Thresholds. Conventionally, the Department of Human and Health Services annually calculates the poverty line according to income and family size, based on the process detailed in the Chapter Two. In addition to including the conventional dichotomous measure of poverty (0 = above 100% of the poverty line, 1 = below 100% of the poverty line), ECLS-B also includes a series of thresholds commonly used by states to qualify individuals for public assistance, specifically 130% and 185% of the poverty line. These measures allow me to capture three different "levels" of poverty.

Income to Needs Ratio. An income-to-needs ratio is a continuous method of capturing the degree of poverty experienced by a family. While the traditional poverty measure described above creates a useful cut-off for policymakers to identify families in need, a continuous measure captures the variation implicit in these dichotomous measures and corrects for the validity critique presented in Chapter Two. Researchers construct an income-to-needs ratio by dividing the exact income of a family by the poverty line income for a family of that size (see Hanson, McLanahan, and Thomson 1997). In lieu of a reliable income measure in large datasets, many researchers develop a proxy for an income-to-needs ratio by specifying several categories of poverty. This is similar to the threshold type of measurement except that each category holds only those between two

points relative to 100% of the poverty line instead of all observations that fall below the threshold. For the purposes of this study, I break down degree of income poverty into five categories: below 50% of the poverty line, between 51% and 100% of the poverty line, between 101% and 130% of the poverty line, between 131% and 185% of the poverty line, and above 185% of the poverty line. I was able to construct the latter four categories simply by using the poverty threshold variables, but constructing the variable indicating if families fall below 50% of the poverty line was more involved. I used the same guidelines utilized by ECLS-B (Snow et al. 2007) to calculate the poverty thresholds described above, divided the poverty threshold in half for each family size and created a dichotomous variable indicating whether a family falls below 50% of the poverty line at nine months and at 24 months.

Wealth/Asset Poverty. In addition to measuring the level or degree of income poverty, many researchers have recently expanded this line of thought to include wealth poverty. To capture the combined impact of wealth and income poverty, I create a wealth index available from four variables in the ECLS-B dataset indicating ownership of a car, ownership of a home, ownership of stocks, bonds, or mutual funds, and possession of a checking or savings account. While these measures are far from ideal, they improve upon the financial information available in many previous NCES datasets that did not account for wealth at all. To indicate wealth poverty, I inverse coded each of these variables (e.g., 0 = did own a car, 1 = did not own a car) and then created an indicator variable by looking at the naturally occurring breaks in the data. The clearest break occurs between those families who own one or fewer types of wealth and the rest of the sample. As a result, this became my indicator of wealth poverty (0 = owns two or more

forms of wealth, 1 = owns one or fewer forms of wealth). Because wealth and income poverty are often examined together in the literature, I also created four categories of wealth poverty indicating its coexistence with income poverty for each time point: wealth poverty and income poverty, wealth poverty but not income poverty, income poverty but not wealth poverty, and neither income nor wealth poverty.

Duration and Timing of Poverty

Using a poor/non-poor dichotomy remains useful for many research projects because of its simplicity, policy relevance, and the potential for testing for non-linear effects. However, with more expansive and better datasets, researchers now have the potential to examine not only the impact of current poverty but also the impact of the *duration* and *timing* of poverty spells. My analyses occur over a limited time period of approximately 13 months and therefore cannot capture the true long-term, extended consequences of poverty in early childhood demonstrated by previous research. Nonetheless, to emphasize the duration and timing aspects of the poverty experience, I constructed a series of dummy variables indicating if families fell below 100% of the poverty line at one, both, or neither of the time points in my analyses. See Table 3-1 for descriptive statistics on these variables.

Material Hardship

To assess the importance and role of material hardship as an additional measure of poverty, I draw on Gershoff et al.'s (2007) and Bauman and Iceland's (2007) conceptualizations of material hardship to construct this variable. This includes a food insecurity measure (parents were asked a series of questions about food insecurity and hunger; these answers were aggregated into a count and then standardized to a scale of

degree of food insecurity by NCES), indicators of residential mobility (if the family changed zip codes from nine months to 24 months), the type of health insurance coverage (e.g., private, CHIP, etc.), and the utilization of federal or state assistance programs. These indicators represent some but not all of the material hardship measures supported by Bauman and Iceland (2007) and Gershoff et al. (2007) due to data availability. After cleaning and multiple imputation, variables were made into a scale to capture degree of material hardship experienced by a family specific to each imputation. The scale ranged from -0.17 to 1, Cronbach's alpha = 0.67. For the purposes of Chapter Four, I broke this scale down into five quintiles to classify children into categories of material hardship. For analyses in Chapter Five and Six, I construct the Material Hardship measure using confirmatory factor analysis (a part of structural equation modeling) with the measures described above.

The variables presented next are latent constructs created from multiple measures that contribute to the overall general concept. These individual measures were combined using confirmatory factor analysis, a step described in my discussion of structural equation modeling later in the chapter.

Parenting Practices

Positive parenting practices is a latent variable constructed from questions asked to parents regarding techniques they use daily to parent their child (e.g., reading, singing, playing games, tickling, telling stories, playing outside, taking the child on errands), how they learned to parent (e.g, used a book or magazine to learn about parenting), and breastfeeding habits of the mother. Higher values indicate that parents used more positive parenting practices.

Infant Health Problems

The infant health variable consists of birth weight status (low birth weight, very low birth weight), extra days spent in the hospital between birth and nine months of age, number of well baby checkups through nine months (reverse coded), and the presence of various conditions included in a subset of questions asked by ECLS-B. These conditions include: asthma, gastrointestinal illness, other respiratory illnesses, accidents, hearing problems, and vision problems. Higher values indicate more health problems from birth to nine months.

Parental Health Problems

I construct a variable capturing the overall status of parental health by combining a series of individual measures of health including a self-report of overall health, tobacco, drug, and alcohol history, and a series of variables capturing the mental health of the parent including a set of items measuring depression and if the parent has ever spent a night in a mental health facility. Higher values indicate a lower level of overall parental health.

Parental Job Conditions

Ideally, the data would contain specific information about processes that happen during a typical work day for parents. However, due to data constraints, I use a proxy for job conditions that measures fringe benefits offered by employers. While most jobs offer some level of benefits, high-prestige jobs emphasizing the values mentioned above tend to offer more. I construct a latent variable capturing the overall level of benefits offered by a parent's employer in two steps. First, I combine a series of questions asked to parents about their current job and their spouse's current job (if applicable) into an ordinal measure that indicates if neither, one, or both parents have jobs with the specific benefit (medical, dental, flex-time, and subsidized childcare benefits, day/night/swing shift). Then I use these measures to construct a latent variable representing the level of

job benefits in the household. Higher values indicate jobs offering many forms of benefits and a higher likelihood of jobs that foster the values specified in Kohn et al.'s (1990) and Lareau's (1987, 2003) research.

Race

NCES records race in two ways for the ECLS-B data. They utilize a parental report and birth certificate coding of race. They also include a variable marking how race was defined for sampling purposes (Nord et al. 2005). For these analyses, I utilize the parental report because it contains a multi-racial category and, according to NCES, the parental report is comparable to race variables in other surveys (Nord et al. 2005: xxxi). In Chapter Five, race is included as a control to assess how the poverty model works for the entire sample of children. In this case, I use only a white/non-white dichotomy. However, in chapter six, I focus on specific individual racial groups and more thoroughly utilize the ECLS-B measure that tabulates six mutually exclusive race categories: White, Black, Hispanic, Asian, American Indian, and multi-racial.[2]

Controls

All models presented below also control for three specific factors. In order to estimate *gains* in cognitive skills, the models must account for prior cognitive skills (i.e., at nine months) when predicting later cognitive skills (i.e., at 24 months). Infant development occurs rapidly throughout early childhood, such that the vast majority of children *do* learn cognitive skills despite structural conditions that may slow some children's development. To account for the impact of age, I include two measures. First, I include a measure of

[2] For the purposes of this project, I lump racial categories together into six broad categories. The racialization experience in the United States is not a universal one even within "established" racial categories. These analyses are intended as a first step into exploring how the structural disadvantage of being born into a minority category may put children at a higher risk for depression of cognitive skills because of different opportunities. Certainly these experiences will vary within group as well as discussed further in Chapters Five and Six.

age in days at nine months. Second, I include a measure of the number of days between the two assessments, capturing the fact that children with longer times between assessments will have more time to gain cognitive skills.

Analytic Strategy

Measuring Poverty

To answer my first research question, I consider multiple conceptualizations of poverty and compare the magnitude of the cognitive skill gap with varying measures of income hardship. As mentioned above, this topic is beginning to receive more attention in sociological research and it has been a topic of common discussion in public health and demography for at least a decade (see Pagini et al. 1997; Gershoff et al. 2007; Axinn et al. 1997 for differing conceptualizations of poverty). The results from this chapter will inform policy makers who determine eligibility for public assistance and for targeted programs to most effectively combat poverty.

This analysis proceeds in three steps. First, I compare the composition of each measure of poverty, explaining who falls into each group and who does not. To accomplish this, I use summary statistics to compare the composition of each group, noting the shift in sample size and variation in demographic characteristics across the groups. For the purpose of these analyses, I use a set of demographic variables common to poverty analyses or analyses predicting cognitive skill growth or achievement. The purpose of this comparison is to expose how the way in which researchers define poverty alters who we perceive as poor. The majority of "the poor" are not a permanent group of families dwelling at the bottom of the income distribution but rather a fluctuating minority that look different depending the aspect of economic hardship we discuss (Rank 2005).

Second, I chart the skill growth for each group of "poor children" and their non-poor peers. The non-poor children are defined differently within each conceptualization. For instance, those children who live in families experiencing the least amount of material hardship are the "non-poor" group in the material hardship conceptualization. The group comparisons of cognitive skills consist of a series of charts and t-tests assessing the difference in magnitude and significance in initial cognitive skills, cognitive skills at 24 months and skill growth from nine months to 24 months.

Finally, I explore the relationship between cognitive skill growth and poverty by building a simple regression model predicting cognitive skills at 24 months using poverty, prior skills, and time elapsed between assessments. I compare the explained variance in each of the models with respect to a base model without a poverty variable. These analyses allow me to investigate if and how the different conceptualizations of poverty impact skill growth in early childhood and to draw conclusions regarding the most substantively useful measurement of poverty for future chapters. It also aids in theoretical development, contributing to the literature assessing how best to measure the experience of poverty in the United States as relevant to the cognitive skill growth of very young children.

Process of Poverty

Following the analysis of the different aspects of the poverty experience, I use structural equation modeling (SEM) to estimate models for both Chapters Five and Six. Because of the complexity of the measures and the sheer number of measures involved in these analyses, I chose a methodological technique appropriate for combining many observed variables together to create an unobserved latent variable in the measurement model step of SEM (i.e., latent variable analysis). These latent variables are described above in the

key variables section. I then use the structural step of structural equation modeling to test how the latent concepts are impacted by poverty and how they impact cognitive skill growth in early childhood (see Gershoff et al. 2007 for similar methodological choices). I use AMOS 17.0 to estimate all measurement and structural models. Specifically, I utilize maximum likelihood estimation (MLE) as it is both appropriate for abnormally and normally distributed data and is highly sensitive to model specification (Olsson et al. 2000).

Measurement Model. SEM occurs in two steps. First, researchers test a *measurement model* using confirmatory factor analysis to capture the relationship between the latent concepts (e.g., infant health status) and their observed indicators (e.g., asthma, ear infections, etc.). The focus of this first step is *specification* of latent variables and not estimation of causal processes (Bollen 1989). Measurement models therefore include only the relationships between observed indicators and their respective latent variables. The various latent variables estimated in a measurement model are allowed to co-vary (or not) according to theory without directional pathways. According to convention, one loading for each latent variable must be set to 1.0 to standardize the metric for that variable (Bollen 1989). As a result, significance values cannot be computed for these loadings. Figure 3-2 presents the measurement model for this project with latent concepts represented by circles and their indicators portrayed below them in squares.

Structural Model. After confirming the fit of indicator measures on latent constructs and the overall fit of the data to the measurement model, I move on to fit the *structural model* (the path analytic model), which hypothesizes causal relationships

between latent and observed variables. Figure 3-3 depicts the structural model used for the analyses presented in Chapters Five and Six. As mentioned above, I use a maximum likelihood estimation routine to generate estimates for each path specified in the figure. The model includes paths for both direct and indirect impacts on learning in early childhood. This specification assesses how poverty works in creating the cognitive skill gap in early childhood, what other factors contribute to the cognitive skill gap, independently of poverty, and how these many factors mediate the relationship between poverty and cognitive skill growth. Part of SEM's appeal stems from the ability to compare models to one another assessing which model most accurately fits the data. In order to gain the most parsimonious and meaningful model, I test different theoretical pathways in order to find the model that best fits the data and theory.

In both steps of structural equation modeling, researchers take account of how well the hypothesized model fits the data. Social scientists have developed many fit statistics for structural equation modeling over the past twenty years (Garson 2008). While AMOS 17.0 presents approximately 25 measures of goodness of fit, my analyses follow the recommendations of Jaccard and Wan (1996), who suggest reporting at least one measure of fit from each of three families of tests. In most cases below, I report the χ^2 statistic, the Root Mean Square Error of Approximation (RMSEA), and one of the baseline measures of fit (e.g., Comparative Fit Index [CFI]). When comparing hypothesized models to one another, I also report one of the information theory measures (Bayesian Information Criterion [BIC]). Typically, values for the RMSEA below .05 and values above .9 for the fit indices indicate an acceptable model fit, although these guidelines are flexible, particularly for models with many variables (see Garson 2008).

While I sometimes present the χ^2 statistic, it is biased against models that have a large sample size and will frequently return a significant result even though the model may fit the data (Hu and Bentler 1999).

In Chapter Six, I run the base model developed in Chapter Five for each specific racial group. The measurement and structural models remain basically the same, but I test the base structural model for each of for racial groups instead of controlling for race with a white/non-white dichotomy.[3] This results in four sets of results for the structural model, allowing me to assess whether and how poverty shapes cognitive skill growth differently for different racial/ethnic groups.

To conclude then, this study provides insight to the conceptualization of poverty and the processes through which poverty creates a cognitive skill gap in early childhood. I do this by using longitudinal and nationally representative data on children born in 2001 and creating multiple measures of poverty prompted by literature exploring the meaning of poverty for children and families. I then compare these groups demographically as well as compare how the cognitive skill gap emerges through 24 months. Next, I use structural equation modeling to model how the emergence of the skill gap actually happens, assessing the usefulness of each mechanism and the links between them. Finally, I use this same model with subsamples of each racial/ethnic categories included in the ECLS-B data to assess how the predictors of cognitive skills vary across groups. Together, the strategies outlined above shed light on the mechanisms, caused by poverty, that lead to cognitive skill gaps between poor and non-poor children at a very early age.

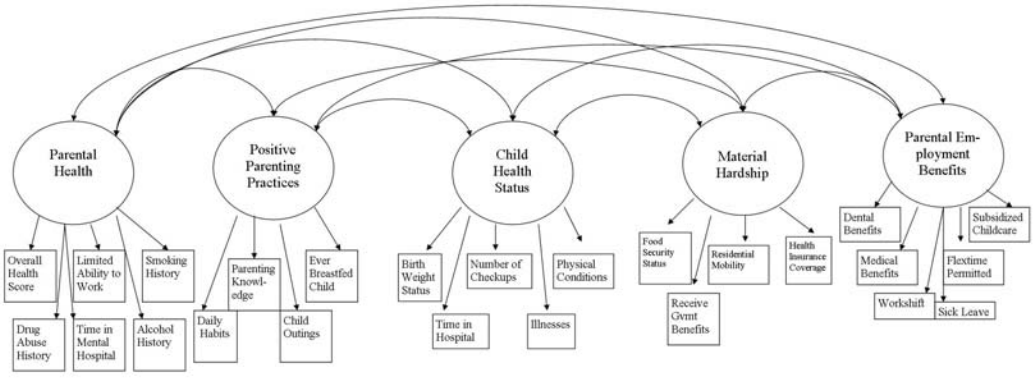
[3] Selection of racial groups is described in depth in Chapter Six.

CHAPTER THREE: TABLES AND FIGURES

Figure 3-1. Example Items from the BSID-II.

Select Items from the BSID-II[4]
Point to two pictures
Uses words to make wants known
Puts three cubes in a cup
Puts six beads in box
Scribbles spontaneously
Uses a three word sentence
Discriminates book, cube, and key
Displays verbal comprehension
Poses question(s)
Understands concept of one
Talks in response to picture book

Figure 3-2. Measurement Model.



[4] Andreassen and Fletcher 2007

Figure 3-3. Structural Model.

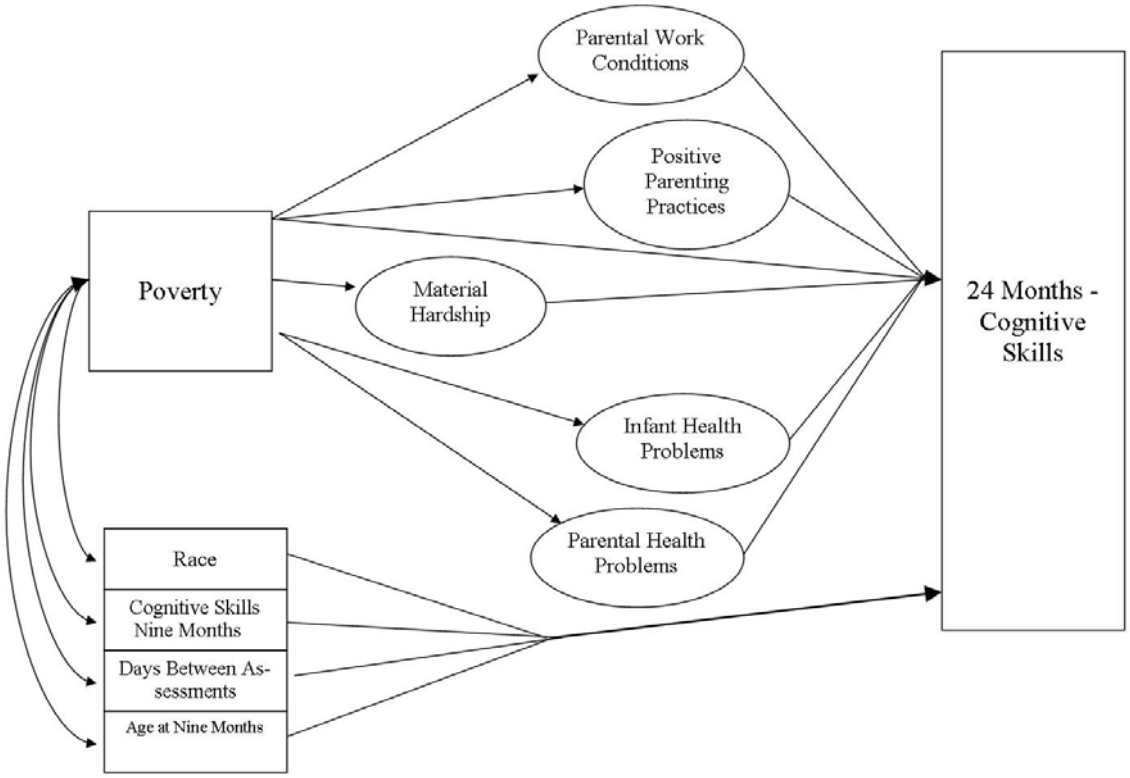


Table 3-1. Descriptive Characteristics of Variables in Chapters Four Through Six.[5]

Variable Name	Variable Description	Value	Minimum	Maximum	Mean	SD
	Cognitive Skills					
dvmental1	Cognitive Skills at 9 months		32.04	131.17	74.99	9.96
dvmental2	Cognitive Skills at 24 months		92.35	174.14	125.53	10.98
	Home Environment					
locale1	Collapsed locale code from census data (extrapolated from locale3)	City			0.35	
		Suburb			0.35	
		Town			0.15	
		Rural			0.15	
nomove12	Family did not change zipcodes between 9 and 24 months data collection		0 (No)	1 (Yes)	0.68	
homeng	Language spoken at home is English		0 (No)	1 (Yes)	0.80	
numsib1	Number of siblings living in the same household as the child		0	6 (6 or More)	1.10	1.14
hhsize1	Number of people living in the same residence as the child		0	9 (9 or More)	4.46	1.44
mstatus	Marital status of parents in household					
		Married			0.66	
		Separated			0.03	
		Divorced			0.03	
		Widowed			0.00	
		Never Married			0.27	

[5] All variables measured at 9 months unless otherwise noted.

Variable Name	Variable Description	Value	Minimum	Maximum	Mean	SD
		No Biological or Adoptive Parents in HH			0.01	
		Child Demographics				
White			0 (No)	1 (Yes)	0.43	
Black			0 (No)	1 (Yes)	0.16	
Hispanic			0 (No)	1 (Yes)	0.20	
Asian			0 (No)	1 (Yes)	0.11	
Native American			0 (No)	1 (Yes)	0.03	
Multi-racial			0 (No)	1 (Yes)	0.08	
agemon1	Age of Child at 9 months in months		6.2	22.3	10.51	1.86
agemon2	Age of Child at 24 months in months		20.1	38.2	24.43	1.20
timeelap	Time elapsed between assessment at 9 months and assessment at 24 months (in months)		2.70	28.80	13.92	2.70
		Infant Health				
Latent Variable	*Higher values indicate more health problems*					
vlbwgt	Child weight at birth falls into the very low category		0 (No)	1 (Yes)	0.10	
lbwgt	Child weight at birth falls below the normal range		0 (No)	1 (Yes)	0.26	
daysprem	# of days child was born premature		0	140	8.88	19.73
prenatalcare	Level of prenatal care utilization ranging from no prenatal care (0) to excellent (4)					
		No Prenatal Care			0.05	
		Inadequate Care			0.10	
		Adequate Care			0.11	

Variable Name	Variable Description	Value	Minimum	Maximum	Mean	SD
		Above Adequate Care			0.35	
		Excellent Care			0.39	
t1hosp	Child spent extra time in the hospital after birth		0 (No)	1 (Yes)	0.24	
t1hspd	Number of extra days child spent in hospital after birth		0	300	7.82	22.18
t1nicud	Days spent in NICU ward		0	180	0.82	6.60
moreoneday	Child spent more than one extra day in the hospital after birth		0 (No)	1 (Yes)	0.22	
t1wellby	Number of well baby checkups		0	10	5.45	2.16
t1asthma	Child suffers from asthma		0 (No)	1 (Yes)	0.06	
t1resp	Child suffers from respiratory illness		0 (No)	1 (Yes)	0.15	
t1gast	Child suffers from gastrointestinal illness		0 (No)	1 (Yes)	0.06	
t1ears	Child suffers from ear infection		0 (No)	1 (Yes)	0.40	
t1injur	Child has had injuries that required hospitalization		0 (No)	1 (Yes)	0.05	
t1seeing	Child has difficulty seeing		0 (No)	1 (Yes)	0.01	
t1hearing	Child has difficulty hearing		0 (No)	1 (Yes)	0.01	
		Poverty				
Poverty1	At 9 months, family living below 100% of the poverty line		0 (No)	1 (Yes)	0.25	
Poverty2	At 24 months, family living below 100% of the poverty line		0 (No)	1 (Yes)	0.24	
p130pov1	At 9 months, family living below 130% of the poverty line		0 (No)	1 (Yes)	0.39	
p130pov2	At 24 months, family living below 130% of the poverty line		0 (No)	1 (Yes)	0.34	
p185pov1	At 9 months, family living below 185% of the poverty line		0 (No)	1 (Yes)	0.49	

Variable Name	Variable Description	Value	Minimum	Maximum	Mean	SD
p185pov2	At 24 monhts, family living below 185% of the poverty line		0 (No)	1 (Yes)	0.47	
poorboth	At 9 and 24 months, family living below 100% of the poverty line		0 (No)	1 (Yes)	0.16	
poorever	At 9 or 24 months, family living below 1005 of the poverty line		0 (No)	1 (Yes)	0.17	
poornever	At 9 and 24 months, family living above 100% of the poverty line		0 (No)	1 (Yes)	0.67	
p50pov1	At 9 months, family living below 50% of the poverty line		0 (No)	1 (Yes)	0.10	
p100only1	At 9 months, family lives between 75% and 100% of the poverty line.		0 (No)	1 (Yes)	0.15	
p130only1	At 9 months, family lives between 101% and 130% of the poverty line.		0 (No)	1 (Yes)	0.12	
p185only1	At 9 months, family lives between 131% and 185% of the poverty line.		0 (No)	1 (Yes)	0.12	
above185t1	At 9 months, family living above 185% of the poverty line		0 (No)	1 (Yes)	0.51	
not_not	At 9 and 24 months, family is living above 185% of the poverty line		0 (No)	1 (Yes)	0.44	
income1	Household income category at 9 months		0	231,250	51,237.10	46,787.45
income2	Household income category at 24 months		0	231,250	54,419.84	48,538.21
ses1	Socio-economic Status at 9 months		-2.06	2.25	-0.03	0.85
ses2	Socio-economic Status at 24 months		-2.11	2.22	-0.03	0.85
wealthpov1	At 9 months, indicates possession of one or fewer wealth variables.		0 (No)	1 (Yes)	0.23	
own1	At 9 months, family owns their own home		0 (No)	1 (Yes)	0.48	
own2	At 24 months, family owns their own home		0 (No)	1 (Yes)	0.52	
rent1	At 9 months, family rents their place of residence		0 (No)	1 (Yes)	0.41	

Variable Name	Variable Description	Value	Minimum	Maximum	Mean	SD
rent2	At 24 months, family rents their place of residence		0 (No)	1 (Yes)	0.38	
owncar1	At 9 months, family owns at least 1 car		0 (No)	1 (Yes)	0.89	
owncar2	At 24 months, family owns at least 1 car		0 (No)	1 (Yes)	0.91	
ownstock1	At 9 months, family owns stocks		0 (No)	1 (Yes)	0.41	
ownstock2	At 24 months, family owns stocks		0 (No)	1 (Yes)	0.41	
bankact1	At 9 months, family has a checking or savings account		0 (No)	1 (Yes)	0.75	
bankact2	At 24 months, family has a checking or savings account		0 (No)	1 (Yes)	0.78	
fdscale1	Raash Food Insecurity Scale at 9 months		0	13	0.84	1.82
fdinsec	Child experienced food insecurity in the first 9 months		0 (No)	1 (Yes)	0.12	
	Familial and Parental Processes					
pedcode1	Highest Level of Parental Education	Less than 8th Grade			0.02	
		Some High School			0.11	
		High School Diploma or GED			0.25	
		Some College or Associate's			0.03	
		Bachelor's Degree			0.25	
		Some Graduate Work, No Degree			0.03	
		Master's Degree			0.09	

Variable Name	Variable Description	Value	Minimum	Maximum	Mean	SD
		Doctorate or Professional Degree			0.06	
	Parenting Practices					
Latent Variable	*Higher values indicate use of more positive parenting practices*					
everbrfd	Ever breast fed child		0 (No)	1 (Yes)	0.68	
peekday	Played peek a boo with child every day		0 (No)	1 (Yes)	0.69	
tickday	Tickled child every day		0 (No)	1 (Yes)	0.95	
playout	Played outside with child every day		0 (No)	1 (Yes)	0.43	
usedmag	Used a magazine to learn parenting skills		0 (No)	1 (Yes)	0.69	
readday	Read to child every day		0 (No)	1 (Yes)	0.30	
storyday	Tell stories to child every day		0 (No)	1 (Yes)	0.26	
singday	Sing to child every day		0 (No)	1 (Yes)	0.73	
errday	Run errands with child every day		0 (No)	1 (Yes)	0.58	
	Parental Health					
Latent Variable	*Higher values indicate more health problems*					
vghealth	Respondent (parent self-evaluation) in very good health		0 (No)	1 (Yes)		
prhealth	Respondent (parent self-evaluation) in poor health		0 (No)	1 (Yes)		
drug	Parent ever had drinking or drug problem		0 (No)	1 (Yes)	0.05	
mntfct	Parent ever spent night in mental facility		0 (No)	1 (Yes)	0.04	
smoke	Parent smokes cigarettes now		0 (No)	1 (Yes)	0.20	
drink	Parent currently drinks alcohol		0 (No)	1 (Yes)		
drinkwk	# of drinks in an average week for parent		0 (None)	4 (>1/day)	0.52	0.86

Variable Name	Variable Description	Value	Minimum	Maximum	Mean	SD
depscale	A scale of 9 items assessing the DSM-IV symptoms of clinical depression		-0.61	3.62	0.00	0.62
	Parental Work Conditions					
Latent Variable	*Higher values indicate jobs with higher levels of benefits*					
ltwork	Parental work limited due to problems		0	2	0.04	
medbenefit	Parental job offers medical benefits		0	2	0.83	
sickleave	Parental job offers paid sick leave		0	2	0.69	
childcare	Parental job offers subsidized childcare		0	2	0.14	
dental	Parental job offers dental insurance		0	2	0.70	
flextime	Parental job offers flexible hours or flextime		0	2	0.51	
dayshift	Parent works the dayshift		0	2	0.93	
momwork1	Mother's employment status at 9 months					
		Full time			0.33	
		Part time			0.18	
		Looking for work			0.08	
		Not in the labor force			0.41	
dadwork1	Father's employment status at 9 months					
		No Resident Father			0.21	
		Full Time			0.67	
		Part Time			0.04	
		Looking for work			0.03	
		Not in the labor force			0.05	

Variable Name	Variable Description	Value	Minimum	Maximum	Mean	SD
	Public Assistance					
wicbft	Family received WIC benefits within the past 12 months		0 (No)	1 (Yes)	0.53	
fdstmp	Since child born, family has received food stamps		0 (No)	1 (Yes)	0.21	
medicd	Since child born, family has received medicaid benefits		0 (No)	1 (Yes)	0.39	
welfr	Since hcild born, family has received welfare		0 (No)	1 (Yes)	0.09	
publicassist	Scale of the four above variables		0	1	0.31	0.33
noprivins1	Family has no private health insurance		0 (No)	1 (Yes)	0.51	
notcover1	Family has no health insurance		0 (No)	1 (Yes)	0.03	

CHAPTER FOUR: CONCEPTUALIZING POVERTY

Painting a picture of what it means to be poor is a complex process during which it is easy to lose sight of the people experiencing hardship in order to establish a standard categorical measurement. When defining poverty, scholars protest both overly-broad and overly-narrow conceptualizations. At the same time, policymakers use one measure to classify families as poor while scholars invoke many others. These dilemmas necessitate answers to the following questions prior to unpacking how poverty impacts developmental outcomes: Who belongs to "the poor" under different conceptualizations of poverty? How do different conceptualizations of poverty lead to different conclusions as to poverty's impact on children's cognitive skill growth? When speaking specifically of variation in cognitive growth, does one conceptualization of poverty have more explanatory power than another?

In this chapter, I use the ECLS-B data to seek answers to these questions. First, I explain the demographic variability of each group when varying the conceptualization of poverty. I can then weigh in on the fluctuating demographics of the group of people referred to as "the poor" and the consequences the use of the different conceptualizations of poverty may have for scholarship and policy. Although demographics of "the poor" may vary by conceptualization, the relationship between my outcome of interest, cognitive skills, and poverty may not vary across conceptualization. The next section of results charts the cognitive skill growth of children from nine months to 24 months of age across conceptualizations of poverty. Next, to better inform the analyses that follow, I assess which aspect(s) of poverty has (have) the most statistical power and substantive

use in predicting cognitive skill growth in early childhood. Finally, I discuss what these results suggest for the remainder of this study.

DEFINING POVERTY (A REMINDER)

As detailed in Chapter Two, I define poverty using five measurement strategies. First, I use the traditional measurement of poverty with the federal poverty threshold for 2001. To align with critiques of the level of the threshold, I include measures indicating whether families fall below 130% and 185% of the poverty line, as well as the more traditional 100% of the poverty line. These categorizations are substantively useful because for some public assistance programs, the qualification cut-off is more generous than the official poverty line. Therefore, the groups falling below each of these thresholds are indeed considered "poor" by some state governments and federal programs. In the charts and tables for this chapter, I label this conceptualization simply as *income poverty*.

Second, I acknowledge the work of many scholars suggesting that the degree aspect of poverty is an important indicator of hardship (Wilson 1991). Similar to income poverty, these measures use the federal poverty threshold but they more accurately specify precisely where a family is located within the poverty range and therefore capture the unique hardship present at each stage of poverty. I refer to this set of measures as *degree of income poverty*, and it indicates families living at the following income levels: below 50% of the poverty line, between 51% and 100% of the poverty line, between 101% and 130% of the poverty line, between 131% and 185% of the poverty line, and above 185% of the poverty line in 2001. This set of measures serves as a proxy for an income-to-needs ratio.

Third, I assess the duration aspect of poverty in predicting cognitive skill gains in very young children. The *duration of income poverty* measure captures the poverty status (defined using the federal poverty threshold) of families at nine and 24 months and categorizes them into three groups: below the poverty line at both time points, at either time point, or at neither time point.

Fourth, as explained in Chapter Two, income poverty may only represent the immediate hardship faced by families. For example, income poor families with "safety nets" may not experience the same level of hardship as income poor families without safety nets. To investigate the longterm insecurity part of poverty, I engage the concept of *wealth poverty*. I begin by looking at the independent impact of being wealth poor. Then I combine wealth poverty and income poverty to categorize families into four groups: families experiencing wealth poverty but not income poverty, families experiencing income poverty but not wealth poverty, families experiencing both wealth poverty and income poverty and families experiencing neither income poverty nor wealth poverty. Finally, I conceptualize the experiential aspect of poverty rather than strictly a lack of monetary resources by developing a scale of *material hardship*. After I created the scale as detailed in Chapter Three, I divided it into quintiles and created five groups, ranging from those in the lowest quintile (experiencing the least amount of material hardship) to those in the highest quintiles (experiencing the highest amount of material hardship). While this measure does not include either income or wealth, it captures the insecurity and adversities that families frequently face when experiencing income poverty or wealth poverty.

WHO IS POOR?

Size of Groups

With these five measurements of poverty, I begin answering the question of "who is poor" by looking at how the size of "the poor" changes with different types of poverty. Table 4.1 presents the percentage of children in the sample who experience each form of poverty starting with income poverty, moving to wealth poverty, followed by degree of income poverty, duration of income poverty, and finally, material hardship. Children can experience one or more of these aspects of poverty. For example, a child who is income poor at 100% of the poverty line may also be in the 3rd quintile of material hardship. All conceptualizations, with the exception of duration of income poverty, are measured at the 9 month assessment to control for temporal ordering in later analyses.

Table 4.1 reveals a few interesting patterns. First, a full one-fourth of the sample live in families whose income falls below the federal poverty line. This is comparable to the U.S. child poverty rate of 22% in 2009 (NCCP 2010). For a family of three in 2009, living at the poverty line means having just over $1500 per month, before taxes, for food, housing, transportation, medical expenses and any other expenses. In a nation often touted as the land of opportunity, it is striking that the U.S. child poverty rate far surpasses those in other wealthy nations where poverty rates are often in the single digits (Rank 2005).

Additionally, virtually half (49%) of this sample of children live in families earning less than 185% of the federal poverty line. According to the National Center for Children in Poverty, it takes approximately 200% of the poverty line to meet the basic needs of young children. Therefore, nearly half of the children in this sample are growing up in families that are coping with the daily stress of being unable to provide

fully for their children (Fass 2009). While somewhat high due to the sampling strategy employed by ECLS-B, these estimates are similar to current, national estimates for the United States which indicate that 44% of all children under the age of six live below 200% of the poverty line, or $36,630 for a family of three in 2009 (NCCP 2010).

Moving beyond low-income families, 23% of the children in my sample live in families experiencing wealth poverty, a percentage similar to the income poverty rate. This means that nearly a quarter of these children come from families that own one or fewer of the following resources: a car, a home, a bank account, or stocks/bonds. While at first glance readers may be able to brush this off because, surely, only the most privileged of families own stock or bonds, in fact, 25% of the full sample does not have a bank account and 52% do not own their own home. If we consider only the families living below the traditionally defined poverty line, these percentages grow even more alarming: 31% of families below the poverty line do not own a car, 59% of families do not possess a bank account (either savings or checking), 93% do not own stocks or bonds, and 84% do not own their own home. To make this more concrete, without a bank account, establishing a credit history is impossible. Without a credit history, there are few pathways to home ownership which is, historically, the most common pathway to intergenerational wealth accumulation in the United States. The wealth poor in this sample have one or fewer of these resources; the vast majority who do have one wealth component own their own car. Contrast these percentages with more privileged families, those with incomes above 185% of the poverty line in 2001: only 6% do not have a bank account, 30% do not own their own home, 32% do not own stock, and 2% do not own

their own car. Without these seemingly basic resources, wealth poor families lack a basic safety net that might otherwise provide stability in times when income is scarce.

However, these wealth poor families are not necessarily the same families as those who experience income poverty. Only 14% of families experience both income and wealth poverty. This supports literature suggesting that many families subsisting above the traditional poverty line, in this case approximately 9% of the total sample, do not have a safety net to protect them if they suddenly lost their cash flow.

Additionally, the percentage of families who experience poverty at one time point (17%) is virtually equal to the percentage of those who experience poverty at both time points (16%), indicating that there is significant movement around the traditionally defined poverty line. This supports Rank's (2005) surprising finding which asserts that when using a life course approach poverty is a much more common experience than most Americans believe, and in fact, "rather than being an event occurring among a small minority of the U.S. population, poverty is an experience that touches a clear majority of Americans at some point in their lifetimes" (Rank 2005: 92). Conversely, the likelihood of spending five or more consecutive years in poverty is very low (9.2% of the U.S. population). These data suggest that even in this short time period, poverty is a time-variant condition in and out of which many families move, rather than remaining consistently "poor," at least in the traditional definition.

Demographics of Poverty

I move next to more specific characteristics of the children experiencing each type of poverty. Table 4.2 displays demographic characteristics of the most disadvantaged group in each aspect of poverty (wealth poor, income poor, income poor at both time

points, < 50% of the poverty line, and most material hardship), as well as the demographic characteristics of the sample as a whole. Many of the variables in Table 4-2 are frequently employed in studies investigating the conceptualization of poverty or the characteristics associated with poverty (see, for example, Rank 2005: Table 2.1). While there are demographics differences across the conceptualizations, some variables are surprisingly stable, including locale, parental education, and residential stability. For instance, research suggests that extreme poverty is more common in rural areas, but Table 4.2 demonstrates that this is only marginally the case as 18% of extremely poor children live in rural areas as compared to 16% of children living below 100% of the poverty line.

However, there are notable differences across aspects of poverty when addressing family structure, family size, home language, and race. Results in Table 4.2 show that families experiencing the most extreme degree of income poverty also have the largest households ($x = 5.09$). Interestingly, this is not the case in families who experience extreme material hardship, as the average household size ($x = 4.59$) and number of siblings living in the household ($x = 1.31$) falls in between the range of household sizes and siblings amongst the poverty conceptualizations. While income poverty may be influenced by family size, this relationship does not appear to extend to material hardship.

There are some shared demographic characteristics between groups experiencing extreme income poverty and extreme material hardship, however. They are much less likely to speak English at home than children experiencing other types of poverty. However, families experiencing wealth poverty, living below 100% of the poverty line,

and living below the poverty line at both time points are more likely to speak English at home (respectively, x = 0.27, 0.24, 0.23) than the sample as a whole (x = 0.19).

Differences in family structure are the clearest point of divergence between families experiencing any type of poverty and the sample as a whole. While the majority of families in the entire ECLS-B sample consist of married parents living in the same household (x = 0.66), this is decidedly not the case for any poverty aspect. As Table 4.2 indicates, impoverished families are half as likely to consist of married parents living in the same household. These families are twice as likely as families in the entire sample to consist of separated or never married parents. Additionally, in the overall sample, mothers are far more likely to be working full time (x = 0.33) than mothers in households experiencing some level of poverty ($0.15 < x < 0.22$).

A key component to this study is the consideration of the varying processes at work in the creation of the cognitive skill gap between poor and non-poor children across racial groups. Tables 4.2 and 4.3 confirm that there are racial differences in poverty experience amongst children. The results addressing race in Table 4.2 show the racial breakdown of each conceptualization of poverty. For instance, the wealth poor, in these data, consists of 19% white children, 32% black children, 34% Hispanic children, 5% Asian children, 5% Native American children, and 6% multi-racial children. These racial breakdowns differ only slightly across poverty types. However, the racial composition of poverty groups differs *drastically* from the racial composition of the sample as a whole (which is nationally representative of children born in 2001). For example, from the final column in Table 4.2, we would expect, if poverty were equally distributed across racial

groups, that white children would make up 43% of each poverty conceptualization. This is clearly not the case.

This pattern is even clearer when looking at results presented in Table 4.3 which shows the percentage of each racial group impacted by a particular conceptualization of poverty. White and Asian children are far less likely to experience any form of poverty than black, Hispanic, or Native American children. For instance, 8% of white children and 7% of Asian children lived in families below the poverty line at both nine and 24 months while 34% of Black children, 23% of Hispanic children, and 35% of Native American children experienced multiple time points of poverty. This pattern holds for conceptualizations of poverty that invoke measures beyond income as well: while 45% of black children, 39% of Hispanic children, and 37% of Native American children lived in families impacted by wealth poverty, only 10% of white children and 10% of Asian children fell into this category. Given disproportionate poverty rates, these results warrant the investigation in Chapter Six exploring how poverty may operate differently across racial groups.

HOW DO COGNITIVE SKILLS VARY ACROSS POVERTY GROUPS?

Figure 4.1 suggests that there are few notable gaps in cognitive skills across poverty aspect at 9 months of age. While the cognitive skill score at 9 months for the overall sample (see Table 3.1, mean=74.99, sd=9.96) demonstrates significant variation around the mean, Figure 4.1 shows that this variation does not appear to vary systematically around poverty status, regardless of the conceptualization. Figure 4-1 is structured such that dark bars represent the “non-poor” group and the lighter bars represent different levels of poverty according to the conceptualization. For example,

children who live in homes experiencing the lowest level of material hardship (dark bar) score lower on the BSF-R than those living in homes experiencing the second lowest level of material hardship (lighter bar).

Indeed, there are few detectable patterns across hardship groups at 9 months. Figure 4.1 demonstrates that, if a cognitive skill gap is emerging between poor and non-poor children, perhaps most reliably around income poverty, it is not a gap that can be validated with other forms of measurement of poverty. The gaps that do seem large in Figure 4.1 may not be substantively meaningful, as variation between groups, in most cases, is less than one point (or less than 10% of a standard deviation) on the BSF-R. Table 4.4 presents the numbers represented in Figures 4.1-4.3 and the corresponding significance levels calculated from two-tailed t-tests. These results suggest that the cognitive skill gaps at 9 months between poor and non-poor children are not yet large in magnitude and few differences reach conventional levels of significance.

The income poverty conceptualization of poverty is somewhat of an exception to the rest of Figure 4.1. That is, as the number of children below a particular threshold increases, the difference in cognitive skills between poor and non-poor children at 9 months becomes more statistically significant in the direction we would expect (non-poor children outperforming their poor peers). I argue that this finding is not as substantially interesting as it first appears because the magnitude of difference is, in reality, very small, and this may be an artifact of the data and sample size (for example, $x_{<185} = 74.71$, $x_{>185} = 75.19$).

Table 4.4 confirms this conclusion, suggesting for the most part, that the differences at nine months do not seem to follow a particular pattern where poor children

demonstrate lower cognitive skills than their more privileged peers. While Table 4.4 and Figure 4.1 include the results at nine months for duration of poverty, these results should be taken with a grain of salt as the duration measures contain poverty measures at 24 months and therefore do not occur prior to or even simultaneously with the dependent variable in this stage of analysis (cognitive skills at nine months). These measures are more useful when looking at the Figures 4.2 and 4.3 as well as the final two columns of Table 4.4.

By 24 months, the cognitive skill gap emerges as substantively large and statistically significant regardless of the conceptualization of poverty. Figure 4.2 uses the same strategy as Figure 4.1 to show that between the two assessments, poverty begins to negatively impact the cognitive skill development of young children. This is even more clear when cognitive skill *gains* are charted across poverty conceptualization because gains accounts for the starting point of children instead of using achievement at 24 months as an outcome (Figure 4.3). For instance, although children belonging to the second quintile of material hardship perform the highest of all material hardship quintiles at nine months, their gains are substantially less than that of the lowest material hardship quintile but still more than the middle quintile (Figure 4.1 through Figure 4.3).

While all groups of children gained cognitive skills between nine months and 24 months, poor children gained less than their more privileged peers. This effect appears linear when using the material hardship, income poverty, or degree of income poverty conceptualization as Figure 4.3 shows. Although the pattern seems linear for these three aspects, it is important to note that, particularly for the income poverty and the degree of income poverty aspects, children who never experience hardship gain *far more* cognitive

skills than even their marginally less privileged peers. That is, although as income levels rise, children gain more cognitive skills, the slope of the relationship appears steeper for the most privileged group. Table 4.4 confirms that the BSF-R scores for these non-poor children are much different from their less privileged peers as t-tests for mean differences in gains and cognitive skills at 24 months are all highly statistically significant.

This story is not as clear when emphasizing the duration or wealth components of poverty. While the linear trend continues for the duration of income poverty variables, the difference between non-poor children and children who have experienced poverty in either of the two time periods is not as numerically large as differences across other conceptualizations of poverty. As Table 4.4 displays, this difference is barely a full point in the BSF-R scoring scheme (never poor gains = 49.57, ever poor gains = 48.23). Children who experience poverty at both time points do gain less than those who do not experience poverty at either time point (x = 47.00). However, when comparing gains across other poverty conceptualizations, this difference is not as notable as the differences discussed above. This finding could be due to the relatively short time period my data cover as well as the young age of my subjects. A better test of the duration of poverty would include more than two time points and assess the impact of early childhood poverty on older children's outcomes.

While there is no distinct linear trend for wealth poverty similar to the other conceptualizations, there is also no clear ordering of the categories of wealth poverty. The categories here consist of the different combinations of wealth and income poverty at nine months. This breakdown explores the differing impact of permanent vs. transitory types of poverty on cognitive skill growth. As discussed in Chapter Two, wealth poverty

represents a safety net or resources that a family could fall back on if the flow of income is interrupted by job loss or another life-altering event. Figure 4.3 shows that children experiencing wealth and/or income poverty gain cognitive skills at about the same rate while children experiencing neither wealth nor income poverty far out-gain them in cognitive skills growth between nine and 24 months. Interestingly, Figure 4.3 does not suggest an additive effect of wealth *and* income poverty. Although results from Figure 4.2 do hint at a slight disadvantage for income and wealth poor children when compared to those experiencing either condition, the magnitude of this disadvantage is very slight. These results convey the message that wealth poverty is important only in the negative sense – that is, children who do not experience wealth poverty gain far more cognitive skills over the first two years of life than their peers who experience one or both forms of income poverty or wealth poverty.

Findings from Table 4.4 and Figures 4.1-4.3 suggest two main conclusions about the relationship between poverty and cognitive skills. First, while cognitive skill levels vary among children who are nine months old, they do not vary systematically with poverty status. This is a critical finding suggesting that a genetic argument regarding the lower cognitive capacity of children born to poor parents in unfounded. By 24 months the skill gap between poor and non-poor children is present both in magnitude and significance for all conceptualizations of poverty. Clearly, this time period is a critical time point for exploring how social systems create the skill gap between poor and non-poor children. Second, the results presented above suggest cautious support for the argument presented in Chapter Two proposing a more complete conceptualization of poverty. Indeed, cognitive skills do vary by *degree* of poverty, whether conceptualized

with the traditional threshold methodology or a material hardship approach. The results for wealth poverty and duration of income poverty are less clear and perhaps indicate a need for better data, both in terms of length of study and information on household wealth.

HOW POWERFUL IS POVERTY IN EXPLAINING COGNITIVE SKILL GAPS?

Table 4.5 presents results from ordinary least squares regressions assessing the power of each aspect of poverty in predicting cognitive skill growth when controlling for other key developmental variables. Each regression contains four independent variables: cognitive skills at 9 months, age in months at 9 months, time elapsed between assessments, and the poverty component. With the exception of the base model without a poverty variable, only coefficients for the poverty variable are listed and all poverty variables are significant at the .001 confidence level. In the column following the poverty coefficient, I present the R^2 for each model and the change in R^2 from the base model in order to compare the explanatory power of the specified poverty variable. This methodological choice highlights which aspects of poverty are most relevant in explaining the cognitive skill growth of young children. Other aspects may be particularly relevant for other outcomes but the purpose of these analyses is to find the aspect of poverty that most strongly predicts cognitive skill growth at 24 months.

From the base model in Table 4.5, it is clear that age, time elapsed, and prior cognitive skills are strong and significant predictors of cognitive skill growth in early childhood as expected. In this base model, 16% of the variance in cognitive skill growth between nine and 24 months is explained. Although coefficient sizes across the models cannot be compared (the coefficients are unstandardized and in different models), by

comparing the change in R^2, I can assess the relative impact of adding different poverty variables to the model. The last column in Table 4.5 presents the change in explanatory power when the variable of interest is added to the equation. Note that, in general, poverty adds to the explanatory power of the model but not nearly in the magnitude that age, time between assessments, and previous cognitive skills add. This is expected because of the accelerated developmental changes occurring for the vast majority of children at this very early age, regardless of their economic circumstances.

All aspects of poverty add credence to the model predicting cognitive skill gains. These results suggest that poverty is a critical component to the cognitive skill growth of young children. Table 4-5 demonstrates interesting results regarding the specifics of poverty levels within conceptualizations. For instance, while much of the literature reviewed in Chapter Two suggests that children in extreme poverty may suffer worse consequences than those living immediately below the poverty line, these results suggest that both groups of children suffer similar cognitive skill growth penalties for poverty ($b_{50\%}$=-5.37, $b_{100\%}$=-5.32). Perhaps the consequences for extreme income hardship have yet to impact children at this early age, or, as results from Chapter Five demonstrate, parents are better able to bear the brunt of poverty, even extreme poverty, for this short period of time before the impact of extreme poverty trickles down to their children. Unlike the non-linear trend in the penalty children pay for degree of income poverty, the impact of material hardship seems the closest to linear. As the level of hardship experienced by a family increases, children gain fewer cognitive skills between nine and 24 months; this culminates with the highest quintile of material hardship where children suffer almost a 6 point disadvantage compared to those in the lowest quintile (b_{5thQ}=-

5.82). Even at this young age, children in families that reside below the traditional poverty line for an extended period of time gain fewer cognitive skills than their peers who only fall below the line at one time point (b_{both}=-5.06, b_{either}=-3.41). While this duration model does not have as much explanatory power (ΔR^2=0.035) as the other conceptualizations of poverty, these results support research that finds educational consequences for children who experience extended periods of poverty (Entwisle, Alexander and Olson 2005; Wagmiller 2006).

The findings regarding degree of income poverty, material hardship and duration of income poverty largely support previous literature. However, Table 4-5 presents interesting findings addressing the impact of wealth poverty on cognitive skill growth in early childhood. Children living in families without a safety net but above the traditional poverty line experience significantly fewer cognitive skill gains than any other wealth poverty conceptualization (b=-5.01), even those children who are both income poor and wealth poor (b=-4.15). This perhaps highlights the importance of a safety net for families who are dangerously close to being unable to meet the income demands of their daily lives. Children from families living paycheck to paycheck without a safety net of home ownership or other wealth resources appear to be suffering cognitive consequences beyond what we might expect, especially when compared to their less "privileged" peers (those experiencing both income and wealth poverty).

When comparing the explanatory power for each of these aspects of poverty, two stand out as stronger predictors of cognitive skill growth in early childhood. Measures of degree of income poverty explains 4.6% more variation in cognitive skills at 24 months than a model without this measure while material hardship adds a similar magnitude of

explanatory power (ΔR^2=0.042). These results suggest that, for the purposes of this study, it is particularly important to focus on the degree of poverty, in terms of income and material hardship, but that that the patterns for duration of income poverty and wealth poverty are not as clear when explaining cognitive skill growth in young children.

THEORETICAL IMPLICATIONS

In general, these results suggest that measuring multiple aspects of poverty provides a more complete picture than using the traditional dichotomous measure alone. More specifically, the results presented above point to three key conclusions regarding theorizing about and measuring poverty in studies of young children and cognitive skill growth. First, altering the aspect of poverty captured by a measure changes the demographic characteristics of who is considered poor. This is particularly true for race and family structure. Families experiencing poverty do share some similar characteristics; however, they are not identical. Researchers and policymakers would benefit by focusing more on how the mere conceptualization of poverty changes *who* we are talking about.

Second, these data suggest that the cognitive skill gap between poor and non-poor children emerges sometime between nine months and 24 months. This confirms my choice of data source as there is little pattern surrounding poverty measures and cognitive skills at nine months but by 24 months, the gaps between privileged and non-privileged children are clear regardless of poverty conceptualization. These results support sociological research that argues for a social source of race- and class-based achievement gaps rather than a biologically based argument.

Third, while age-related covariates are strong predictors of cognitive skill gains in young children, poverty, regardless of conceptualization, is also an important indicator.

All aspects of poverty matter significantly when predicting cognitive skill gains in young children but these results show that degree of poverty, in terms of income and material hardship, add the most explanatory power. Models in the following two chapters will include both of these conceptualizations of poverty. Because the degree of material hardship is experienced as a result of a lack of resources and this lack of resources often stems from income dearth, the modeling in the following chapters will lead from income poverty to material hardship. While wealth poverty and the duration of income poverty are certainly strong and important predictors of skill gains in young children, the results for these two conceptualizations were not as strong, in the case of duration, or as clear, in the case of wealth, as those of material hardship and degree of income poverty. Data limitations impact the wealth poverty indicator while the timing of the poverty duration variable may be too early in a child's life or too short of a time period to show the cumulative impact of duration of poverty demonstrated by previous research.

CHAPTER FOUR: TABLES AND FIGURES

Table 4.1. Sample Breakdown of Poverty Conceptualization.

Poverty Conceptualization	**Category Definition**	**N**[6]	**Percent of Total Sample**
Total Sample	*All Children*	8,900	100%
Income Poverty[7]	*< 100% Poverty Line*	2,250	25.00%
	< 130% Poverty Line	3,300	36.82%
	<185% Poverty Line	4,400	49.22%
Wealth Poverty	*Wealth Poor*	2,000	22.57%
	Income Poor not Wealth Poor	950	10.54%
	Wealth Poor not Income Poor	700	8.11%
	Wealth Poor and Income Poor	1,300	14.46%
Degree of Income Poverty	*< 50% Poverty Line*	900	10.30%
	50% - 100% Poverty Line	1,300	14.70%
	100% - 130% Poverty Line	1,050	11.83%
	130% - 185% Poverty Line	1,100	12.40%
Duration of Income Poverty	*Below Poverty Line either at 9 and 24 Months*	1,500	16.67%
	Below Poverty Line at both 9 and 24 Months	1,450	16.29%
	Not Below Poverty Line at 9 or 24 Months	6,000	67.05%
Degree of Material Hardship	*Most Material Hardship*	1,400	15.60%
	Fourth Quintile	1,250	13.93%
	Third Quintile	1,450	16.19%
	Second Quintile	2,050	22.83%
	Least Material Hardship	2,800	31.45%

[6] Sample sizes rounded to the nearest 50 as specified in IES's security protocol.

[7] Unless otherwise specified, "poverty line" refers to the federally established poverty line for the year in question, in the baseline sample, 2001. Unless otherwise specified, all conceptualizations refer to poverty status at the baseline wave of 9 months.

Table 4.2. Demographic Statistics.

		Wealth Poor and Income Poor	< 100% Poverty Line	Below Poverty Line at both 9 and 24 Months	< 50% Poverty Line	Most Material Hardship (1st Quintile)	Complete Sample (9 Months)
N		2000	2250	1450	900	1400	8900
Locale	*City*	0.41	0.39	0.40	0.39	0.40	0.35
	Suburb	0.27	0.26	0.25	0.25	0.27	0.35
	Town	0.17	0.18	0.18	0.18	0.16	0.15
	Rural	0.14	0.16	0.18	0.18	0.17	0.15
Race	*White*	0.19	0.23	0.21	0.19	0.25	0.43
	Black	0.32	0.30	0.33	0.38	0.34	0.16
	Hispanic	0.34	0.29	0.29	0.26	0.23	0.20
	Asian	0.05	0.06	0.05	0.04	0.03	0.11
	Native American	0.05	0.05	0.06	0.06	0.05	0.03
	Multiracial	0.06	0.07	0.07	0.06	0.09	0.08
Highest Level of Parental Education (Years)		11.55	11.69	11.35	11.34	11.71	13.97
Household Size		4.57	4.96	5.02	5.09	4.59	4.46
Number of Siblings		1.17	1.37	1.50	1.48	1.31	1.10
Home Language	*Language Other than English*	0.27	0.24	0.23	0.19	0.13	0.19
Marital Status of Parents	*Married*	0.31	0.34	0.30	0.22	0.26	0.66
	Separated	0.06	0.06	0.06	0.09	0.07	0.03
	Divorced	0.04	0.05	0.05	0.05	0.05	0.03
	Widowed	0.00	0.00	0.00	0.01	0.01	0.00
	Never Married	0.58	0.55	0.58	0.63	0.61	0.27
	No Biol. Or Adoptive Parents in HH	0.00	0.01	0.01	0.01	0.01	0.01
Mother Work Status	*Fulltime Employment*	0.22	0.19	0.17	0.15	0.21	0.33
Residential Stability	*Moved b/t Wave 1 and 2*	0.35	0.32	0.31	0.31	XXXXXXX XXXX	0.31

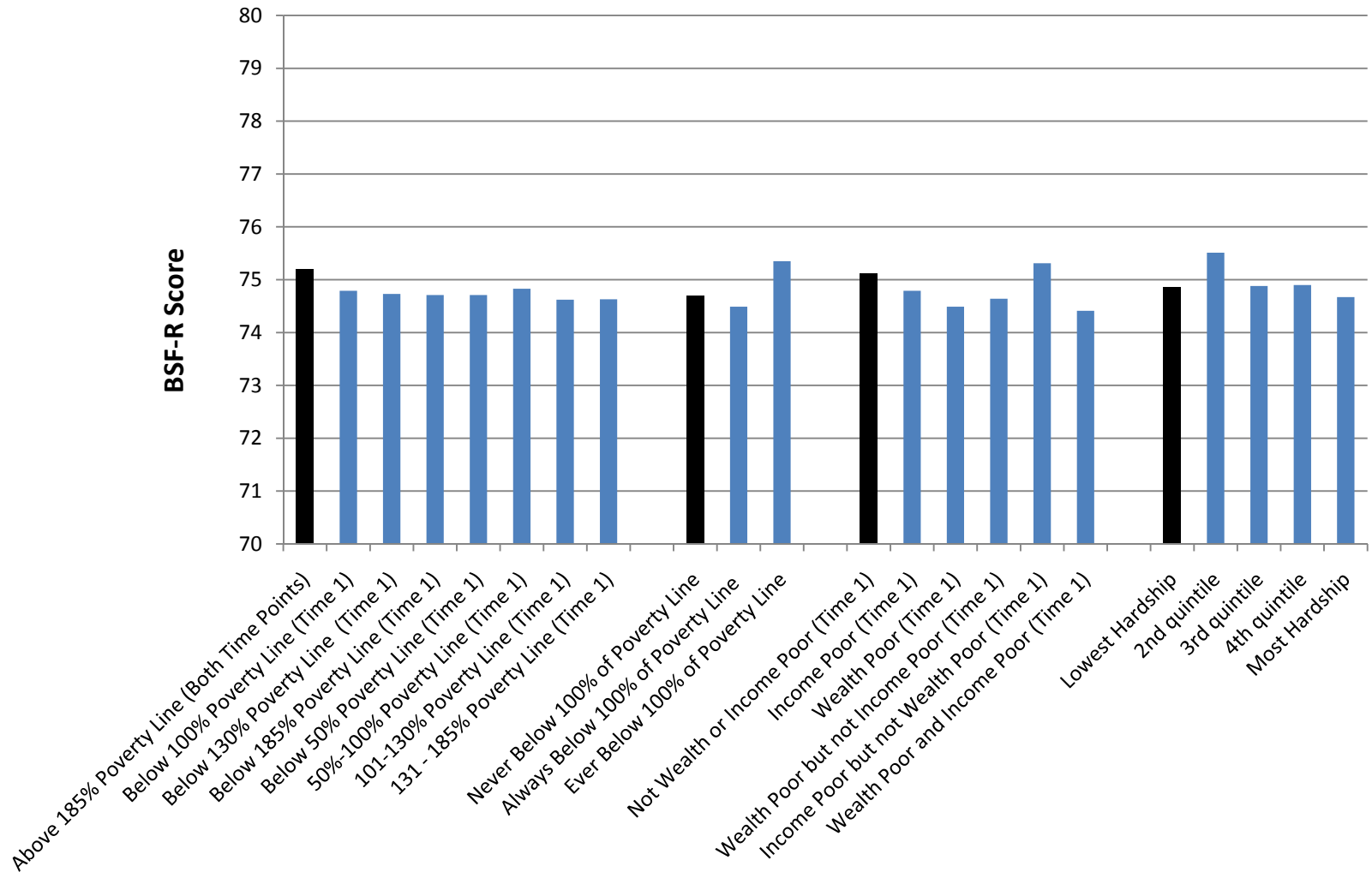
Proportions may sum to 1.01 or 0.99 due to rounding constraints. Sample sizes are rounded to the nearest 50 as dictated by IES protocol.

Table 4.3. Proportion of Race Groups Experiencing Poverty.

	White	Black	Hispanic	Asian	Native Amer.	Multi-Racial
N	3850	1400	1800	950	250	700
Wealth Poverty (9 Months)	0.10	0.45	0.39	0.10	0.37	0.17
Income Poverty (9 Months)	0.14	0.48	0.36	0.13	0.45	0.22
Duration of Income Poverty (9 and 24 Months)	0.08	0.34	0.23	0.07	0.35	0.14
Extreme Income Poverty (9 Months)	0.05	0.25	0.14	0.04	0.22	0.08
Extreme Material Hardship (9 Months)	0.09	0.33	0.17	0.05	0.31	0.19

Sample sizes are rounded to the nearest 50 as dictated by IES protocol.

Figure 4.1 Cognitive Skills Time 1.



The scale of Figure 4-1 encompasses one standard deviation around the mean of cognitive skills at nine months, from 70-80.

Table 4.4 Cognitive Skills and Poverty.

Poverty Conceptualization	Category Definition	N	Cognitive Skills (9 Months)	Cognitive Skills (24 Months)	Cognitive Skill Gains
Total Sample	*All Children*	8,900	74.99	125.53	50.54
Income Poverty[^]	*>185% Poverty Line at Both Time Points*	3,900	75.19	128.43	53.24
	< 100% Poverty Line	2,250	74.79^{+}	122.19***	47.40***
	< 130% Poverty Line	3,300	74.73*	122.61***	47.88***
	<185% Poverty Line	4,400	74.71*	123.10***	48.39***
Wealth Poverty[#]	*Not Wealth or Income Poor*	5,950	75.11	127.09	51.98
	Wealth Poor	2,000	74.49*	122.13***	47.64***
	Income Poor not Wealth Poor	950	75.31	122.91***	47.60***
	Wealth Poor not Income Poor	700	74.64	122.97***	48.32***
	Wealth and Income Poor	1,300	74.41*	121.66***	47.26***
Degree of Income Poverty[^]	*< 50% Poverty Line*	900	74.71^{+}	121.90***	47.19***
	50% - 100% Poverty Line	1,300	74.83	122.39***	47.55***
	100% - 130% Poverty Line	1,050	74.62*	123.50***	48.89***
	130% - 185% Poverty Line	1,100	74.63*	124.53***	49.91***
Duration of Income Poverty	*Below Poverty Line either at 9 and 24 Months*	1,500	75.35	123.58***	48.23***
	Below Poverty Line at both 9 and 24 Months	1,450	74.49**	121.49***	47.00***
	Not Below Poverty Line at 9 or 24 Months[<]	6,000	74.70	124.27	49.57
Degree of Material Hardship[~]	*Least Material Hardship*	2,800	74.86	128.35	53.49
	Second Quintile	2,050	75.51	126.66***	51.15***
	Third Quintile	1,450	74.88	123.81***	48.94***
	Fourth Quintile	1,250	74.9	123.15***	48.25***
	Most Material Hardship	1,400	74.67	122.10***	47.42***

$^{+}$ $p < 0.10$, * $p < .05$, ** $p < 0.01$, *** $p < 0.001$. Sample sizes rounded to the nearest 50 as specified in IES's security protocol.
[^] Compared to children living in families above 185% of the poverty line at both time points
[#] Compared to children living in families that are neither wealth poor nor income poor
[<] No significance testing done with this measure due to membership in more than one category
[~] Compared to children living in homes with the least degree of material hardship

Figure 4.2. Cognitive Skills Time 2.

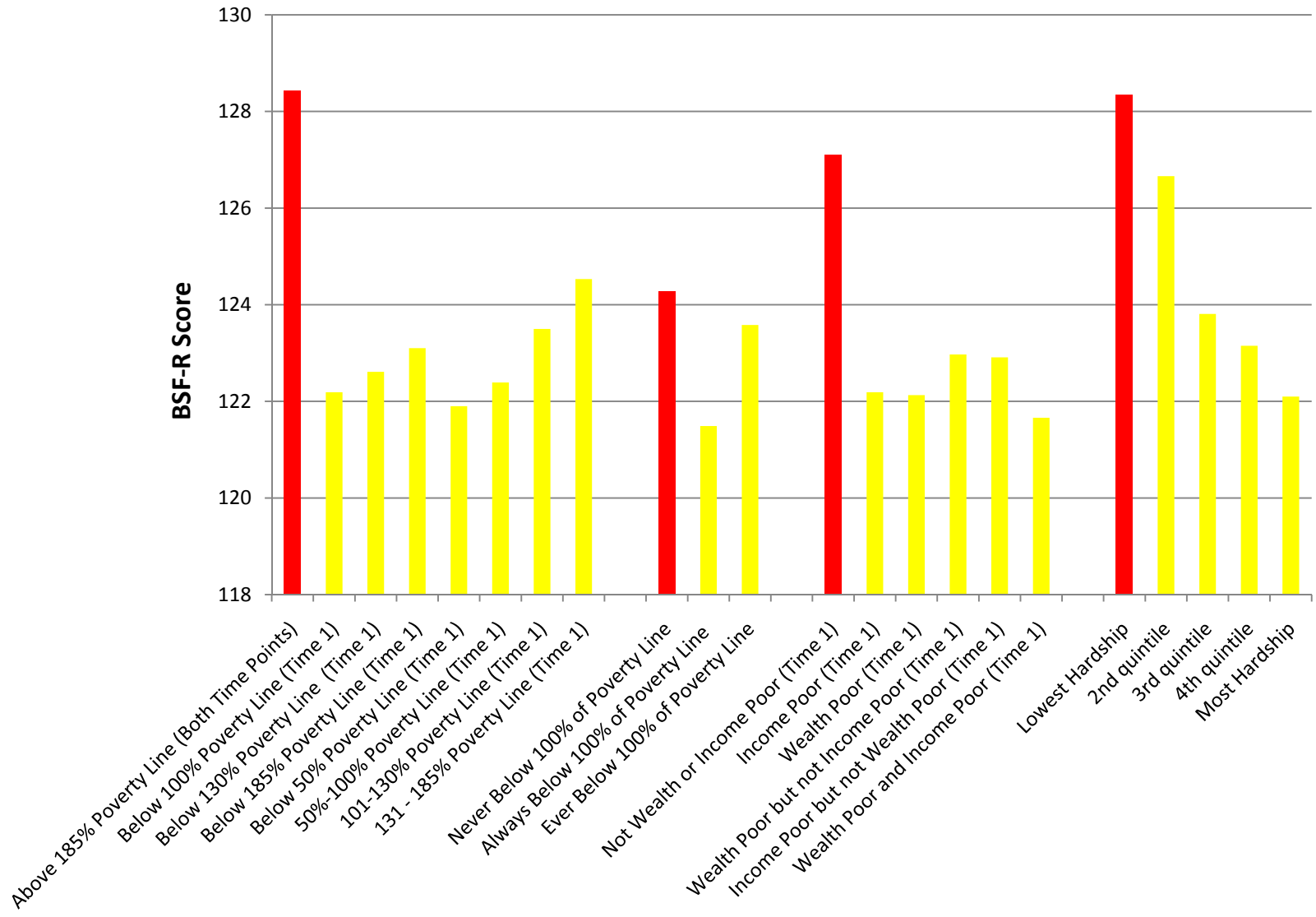


Figure 4.3. Gains from 9 to 24 Months.

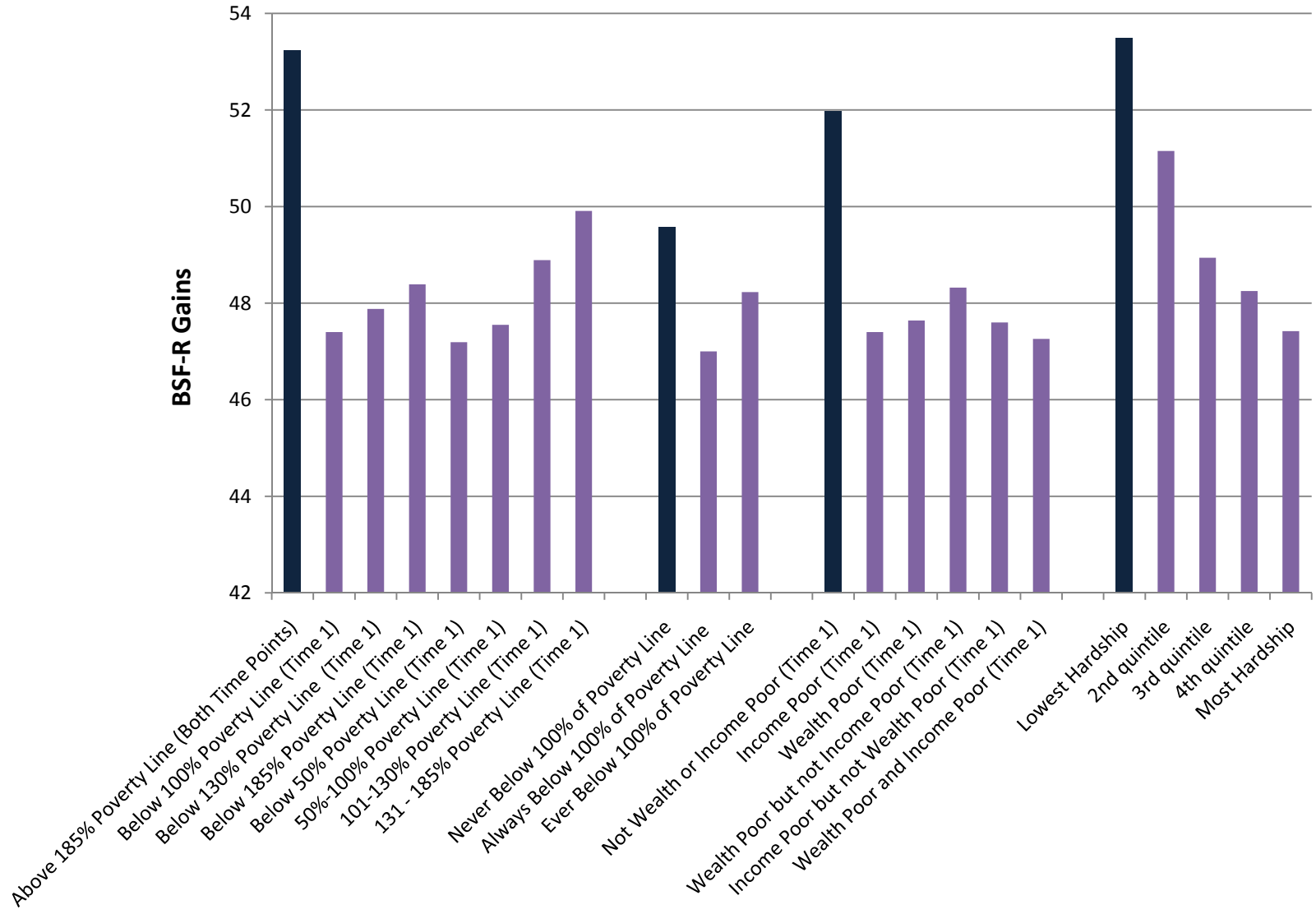


Table 4.5. Regression Coefficient and Poverty Conceptualizations (Multiple Indicators).

		Unstand. Coefficient	Sig. Level	R-Square	R-square Δ from Model 1
Base Model (Model 1)	*Age in Months at 9 Months*	-0.36	**	0.161	------
	Time Elapsed between	1.90	***		
	Cognitive Skills at 9 Months	0.54	***		
Wealth Poverty	*Reference Category: Not Income or Wealth Poor*			0.199	0.038
	Income Poor not Wealth Poor	-4.05	***		
	Wealth Poor not Income Poor	-5.01	***		
	Wealth and Income Poor	-4.15	***		
Degree of Income Poverty	***Reference Category: Above 185% of Poverty Line***			**0.207**	**0.046**
	< 50% Poverty Line	**-5.37**	***		
	50%-100% Poverty Line	**-5.32**	***		
	100%-130% Poverty Line	**-4.22**	***		
	130%-185% Poverty Line	**-3.11**	***		
Duration of Income Poverty	*Reference Category: Not Below Poverty Line either at 9 and 24 Months*			0.196	0.035
	Below Poverty Line at both 9 and 24 Months	-5.06	***		
	Below Poverty Line at 9 or 24 Months	-3.41	***		
Degree of Material Hardship	***Reference Category: Least Material Hardship***			**0.203**	**0.042**
	Second Quintile	**-1.80**	***		
	Third Quintile	**-4.16**	***		
	Fourth Quintile	**-4.95**	***		
	Most Material Hardship	**-5.82**	***		

CHAPTER FIVE: CREATION OF THE SKILL GAP IN THE MICRO-, MESO-, AND EXOSYSTEMS OF VERY YOUNG CHILDREN

Early childhood poverty is a persistent problem with serious economic consequences lasting into adulthood (Entwisle, Alexander, and Olson 2005). While ultimately felt most keenly through lower wages and less prestigious occupations, these eventual outcomes could be mitigated if children who experienced poverty at a very early age could achieve academically at a level rivaling their non-poor peers. However, as suggested above, this academic disadvantage originates prior to enrollment in formal schooling in the form of unequal cognitive skills. Results from Chapter Four suggest that degree of income poverty and material hardship are the aspects of poverty with the strongest relationship with cognitive skill growth at a very early age. This chapter continues the examination of poverty's impact on cognitive growth by exploring the following questions: How do material hardship and degree of income poverty impact cognitive skill growth in early childhood? Which microsystem and exosystem (as defined by Bronfenbrenner 1986) processes mediate the relationship between poverty and cognitive skill growth? How much of the relationship between poverty and cognitive skill growth can be explained by these proximate influences?

To answer these questions, I first use confirmatory factor analysis to construct the measures of microsytem and exosystem processes developed in Chapter Two. I then use structural equation modeling to assess the impact of poverty (both degree of income poverty and material hardship together) on cognitive skill growth, demonstrating the size of the gap at 24 months of age. Next, I develop and test a structural model that evaluates the relative impact of infant health problems, parental health problems, job benefits, and positive parenting practices on the relationship between poverty and cognitive skill

growth in early childhood. Finally, I evaluate the extent to which these mechanisms mediate the relationship between poverty and cognitive skill growth.

This chapter offers illuminating evidence for the emergence of the cognitive skill gap at 24 months of age, demonstrating that the degree of income poverty shapes cognitive skill growth primarily through material hardship. Evidence also suggests that infant and parental health problems, as well as positive parenting practices, directly predict cognitive skill growth. However, the most important mediating mechanism between both aspects of poverty and cognitive skill growth is parental health problems. Poverty negatively impacts parental health and, when parents are mentally and physically unhealthy, their children often suffer the consequences.

METHODOLOGICAL CAVEATS

Because structural equation modeling (SEM) moves beyond the more common place ordinary least squares techniques employed in sociological analyses, a few issues are worth mentioning before proceeding to the presentation of results. First, while included in the tables and text below, I do not often discuss the importance of significance levels. A common assumption of SEM explains that most pathways are statistically significant; the interest lies more in which pathways hold the most weight in predicting the outcome, rather than significance levels (Bollen 1989). Consequently, I focus on standardized regression coefficients and mention statistical significance only occasionally (e.g., if a pathway loses significance). Otherwise, pathways are significant at the most conservative confidence level ($p<0.001$).

Second, as mentioned in Chapter Three, there are many measures of fit for a structural equation model. Each of these measures of fit assesses a slightly different

aspect of how well the model fits the data. Thresholds for these measures vary. Convention suggests that the RMSEA should fall below a .06 threshold and that as the remaining measures of fit approach 1.0, the model more accurately fits the data. I do not present one of the most familiar measures of fit, the χ^2 statistic, because in SEM, the χ^2 statistic is an extremely conservative measure of fit. They are particularly sensitive to large sample sizes and the large number of variables included in the analysis and the models below have a sample size of almost 9,000 and include many indicators as well as latent variables (see Bollen 1989 for more information on goodness-of-fit statistics). Because of this, χ^2 statistics would often be significant, leading readers to question the model fit unnecessarily.

MEASUREMENT MODEL

The validity of measurement models is determined by the magnitude, size, and significance of the factor loadings in addition to the model fit statistics. The measurement models for these analyses are represented in Figure 5-1 and results from the model are presented in Table 5-1. All latent variables are allowed to vary with one another without hypotheses of how they vary. Results suggest that the model fit is adequate (RMSEA=.029, GFI=.966, CFI=.869) and that all factor loadings are strong and significant. For each latent variable, one factor loading must be set to 1 to set the metric for that variable. I completed preliminary analyses to determine the strongest observed indicator for each latent variable and set the regression weight for that variable to one in each case.

Material Hardship

Unlike in Chapter Four, where I measure material hardship as a scale to be consistent with the rest of the chapter, for these analyses, I estimate material hardship using confirmatory factor analysis which is a more robust analytic technique. Material hardship includes a measure of residential mobility, food insecurity, health insurance coverage, and receipt of public assistance. Lack of private health insurance loads most strongly on this measure and the regression weight is set to 1 for this reason (β=.87). A higher level of material hardship indicates that a family experiences more than one of the conditions above. As expected for subsequent structural models, material hardship was significantly and strongly correlated with all other latent variables: infant health (r=0.136, $p < .001$), positive parenting practices (r =-.203, $p < .001$), job benefits (r=-0.663, $p<.001$), and parental health problems (r=0.630, $p<.001$).

Positive Parenting Practices

This construct is composed of nine factors ranging from daily activities including the child to how parents learned about parenting skills (See Table 3-1). All measures were coded dichotomously prior to entry into the measurement model (1=engaged in the activity, 0=did not engage in the activity). A higher score on positive parenting practices indicates that parents engaged in more of these practices. Daily reading to the child was the factor most strongly related to the underlying construct of positive parenting practices (β=.68, $p < .001$). As mentioned above, positive parenting practices is strongly correlated with material hardship but the correlation between positive parenting practices and infant health problems is not significant (r=-.002, p=.918) suggesting that parents with children experiencing more health problems do not care for their children differently than parents with healthy children.

Infant Health Problems

I constructed infant health problems from a number of sources in the data including a series of questions assessing prenatal care, the specific health conditions of young children, extra time spent in the hospital at birth, birth weight and the quantity of health care since birth. These nine factors were also coded dichotomously; for example, a child who stayed at least one extra day in the hospital is coded as "1" in the extra day category. The indicator for extra days spent in the hospital was the most strongly correlated factor with the latent construct (β=.82, $p < .001$). All factors in this construct load positively onto the latent variable, "Infant Health Problems," except for the measure capturing the adequacy of prenatal care. This variable represents less than adequate prenatal care (values include approaching adequate, inadequate, no prenatal care). Surprisingly, this loads negatively on infant health problems indicating that children whose mothers received adequate to more than adequate prenatal care had more health problems than those who mothers received a lower quality of prenatal medical care.

Parental Health Problems

Parents were asked multiple questions about their own health status in the ECLS-B surveys. I combined many of these questions to construct a latent variable that captures both mental and physical health of the primary caregiver. The indicator assessing whether or not a parent currently smokes was the most strongly correlated factor for parental health (β=.43, $p<.001$). All but one observed variable load positively on this variable, indicating that as parents scored higher on the observed variables, they experienced more health problems. Interestingly, parent's current drinking habits loaded

negatively suggesting that, on a bivariate basis, parents who drink currently may have fewer health problems than those who do not.

Job Benefits

ECLS-B asked parents about the job benefits offered at their present position and about the job benefits of their spouse's primary employment (if applicable). For each job benefit, I combine these two questions and give each family a score of 0, 1, or 2 representing the number of jobs that offered the benefit in question. Then, using confirmatory factor analysis, I combined the seven indicators of job benefits available to families. Medical benefits loaded most strongly on the "Job Benefits" latent construct (β=.94, $p<.001$) and all indicator variables load positively on this factor. Higher scores on this factor indicate families with access to more overall fringe benefits and a higher likelihood of job conditions that foster skill sets benefiting the cognitive growth of children (Parcel and Menaghan 1994; Kohn et al. 1990).

UNMEDIATED EFFECT OF POVERTY ON COGNITIVE SKILL GROWTH

I use the model depicted in Figure 5-2 to provide a baseline estimate of the unmediated relationship between degree of income poverty and cognitive skill growth in very young children. Figure 5-2 is a simplified version of the conceptual model presented in Figure 3-3 with all mediating pathways removed. To maintain continuity with the remainder of this chapter, I use structural equation modeling to estimate the path coefficients in this model. However, these estimates are identical to an OLS regression predicting cognitive skills at 24 months while controlling for prior cognitive skills, age in months, time elapsed between assessments, and race. The full results for the structural equation model

are presented in the first model of Table 5-2 while Figure 5-2 displays that standardized coefficients for this model.

Confirming results from Chapter Four, Model 1 shows a strong negative effect associated with the degree of income poverty experienced by a child (b=-1.26, $p < .001$, β=-0.17). Recall degree of income poverty is constructed as an ordinal measure that increases as the degree of income poverty increases. As expected, all control variables have a significant impact on cognitive skills at 24 months. Race is a strong and significant predictor of cognitive skill growth in early childhood; white children are out-performing their non-white peers independently of poverty status (b=3.07, $p < .001$, β=0.14). As expected, prior cognitive skills at nine months and months elapsed between assessments are the strongest predictors of skills at 24 months of age. Once time elapsed between assessments is controlled for, age in months is no longer a significant predictor of cognitive skill growth at 24 months, indicating that time to grow is a more important determinant of skill growth than the age of first assessment. Measures of fit for this model are not presented because this is not, in essence, a structural equation model. By design, this model is underspecified and serves simply to provide a baseline for future models.

The results from this model highlight two points. First, as children experience a higher degree of income poverty, the rate of cognitive skill growth decreases, net of age, prior skills, race, and time between assessments. As mentioned above, this confirms findings from Chapter Four which found few bivariate relationships between poverty conceptualizations and cognitive skills at 9 months but significant differences in skills at 24 months. Clearly, poor children are not gaining cognitive skills at the same rate as their

non-poor peers; as the extent of the poverty condition worsens, their cognitive skill growth diminishes even more. Second, degree of income poverty impacts cognitive skill growth to a larger extent than race at 24 months of age. While the data suggest that the race gap emerges simultaneously with the poverty gap, poverty is a stronger overall predictor of skill growth.

Figure 5-3 continues the estimation of the impact of poverty on cognitive skill growth in early childhood with the addition of material hardship[8]. As Figure 5-3 shows, degree of income poverty is an antecedent to material hardship because families faced with low-incomes experience many of the day-to-day hardships because of low-income flow. That is, as the degree of income poverty increases, families are more likely to face one or more of the adverse life events captured by material hardship, including food insecurity, residential instability, lack of adequate healthcare, and receipt of public assistance (see Gershoff et al. 2007 for a similar modeling strategy). Results from model fit analyses confirm this analytic strategy. Table 5-3 presents a comparison between the full structural model described below and a structural model without the path between degree of income poverty and material hardship. The model containing the link between degree of income poverty and material hardship is a far more accurate model than without this link. Table 5-3 presents the fit statistics for both models followed by a column comparing the magnitude of each fit statistic. The final model is a better fit in all cases as the CFI and GFI are closer to 1 and the RMSEA is closer to zero. More notable is the *Bayesian Information Criteria* (BIC) ; these measures are useful only in a relative sense, that is when comparing models to one another. As the BIC gets smaller, the model

[8] Recall from Chapter Four that material hardship and degree of income poverty explain the most variation in my outcome of interest. As a result, these are the two conceptualizations of poverty used in Chapter Five and Chapter Six.

better fits the data. Indeed Table 5-3 shows that the final model (BIC = 12,559) is a significantly better fit than the model *without* material hardship (BIC = 18,685).[9] That being said, I am *not* asserting that the full impact of degree of income poverty works through material hardship. Thus, Figure 5-3 models both the direct and indirect effects of degree of income poverty and the direct effect of material hardship on cognitive skill growth at 24 months. Like Figure 5-2, Figure 5-3 presents the standardized path coefficients while Table 5-2, Model 2 presents the full results from this analysis.

These results suggest that while the degree of income poverty significantly slows cognitive skill growth in very young children ($b=-0.35$, $p<.01$, $\beta=-0.05$), the majority of its impact works through material hardship. In fact, the pathway between income poverty and material hardship is the strongest relationship in the model ($b=0.22$, $p < .001$, $\beta=0.75$) such that the indirect effect of the degree of income poverty on cognitive skill growth ($b=-0.93$, $p<.001$, $\beta=-0.12$) accounts for 70% of the impact of degree of income poverty on skill growth at 24 months. Material hardship is also directly and negatively related to cognitive skill growth ($b=-4.24$, $p < .001$, $\beta=-0.16$). Similar to Model 1, the path coefficients for the control variables are significant predictors of skill gains. As in previous analyses, prior skill level and the time between tests both strongly promote cognitive skill growth.

This model demonstrates the importance of material hardship in the experience of poverty. Results suggest that being "poor" is more about the tangible experiences that accompany income hardship than just the lack of income. Many of these experiences are shared by those who are not commonly thought of as poor and thus, any child residing

[9] Rafferty (1993) suggests that a BIC difference of 5 strongly suggests that one model is superior to another while a difference of 10 is conclusive evidence.

with a family impacted by material hardship may experience some of the skill depreciation stemming from this relationship. Modeling income poverty through a summary measure that captures multiple dimensions of material hardship is a first step to uncovering how exactly poverty impacts children at a very young age. The primary question in this project is to explore how poverty works to create a cognitive skill gap in early childhood. Already, we have begun to find an answer to that question: income poverty creates daily living experiences that negatively impact cognitive skill growth. The question remains, how does material hardship slow cognitive skill growth in very young children?

MEDIATED EFFECT OF POVERTY ON COGNITIVE SKILL GROWTH

Figure 5-4 models the mediated relationship between poverty and cognitive skill gains through positive parenting practices, infant health problems, parental health problems, and job benefits. I represent pathways with coefficients that do not reach conventional levels of significance with dashed lines instead of solid lines. Table 5-4 presents both the standardized and unstandardized direct, indirect, and total effects for this model as well as the model fit statistics. The fit for this model is sufficient at conventional thresholds. The GFI and CFI are both close to 1 while the RMSEA is below .05 (GFI=0.885, CFI=0.944, RMSEA=0.037). Similar to the unmediated models presented above, the controls are significant and important predictors of gains in the mediated model. In terms of total effects, prior skills ($b=0.41$, $p<.001$, $\beta=0.38$) and time between assessments ($b=1.63$, $p<.001$, $\beta=0.31$) remain the strongest predictors of cognitive skill gains at 24 months. Interestingly, a child's age at the time of the first assessment is now a significant predictor of skill gains indicating a slight advantage for children who were tested at a

later age (b=0.36, p<.001, β=0.06). The rudimentary measure of race is also a strong predictor of gains (b=2.80, p<.001, β=0.13) confirming the emergence of a racial cognitive skill gap at two years of age.

The literature reviewed in Chapter Two suggests that the microsystem, mesosystem, and exosystem processes included in this model impact cognitive skill gains and may mediate the relationship between poverty and cognitive skill gains (positive parenting practices, infant health problems, parental health problems, and job benefits). To confirm and test these suppositions, I discuss the results from Figure 5-4 in three steps. First, I engage the left side of Figure 5-4, or the links between poverty (both degree of income poverty and material hardship) and the four mediating mechanisms. Then I move on to the right side of Figure 5-4, assessing how each mediating mechanism directly impacts cognitive skill growth. Finally, I talk about these two stories together to gain insight regarding which mechanisms have the strongest role in the creation of the cognitive skill gap between poor and non-poor children.

Direct Effects of Poverty on Mediating Mechanisms

The degree of income poverty is significantly related to some but not all of the mediating mechanisms, partially supporting the expectations outlined in Chapter Two. As families experience a more severe level of poverty, parents are less likely to use positive parenting practices (b=-0.02, p<.001, β=-0.08) and parents are more likely to be employed in jobs with few benefits (b=-0.81, p<.001, β=-0.61). However, contrary to expectations, more severe income poverty is negatively related to infant health problems, suggesting that extremely poor infants are less likely to have health problems (b=-0.01, p<.01, β=-0.06) although this path coefficient is smaller in magnitude when compared with other

coefficients. Another surprising finding arises when addressing parental health problems; the pathway leading from the degree of income poverty to parental health problems is not significant at conventional levels of significance.

The relationship between material hardship and infant health problems (b=0.14, p<.001, β=0.18) as well as between material hardship and parental health problems (b=0.35, p<.001, β=0.61) is strong and in the expected direction. These data suggest that families experiencing high levels of material hardship suffer consequences through health status, both adults and children. In fact, the relationship between material hardship and parental health is one of the strongest relationships in the model (β=0.61), accentuating the point that parental physical and mental health is directly and critically related the material aspects of poverty. High levels of material hardship are also associated with few fringe benefits at work (b=-0.81, p<.001, β=-0.52) and fewer positive parenting practices in early childhood (b=-0.11, p<.001, β=-0.14). When comparing standardized coefficients of the pathways leading from degree of income poverty and those originating with material hardship, the coefficients for degree of income poverty are substantially weaker than the pathways leading from material hardship. This indicates, once again, that the impact of degree of income poverty works primarily through material hardship.

Direct Effects of Mediating Mechanisms on Cognitive Skills

The next step in assessing the importance of mediating processes on cognitive skill growth is to discuss the importance of each mechanism in predicting cognitive skill gains. The right side of Figure 5-4 presents the standardized path coefficients while the top section of Table 5-4 presents both standardized and unstandardized coefficients for the direct paths between the latent variables and skill growth. With the exception of job

benefits, all mechanisms impact cognitive skills in the expected direction. Using positive parenting practices promotes skill growth (b=4.51, p<.001, β=0.13) while infant health problems (b=-4.23, p<.001, β=-0.13) and parental health problems (b=-3.97, p<.001, β=-0.09) both slow it. My measure of fringe benefits offered at work, however, does not impact learning at conventional levels of significance.

These data suggest that at two years of age, positive parenting practices and infant health are critically important to promoting learning in early childhood, slightly more important than parental health (β's respectively=0.13, -0.13, and -0.09). This supports sociological and public health research that emphasizes the importance of specific parenting techniques for the promotion of cognitive skills in childhood (Lareau 1987; Smith, Brooks-Gunn, and Klebanov 1997) and much of the public health literature that emphasizes that children who gain skills most rapidly are children with few health problems (Rank 2005; Rothstein 2004; Palloni 2006). Parental health problems significantly predict cognitive skill growth but not to the extent of positive parenting practices or infant health. Much of the impact of parental health problems on cognitive skill growth may be indirect. Parents with more health problems may not have the same amount of physical and emotional energy to spend with their children engaging in positive parenting practices. While extensive analyses are beyond the scope of this study, preliminary analyses indicate that parental health problems do negatively impact positive parenting practices (b=-0.145, p<.001, β=-0.11) but this indirect impact on cognitive skill gains is in addition to the still strong and significant direct link.

Significance of Mediated Pathways on Cognitive Skill Gains

Knowing the significant and relative importance of each step of the path diagram presented in Figure 5-4 is insufficient to draw conclusions regarding the mediation of the relationship between poverty and cognitive skill gains in early childhood. To make inferential conclusions regarding these mediated pathways, I follow the guidelines of MacKinnon and Dwyer (1993) and Gershoff et al. (2007) to calculate the significance of each of the mediated pathways presented in the full model. Figure 5-5 clarifies the final model by displaying only significant mediated pathways while Table 5-5 presents the unstandardized coefficients of each pathway, mediated effect sizes, and the associated joint z-score for each pathway.[10] No additional models were run for Figure 5-5; it is simply a simplification of Figure 5-4. All mediated pathways are significant at conventional levels of significance indicating that the mediators included in the model do account for significant portions of the association between poverty and cognitive skill gains. Surprisingly, the positive finding regarding the relationship between the degree of income poverty and cognitive skill growth when modeled through infant health problems remains significant in the meditational analysis.

While unstandardized coefficients must be used to calculate the significance of the mediated pathways, to assess the overall strength of each pathway leading from poverty to cognitive skill growth, I use the same multiplicative procedure with the standardized coefficients. Table 5-6 displays these calculations for both income poverty and material hardship. See Lindhorst et al. (2009) for a similar methodological approach.

The bolded pathways in Table 5-6 highlight the strongest indirect pathways from poverty to cognitive skills. One of the two strongest pathways leads from degree of

[10] See MacKinnon and Dwyer for detailed formulas regarding how to calculate the mediated pathway coefficient as well as the standard error and Z-score for the pathway as a whole.

income poverty through material hardship to cognitive skill growth (Mediated Coefficient = .05). Together with the significance tests in Table 5-5, these results suggest that much of the association between poverty (in this case, material hardship) and cognitive skill growth remains to be explained. This is likely due to the focus on my model primarily on a child's immediate social environment. I expect that as more exogenous factors are incorporated into this model, more of the association between poverty and cognitive skill growth will be explained.

With regard to the mediating mechanisms, poverty works most strongly through parental health (Mediated Coefficient = .05). Although infant health problems and positive parenting practices have the strongest direct effects of the mediating mechanisms on cognitive skill growth, the strongest overall mediated pathway works through parental health. Parents, perhaps, are able to shield their children from the worst consequences of poverty and instead, they shoulder the brunt of it themselves to the detriment of their own mental and physical health. However, this strategy backfires as unhealthy parents are less able to positively impact their children's cognitive growth. Notably, results from Table 5-6 also suggest that the strongest pathways leading from poverty to cognitive skills work through material hardship, not degree of income poverty, suggesting that at least in terms of predicting cognitive skills, the daily stresses of being "poor" are more critical than the level of income.

EXTENT OF MEDIATION AT THE MICROLEVEL AND MESOLEVEL

Although the full structural model indicates a critical role for the conditions of a child's microsystem, mesosystem, and exosystem, both degree of income poverty and material hardship still maintain significant, negative, and direct effects on cognitive skill growth in

early childhood (Table 5-4). These path coefficients are far from the strongest relationships in the model and both have lost levels of significance and magnitude when compared to the unmediated model. Similar to the unmediated model presented in Figure 5-3 and Table 5-2, material hardship ($b=-1.69$, $p<.01$, $\beta=-0.07$) remains a stronger predictor than degree of income poverty ($b=-0.28$, $p<.05$, $\beta=-0.04$). The indirect effects of both aspects of poverty are stronger than their direct effects. The indirect effect of material hardship on cognitive skills accounts for 65% of the total effect of material hardship. This pattern is even more notable for income poverty as the indirect effect of income poverty accounts for 78% of the total effect on the degree of income poverty on cognitive skill gains.

All of this is to say that the mediating mechanisms represented here explain a significant amount of the effect of poverty on cognitive skill gains but a portion of the direct effect remains unexplained. This can probably be attributed to processes taking place outside of the micro-, meso-, and exosystems, in addition to characteristics not measured from these systems in this chapter. For instance, my admittedly raw proxy for job conditions fails to capture the effect documented by previous literature of job conditions and the promotion of cognitive skills. Bronfenbrener (1986) also suggests that processes specific to locale, region, and time also impact child development. These social spheres are outside the scope of this study but certainly warrant more investigation.

DISCUSSION

The impact of childhood poverty on life chances is well documented (see Entwisle, Alexander, and Olson 2005). This chapter explores *how* the consequences of an early

childhood spent in poverty have immediate and serious consequences on learning. The results presented above contribute to the literature in three important ways.

First, these results concur with recent research suggesting that poverty works through material hardship, not simply as a function of income dearth. Indeed, the results from Table 5-4 suggest a weak impact on cognitive skill growth *directly* through income poverty, providing contradictory evidence to suggestions of an innate condition of the poor that creates a "natural" gap between the "haves" and the "have nots" of American society. Instead, the lack of resources and the instability stemming from this scarcity drives the impact income poverty has on learning in early childhood. Although the association between income poverty and learning remains significant in models including material hardship, the direct effect of material hardship on cognitive skill growth remains stronger than the direct effect of income poverty, even when accounting for micro-, meso-, and exosystem processes like infant health problems, positive parenting practices, and parental health problems.

Second, the link between infant health problems and cognitive skill growth is strong and significant but the link between poverty and *parental health problems* is stronger when explaining the skill gap between poor and non-poor children. As explained above, degree of income poverty works through parental health problems primarily by first increasing the likelihood of material hardship. That is, degree of income poverty has an *indirect*, positive impact on parental health problems; poor families are more likely to experience material hardship which leads to higher levels of depression, unhealthy habits, and poor overall physical health. While this indirect effect may seem substantively intuitive, the lack of a significant effect between degree of income poverty and parental

health problems suggests that the mere lack of income does not cause health difficulties for parents. Instead, it is the daily stresses of low-income that lead to detrimental health. Following, parents struggling with health problems slow their children's cognitive skill growth. How this happens remains an issue for future research and thus calls for additional theorizing regarding the pathways through which parental health impacts learning at a very early age.

Finally, positive parenting practices promote cognitive skill growth, as we would expect from the literature reviewed in Chapter Two. However, I expected that poverty would have a negative impact on parenting practices and that this relationship would explain a substantial part of the relationship between poverty and cognitive skill growth. Results only partially support this hypothesis. Poverty does negatively and directly impact parenting practices but it more strongly impacts positive parenting practices through material hardship. Material hardship has a stronger negative (almost double the effect of degree of income poverty) impact on positive parenting practices, which subsequently positively impacts cognitive skills. However, recall that material hardship and degree of income poverty are not synonymous, suggesting interesting implications for sociological literature regarding the behaviors of "the poor."

The culture of poverty tradition suggests that "the poor" in the United States (characterized most often by the traditionally measured poverty line) possess a value system leading to parenting practices that differ from the commonly accepted code (Lewis 1965). However, these results suggest that material hardship, or daily distress, more strongly predicts this cultural measure. As mentioned above, material hardship, while experienced by the poor more often, is also a measure of insecurity and could be

experienced by most families, whether above or below the income poverty threshold. While class differences in parenting may still exist (see Lareau 2003), perhaps at a more finely delineated level, these results challenge research suggesting that poor parents utilize parenting strategies that do not benefit their children cognitively.

CHAPTER FIVE: TABLES AND FIGURES

Figure 5-1. Measurement Model.

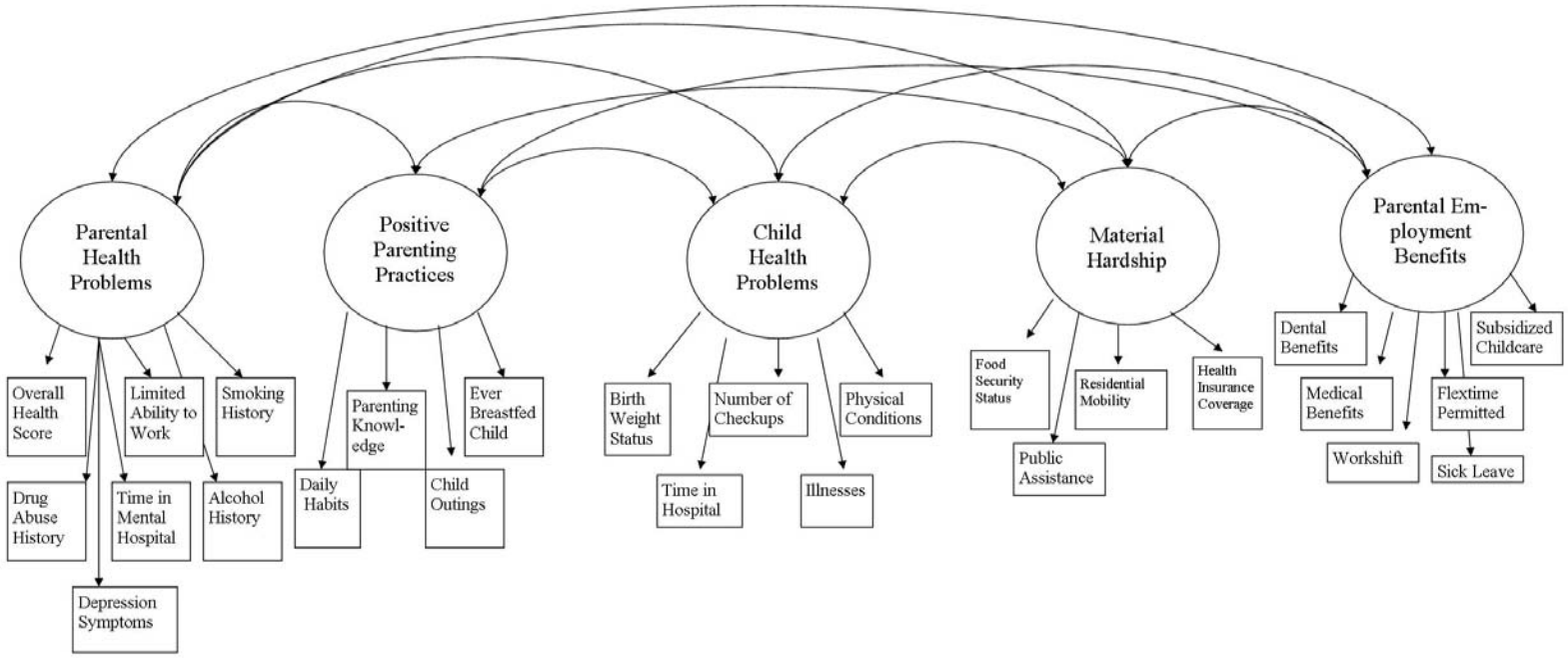


Figure 5-2. Unmediated Effect of Degree of Income Poverty on Cognitive Skills at 24 Months (Standardized Coefficients).

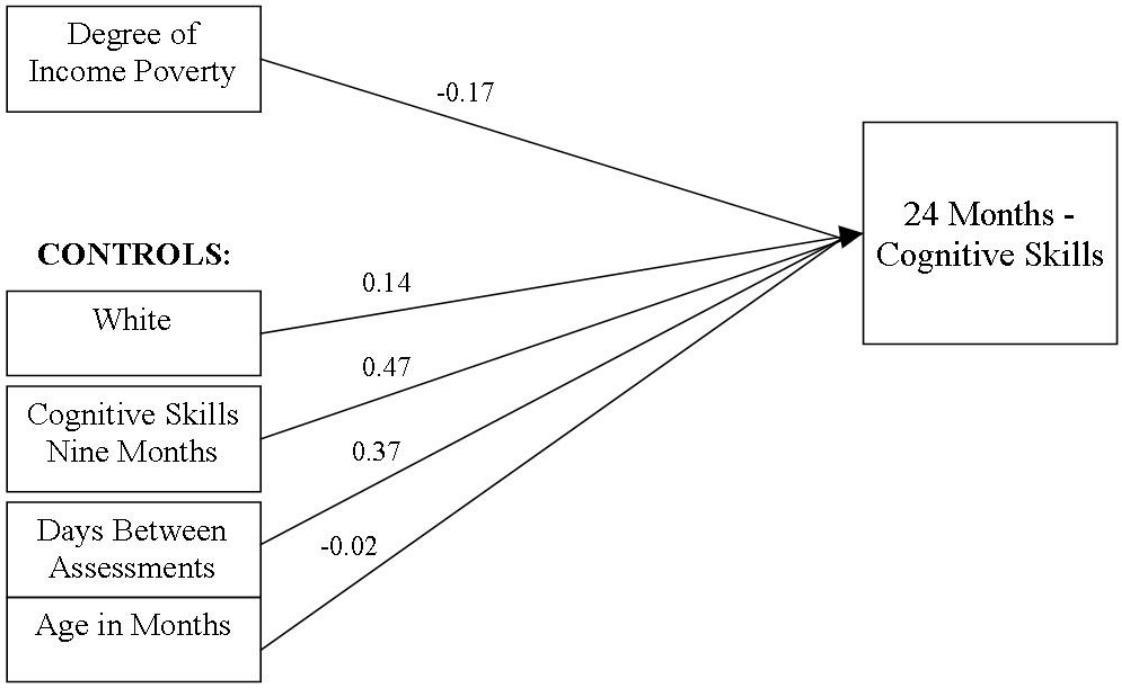


Figure 5-3. Effect of Degree of Income Poverty and Material Hardship on Cognitive Skills at 24 Months (Standardized Coefficients).

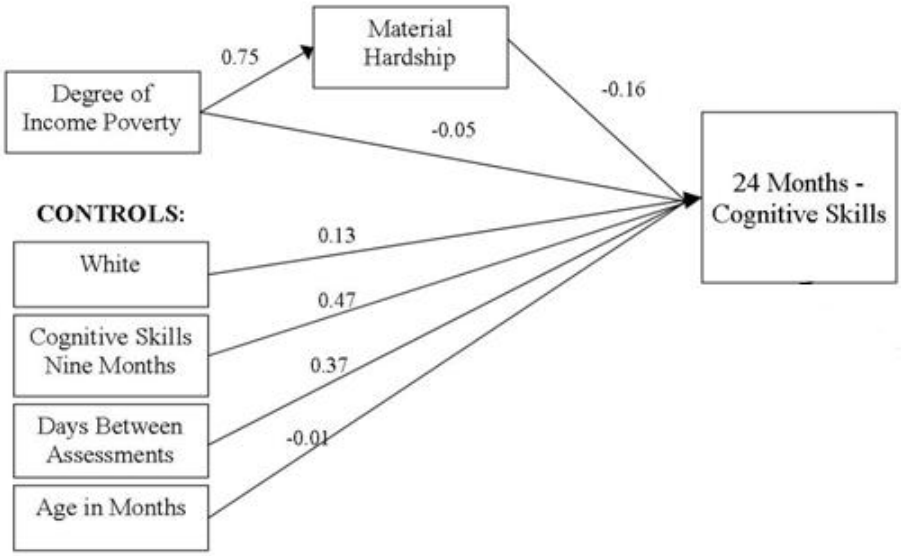


Figure 5-4. Mediated Effects of Income Poverty and Material Hardship on Cognitive Skills at 24 Months (Standardized Coefficients).

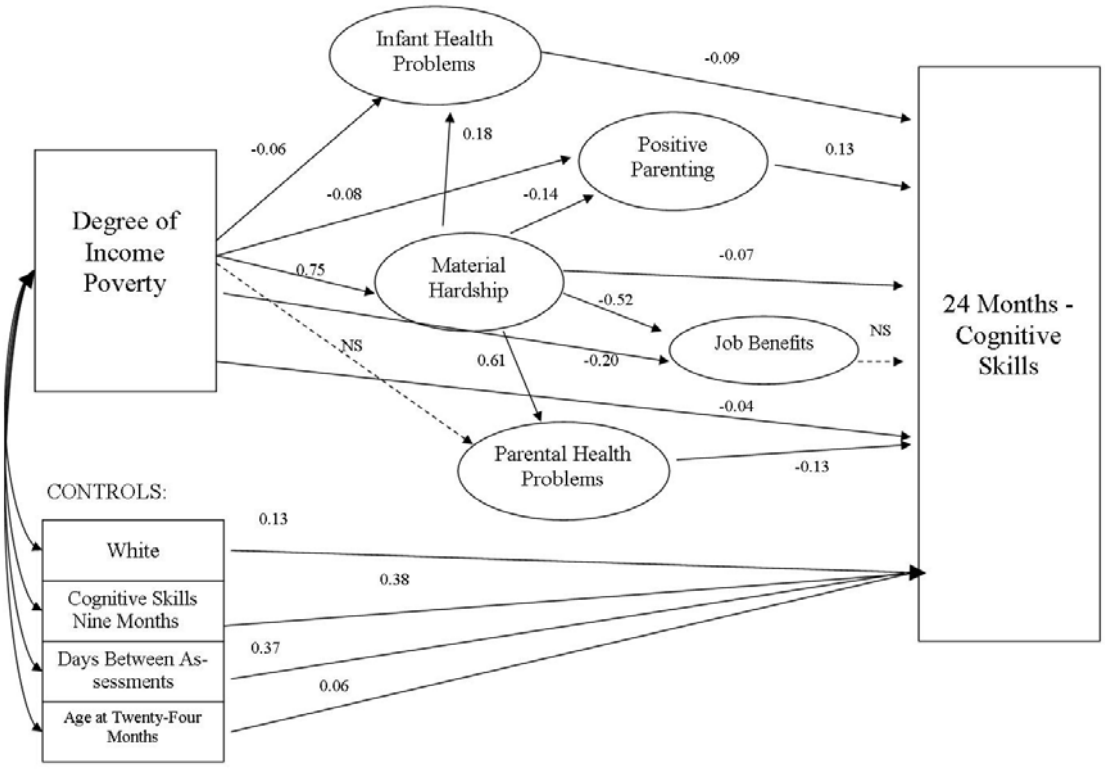


Figure 5-5. Significant Mediated Pathways from Income Poverty and Material Hardship to Cognitive Skill Growth at 24 Months (Standardized Coefficients).

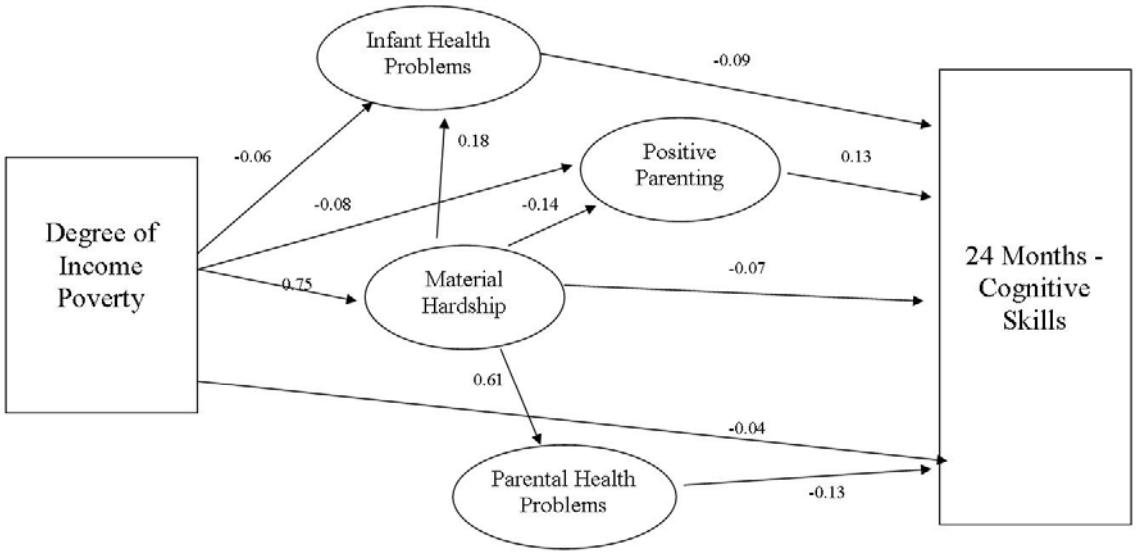


Table 5-1. Measurement Model.

Relationship	Unstand. Coefficient	Stand. Error	Stand. Coefficient
Material Hardship			
Residential Mobility ← Material Hardship	0.03**	0.01	0.03
No Private Health Insurance ← Material Hardship	1.00		0.87
Food Insecurity Status ← Material Hardship	0.31***	0.01	0.32
WIC Benefits ← Material Hardship	0.84***	0.01	0.74
Other Welfare Receipt ← Material Hardship	0.28***	0.01	0.41
Food Stamps ← Material Hardship	0.61***	0.01	0.65
Medicaid ← Material Hardship	0.90***	0.01	0.80
Positive Parenting Practices			
Ever Breast Fed ← Positive Parenting Practices	0.23***	0.02	0.15
Play Peek-a-Boo Daily ← Positive Parenting Practices	0.32***	0.02	0.22
Tickle Child Daily ← Positive Parenting Practices	0.11***	0.01	0.15
Play Outside Daily ← Positive Parenting Practices	0.25***	0.02	0.16
Read to Child Daily ← Positive Parenting Practices	1.00		0.68
Tell Stories Daily ← Positive Parenting Practices	0.88***	0.03	0.62
Sing to Child Daily ← Positive Parenting Practices	0.49***	0.02	0.35
Run Errands with Child Daily ← Positive Parenting Practices	0.16***	0.02	0.10
Used a Parenting Magazine ← Positive Parenting Practices	0.28***	0.02	0.19
Infant Health Problems			
Low Birth Weight ←Infant Health Problems	0.95***	0.03	0.74
More than One Day Extra in Hospital ←Infant Health Problems	1.00		0.82
Asthma ←Infant Health Problems	0.10***	0.01	0.14
Other Respiratory Illness ←Infant Health Problems	0.16***	0.01	0.16
Gastrointestinal Illness ←Infant Health Problems	0.10***	0.01	0.15
Hearing Problems ←Infant Health Problems	0.02***	0.00	0.08
Vision Problems ←Infant Health Problems	0.07***	0.00	0.19
Wellbaby Checkups ←Infant Health Problems	1.23***	0.08	0.19
Less than Adequate Prenatal Care ←Infant Health Problems	-0.05**	0.02	0.04
Parental Health Problems			
Not in Very Good Overall Health ← Parental Health Problems	1.10***	0.05	0.40
Smokes Now ← Parental Health Problems	1.00		0.43
Drinks Now ← Parental Health Problems	-0.48***	0.04	-0.18
Ever Used Drugs ← Parental Health Problems	0.32***	0.02	0.25
Ever Spent Night in Mental Facility ← Parental Health Problems	0.22***	0.02	0.19
Score on Depression Scale ← Parental Health Problems	1.40***	0.07	0.39
Parental Job Benefits			
Dental Benefits ← Parental Job Benefits	0.95***	0.01	0.90
Medical Benefits ← Parental Job Benefits	1.00		0.94
Subsidized Childcare ← Parental Job Benefits	0.20***	0.01	0.34
Day Shift ← Parental Job Benefits	0.63***	0.01	0.60
Flexible Time ← Parental Job Benefits	0.45***	0.01	0.46
Sick Leave ← Parental Job Benefits	0.87***	0.01	0.83
Model Fit (n=8,913) GFI=0.966, CFI=0.869, RMSEA=.029, AIC=5727.23, BIC=6436.75			

Table 5-2. Unmediated Effects of Poverty on Cognitive Skill Growth.

Relationship	**Unstandardized Effect**	**Standardized Effect**
Model 1: Degree of Income Poverty		
Direct Effects		
Degree of Income Poverty → Cognitive Skills at 24 Months	-1.26***	-0.17
White → Cognitive Skills at 24 Months	3.07***	0.14
Cognitive Skills at 9 Months → Cognitive Skills at 24 Months	0.52***	0.47
Age in Months at 9 Months → Cognitive Skills at 24 Months	-0.13	-0.02
Time Between Assessment → Cognitive Skills at 24 Months	2.01***	0.37
Model 2: Degree of Income Poverty and Material Hardship		
Direct Effects		
Degree of Income Poverty → Cognitive Skills at 24 Months	-0.35**	-0.05
Material Hardship → Cognitive Skills at 24 Months	-4.24***	-0.16
White → Cognitive Skills at 24 Months	2.81***	0.13
Cognitive Skills at 9 Months → Cognitive Skills at 24 Months	0.52***	0.47
Age in Months at 9 Months → Cognitive Skills at 24 Months	-0.07	-0.01
Time Between Assessment → Cognitive Skills at 24 Months	2.01***	0.37
Degree of Income Poverty → Material Hardship	0.22***	0.75
Indirect Effects		
Degree of Income Poverty → Cognitive Skills at 24 Months	-0.93***	-0.12
Total Effects		
Degree of Income Poverty → Cognitive Skills at 24 Months	-1.29***	-0.17

Model Fit (n=8,913) GFI=0.979, CFI=0.973, RMSEA=.050, AIC=1320.95, BIC=1590.57

Table 5-3. Comparison of Model Fit for Mediated Poverty Models.

Model	**CFI**	**ΔCFI**	**GFI**	**ΔGFI**	**RMSEA**	**ΔRMSEA**	**BIC**	**ΔBIC**
Degree of Income Poverty Directly Predicting Material Hardship *(Final Model)*	0.894		0.944		0.037		12,559	
Degree of Income Poverty unrelated to Material Hardship	0.833	-0.061	0.922	-0.022	0.046	0.09	18,685	6,126

Table 5-4. Mediated Effects of Poverty on Cognitive Skills at 24 Months.

Relationship	Unstandardized Effect	Standardized Effect
Direct Effects		
Degree of Income Poverty → Cognitive Skills at 24 Months	-0.28*	-0.04
Material Hardship → Cognitive Skills at 24 Months	-1.69**	-0.07
Job Benefits → Cognitive Skills at 24 Months	0.27 ^{NS}	0.02
Positive Parenting Practices → Cognitive Skills at 24 Months	4.51***	0.13
Parental Health Problems → Cognitive Skills at 24 Months	-3.97***	-0.09
Infant Health Problems → Cognitive Skills at 24 Months	-4.23***	-0.13
White → Cognitive Skills at 24 Months	2.80***	0.13
Age in Months at 9 Months → Cognitive Skills at 24 Months	0.36***	0.06
Time Between Assessments → Cognitive Skills at 24 Months	1.99***	0.37
Cognitive Skills at 9 Months → Cognitive Skills at 24 Months	0.41***	0.38
Degree of Income Poverty → Material Hardship	0.22***	0.75
Degree of Income Poverty → Positive Parenting Practices	-0.02***	-0.08
Degree of Income Poverty → Job Benefits	-0.09***	-0.20
Degree of Income Poverty → Parental Health Problems	0.01^{+}	0.04
Degree of Income Poverty → Infant Health Problems	-0.01**	-0.06
Material Hardship → Positive Parenting Practices	-0.11***	-0.14
Material Hardship → Job Benefits	-0.81***	-0.52
Material Hardship → Parental Health Problems	0.35***	0.61
Material Hardship → Infant Health Problems	0.14***	0.18
Indirect Effects		
Degree of Income Poverty → Positive Parenting Practices	-0.02***	-0.10
Degree of Income Poverty → Job Benefits	0.08***	0.46
Degree of Income Poverty → Parental Health Problems	0.03***	-0.14
Degree of Income Poverty → Infant Health Problems	-0.18***	-0.39
Degree of Income Poverty → Cognitive Skills at 24 Months	-1.05***	-0.14
Material Hardship → Cognitive Skills at 24 Months	-2.68***	-0.11
Total Effects		
Degree of Income Poverty → Cognitive Skills at 24 Months	-1.32***	-0.18
Material Hardship → Cognitive Skills at 24 Months	-4.37***	-0.17

Model Fit (n=8,913) GFI=0.944, CFI=.894, RMSEA=.037, AIC=11,687.06, BIC=12,559.78

Table 5-5. Significance of Mediated Pathways in the Final Model Predicting Cognitive Skill Gains.

a b IV → M → DV	a (se)	b (se)	Mediated Effect a *x* b (se)	*Z*
Degree of Income Poverty → Infant Health Problems → Skill Gains	-.01 (.005)	-4.23 (.352)	0.04 (.02)	2.00*
Degree of Income Poverty → Positive Parenting Practices → Skill Gains	-.02 (.005)	4.51 (.421)	-0.09 (.02)	-4.50***
Degree of Income Poverty → Material Hardship → Skill Gains	.22 (.003)	-1.69 (.597)	-0.37 (.13)	-2.85**
Material Hardship → Infant Health Problems → Skill Gains	.14 (.016)	-4.23 (.352)	-0.59 (.05)	-11.80***
Material Hardship → Parental Health Problems → Skill Gains	.35 (.018)	-3.97 (.978)	-1.39 (.35)	-3.97***
Material Hardship → Positive Parenting Practices → Skill Gains	-.11 (.016)	4.51 (.421)	-0.89 (.08)	-11.13***

*$p < .05$, **$p < .01$, ***$p < .001$

N = 8,933, IV = Independent Variable, M = Mediating Variable, DV = Dependent Variable

Unstandardized coefficients are presented with standard errors in parantheses.

Table 5-6. Strength of the Mediated Pathways in the Final Model Predicting Cognitive Skill Gains.

a b IV → M → DV	a	b	Mediated Effect a *x* b
Degree of Income Poverty → Infant Health Problems → Skill Gains	-0.06	-0.13	0.01
Degree of Income Poverty → Positive Parenting Practices → Skill Gains	-0.08	0.13	-0.01
Degree of Income Poverty → Material Hardship → Skill Gains	**0.75**	**-0.07**	**-0.05**
Material Hardship → Infant Health Problems → Skill Gains	0.18	-0.13	-0.02
Material Hardship → Parental Health Problems → Skill Gains	**0.61**	**-0.09**	**-0.05**
Material Hardship → Positive Parenting Practices → Skill Gains	-0.14	0.13	-0.02

N = 8,933, IV = Independent Variable, M = Mediating Variable, DV = Dependent Variable

All presented coefficients are standardized.

CHAPTER SIX: THE IMPLICATIONS OF POVERTY FOR EARLY COGNITIVE SKILL GROWTH ACROSS RACIAL/ETHNIC GROUPS

Results from Chapter Five show how the cognitive skill gap between poor and non-poor children emerges by two years of age. However, sociological theory suggests that due to negative structural conditions and the legacy of racist policies, poverty may impact children of particular minority groups differently. This chapter explores this possibility by asking: *How does poverty inhibit cognitive skills differently across racial/ethnic groups?*

More specifically, within each racial category, does poverty create a skill gap? If so, does poverty create a skill gap in a similar manner to results from Chapter Five? What processes do racial groups share and what processes are unique to each group? The analyses below explore these questions and come to three main conclusions. First, the type of poverty is crucial to explaining cognitive skill gaps within racial groups. For example, for white children, the degree of income poverty experienced early in life strongly predicts cognitive skills at 24 months of age. However, for Hispanics, these results suggest that material hardship explains more about cognitive skill growth than the degree of income poverty. Second, the cognitive skill gap does emerge through different processes within each racial category, although some similarities remain across groups. While parenting practices significantly predicts skill growth for all racial/ethnic groups, poverty (regardless of conceptualization) is not significantly related to parenting practices for American Indian/Native Alaskan children. Further differences across the mediated pathways described in Chapter Five exist across racial/ethnic categories. Finally, when looking at the cognitive skill growth of American Indian and Native Alaskan children,

poverty appears to be much less salient than it is for other groups. Therefore, researchers need to be particularly cautious before drawing conclusions about poverty and cognitive skills for particular demographics.

The literature reviewed in Chapter Two suggests that segregation and isolation may be impacting the development of children differently for four particular racial groups: whites, Blacks, Hispanics, and American Indian/Native Alaskans (AI/NA). Although Asian children and multi-racial children are also included in the ECLS-B sample, I exclude them from the following analyses. Historically, Asians have been able to integrate into white communities to a much larger degree than Blacks, Hispanics, or American Indians/Native Alaskans, thereby suggesting that if there are differences in how poverty slows cognitive growth for Asian children, they are not due to the same structural conditions as those that have historically disadvantaged Black, Hispanic and AI/NA children (Massey and Denton 1998; Charles, Dinwiddie, and Massey 2004). I exclude multi-racial children from the analyses because I have no theory-driven expectations for how poverty slows cognitive growth for these children. Few studies focus on the processes that impact multiracial children, probably due to the considerable variation present in this group. For these reasons, below I only compare analyses across four racial/ethnic groups: Blacks, Hispanics, American Indians/Native Alaskans, and Whites.

My presentation of results takes place in five steps for this chapter. First, I establish the emergence of skill gaps at 24 months of age between the four racial categories discussed above regardless of poverty status. Next, I discuss how poverty status varies across racial categories using the two key measures of poverty discussed in

Chapter Four. Following, I outline the relationship between cognitive skill gains and poverty status across racial groups to assess whether a poverty skill gap *within* racial group emerges at 24 months. I follow these results with an assessment of how the patterns from the final model discussed in Chapter Five differ when considering each racial/ethnic group. Finally, I discuss the implications of these results for policy and future research.

THE RACIAL GAP IN COGNITIVE SKILL GAINS IN EARLY CHILDHOOD

While the racial achievement gap is well documented and garners much attention in sociological literature (see Magnuson and Waldfogel [2008] regarding the Black-White achievement gap; Reardon and Galindo [2009] for the Hispanic-White achievement gap), the racial learning gap prior to formal schooling is less studied, particularly within sociology (cf., Halle et al. 2009). However, results from the ECLS-B data suggest that early childhood is not only the critical time in which to examine the emergence of a skill gap between poor and non-poor children but also the critical time to examine the emergence of a racial skill gap. Figure 6-1 clearly suggests that by 24 months of age, racial groups are already gaining cognitive skills at different rates.

White children out-gain all other racial groups significantly by 24 months of age. When comparing white children's skill gains to AI/NA children's skill gains, the difference is almost a full standard deviation. The time period between nine and 24 months pinpoints the emergence of the racial achievement gap as very few significant differences across racial groups emerge at nine months of age. By the time children are about two years old, white children already have a significant advantage over their non-white peers, particularly those children who belong to racial groups that have been

subjected to high levels of segregation and isolation. These data suggest that racial achievement gaps are growing even prior to entry to *preschool*, lending support to research that emphasizes the importance of factors *external* to schooling and institutional environments in promoting learning (Condron 2009; Alexander, Entwisle, and Olson 2007; Downey, von Hippel, and Broh 2004). Clearly, these results suggest that the racial skill gap emerges simultaneously with the poverty skill gap, but how these two processes overlap remains unclear.

POVERTY STATUS BY RACE

To delve further into the cognitive skill gains of young children within each racial group, I next explore how poverty may account for some of the racial skill gaps presented in Figure 6-1. Table 6-1 displays the breakdown of poverty categories by racial group, first for degree of income poverty followed by degree of material hardship.[11]

If poverty and race were unrelated in U.S. society, we would expect to see few differences across racial categories in Table 6-1. That is, when we compared the percentage of white children living in extreme income poverty (<50% poverty line) to the percentage of Black children living in extreme income poverty, the estimates would differ little. This is clearly not the case. Unsurprisingly, as discussed in Chapter Two, children belonging to racial groups that have been subjected to hypersegregation, discrimination, and racist policies experience poverty at a much higher rate than white children. While just 4.6% of white children live in extreme income poverty, fully 25% of Black children and 22% of AI/NA children reside with families with income flow far below the traditional poverty line. When combining the first two columns of Table 6-1,

[11] For the purposes of presenting group membership, I used the quintile measurement of material hardship, similar to Chapter Four. Recall this variable is a scale created from the categories used later in the CFA procedure and then divided into quintiles.

this pattern becomes even more clear; in the ECLS-B sample, only 14% of white children live in traditionally poor (100% of the poverty line) families while for Black, Hispanic, and AI/NA children, the poverty rate is 47%, 36%, and 45% respectively.[12] A similar pattern emerges when looking at the distribution of material hardship across racial categories. White children are disproportionately located in the most privileged quintile (42.9%) compared to other racial groups. For instance, only 9.9% of AI/NA children are born into this relatively privileged category. Interestingly, Hispanic membership in each quintile of material hardship is relatively equal, supporting research that suggests scholars be wary of combining all Hispanic individuals into one category as extensive socio-economic and cultural variation exists within the community (Portes and Truelove 1987).

As mentioned in Chapters One and Two, early childhood poverty has severe ramifications for adult educational and economic outcomes. These data suggest that part of the explanation for racial gaps in education and income may stem from conditions in early childhood: non-white children are much more likely to experience poverty hardship at a young age. Does this hardship correspond to inhibition of early cognitive skill growth?

COGNITIVE SKILL GAINS BY RACE AND POVERTY STATUS

Degree of Income Poverty

Table 6-2 provides a first foray into understanding the relationship between poverty and cognitive skill growth within racial groups. Each row of Table 6-2 lists the cognitive skill gains between nine and 24 months for a specific subsection of children within the designated racial category. For instance, the fourth row of Table 6-2 represents just

[12] These poverty rates are similar to national estimates of poverty for children under the age of 3 in 2008 (Wight and Chau 2008).

Hispanic children, the intersection of the fourth row and the second column explains that Hispanic children who lived in families with incomes below 50% of the poverty line gained 45.86 points between nine and 24 months of age on the BSF-R.

Looking across the table (staying within racial categories), the distribution of cognitive skill gains for white children follow expectations: as the degree of income hardship decreases, cognitive skill gains increase such that white children living in families with incomes above 185% of the traditional poverty line gain the most skills at this early age. However, this smooth increase in gains as income hardship decreases is not the case for other racial/ethnic groups. Black and Hispanic children living in extreme poverty (<50% of the poverty line) or traditional poverty (50%-100% of the poverty line) gain approximately the same magnitude of cognitive skills from nine to 24 months. This indicates that extreme income hardship may not have an additional impact for these racial groups possibly because of the support systems within communities that mitigate the worst effects of extreme income hardship. This may be especially true for Black children living under extreme income hardship as their cognitive skill gains are higher than the skill gains of children as a whole ($x = 48.59$ vs. $x = 47.19$) as well as other racial groups living under extreme income hardship.

Figure 6-2 charts the data from Table 6-2 as the cognitive skill gains by race group along the degree of income poverty continuum. This figure raises many interesting questions. First, these results suggest that in general, the expected pattern of income privilege corresponding to cognitive skill growth holds for white children and Hispanic children (with the above caveat for Hispanic children). However, the story for Black children and AI/NA children is much less clear. Skill growth for American Indian

children appears to peak immediately above the traditional poverty line. For Black children, the data suggest that cognitive skill growth changes little with degree of income poverty. These results imply that the traditional form of poverty measurement, amount of income, may not be the most critical measure of poverty for all racial/ethnic groups. Specifically, for Black children and AI/NA children, the relationship between degree of income poverty and cognitive skill growth is far weaker than the linear relationship that we would expect from the literature regarding the impact of poverty later in childhood and into adulthood.

Degree of Material Hardship

Results from Chapter Four suggest that material hardship is a critical component in the explanation of how poverty impacts cognitive skill growth. When we turn to the relationship between cognitive skill gains and degree of material hardship by racial/ethnic group, the story regarding poverty and race complicates even further. Table 6-3 presents skill gains by race by degree of material hardship similar to Table 6-2. Following a racial group across the table horizontally allows one to follow the skill gains corresponding to each level of material hardship for that race group only.

In general, the expected pattern of increased cognitive skill gains associated with less hardship is supported by the data in Table 6-3. When comparing children experiencing the most material hardship to those in the middle quintile to those in the most privileged category (moving left to right in Table 6-3), it is clear that gains are associated with less material hardship for each racial category. However, when looking at the more specific trajectory of gains for each racial group, this general conclusion may not hold as shown in Figure 6-3.

Figure 6-3 charts the cognitive skill gains for each racial group over degree of material hardship. More so than in Figure 6-2, we see the general trend upward that we expected from the literature reviewed in Chapter Two. Like with degree of income poverty, this trend is smoothest for white children and Hispanic children. Cognitive skill gains grow, in general, for AI/NA children as well although the pattern is not as smooth as for white and Hispanic children. Black children's experience with material hardship somewhat mirrors their experience with degree of income poverty in that Black children's gains do not appear to strongly correspond to material hardship. Although there is a significant relationship between material hardship and skill growth, the rate of skill growth between categories of hardship is not as steep for Black children as it is for children of other races. These results along with those from Figure 6-2 suggest that other forces are slowing cognitive skill growth within the Black community. Although research suggests that social class differences are a key explanatory factor in the cognitive skill gaps between black and white children (Conley 1995), these results suggest that for very young Black children, additional structural disadvantages (e.g., lack of access to social services, environmental conditions of neighborhoods) may also be hindering cognitive skill growth.

The story for Hispanic children is in stark contrast to the story for Black children. Poverty seems to critically impact cognitive skill growth for Hispanic children more than it does for Black and AI/NA children. In fact, Hispanic children who experience the most extreme forms of poverty gain fewer skills than their Black peers experiencing similar hardship. But as we shift the poverty categories to less hardship, Hispanic children gain more skills than Black children in similar situations. Indeed, in the most

privileged categories, Hispanic children's cognitive skill gains outpace Black children's gains. That is, the slopes in Figures 6-2 and 6-3 for Hispanic children are steeper than the slopes for Black children. These data suggest that as poverty become more severe, whether degree of income poverty or degree of material hardship, Hispanic children's cognitive skill gains suffer to a greater extent than Black children.

In general, these results support my early suspicions that the degree of income poverty is insufficient to capturing the full impact of poverty on cognitive skill growth, especially when exploring racial differences. Additionally, these results prompt further examination of *how* poverty impacts skill growth. If differences exist in the bivariate relationship between types of poverty and skill growth, I expect further differences to emerge when comparing how the skill gap emerges in early childhood for each racial group.

MEDIATING MECHANISMS BETWEEN POVERTY AND COGNITIVE SKILLS BY RACE

I present the next set of results primarily through figures. For the sake of clarity, Figures 6-4 through 6-7 do not contain standardized regression coefficients similar to the figures presented in Chapter Five. Instead, I designate only the significance of the pathways hypothesized in Chapter Five for each racial/ethnic group. Thus each Figure has two types of arrows, solid black arrows representing significant pathways and dashed arrows representing insignificant pathways. Tables 6-3 through 6-7 include the corresponding unstandardized and standardized regression coefficients for the direct relationships in these models but I mention them only in terms of the directionality in the text below. I use this approach to emphasize the purpose of this section of my study: an exploratory foray into how the emergence of the cognitive skill gap between poor and non-poor

children differs across racial groups. The goal of this chapter is not an indepth analysis of the strength of each possible pathway between poverty and skill growth. These results provide a foundation for future research to explore the specific mechanisms at play in this process for each racial group.

Before presenting general conclusions from these analyses, it is critical to recognize that Figure 6-7 suggests that the process of cognitive skill growth for AI/NA children is much different than any other racial group. Therefore, I save much of the discussion of this under-studied population until the end of this section in order to devote a brief discussion solely to the results presented in Figure 6-7 and Table 6-7.

Direct Effects of Poverty

Figures 6-4 through 6-7 suggest some commonalities across racial groups for the direct impact of poverty on cognitive skills, mainly that the proposed model effectively explains away the direct effect of poverty on cognitive skill growth between nine and 24 months. This is represented in Figures 6-4 through 6-7 by a dashed line between degree of income poverty and cognitive skill growth. This suggests that the proposed mediating mechanisms, including material hardship, fully mediate the impact of income poverty on cognitive skill growth. However, it is important to note from the results presented above that the magnitude of the relationship between income poverty and cognitive skill growth is stronger for some racial groups than others, particularly for white and Hispanic children.

Indirect Effects of Poverty Through Material Hardship

Similar to models in Chapter Five, degree of income poverty is strongly associated with material hardship for all racial/ethnic groups. This is not surprising as this was one of the

strongest relationships in the model including all children. Regardless of race, children who experience high levels of income hardship tend to experience higher levels of residential instability, lack of adequate health care coverage, use of public assistance and food insecurity. However, differences start to emerge between racial groups when looking at the direct effect of material hardship in predicting cognitive skill growth.

For three racial/ethnic groups, the direct relationship between material hardship and cognitive skill growth disappears. This relationship, however, remains significant and negative. That is, the other mediating mechanisms (e.g., parenting practices, infant health problems, parental health problems, and job benefits) fail to explain the relationship between material hardship and cognitive skill growth for very young Hispanic children. Other mediating processes need to be explored for this group of children while the model seems to adequately explain the link between poverty (both degree of income poverty and material hardship) and cognitive skill growth for white and Black children. While the links between poverty and skill growth may be accounted for, results presented in Figures 6-4 through 6-7 suggest that the relationship between poverty and the proposed mediating mechanisms differs drastically across racial groups.

Indirect Effects of Poverty Through Mediating Mechanisms

There are some similarities across racial groups in terms of the relationship between poverty and the mediating mechanisms. For instance, degree of income poverty and material hardship are negatively associated with fringe benefits offered by employers in all models. Additionally, for white, Black and Hispanic children, it is not the accessibility of income that predicts infant health but rather the constraints that material hardship places on families that negatively impacts the health of young children. This finding is

somewhat unsurprising as material hardship contains a measure of access to health care. As access to healthcare becomes more difficult for families, not necessarily as income flow decreases, their children exhibit more health problems. Beyond the relationship between poverty and job benefits and poverty and infant health, Figures 6-4 through 6-6 display few similarities.

Parenting Practices. For white and Hispanic children, degree of income poverty is not associated with parenting practices but material hardship remains significant in predicting parenting habits. This means that as white and Hispanic families experience more stressors like food insecurity or residential instability, parents shift their focus from particular parenting practices to these more immediate concerns. However, the opposite holds true for Black children. Material hardship is not significantly associated with positive parenting practices but degree of income poverty does have a significantly negative effect. This suggests that instead of responding to the stressors of material hardship, Black families with lower incomes exhibit less use of positive parenting practices than their more advantaged Black counterparts. These results, unlike those presented in Chapter Five, support Lareau's findings that class differences in parenting practices. However, by suggesting race differences in how class works to produce cognitive skill gaps, they challenge those same findings.

Parental Health Problems. According to these results, parents' mental and physical health is particularly vulnerable to poverty. For Black children, both material hardship and degree of income poverty negatively influence the health of parents. For white and Hispanic children, material hardship hampers parental health but degree of income poverty only indirectly affects parental health through material hardship. This

may be a similar function to the relationship between parenting and material hardship. As parents feel the strain of not being able to meet the basic material needs of their family, they take the toll themselves in order to protect their children from the full negative impact of this adversity.

Mediating Mechanisms and Cognitive Skill Growth

The relationships between poverty and mediating mechanisms are only half of the story in predicting cognitive skill growth. In order to confirm that a pathway leads from poverty to skill growth, the link between the mediating mechanism and cognitive skills must be established as well. Perhaps unsurprisingly, due to the support in the psychological and public health literature, the majority of the pathways between the mediating mechanisms and cognitive skill growth are consistent across racial/ethnic groups. Use of positive parenting practices promotes cognitive skill growth from nine to 24 months regardless of the race of the child in question. Similarly, as children experience more physical health problems, their cognitive skill gains decrease. The link between fringe benefits offered by employers and children's cognitive skill growth is insignificant for all racial/ethnic groups, similar to the results presented in Chapter Five. These results confirm that this measure is perhaps too imprecise of a proxy to capture the aspects of jobs that promote cognitive skill growth as suggested by prior research (e.g., Parcel and Menaghan 1994).

Parental Health Problems. The only difference across models emerges for parental health problems. For Black, Hispanic, and American Indian children, parental health problems do not directly influence cognitive skill growth; however, for white children, an increase in parental health problems inhibits cognitive gains of the child.

This suggests that while some form of poverty is linked to parental health problems for all groups of children, this is only a critical process for the cognitive skill growth of young children in the white community. Alternatively, for other racial groups, the impact of parental health problems on cognitive skill growth could function as an indirect pathway leading from parental health problems through positive parenting practices and finally to skill gains.

Positive Parenting Practices. It is worth noting that positive parenting practices promote skill gains for all racial/ethnic groups. These parenting strategies, including daily activities like tickling, reading, playing outside with your child, as well as knowledge-gaining strategies such as reading a book to learn about parenting have a direct influence on the cognitive growth of very young children. However, the use of these practices does not mediate the relationship between poverty and skill growth in the same way for all racial/ethnic groups as discussed above.

The Puzzle of American Indian/Native Alaskan Children

While Figure 6-1 confirms that AI/NA children gain far fewer cognitive skills in early childhood than any other racial/ethnic group, Figure 6-7 suggests that this skill gap has little to do with poverty or material hardship.[13] There are some similarities from the models for other racial/ethnic groups, particularly regarding infant health problems and parenting practices. Infant health problems slow cognitive skill growth while use of positive parenting practices promotes skill gain. However, contrasting with results from Figures 6-4 through 6-6, poverty, both degree of income poverty and degree of material hardship, is insignificantly related to these mechanisms. Additionally, neither form of

[13] Although the sample size of this model is smaller than other models (n=242), it is sufficient to predict significant relationships.

poverty is directly related to cognitive skill growth. The literature suggests that poverty plays a large part in the inhibition of economic and educational outcomes for American Indian adults (Waters and Eschbach 1995) but these results suggest the process differs for very young children. Additionally, predicting skill growth in general for American Indian/Alaskan Native children may differ from other racial/ethnic groups.

Clearly more research is needed here, particularly because this minority group has experienced comprehensive physical and symbolic violence for the entirety of U.S. history. I argue that this violence is continued unwittingly by researchers in a well-meant attempt to not exploit the community any further. However, it is clear from these exploratory results that American Indian and Native Alaskan children suffer in comparison to their White, Black, and Hispanic peers and that this adversity slows skill growth in unique ways. Given these findings, future research should focus closely on American Indian and Native Alaskan children in particular as policies that ameliorate conditions facing other minority groups and other poor children may be ineffective for these children.

DISCUSSION

Overall these results suggest that the intersection of class and race is a critical place to investigate early childhood cognitive skill growth. The story is neither completely about poverty nor is it sufficient to only talk about race; instead, to adequately address skill gaps in early childhood, researchers should include the interaction of these two categories. Specifically, the results presented above lead to four main conclusions regarding poverty and cognitive skill growth in early childhood across racial/ethnic groups.

First, it is imperative that scholars focus on determining the specific forms of poverty that most hinder outcomes for particular groups of children. Tables 6-1 through 6-3 show that the degree of income poverty and degree of material hardship impact cognitive skill gains differently depending on a child's racial/ethnic identity. Possible reasons for this include the structural conditions and historical legacies discussed in Chapter Two that have effectively isolated minority groups from resources widely available to whites. For instance, Black Americans, in particular, historically have been denied rights to accumulate wealth that have been bestowed upon white Americans, particularly in the form of home ownership (Oliver and Shapiro 1997). Without this safety net to rely on, when periods of income dearth occur, these families may suffer more severely than families that have accumulated some degree of wealth (in this case, home equity). As a result, income poverty may work through more strongly or through different mechanisms for Black families than for White families.

Similarly, the story for the Hispanic community is probably even more complex than it appears here. I suspect that upon further deconstructing the category Hispanic into categories representing immigrant status, generation of native birth, and nationality of origin would exhibit even more disparate patterns in explaining the relationship between poverty and skill growth. The takeaway point here is that researchers should be cautious in presuming that one conceptualization of poverty explains hardship for every racial/ethnic group in similar ways. Instead these findings suggest that the historical and present conditions facing specific groups should be taken into account prior to drawing conclusions about poverty and race.

Second, while positive parenting practices and infant health problems impact the cognitive skill growth of young children regardless of racial/ethnic group, poverty impacts these processes differently. Hispanic and white families seem to be more impacted by material hardship while Black families appear to be impacted more by lack of income. This is especially relevant when predicting parenting practices and infant health conditions. These results are primarily due to the lack of explanatory power that either of these forms of poverty have for the cognitive skill growth of young, Black children. Results from Table 6-1 suggest that Black children are more likely to be living in families experiencing high degree of income poverty and material hardship. Yet, these experiences do not translate into cognitive skill gaps *within* the Black community as results from Table 6-3 document. Indeed, without controlling for age specific predictors, there appears to be a weak but significant relationship between poverty and skill gains for only one category of income poverty (*50% - 100% Poverty Line*) and material hardship (*Second Highest Material Hardship Quintile*).[14] These results suggest a corollary to the conclusion discussed above: perhaps due to the historical, structural disadvantages faced by the Black community in the United States, this community has developed responses to poverty that mitigate the otherwise significant disadvantage they might face. However, these strategies are not sufficient to overcome the race gap between Black and white children at this age.

Third, parental health mediates the relationship between poverty and cognitive skill gains only for white children. This suggests that policies aimed at addressing the well-being of parents before the well-being of the children may shrink the cognitive skill

[14] In preliminary regressions, results show a significant relationship between degree of income poverty and cognitive skill growth for Black children, once accounting for the basic controls (age in months and time elapsed between assessments) prompting the analyses presented in this chapter.

gap between the poor and non-poor only in the white community while being relatively ineffective for minority groups. Policies may be more effective when aimed at targeting particular parenting practices that promote skill gains for all children as well as policies that aim at improving some of the material hardship conditions that negatively impact these parenting skills (although this form of policy may not have beneficial impact on Black families).

Finally, my model predicting cognitive skill growth for American Indian and Native Alaskan children shows no association between either form of poverty and cognitive skill growth. The bivariate analysis provided in Figures 6-2 and 6-3 suggest that, in some cases, AI/NA children who experience high levels of hardship in terms of poverty outgain their more privileged peers. AI/NA children, on the whole, fall *far* behind all other racial/ethnic groups prior to any institutional form of schooling. By 24 months of age, the average cognitive skill gains of an AI/NA child are almost a full standard deviation behind the gains of the average white child. This lack of an association between poverty and skill growth indicates that the disadvantage faced by American Indian children is experienced by the majority of American Indian children and not just children suffering from poverty or levels of material hardship. However, future research should explore not just the negative reasons of *why* AI/NA do not perform as high as other groups of children but also what successful strategies have been implemented within the community to mitigate some of the adverse circumstances facing these young children.

CHAPTER SIX: TABLES AND FIGURES

Figure 6-1. Cognitive Skill Gains from 9-24 Months by Racial/Ethnic Group.

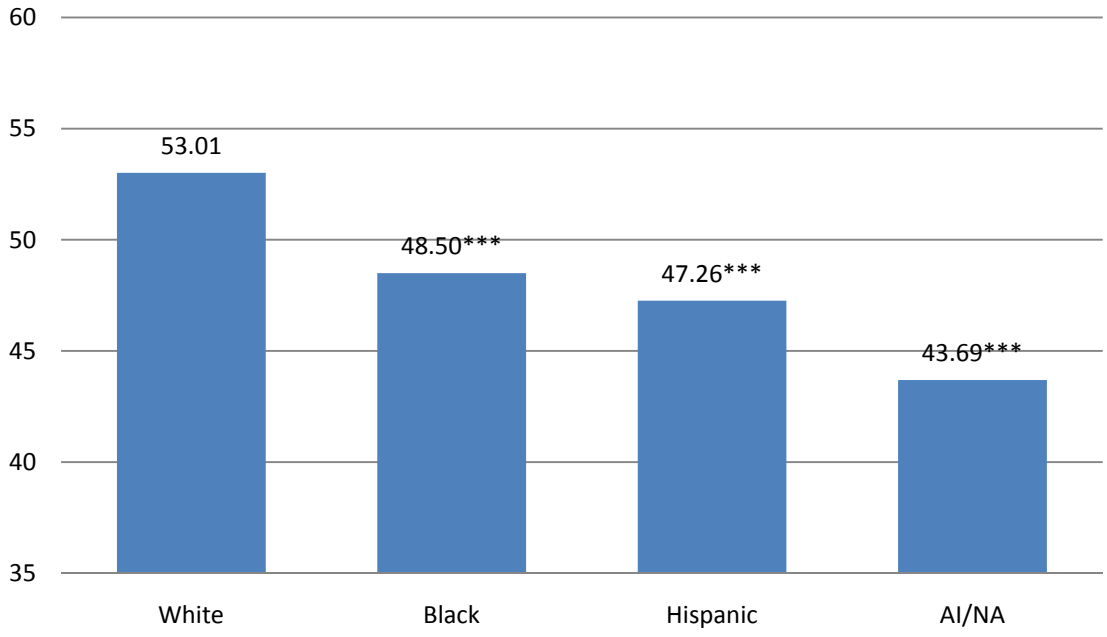


Table 6-1. Degree of Income Poverty by Racial/Ethnic Group.

	Degree of Income Poverty				
Racial/Ethnic Group	*<50% Poverty Line*	*50% - 100% Poverty Line*	*100% - 130% Poverty Line*	*130% - 185% Poverty Line*	*Above 185% Poverty Line*
	%	%	%	%	%
All Children	10.30%	14.70%	11.83%	12.40%	50.78%
White	4.60%	9.07%	9.05%	11.44%	65.84%
Black	25.00%	22.52%	14.02%	12.39%	26.06%
Hispanic	13.56%	22.49%	17.63%	14.79%	31.53%
AI/NA	22.31%	23.55%	15.70%	14.05%	24.38%
	Degree of Material Hardship				
Racial/Ethnic Group	*Most Material Hardship*	*4th Quintile*	*3rd Quintile*	*2nd Quintile*	*Lowest Material Hardship*
	%	%	%	%	%
All Children	15.46%	14.08%	16.13%	22.96%	31.37%
White	9.07%	10.24%	13.00%	24.80%	42.89%
Black	33.22%	24.72%	16.71%	11.97%	13.39%
Hispanic	17.52%	17.86%	23.72%	23.44%	17.47%
AI/NA	31.40%	17.77%	21.07%	19.83%	9.92%

Table 6-2. Gains from 9-24 Months by Racial/Ethnic Group and Degree of Income Poverty.

	Degree of Income Poverty				
Racial/Ethnic Group	*<50% Poverty Line*	*50% - 100% Poverty Line*	*100% - 130% Poverty Line*	*130% - 185% Poverty Line*	*Above 185% Poverty Line*
All Children	47.19	47.55	48.89	49.91	52.62
White	47.79***	49.17***	51.58***	51.55***	54.35
Black	48.59	48.39	47.42	49.02	48.84
Hispanic	45.86***	45.79***	46.57**	47.78	49.06
AI/NA	39.41**	43.46	47.13	42.29	46.44

Tests compared within race-group to the most privileged category.

Table 6-3. Gains from 9-24 Months by Racial/Ethnic Group of Degree of Material Hardship.

	Degree of Material Hardship				
Racial/Ethnic Group	*Most Material Hardship*	*4th Quintile*	*3rd Quintile*	*2nd Quintile*	*Least Material Hardship*
All Children	47.43***	48.16***	48.94***	51.16***	53.51
White	47.76***	51.21***	51.69***	52.96***	54.98
Black	48.53	47.24*	48.82	48.83	50.05
Hispanic	45.90***	45.61***	46.31***	48.20*	50.35
AI/NA	43.64	40.09*	44.86	43.58	48.10

Tests compared within race-group to the most privileged category.

Figure 6-2. Cognitive Skill Gains by Race and Degree of Income Poverty.

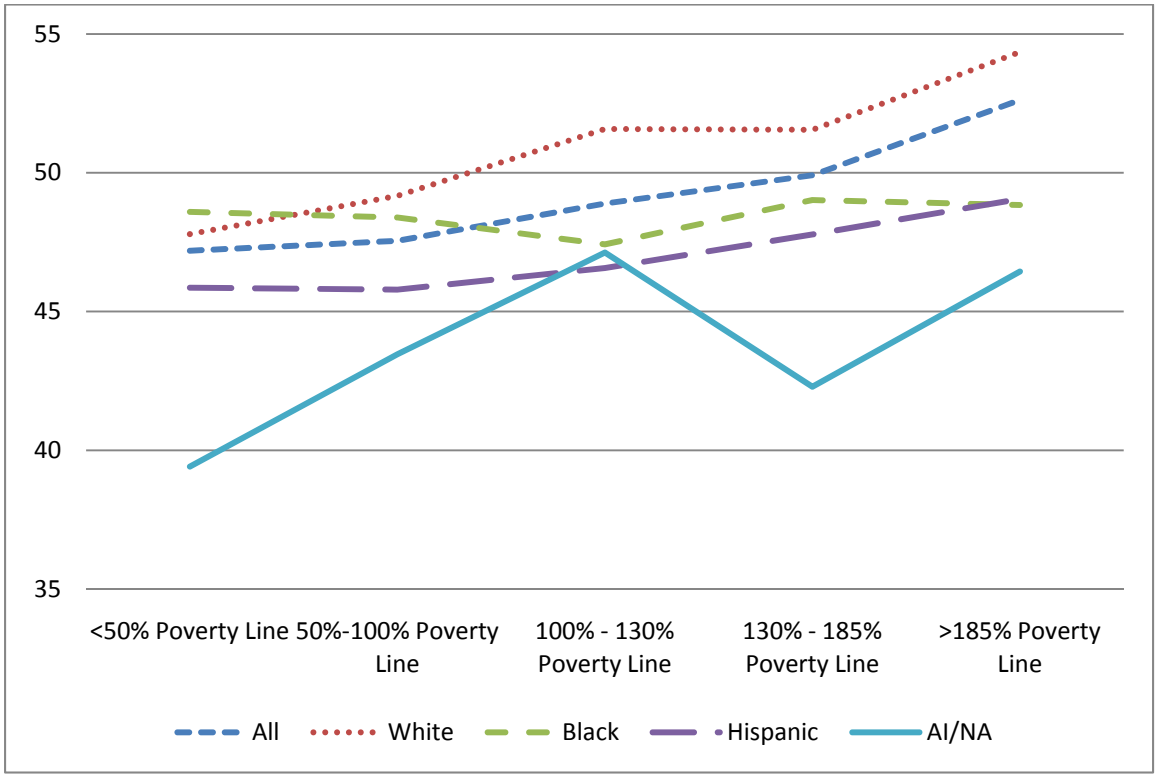


Figure 6-3. Cognitive Skill Gains by Race and Degree of Material Hardship.

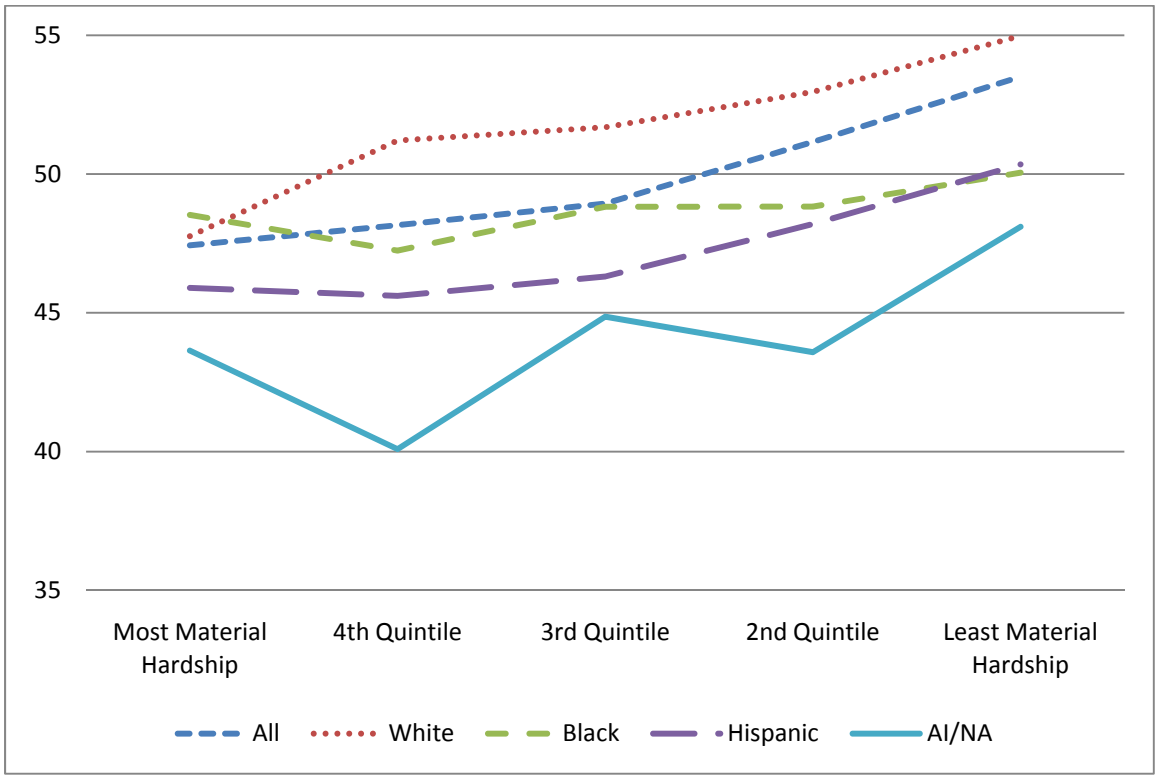


Figure 6-3. Mediating Mechanisms – White Children.

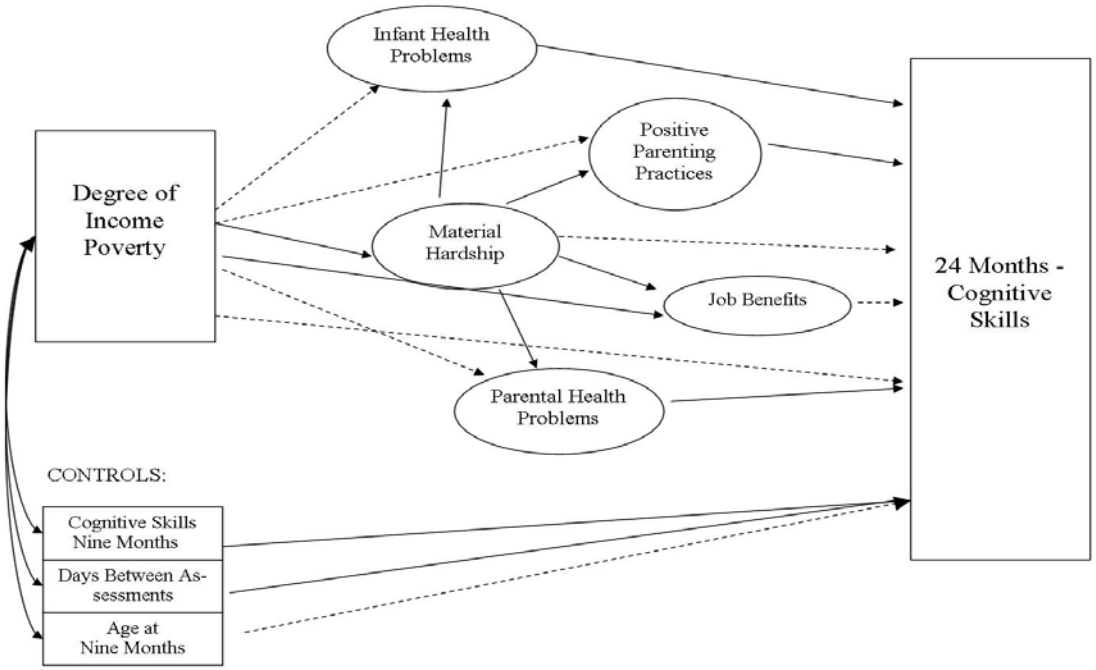


Figure 6-4. Mediating Mechanisms – Black Children

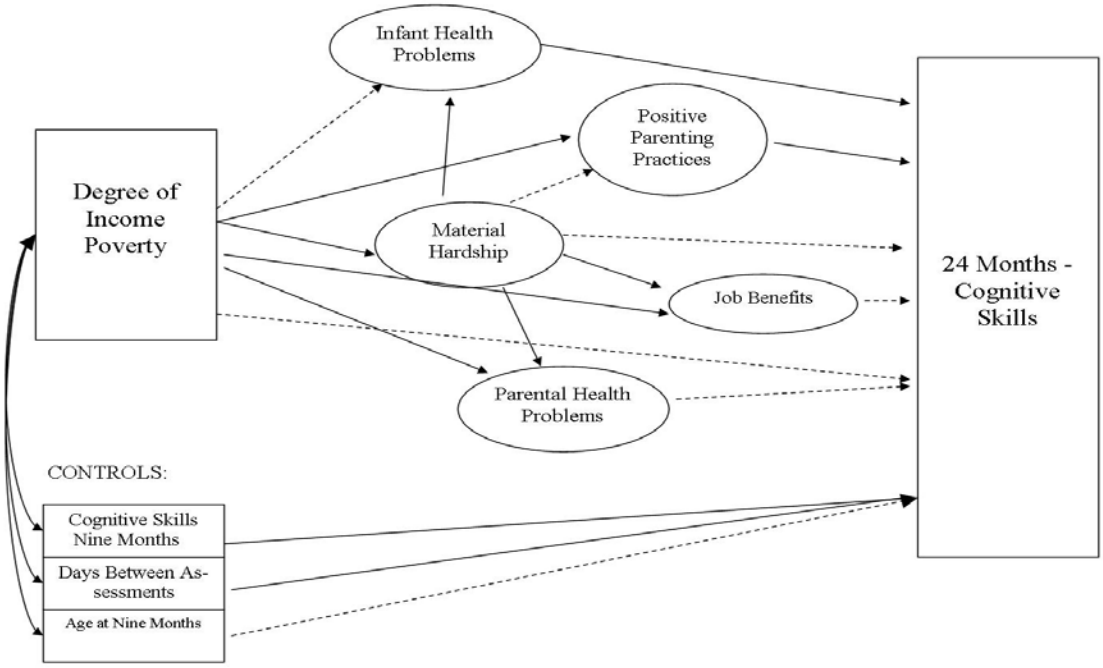


Figure 6-5. Mediating Mechanisms – Hispanic Children.

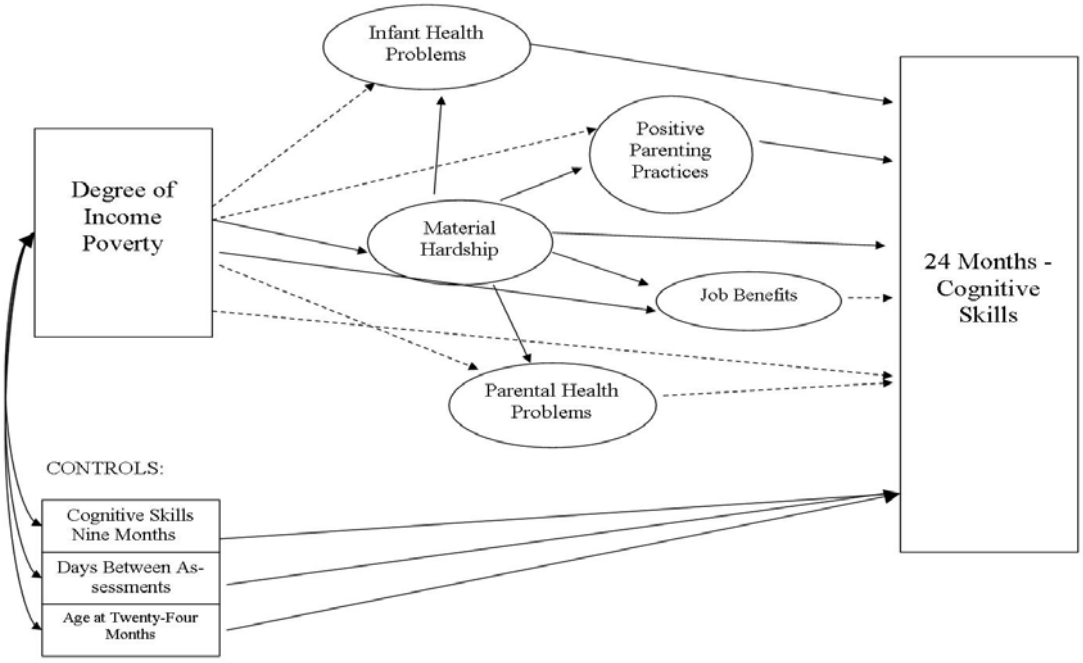


Figure 6-6. Mediating Mechanisms – Native American / Alaskan Native Children.

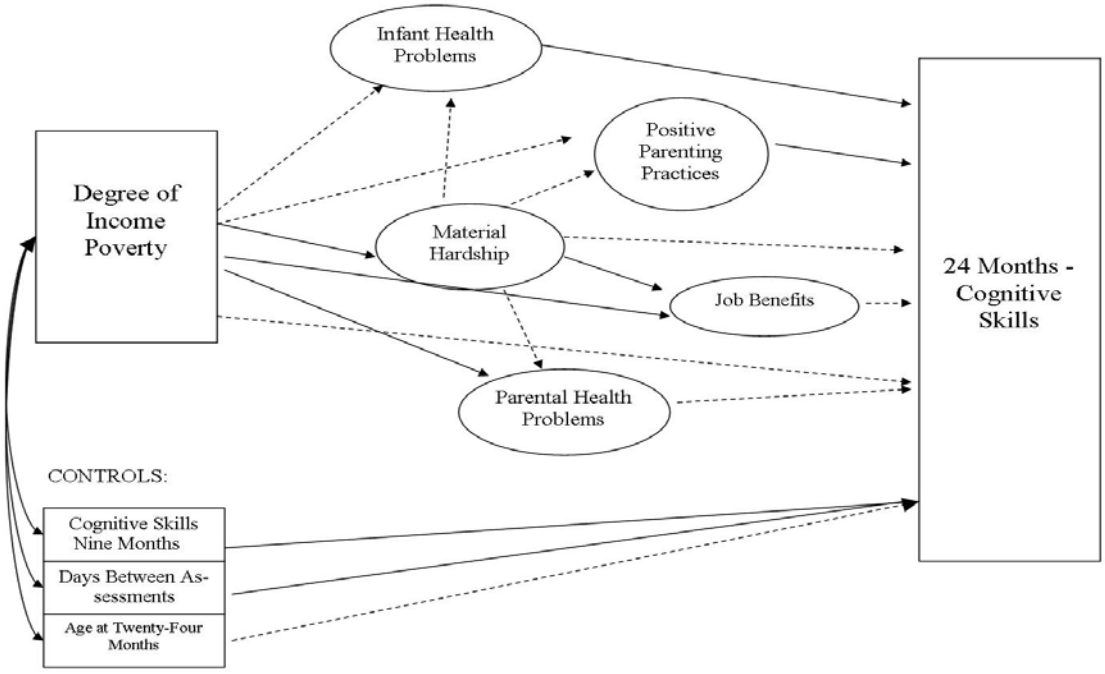


Table 6-4. Direct Effects of Poverty on Cognitive Skill Growth – White Children.

Relationship	Unstandardized Effect	Standardized Effect
Degree of Income Poverty → Cognitive Skills at 24 Months	-0.296	NS
Material Hardship → Cognitive Skills at 24 Months	-0.672	NS
Job Benefits → Cognitive Skills at 24 Months	0.396	NS
Positive Parenting Practices → Cognitive Skills at 24 Months	4.013***	0.129
Parental Health Problems → Cognitive Skills at 24 Months	-7.162***	-0.148
Infant Health Problems → Cognitive Skills at 24 Months	-4.003***	-0.134
Age in Months at 9 Months → Cognitive Skills at 24 Months	0.269	NS
Time Between Assessments → Cognitive Skills at 24 Months	2.002***	0.359
Cognitive Skills at 9 Months → Cognitive Skills at 24 Months	0.435***	0.404
Degree of Income Poverty → Material Hardship	0.254***	0.747
Degree of Income Poverty → Positive Parenting Practices	-0.013	NS
Degree of Income Poverty → Job Benefits	-0.064***	-0.122
Degree of Income Poverty → Parental Health Problems	0.010^{+}	NS
Degree of Income Poverty → Infant Health Problems	-0.016^{+}	NS
Material Hardship → Positive Parenting Practices	-0.109***	-0.133
Material Hardship → Job Benefits	-0.817***	-0.530
Material Hardship → Parental Health Problems	0.370***	0.696
Material Hardship → Infant Health Problems	0.138***	0.160

Model Fit (n=3,847) GFI = 0.942, CFI = 0.897, RMSEA = 0.037, AIC = 5348.00, BIC = 6092.35

Table 6-5. Direct Effects of Poverty on Cognitive Skill Growth – Black Children.

Relationship	Unstandardized Effect	Standardized Effect
Degree of Income Poverty → Cognitive Skills at 24 Months	-0.128	NS
Material Hardship → Cognitive Skills at 24 Months	-1.069	NS
Job Benefits → Cognitive Skills at 24 Months	0.004	NS
Positive Parenting Practices → Cognitive Skills at 24 Months	2.861*	0.073
Parental Health Problems → Cognitive Skills at 24 Months	-1.489	NS
Infant Health Problems → Cognitive Skills at 24 Months	-3.238***	-0.119
Age in Months at 9 Months → Cognitive Skills at 24 Months	-0.078	NS
Time Between Assessments → Cognitive Skills at 24 Months	1.598***	0.319
Cognitive Skills at 9 Months → Cognitive Skills at 24 Months	0.468***	0.465
Degree of Income Poverty → Material Hardship	0.149***	0.630
Degree of Income Poverty → Positive Parenting Practices	-0.015*	-0.087
Degree of Income Poverty → Job Benefits	-0.141***	-0.317
Degree of Income Poverty → Parental Health Problems	0.032**	0.159
Degree of Income Poverty → Infant Health Problems	-0.012	NS
Material Hardship → Positive Parenting Practices	-0.059^{+}	NS
Material Hardship → Job Benefits	-0.854***	-0.453
Material Hardship → Parental Health Problems	0.262***	0.305
Material Hardship → Infant Health Problems	0.135**	0.128

Model Fit (n=1,412) GFI = 0.925, CFI = 0.893, RMSEA = 0.038, AIC = 2656.47, BIC = 3271.04

Table 6-6. Direct Effects of Poverty on Cognitive Skill Growth – Hispanic Children.

Relationship	Unstandardized Effect	Standardized Effect
Degree of Income Poverty → Cognitive Skills at 24 Months	0.005	NS
Material Hardship → Cognitive Skills at 24 Months	-4.102***	-0.153
Job Benefits → Cognitive Skills at 24 Months	-0.119	NS
Positive Parenting Practices → Cognitive Skills at 24 Months	4.770***	0.130
Parental Health Problems → Cognitive Skills at 24 Months	-0.990	NS
Infant Health Problems → Cognitive Skills at 24 Months	-4.241***	-0.144
Age in Months at 9 Months → Cognitive Skills at 24 Months	1.009***	0.190
Time Between Assessments → Cognitive Skills at 24 Months	2.120***	0.437
Cognitive Skills at 9 Months → Cognitive Skills at 24 Months	0.329***	0.325
Degree of Income Poverty → Material Hardship	0.170***	0.662
Degree of Income Poverty → Positive Parenting Practices	-0.016^{+}	NS
Degree of Income Poverty → Job Benefits	-0.932***	-0.178
Degree of Income Poverty → Parental Health Problems	0.009	NS
Degree of Income Poverty → Infant Health Problems	-0.006	NS
Material Hardship → Positive Parenting Practices	-0.068*	-0.092
Material Hardship → Job Benefits	-0.932***	-0.556
Material Hardship → Parental Health Problems	0.250***	0.465
Material Hardship → Infant Health Problems	0.093*	0.102

Model Fit (n=1,792) GFI = 0.933, CFI = 0.885, RMSEA = 0.036, AIC = 2870.76, BIC = 3513.22

Table 6-7. Direct Effects of Poverty on Cognitive Skill Growth – American Indian/Native Alaskan Children.

Relationship	Unstandardized Effect	Standardized Effect
Degree of Income Poverty → Cognitive Skills at 24 Months	-0.516	NS
Material Hardship → Cognitive Skills at 24 Months	3.724	NS
Job Benefits → Cognitive Skills at 24 Months	1.443	NS
Positive Parenting Practices → Cognitive Skills at 24 Months	6.597*	0.165
Parental Health Problems → Cognitive Skills at 24 Months	-4.603	NS
Infant Health Problems → Cognitive Skills at 24 Months	-17.233**	-0.236
Age in Months at 9 Months → Cognitive Skills at 24 Months	0.320	NS
Time Between Assessments → Cognitive Skills at 24 Months	2.357***	0.677
Cognitive Skills at 9 Months → Cognitive Skills at 24 Months	0.521***	0.607
Degree of Income Poverty → Material Hardship	0.092***	0.768
Degree of Income Poverty → Positive Parenting Practices	-0.014	NS
Degree of Income Poverty → Job Benefits	-0.124**	-0.286
Degree of Income Poverty → Parental Health Problems	0.064*	0.374
Degree of Income Poverty → Infant Health Problems	-0.009	NS
Material Hardship → Positive Parenting Practices	-0.293	NS
Material Hardship → Job Benefits	-1.362***	-0.379
Material Hardship → Parental Health Problems	0.341	NS
Material Hardship → Infant Health Problems	0.053	NS

Model Fit (n=242) GFI = 0.840, CFI = 0.905, RMSEA = 0.035, AIC = 1316.02, BIC = 1731.20

CHAPTER SEVEN: DISCUSSION AND CONCLUSIONS

The child poverty rate in the United States, particularly for young children, is unacceptably high and has hovered around 20% in the recent past (NCCP 2010). The consequences of poverty in early childhood are long-reaching and severe, including poor health, increased likelihood of poverty as adults, failure to complete high school, decreased earnings, and higher rates of premature death (NCCP 2010; Entwisle, Alexander, and Olson 2005; Rank 2005; Rothstein 2004). Additionally, researchers estimate that the United States also bears several economic consequences of poverty. Indeed, poverty costs 500 billion dollars a year (nearly 4% of GDP) in health care costs, criminal justice system costs, and lost productivity (Holzer et al. 2007). Yet policies in the United States have continually failed to reduce poverty to levels found in other affluent countries. These long-term consequences begin immediately as evidenced by the large gap in cognitive skill between poor and non-poor children that emerges before they even enter formal schooling.

This study aimed to: (1) demonstrate that multiple aspects of poverty, even at a very early age, have immediate and severe consequences for young children's cognitive trajectories and (2) shed light on how these disparities emerge through proximate social systems in the first two years of a child's life. Additionally, it emphasized not only the importance of a child's immediate social context in the production of the cognitive skill gap between poor and non-poor children but also to demonstrate that wider, historical contexts matter in the production of the skill gap. Specifically, it begins to unpack how poverty impacts cognitive skill growth differently within racial/ethnic groups.

ECLS-B provides researchers with a unique window into the lives of children before they are subsumed in formalized educational processes. This is critical to research

investigating the relationship between poverty, race and cognitive outcomes in early childhood, an under-studied area in sociology. By utilizing multiple sources of data within the ECLS-B study, I was able to measure potential mechanisms through which poverty may impact the development of very young children. These results uniquely contribute to the sociology of education, social stratification, and children and youth literatures. In this chapter, I synthesize and conclude this study by briefly reviewing the general findings from Chapters Four through Six, followed by a discussion of where I think this research fits into the larger problem of social inequality and steps policymakers could take to address this problem. I then outline suggestions for future research which emanate from limitations of this study.

SUMMARY OF FINDINGS

Poverty is More than a Lack of Income

Results from Chapter Four confirm sociological research highlighting the multidimensional nature of poverty. In fact, income poverty alone seems like a rather poor proxy for the experience of poverty. In Chapter Five, most of the explanation of the poor/non-poor skill gap stems from disparities in material hardship. Income poverty is only a part of the reality faced by poor people living in the United States. This becomes strikingly clear when we look at how poverty impacts cognitive skill growth for specific racial groups. The cognitive skill growth of some children (e.g, white children) is slowed by income poverty while others are more impacted by material hardship (e.g, Hispanic children). In some cases (e.g, American Indian/Native Alaskan children), neither form of poverty seems to strongly predict cognitive skill growth at all. The conclusion here is that income poverty is an incomplete way to conceptualize, theorize, and measure

poverty. Outcomes vary according to the level of poverty experienced and the aspect of poverty captured by the measure (e.g, assets, income, material hardship, duration). Therefore, to understand the full complexity of what it means to be poor, researchers need to incorporate more than just the income dimension of poverty. Although this study only invokes material hardship and degree of income poverty in predicting the cognitive skill growth of young children, with more longitudinal data and a better measure of wealth/assets, the duration and asset dimensions of poverty may also demonstrate unique relationships with cognitive skill growth.

Context Matters When Predicting Skill Growth

Similar to the importance of theorizing about all aspects of poverty in the examination of social stratification, results from Chapter Five and Chapter Six highlight the importance of multiple social spheres in the promotion of learning for very young children.

The Importance of Social Systems in Cognitive Skill Growth. For instance, as documented by previous research (Fass and Cauthen 2007), my results confirm that a child's health is critical to learning in the first two years of life. Children experiencing more health problems learn significantly less than their healthier peers and some health problems have long-term consequences for educational outcomes (Rothstein 2004). But a child's health is not the only significant predictor of skill growth in early childhood. Unsurprisingly, the conditions in a child's immediate external environment also influence his or her cognitive trajectory. For example, although prior research suggests a mostly indirect effect (Gershoff et al. 2007), parental mental and physical health is a strong indirect *and* direct predictor of skill growth in early childhood. Finally, the strategies parents use when raising their children, even in early childhood, impact how much a child

learns. Children with parents who interact with them frequently often gain more cognitive skills than children whose parents are less able or less willing to use commonly held positive parenting practices when interacting with their child.

The Importance of Poverty Aspect in Skill Growth. The results just presented, however, do not tell the story of how the cognitive skill gap between poor and non-poor children emerges. They merely explain that multiple social spheres matter for learning in early childhood. The bulk of Chapter Five was devoted to investigating how poverty impacted these processes. The overarching conclusion drawn from these analyses is similar to that drawn from Chapter Four. The different *aspects* of poverty interact with these mediating mechanisms to slow the cognitive skill growth of poor young children. However, income poverty and material hardship did not impact these mechanisms in uniform ways. For instance, once the mediating mechanisms are included in the model, the degree of income poverty experienced by a child has little power to slow cognitive skill growth. Instead, the bulk of the power poverty has in dampening learning in early childhood comes through material hardship. The hardship dimension of poverty, or the day-to-day stressors that stem from a lack of resources needed to meet basic needs, plays the largest part in explaining the skill gap between poor and non-poor children in early childhood.

We can also see that these two aspects of poverty, material hardship and degree of income poverty, differ in how they impact the mechanisms that affect skill growth (Figure 5-4). For instance, as families fall farther below the poverty line, they do not experience more health problems. The dimension of poverty that has a deteriorating effect on health outcomes is material hardship, not income scarcity. This challenges the

simplicity of statements often touted by public interest groups stating that people below the poverty line are unhealthy. On the surface, this seems accurate. However, a more nuanced version of this statement clarifies that people who do not have regular access to food and adequate health coverage (material hardship) are unhealthy. The story is not just about income, but also about an additional aspect of poverty, material hardship. My results suggest that this extends to conclusions regarding cognitive skill growth in early childhood. Yes, poor children do experience more health problems than non-poor children and this inhibits cognitive skill growth. However, these health problems do not stem directly from a lack of income but rather are the result of resource deprivation that could be ameliorated by policies aimed at healthcare and food provision for children.

The Importance of Structural Constraints in Skill Growth. Perhaps the most interesting set of results from this study is the exploratory analyses assessing the role of the intersection of poverty and race for young children's learning. Results from Chapter Six demonstrate that context matters for the presumed relationship between class, race, and cognitive skills. Researchers often use class as a primary mechanism explaining the existence of the black/white achievement gap (Conley 1995). Additionally, social class often explains much of the variation *within* racial groups. However, results from this study suggest that poverty does not entirely mediate the race gap between groups in early childhood (Chapter Five) and poverty only partially explains variation within racial groups (Chapter Six). In fact, the skill gap between poor Black children and non-poor Black children is barely significant and does not exhibit the same patterns that we would expect from results in Chapter Five. The story for American Indian/Native Alaskan children is similar. While class differences still explain much of the broader racial skill

gap between Black and White children, they do not explain variation within the Black community. This suggests particularly interesting implications for future research investigating the role poverty plays within particular racial contexts. The question remains, why do the income scarcity and material hardship dimensions of poverty work through a child's microsystem, exosystem, and mesosystem for White and Latino children but not for Black and American Indian children? Do different aspects of poverty matter more for these groups' skill growth? Have these communities, as a response to abandonment and social isolation, responded to poverty in ways that mitigate the otherwise negative consequences that children of other racial groups experience?

IMPLICATIONS FOR CLOSING THE POVERTY ACHIEVEMENT GAP

The Importance of Non-School Context

This research makes important contributions to the literature on the importance of non-school contexts in generating achievement gaps (Downey et al. 2004; Entwisle, Alexander, and Olson 2007). This work suggests that schools slow the growth of socioecnomic achievement gaps during the school year, but when children are not under the immediate purview of the education system, these gaps widen faster. Therefore, efforts to close socioeconomic achievement gaps should focus on what happens when children are *outside* of school. Once children are in school, this means during breaks and summer vacation, but the results from this study suggest that a gap between poor and non-poor children exists prior to formal school entry, as early as age 24 months. Results also confirm that this gap is *not* genetically bound in terms of social class as it does not emerge until after nine months of age. When children are assessed at nine months of age, poor children's skills are similar to those of non-poor children. Therefore, this research

suggests that very early childhood is a critical moment to prevent the emergence of the socioeconomic achievement gap.

Additionally, sociological research often addresses the existence of an achievement gap as if it is and always has been present between groups of children, whether the grouping variable is race, class, or gender. My results resoundingly suggest the opposite. This research suggests that the commonly analyzed gaps emerge through the non-school context of children *when they are very young*, even *prior* to the emergence of skill gaps. If we can better understand achievement gaps at this early age, we will better understand achievement gaps at older ages too.

Potential Difference-Making Policy Changes

Partially in the interest of preventing achievement gaps in early childhood, most affluent nations provide assistance to all families (not just wealthy families, not just poor families) in an attempt to prevent income poverty from occurring and therefore preventing the consequences stemming from poverty. These supports often include universal health care coverage, child care assistance and paid family leave (Moller et al. 2003; Bradley et al. 2003). However, the United States welfare system has long taken a different approach by only providing aid (and limited aid at that) to families once they already have fallen below-income levels needed to meet daily needs. One approach to addressing the problem of poverty's relationship to cognitive skill growth and eventual disparities in economic outcomes would certainly be to shift the focus of the American welfare state to an emphasis on poverty reduction. However, as we have seen with recent backlash to the Obama administration, a shift emphasizing universal coverage or universal benefits of any kind is highly unlikely in the current political climate.

If we assume that policymakers must work within the current system, there are policies in place that, if revised, could decrease the degree of income inequality in the United States to begin with and therefore address the problem of income scarcity and much of the disparity in material hardship altogether. For instance, the Earned Income Tax Credit is one of the few redistributive policies currently in use in the United States. It is designed to supplement the wages of low-income workers by reducing the burden of payroll taxes. Each year, the EITC moves 2.5 million children out of poverty (Holt 2006). If policymakers were able to increase the amount of money low-income families were to receive from the IRS annually, the redistributive properties of the EITC could more effectively lift families out of income poverty and thus serve to dampen the impact of poverty on child health, parental health, and indirectly, on parenting practices.

Additionally, income inequality in the United States could be reduced by increasing the minimum wage and indexing it to inflation. The majority of poor families have a working adult in the household (Rank 2005). However, if the minimum wage is insufficient to provide a livable income for one person, let alone an individual with children, that family will still face many of the consequences detailed in Chapters Five and Six. If the structure of minimum wage was shifted, parents would be able to pay for basic expenses like healthcare, childcare, and food for the family. These policies, often mentioned in sociological studies of inequality, would serve to mitigate the stresses of economic inequality and instability that contribute to the early skill gap. That is, the relationship between income poverty and the mediating mechanisms as well as income poverty and material hardship would be significantly weakened with the implementation of redistributive policies such as these.

However, as clearly demonstrated in Chapter Five, income flow is not the entire story. Material hardship plays a key role demonstrating that families who experience a lack of adequate health care coverage, food insecurity or residential mobility are ultimately unable to care for their family in ways conducive to cognitive skill growth in their young children. While increasing the Earned Income Tax Credit and addressing the failings of the minimum wage system would ease some of this burden, it would not address every component. In addition, policymakers and liberal thinktanks have been advocating for the above two policies for many years with little response from Congress. By addressing the material hardship component of poverty, policies could mitigate many of the causal mechanisms that work to create the skill gap between poor and non-poor children while not presenting an overwhelming threat to the elites at the top of the country's economic hierarchy.

First, policymakers could directly mitigate the experiential aspect of poverty by guaranteeing families health coverage that is sufficient to meet their needs. The recent healthcare package passed in early 2010 represents a step in the right direction but is far from complete in guaranteeing poor Americans access to adequate healthcare. Second, local communities could begin to emphasize the importance of mental health care, particularly for poor communities and communities of color. Mental illness is underdiagnosed and therefore often goes untreated in poor communities and particularly poor communities of color despite documented higher levels of stress in these communities due to racism and discrimination (Hughes and Thomas 1998; Noh et al. 1999; Adler et al. 1994). When families are struggling to get basic health coverage, their mental health status may often not be an issue they feel comfortable seeking care for and

certainly not an illness they can pay to treat. By engaging in a public interest campaign to raise awareness about the ramifications of poor mental health status not only on parents but their children as well, and providing *all* citizens with options for treatment, state and federal governments could begin to intervene before children living in poor families feel the consequences of poverty that will follow them into adulthood.

LIMITATIONS AND FUTURE DIRECTIONS

This research is far from complete. Data limitations and a preference for breadth over depth, particularly with regard to the creation of poor/non-poor skill gaps within racial groups, leave three questions in particular unanswered.

First, ECLS-B, while much improved over previous datasets, still does not contain a wealth variable comprehensive to capturing the *amount* of value contained in a family's possessions. Future research should measure wealth poverty more thoroughly. Research suggests that once controlling for wealth, educational attainment race gaps disappear and, in some cases, reverse (Conley 1995). To accurately capture the poverty experience particularly for children of color versus white children, a more comprehensive wealth measure needs to be developed. These measures should focus on the idea of net worth. For instance, as mentioned in Chapter Four, the main vehicle of obtaining intergenerational wealth in the United States is home-ownership. However, a dichotomous measure representing simple home ownership is not sufficient to capture the vast differences in net worth between white families and families of color; a measure of home equity would be much more accurate. Additionally, income measures fail to capture the depth of debt experienced by many families. While the credit crisis has brought American debt to the media forefront, datasets have yet to follow suit. In the

future, in order to accurately assess the concept of wealth or asset poverty, datasets need to refine their measurements of home equity and family debt.

Second, while a child's family is probably the most influential social system when children are younger than two years of age, there is little doubt that wider factors influence development as well. My study focuses on the most proximate social systems to a young child, however, results from Chapters Five and Six should certainly be tested in a framework that also assesses neighborhood and policy factors at work in a child's more distal social spheres. Due to data restrictions in the ECLS-B, I could not get at neighborhood patterns at a sufficiently precise level. Future studies could perhaps engage a more regionally specific study, collect neighborhood data at the census block level and assess the impact of neighborhood processes along with child-specific and family processes in the creation of the skill gap between poor and non-poor children in early childhood.

Finally, the patterns within racial/ethnic communities uncovered in Chapter Six are intriguing and deserve significantly more space and exploration than given here. Indeed, the relationship between poverty and skill growth within each of these communities deserves a dissertation project of its own. Uncovering the specific patterns of behavior and unique processes to each community may not be possible with quantitative data. Particularly in the cases where the relationship between poverty and cognitive skill growth seems unclear, this research should begin qualitatively, allowing for causal pathways to emerge inductively. Perhaps then, when we have built a research base founded on what is actually happening within these communities, we could build

surveys to generalize about the relationship between poverty and cognitive skill growth in early childhood within racial/ethnic groups as well as between them.

CONCLUSION

To conclude this study, I point readers once again to the substantive reality of what it means to be poor in this country. It means having an income insufficient to pay rent, bills, and still buy food for your family. It means, possibly: not knowing where you will live next month; choosing who in your family gets to eat because you can't afford to feed everyone; not having health coverage so that minor conditions go untreated until they become major and must be treated at an emergency room. It means not owning enough assets to get your family through one month without a steady income flow. Imagine all of these (or any) of these realities and then imagine raising a young child on top of it. What choices would you make to assure that he or she learns at a level equal to children not faced with this reality? Are there choices that you could make to mitigate these circumstances? I suggest that poverty is not a condition that can be changed only by individuals but one that must be addressed on a societal level. This study suggests the pathways that could be addressed to most immediately impact the creation of a skill gap as well as policies to accomplish this. However, until Americans move toward creating a culture of social responsibility, particularly within the economic sphere, the problems caused by poverty will continue to exist.

BIBLIOGRAPHY

Adler, Nancy E., Thomas Boyce, Margaret A. Chesney, Sheldon Cohen, Susan Folkman, Robert L. Kahn, and Leonard S. Syme. 1994. Socioeconomic status and health: The challenge of the gradient. *American Psychologis*t 49(1): 15–24.

Annie E. Casey Foundation (AECF). 2003. *2003 Kids Count Data.* Baltimore, MD.

Ainsworth-Darnell, James and Douglas B. Downey. 1998. "Assessing the Oppositional Culture Explanation of Racial/Ethnic Differences in School Performance." *American Sociological Review* 63(4): 536 – 553.

Alexander, Karl, Doris R. Entwisle, and Linda S. Olson. 2007. "Lasting Consequences of the Summer Learning Gap." *American Sociological Review* 72: 167-180.

Andreassen, Carol and Philip Fletcher. (2007). *Early Childhood Longitudinal Study, Birth Cohort (ECLS–B) Psychometric Report for the 2-Year Data Collection* (NCES 2007–084). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Ashiabi, Godwin S. and Keri K. O'Neal. 2008. "A Framework for Understanding the Association between Food Insecurity and Children's Developmental Outcomes." *Child Development Perspectives* 2(2): 71-77.

Axinn, William, Greg J. Duncan, and Arland Thornton. 1997. "The Effects of Parents' Income, Wealth, and Attitudes on Children's Completed Schooling and Self-Esteem." Pp. 518 – 540 in *Consequences of Growing Up Poor*, edited by Greg J. Duncan and Jeanne Brooks-Gunn. New York: Russell-Sage Foundation.

Bankston, Carl, and Stephen Caldas. 1998. "Race, Poverty, Family Structure, and the Inequality of Schools." *Sociological Spectrum* 18:55 - 76.

Betson, David M. and Jennifer L. Warlick. 1998. "Alternative Historical Trends in Poverty." *American Economic Review* 88: 348-351.

Blank, Rebecca M. 2008. "Presidential Address: How to Improve Poverty Measurement in the United States." *Journal of Policy Analysis and Measurement* 27(2): 233-254.

Bloom, Paul and Lori Markson. 1998. "Capacities Underlying Word Learning." *Trends in Cognitive Science* 2: 67 – 73.

Bollen, Kenneth A. 1989. *Structural Equations with Latent Variables.* New York: Wiley.

Borowsky, Iris W., Michael D. Resnick, Marjorie Ireland, and Robert W. Blum. 1999. "Suicide Attempts Among American Indian and Alaska Native Youth: Risk and Protective Factors." *Archives of Pediatric Adolescent Medicine* 153: 573-580.

Bourdieu, Pierre. 1973. "Cultural Reproduction and Social Reproduction." Pp. 487 - 511 in *Power and Ideology in Education*, edited by Jerome Karabel and A. H. Halsey: Oxford University Press.

Bradley, David, Evelyne Huber, Stephanie Moller, François Nielsen and John Stephens. "Distribution and Redistribution in Post-Industrial Democracies." *World Politics* 55:193-228.

Brady, David. 2003. "Rethinking the Sociological Measurement of Poverty." *Social Forces* 81(3): 715-752.

Bronfenbrenner, Urie. 1986. "Ecology of the Family as a Context for Human Development: Research Perspectives." *Developmental Psychology* 22:723 -742.

Brooks-Gunn, Jeanne, Greg J. Duncan, and N. Maritato. 1997. "Poor Families, Poor Outcomes: The Well-Being of Poor Children and Youth." Pp. 1 - 17 in *Consequences of Growing Up Poor*, edited by Greg J. Duncan and Jeanne Brooks-Gunn. New York: Russell-Sage Foundation.

Burns, M. Susan, Peg Griffin, and Catherine E. Snow. 1999. *Starting Out Right: A Guide to Promoting Children's Reading Success*. Washington D.C.: National Academy of Sciences.

Carter, Michael R. and Christopher B. Barrett. 2006. "The Economics of Poverty Traps and Persistent Poverty: An Asset-Based Approach." *The Journal of Developmental Studies* 42(2): 178 – 199.

Charles, Camille Z., Gniesha Dinwiddle, Douglas S. Massey. 2004. "The Continuing Consequences of Segregation: Family Stress and College Academic Performance." *Social Science Quarterly* 85(5): 1353 – 1373.

Children's Defense Fund. 2008. "The State of America's Children: 2008." Washington, D.C.

Chiteji, Ngina and Darrick Hamilton. 2006. "Estimating the Effect of Race and Ethnicity on Wealth Accumulation and Ownership Patterns." Pp. 75-90 in *Wealth Accumulation and Communities of Color in the United States*: *Current Issues,* Edited by Jessica G. Nembhard and Ngina Chiteji. Ann Arbor, MI: The University of Michigan Press.

Citro, Constance F. and Robert T. Michael. 1995. *Measuring Poverty: A New Approach.* Washington D.C.: National Academy Press.

Condron, Dennis J. 2009. "Social Class, School and Non-School Environments, and Black/White Inequalities in Children's Learning." *American Sociological Review* 74: 683-708.

Conger, Rand D., Katherine J. Conger, Glen H. Elder, Jr., Frederick O. Lorenz, Ronald L. Simons, & Les B. Whitbeck. 1992. "A family process model of economic hardship and adjustment of early adolescent boys." *Child Development, 63:* 526–541.

Conger, Rand D., Lora E. Wallace, Yumei Sun, Ronald L. Simons, Vonnie C. McLoyd, and Gene H. Brody. 2002. "Economic Pressure in African-American Families: A Replication and Extension of the Family Stress Model." *Development Psychology* 38(2): 179-193.

Conley, Dalton. 1995. *Being Black, Living in the Red: Race, Wealth, and Social Policy in America.* Berkeley, CA: University of California Press.

Cooper, Carey E., Robert Crosnoe, Marie-Anne Suizzo, and Keenan A. Pituch. 2010. "Poverty, Race, and Parental Involvement During the Transition to Elementary School." *Journal of Family Issues* 31(7): 859 – 893.

Downey, Douglas B., Paul T. von Hippel, and Beckett A. Broh. 2004. "Are Schools the Great Equalizer? Cognitive Inequality during the Summer Months and the School Year." *American Sociological Review* 69:613-635.

Duncan, Greg J. and Jeanne Brooks-Gunn. 1997a. "The Effects of Poverty on Children." *The Future of Children* 7(2): 55 – 71.

Duncan, Greg J. and Jeanne Brooks-Gunn, Editors. 1997b. *The Consequence of Growing Up Poor.* New York: Russell Sage Foundation.

Duncan, Greg J., Jeanie Brooks-Gunn, J. Yeung, and J. Smith. 1998. "How Much Does Childhood Poverty Affect the Life Chances of Children?" *American Sociological Review* 63: 406-423.

Duncan, Greg J., Jeanne Brooks-Gunn, and Pamela K. Klebanov. 1994. "Economic Deprivation and Early Childhood Development." *Child Development* 65(S2): 296-318.

Duncan, Greg J. and Katherine A. Magnuson. 2003. "Off with Hollingshead: Socioeconomic Resources, Parenting, and Child Development." Pps 83-106 in *Socioeconomic Status, Parenting, and Child Development*, Edited by Marc H. Bornstein and Robert H. Bradley. Mahweh, NJ: Lawrence Erlbaum Associates, Inc.

Dunifon, Rachel, Greg J. Duncan, and Jeanne Brooks-Gunn. 2004. "The Long-Term Impact of Parental Organization and Efficiency." Pp. 85 - 118 in *Family Investments in Children's Potential: Resources and Parenting Behaviors that Promote Success*, edited by Ariel Kalil and Thomas DeLeire. Mahweh, NJ: Lawrence Erlbaum Associates, Inc.

Eckholm, Erik. 2008. "Higher Education Gap May Slow Economic Mobility." in *New York Times*. New York.

Entwisle, Doris. R., Karl Alexander, and Linda S. Olson. 2005. "First Grade and Educational Attainment by Age 22: A New Story." *American Journal of Sociology* 110(5): 1458-1502.

Entwistle, Doris R., Karl Alexander, and Linda Olson. 2007. "Leveling the Home Advantage: Assessing the Effectiveness of Parental Involvement in Elementary School." *Sociology of Education* 80:114 - 138.

Farkas, George. 2006. "How Educational Inequality Develops." Version #06-09. June. *National Poverty Center Working Paper Series.*

Fass, Sarah. 2009. *Measuring Poverty in the United States*. New York, NY: Mailman School of Public Health, Columbia University.

Fass, Sarah, and Nancy K. Cauthen. 2007. "Who are America's Poor Children?" New York: The National Center for Children in Poverty.

Fordham, Signithia and John Ogbu. 1986. "Black Students' School Success: Coping with the "Burden of 'Acting White.'" *The Urban Review* 18(3): 176-206.

Garson, G. David. 2008. "Path Analysis", from *Statnotes: Topics in Multivariate Analysis.* Retrieved 5/18/2010 from http://faculty.chass.ncsu.edu/garson/PA765/path.htm.

Gershoff, Elizabeth T., J. Lawrence Aber, C. Cybele Raver, and Mary Clare Lennon. 2007. "Income is Not Enough: Incorporating Material Hardship Into Models of Income Associations with Parenting and Child Development." *Child Development* 78:70 - 95.

Guo, Guang. 1998. "The Timing of the Influences of Cumulative Poverty on Children's Cognitive Ability and Achievement." *Social Forces* 77:257 - 287.

Guo, Guang and Kathleen M. Harris. 2000. "The Mechanisms Mediating the Effects of Poverty on Children's Intellectual Development." *Demography* 37(4): 431-447.

Hagan, John, Ross MacMillan, and Blair Wheaton. 1996. "New Kid in Town: Social Capital and the Life Course Effects of Family Migration on Children." *American Sociological Review* 61(3): 368-385.

Hagenaars, Aldi J. M. 1991. "The Definition and Measurement of Poverty." Pp. 134-156 in *Economic Inequality and Poverty: International Perspectives*. Edited by Lars Osberg. London, England: M.E. Sharpe.

Halle, Tamara, Nicole Forry, Elizabeth Hair, Kate Perper, Laura Wandner, Julia Wessel, and Jessica Vick. 2009. *Disparities in Early Learning and Development: Lessons from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B).* Washington, DC: Child Trends.

Hanson, Thomas L., Sara McLanahan, and Elizabeth Thomson. 1997. "Economic Resources, Parental Practices, and Children's Well-Being." Pp. 190 – 236 in *Consequences of Growing Up Poor*, edited by Greg J. Duncan and Jeanne Brooks-Gunn. New York: Russell-Sage Foundation.

Haveman, Robert and Edward N. Wolff. 2005. "The Concept and Measurement of Asset Poverty: Levels, Trends, and Composition for the U.S., 1983-2001." *Journal of Economic Inequality* 2(2): 145-169.

Herrnstein, Richard J., and Charles Murray. 1994. *The Bell Curve: Intelligence and Class Structure in American Life*. New York: Free Press.

Holt, Steve. 2006. "The Earned Income Tax Credit at Age 30: What We Know." Washington: The Brookings Institution.

Holzer, Harry J., Diane W. Schanzenbach, Gregory J. Duncan, and Jens Ludwig. 2007. "The Economic Costs of Poverty in the United States: Subsequent Effects of Children Growing Up Poor." Institute for Research on Poverty Discussion Paper No. 1327-07. http://www.irp.wisc.edu/publications/dps/pdfs/dp132707.pdf

Hu, Li-Tze and Peter M. Bentler. 1999. "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives." *Structural Equation Modeling: A Multidisciplinary Journal* 6(1): 1 – 55.

Hughes, Micheal and Melivn E. Thomas. 1998. "The Continuing Significance of Race Revisited: A Study of Race, Class and Quality of Life in America, 1972 –1996." *American Sociological Review* 63: 785–795.

Iceland, John. 2006. *Poverty in America*. Berkeley: University of California Press

Iceland, John and Kurt J. Bauman. 2007. "Income Poverty and Material Hardship: How Strong is the Association?" *Journal of Socio-Economics* 36(3): 376-396.

Institute of Education Sciences (IES). 2007. *Restricted Use Data Procedures Manual.* National Center for Educational Statistics, Institute of Education Sciences, U.S. Department of Education. Washington D.C.

Jaccard, James and Choi K. Wan. 1996. *LISREL Approaches to Interaction Effects in Multiple Regression.* Thousand Oaks, CA: Sage Publications.

Johnson, Heather Beth. 2006. *The American Dream and the Power of Wealth: Choosing Schools and Inheriting Inequality in the Land of Opportunity*. New York: Routledge.

Kohn, Melvin L. 1969. *Class and Conformity: A Study in Values*. Homewood, IL: Dorsey Press.

Kohn, Melvin L. and Carmi Schooler. 1982. “Job Conditions and Personality: A Longitudinal Assessment of their Reciprocal Effects.” *American Journal of Sociology* 87: 1257 – 1285.

Kohn, Melvin L., Atsushi Naoi, Carrie Schoenbach, Carmi Schooler, and Kazimierz Slomczynski. 1990. “Position in the Class Structure and Psychological Functioning in the United States, Japan, and Poland.” *American Journal of Sociology* 95: 964-1008.

Klebanov, Pamela K., Jeanne Brooks-Gunn, and Greg J. Duncan. 1994. “Does Neighborhood and Family Poverty Affect Mothers’ Parenting, Mental Health and Social Support?” *Journal of Marriage and Family* 56(2): 441-455.

Lamont, Michele and Annette Lareau. 1988. “Cultural Capital: Allusions, Gaps, and Glissandos in Recent Theoretical Developments.” *Sociological Theory* 6: 153 – 68.

Lareau, Annette. 1987. *Home Advantage: Social Class and Parental Intervention in Elementary Education*. Lanham, MD: Rowman and Littlefield Publishers, Inc.

—. 2002. "Invisible Inequality: Social Class and Childrearing in Black Families and White Families." *American Sociological Review* 67:747-776.

----. 2003. *Unequal Childhoods: Class, Race, and Family Life.* Berkeley, CA: University of California Press.

Lewis, Oscar. 1965. *La Vida: A Puerto Rican Family in the Culture of Poverty.* New York: Random House.

Lichter, Daniel T. 1997. “Poverty and Inequality among Children.” *Annual Review of Sociology* 23: 121-145.

Lichter, Daniel T., and Lori Ann Campbell. 2005. “Changing Patterns of Poverty and Spatial Inequality in Appalachia.” In *Demographic and Socioeconomic Change in Applachia Series.* Washington DC: Population Reference Bureau and Appalachian Regional Commission.

Lichter, Daniel T., and Kenneth M. Johnson. 2007. "The Changing Spatial Concentration of America's Rural Poor Population." *Rural Sociology* 72:331 - 358.

Lindhorst, Taryn, Blair Beadnell, Lovie J. Jackson, Karen Fieland, and Angela Lee. 2009. “Mediating Pathways Explaining Psychosocial Functioning and Revicitimization as Sequelae of Parental Violence Among Adolescent Mothers.” *Journal of Orthopsychiatry* 79(2): 181-190.

Luster, Tom, Kelly Rhoades, and Bruce Haas. 1989. “The Relation between Parental Values and Parenting Behavior: A Test of the Kohn Hypothesis.” *Journal of Marriage and Family* 51: 139-147.

MacKinnon, David P. and James H. Dwyer. 1993. “Estimating Mediated Effects in Prevention Studies.” *Evaluation Review* 17(2): 144-158.

MacLeod, Jay. 1995. *Ain't No Makin' It: Aspirations and Attainment in a Low-Income Neighborhood.* Boulder, CO: Westview Press.

Magnuson, Katherine and Jane Waldfogel, Editors. 2008. *Steady Gains and Stalled Progress: Inequality and the Black-White Test Score Gap.* New York: Russell-Sage Foundation.

Massey, Douglas S. 2007. *Categorically Unequal: The American Stratification System.* New York: Russell-Sage Foundation.

Massey, Douglas S., Camille Z. Charles, Garvey F. Lundy, and Mary J. Fischer. 2003. *Source of the River: the Social Origins of Freshmen at America’s Selective Colleges and Universities*. Princeton, N.J.: Princeton University Press.

Massey, Douglas S. and Nancy Denton. 1998. *American Apartheid: Segregation and the Making of the Underclass.* Cambridge, MA: Harvard University Press.

Massey, Douglas S. and Mary J. Fischer 2000. “How Segregation Concentrates Poverty.” *Ethnic and Racial Studies* 23: 670-691.

Maurin, Eric. 2002. "The Impact of Parental Income on Early Schooling Transitions: A Re-examination Using Data over Three Generations." *Journal of Public Economics* 85:301-332.

Matheson, Flora I., Rahim Moineddin, James R. Dunn, Maria Isabella Creatore, Piotr Gozdyra, and Richard H. Glazier. 2006. "Urban Neighborhoods, Chronic Stress, Gender, and Depression." *Social Science and Medicine* 63:2604 - 2616.

McLanahan, Sara and Gary Sandefur. 1994. *Growing Up with a Single-parent: What Hurts, What Helps.* Cambridge: Havard University Press.

Miller, Jane E., and Sanders Korenman. 1994. "Poverty and Children's Nutritional Status in the United States." *American Journal of Epidemiology* 140:233 - 243.

Mirowsky, John and Catherine E. Ross. 1999. “Economic Hardship across the Life Course.” *American Sociological Review* 64: 548 – 569.

Mistry, Rashmita S., Elizabeth A. Vandewater, Aletha C. Huston, and Vonnie C.

McLoyd. 2002. “Economic Well-Being and Children’s Social Adjustment: The Role of Family Process in an Ethnically Diverse Low-Income Sample.” *Child Development* 73(3): 935-951.

Mistry, Rashmita S., Edward D. Lowe, Aprile D. Renner, and Nina Chien. 2008. “Expanding the Family Stress Model: Insights from a Mixed Methods Approach.” *Journal of Marriage and Family* 70(1): 196-209.

Moller, Stephanie, David Bradley, Evelyne Huber, François Nielsen and John D. Stephens. “Determinants of Relative Poverty in Advanced Capitalist Democracies.” *American Sociological Review* 68:22-51.

National Center for Children in Poverty. March 2010. *United States Early Childhood Profile*. New York, NY: Mailman School of Public Health, Columbia University. Nolan and Whelan 1997

Noh, Samuel, Morton Beiser, Violet Kaspar, Feng Hou, and Joanna Rummens. 1999. Perceived racial discrimination, depression and coping: A study of Southeast Asian refugees in Canada. *Journal of Health and Social Behavior* 40: 193–207.

Nolan, Brian, and Christopher T. Whelan. 1996. *Resources, Deprivation, and Poverty.* Oxford: Clarendon Press.

Nord, Christine, Brad Edwards, Carol Andreassen, Jim L. Green, and Kathleen Wallner-Allen. 2006. *Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), User’s Manual for the ECLS-B Longitudinal 9-Month–2-Year Data File and Electronic Codebook* (NCES 2006–046). U.S. Department of Education.Washington, DC: National Center for Education Statistics.

Nord, Christine, Bard Edwards, Richard Hilpert, Laura Branden, Carol Andreassen, Anne Elmore, Desrene Sesay, Philip Fletcher, Jim Green, Ray Saunders, Rick Dulaney, Lizabeth Reaney, Kristin D. Flanagan, and Jerry West. 2005. *Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) Nine-Month Public Use Data User’s Manual* (NCES 2005-013). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington D.C.

Oliver, Melvin L. and Thomas M. Shapiro. 1997. *Black Wealth/White Wealth: A New Perspective on Racial Inequality.* New York: Routledge.

Olsson, Ulf H., Tron Foss, Sigurd V. Troye & Roy D. Howell. 2000. “The Performance of ML, GLS, and WLS Estimation in Structural Equation Modeling Under Conditions of Misspecification and Nonnormality.” *Structural Equation Modeling* 7(4): 557-595.

Orshanky, Mollie. 1965. “Counting the Poor: Another Look at the Poverty Profile.” *Social Security Bulletin* 28: 3- 29.

Pagini, Linda, Bernard Boulerice, and Richard E. Tremblay. 1997. "The Influence of Poverty on Children's Classroom Placement and Behavior Problems." Pp. 311 - 339 in *Consequences of Growing Up Poor*, edited by Greg J. Duncan and Jeanne Brooks-Gunn. New York: Russell Sage Foundation.

Palloni, Alberto. 2006. "Reproducing Inequalities: Luck, Wallters, and the Enduring Effects of Childhood Health." *Demography* 43:587 - 615.

Parcel, Toby L. and Elizabeth G. Menaghan. 1994. *Parents' Jobs and Children's Lives.* New York: deGruyter.

Patel, Kant. 2001. "Down and Out in America: Children and Health Care." *Journal of Health and Social Policy* 13:33 - 57.

Peters, H. Elizabeth, and Natalie C. Mullis. 1997. "The Influence of Poverty on Children's Classroom Placement and Behavior Problems." Pp. 340 - 381 in *Consequences of Growing Up Poor*, edited by Greg J. Duncan and Jeanne Brooks-Gunn. New York: Russell-Sage Foundation.

Portes, Alejandro and Truelove, Cynthia. 1987. "Making Sense of Diversity: Recent Research on Hispanic Minorities in the United States." *Annual Review of Sociology* 13: 359-385.

Raftery, Adrian E. 1993. "Bayesian model selection in structural equation models. Pp. 162-180 In *Testing Stuctural Equation Models*, Edited by Kurt A. Bollen and J. Scott Long, eds.), Beverly Hills, CA: Sage.

Rank, Mark Robert. 2005. *One Nation, Underprivileged: Why American Poverty Affects Us All*. New York: Oxford University Press.

Reardon, Sean F. and Claudia Galindo. 2009. "The Hispanic-White Achievement Gap in Math and Reading in the Elementary Grades." *American Educational Research Journal* 46: 853-891.

Reiman, Jeffrey H. 2006. *The Rich Get Richer and The Poor Get Prison: Idealogy, Class, and Criminal Justice*. Boston: Allyn and Bacon.

Romero, Mariajose, and Young-Sun Lee. 2008. "The Influence of Maternal and Family Risk on Chronic Absenteeism in Early Schooling." New York: National Center for Children in Poverty.

Rosenfield, Jake. 2010. "The Meaning of Poverty and Contemporary Quantitative Poverty Research." *British Journal of Sociology* 61 (Supp 1): 103 – 110.

Rothstein, Richard. 2004. *Class and Schools: Using Social, Economic, and Educational Reform to Close the Black-White Achievement Gap*. New York: Economic Policy Institute.

Sandoval, Daniel A., Mark R. Rank, and Thomas A. Hirschl. 2009. "The Increasing Risk of Poverty Across the American Life Course." *Demography* 46(4): 717-737.

Schafft, Kai A. 2006. "Poverty, Residential Mobility, and Student Transiency within a Rural New York School District." *Rural Sociology* 71(2): 212-231.

Shapiro, Thomas M. 2004. *The Hidden Cost of Being African-American: How Wealth Perpetuates Inequality*. Oxford: Oxford University Press.

Shapiro, Thomas M. and Heather Beth Johnson. 2003. "Good Schools: Race and the Good Choices of White Families." In *White Out: The Continuing Significance of Race* edited by Ashley Doan and Eduardo Bonilla-Silva. Routledge.

Smith, Judith R., Jeanne Brooks-Gunn, and Pamela K. Klebanov. 1997. "Consequences of Living in Poverty for Young Children's Cognitive and Verbal Ability and Early School Achievement." Pp. 132-189 In *Consequences of Growing Up Poor*, edited by Greg J. Duncan and Jeanne Brooks-Gunn. New York: Russell Sage Foundation.

Snow, Kyle, Lisa Thalji, Azucena Derecho, Sara Wheeless, John Lennon, Susan Kinsey, Jim Rogers, Melissa Raspa, and Jennifer Park. 2007. *Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Preschool Year Data File User's Manual (2005–06)* (NCES 2008-024). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Solomon, Amy L., Jenny W. L. Osborne, Stefan F. LoBuglio, Jeff Mellow, and Debbie A. Mukamal. 2008. "Life After Lockup: Improving Reentry from Jail to Community." Montgomery County, MD: Urban Institute.

Teachman, Jay D., Kathleen M. Paasch, Randal D. Day, and Karen P. Carver. 1997. "Poverty During Adolescence and Subsequent Educational Attainment." Pp. 382 - 418 in *Consequences of Growing Up Poor*, edited by Greg J. Duncan and Jeanne Brooks-Gunn. New York: Russell-Sage Foundation.

Wagmiller Jr., Robert L., Mary Clare Lennon, Li Kuang, Philip M. Alberti, and J. Lawrence Aber. 2006. "The Dynamics of Economic Disadvantage and Children's Life Chances." *American Sociological Review* 71:847 - 866.

Waters, Mary C. and Karl Eschbach. 1995. "Immigration and Ethnic and Racial Inequality in the United States." *Annual Review of Sociology* 21: 419-446.

Weinreb, Lisa, Cheryl Wehler, Jennifer Perloff, Richard Scott, David Hosmer, Linda Sagor, and Craig Gundersen. 2002. "Hunger: Its Impact on Children's Health and Mental Health." *Pediatrics* 110(4): 41-50.

Wight, Vanessa R. and Michelle Chau. 2009. "Basic Facts About Low-Income Children, 2008: Children Under the Age of 3." New York, NY: National Center for Children in Poverty, Columbia University, Mailman School of Public Health.

Wilson, William Julius. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Urban Poverty*. Chicago: The University of Chicago Press.

—. 1991. "Studying Inner-City Social Dislocations: The Challenge of Public Agenda Research." *American Sociological Review* 56: 1-14.

—. 1996. *When Work Disappears: The World of the New Urban Poor*. New York: Vintage.

Winship, Christopher and Larry Radbill. 1994. "Sampling Weights and Regression Analylsis." *Sociological Methods Research* 23(2): 230-257.

Wolff, Edward N. 2001. *Top Heavy: The Increasing Inequality of Wealth in America and What Can Be Done About It.* New York: The New Press.

Wight, Vanessa and Michelle Chau. 2009. *Basic Facts About Low-Income Children, 2008: Children Under 3.* New York, NY: National Center for Children in Poverty, Columbia University, Mailman School of Public Health.