

**FOCUSING ON SUCCESS: PATHWAYS
OUT OF CHILDHOOD POVERTY**

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1. INTRODUCTION

Much recent literature—both popular and academic—has focused our attention on conditions under which children are raised and the potential consequences of these contextual factors for a variety of outcomes in later life. Of particular concern are the long-lasting effects of growing up in families that lack economic (and perhaps other) resources, especially the stability of homeownership, and of growing up in neighborhoods of concentrated poverty.

Our research project was intended to improve our understanding of the extent to which the success of children in early adult life is related to the characteristics of their families (including income, education, attitudes, values, family structure), parents' homeownership status, residential mobility history, and characteristics of neighborhoods (particularly owner-occupancy rate and poverty rate) in which they are raised. By success we have in mind adult outcomes that are stereotypically the hallmarks of middle class life, such as stable employment, decent income, educational attainment of a high school degree or beyond, and the absence of out-of wedlock births during adolescence.

The next section of this report describes our conceptual framework and model. Section 3 contains a review of pertinent literature. Our data source (the Panel Study of Income Dynamics) and analytical approach are described in section 4. Sections 5 through 7 contain our main results. Policy implications of these results are discussed in section 8.

2. CONCEPTUAL FRAMEWORK

The literature on family background, personal characteristics, neighborhood effects, and the roles of home ownership and housing mobility have largely focused on looking at a subset of influential variables. In many cases, the study design draws on roughly contemporary circumstances to identify the determining factors in, for instance, the decision to drop out or stay in high school, or become a parent while still a teenager. Some longitudinal studies allow for the simultaneity of family and neighborhood characteristics. The few studies that examine the role of parental home ownership and residential relocation during childhood largely fail to address the inter-relatedness of other factors. Greater insight could be gained by developing a conceptual framework that incorporates all of the factors that contribute to the outcome in question, and the casual interrelationships among these various factors.

The conceptual model that guided our efforts, which is portrayed in Figure 1, overcomes these limitations. We posit that young adult outcomes of interest (shown on the right panel of Figure 1) are determined by four sets of exogenous or predetermined variables: observed characteristics of individual children (path A: gender, race, e.g.), unobserved characteristics of individual children (path H: intelligence, e.g.), observed parental characteristics (path G: education, age, e.g.), and unobserved parental characteristics (path B: ambition, present orientation, concern for their children's future, e.g.). These unobserved parental factors (shown as dotted lines in Figure 1) are the source of omitted variables bias associated with selection, which we shall discuss below. Young adult outcomes are also influenced by a set of parental characteristics that may more properly be modeled as endogenous to the childhood residential context (path E:

parental employment and income history, e.g.). Finally, we see young adult outcomes as influenced by a set of intervening endogenous variables: neighborhood characteristics (path C), parental homeownership status (path D), and parental mobility expectations mediated by actual mobility behavior (path F).

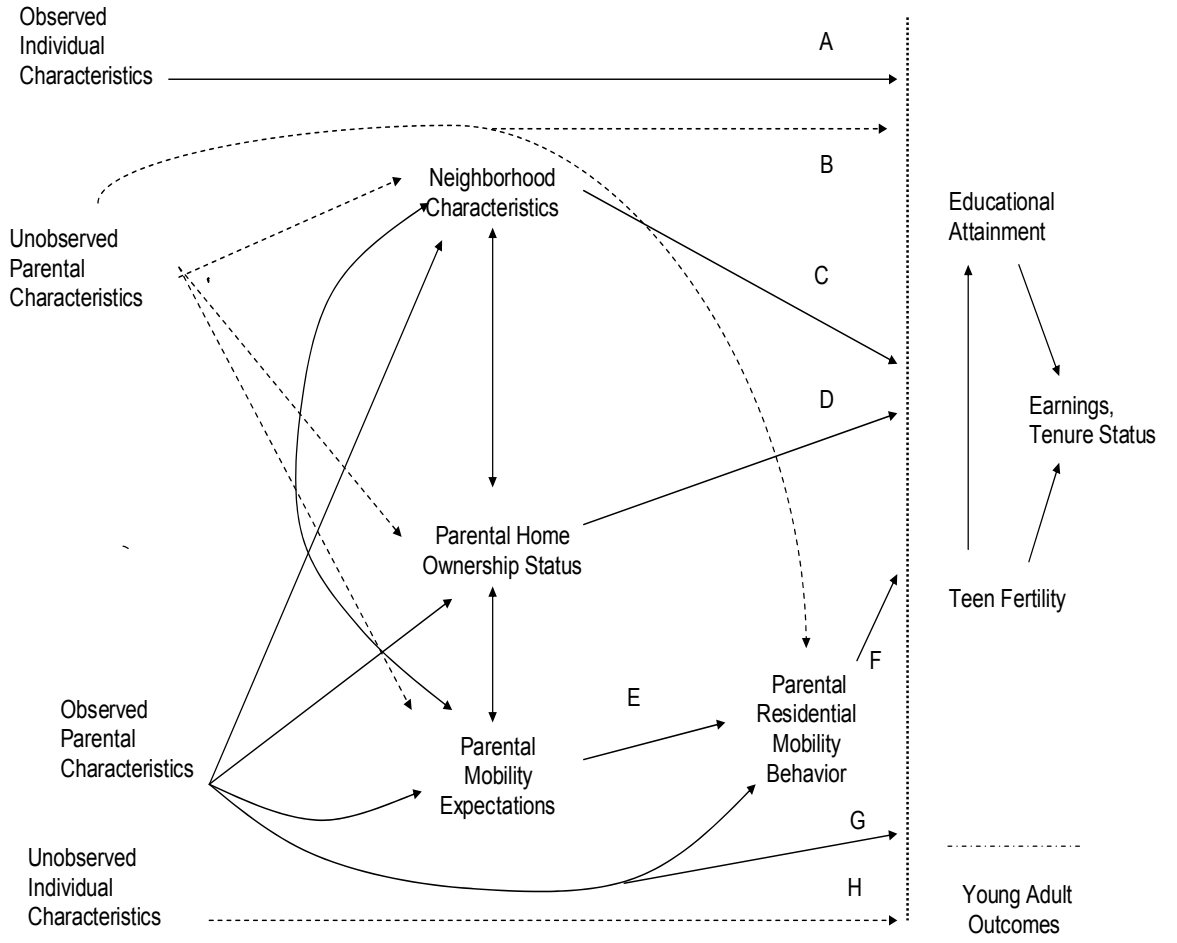
Tenure and neighborhood selections are simultaneously determined: if economic status constrains a household to a set of “affordable” neighborhoods, but in all these there is much social instability / problems and concomitant expectations of property value deflation, there will be little motivation to buy; if a household would like to buy, certain neighborhoods may not be selected if they hold the prospect for little property appreciation.

Tenure and neighborhood *and* mobility expectations (expected duration of stay) are also simultaneously determined: if one expects to remain long in a home or city, given his or her employment, and life-cycle stage situation, he or she may be more likely to bear the high transaction costs of buying and will try harder to avoid weak/declining neighborhoods; in turn, if one can purchase a home, and succeed in doing so in a good neighborhood, he or she will probably expect to move less in the future.

Parental wealth is another endogenous variable. Homeownership can enhance wealth if homeowners increase their equity position through the appreciation of their housing asset, a financial option unavailable to renters. Yet one must generally have access to buy a house in the first place. Once a homeowner, the combination of housing and non-housing wealth will affect one’s ability to remain so; neighborhood characteristics may affect housing appreciation (Rohe and Stewart, 1996).

Figure 1

A Structural Model of Young Adult Outcomes



Each of these sets of variables (parental home ownership, neighborhood, mobility expectations and parental wealth) influence and are influenced by family characteristics. For instance, a married couple with two children, with an annual income twice that of the median family in the area and a large nest egg will make very different housing decisions than a single mother who works irregularly, or a retired couple on a fixed income. At the same time, each family, including the children, will be influenced in very complex ways by the environment in which they live. To the extent that neighborhood conditions better enable parents themselves to succeed, the parents will likely be better able to help their children succeed. Behavioral norms of the community may influence parental choices and behaviors. The stigma that a neighborhood attaches to single parenthood, being unemployed, having low income, drinking, smoking, participating in welfare, and so on, may discourage parents from making those choices or engaging in those behaviors. A high rate of single motherhood may give a woman confidence (or a support network) to raise her family alone, or a high rate of participation in the labor force may encourage men and women to work and to avoid welfare.

The family's connection to the neighborhood indicates the extent to which the neighborhood might be expected to influence the family. A family that refrains from socializing with neighbors may be little affected by neighborhood conditions. Such connectedness or lack of connectedness tends to be self-reinforcing (Putnam, 1998). For instance, home ownership promotes connectedness among residents, both because they tend to live there longer and because they tend to be more attuned to the workings of local government (DiPasquale and Glaeser, 1999; Rohe and Stewart, 1996). Having family and friends nearby also contributes to a family's connection to the neighborhood,

making one more likely to buy a home in such a neighborhood and more likely to stay in such a neighborhood.

3. LITERATURE REVIEW

The body of scholarly statistical work seeking to identify the multiple predictors of various social, economic, and psychological outcomes for children and adults is voluminous and rapidly growing; it has been the subject of several recent comprehensive reviews (Robert 1999, Leventhal and Brooks-Gunn 2000, Earls and Carlson 2001, and Sampson, Morenoff and Gannon-Rowley 2002; Ellen and Turner, 2003; Galster, 2005.). The bulk of this literature (e.g., Furstenberg et al., 1999, Brooks-Gunn et al., 1997) examines factors affecting outcomes at various stages of childhood. However important such outcomes are, we believe it is also crucial to examine factors that account for young adult outcomes. In this regard there is an established literature examining adult outcomes such as: welfare usage (e.g., Moffitt, 1992; Gottschalk, McLanahan, and Sandefur, 1994; Gottschalk, 1996; Vartanian, 1999b; Pepper, 2000); school dropouts (e.g., Clark, 1992; Mayer, 1997, Gleason and Vartanian, 1999; Sawhill and Chadwick, 1999); crime (e.g., Sullivan, 1989; Freeman, 1991; Peeples and Loeber, 1994; Grogger, 1997); teen childbearing (e.g., Maclanahan and Bumpass, 1988; Furstenberg, Levine and Brooks-Gunn, 1990; Haurin, 1992; Sawhill and Chadwick, 1999; Barber, 2001), economic idleness (e.g., Payne, 1987; Haveman and Wolfe, 1994; Mayer, 1997; Sawhill and Chadwick, 1999) and earnings (e.g., Haveman and Wolfe, 1994, Corcoran et al. 1992, Vartanian, 1999a).

FAMILY CHARACTERISTICS

In light of the important role that parents play in their children's lives, family background factors are expected to have a strong influence on children. In addition to

acting as role models, parents provide physical and emotional comfort as well as the basic necessities for their children. They also spend time with their children, providing companionship, guidance, discipline, affirmation and assistance. Moreover, the extent to which parents engage in behavior that supports or undermines their own success allows them to better help their children. In addition to a healthy, supportive and nurturing environment, parents provide a genetic endowment that may predispose their children to certain ranges of physical and mental ability.

The family background characteristics that are widely believed to influence adult outcomes include family structure, family income and wealth, parents' educational attainment, and parents' values and attitudes. We now turn to the literature regarding the influence of these factors on early adult outcomes.

Family Structure

Conventional wisdom holds that children are better off living with two married parents. What are the consequences for children if that arrangement is not possible? Single parenthood can be detrimental to children for several reasons. There is at most one parent who can be employed and generate income. A single working parent does not have a spouse to watch the children while he or she works and so must arrange and pay for child-care. If the single parent is an unemployed woman, the family may be receiving welfare or other forms of public support. Yet introducing a step-parent into the family is not clearly more beneficial for the children.

Most studies find that growing up in a single-parent household is associated with lower levels of educational attainment, but the disadvantage is reduced (McLanahan, 1985; Haveman, Wolfe, and Wilson, 1997; Krein and Beller, 1988) or disappears (Haurin

1992; Conley, 1999; Loh, 1996; Haveman and Wolfe, 1994) when controlling for income and/or wealth. Controlling for the duration of residence also diminishes the importance of living in a nonintact family (Astone and McLanahan, 1994). Some studies have suggested that the importance of intact family status may be limited to the preschool years (Krein, 1986; Krein and Beller, 1988) or women (Powell and Parcel, 1997).

The role of family structure in labor market outcomes is less well-established. Living with a single mother plays an insignificant part in annual hours worked, idleness (Conley, 1999) and hourly wages (Conley, 1999), except when daughters (Powell and Parcel, 1997) and sons (Couch and Lillard, 1998) are modeled separately.

At the same time, daughters of single mothers were more likely than daughters in intact families to have a child during her teen years (McLanahan and Bumpass, 1988; Furstenberg, Levine and Brooks-Gunn, 1990; Haurin, 1992).

Income and Wealth

Parents' command of monetary resources better enables them to provide for their children. At the low end, this may mean providing enough of the basic necessities to ensure the child's physical and emotional comfort. At the high end, this may mean investing in enrichment activities and pursuits for their children, such as private school, cultural opportunities and enabling social connections. One explanation for the strong correlation between parents' and children's earnings is that parents serve as important role models in the areas of ambition, self-discipline, value of work, sense of efficacy and other possibly unobserved characteristics. Closely related, parents may directly (by teaching) and/or indirectly (by example) shape their children's vocational and financial

expectations and aspirations. The marginal effect of increased income is generally strongest among families with the lowest income.

Some studies also include a variable to denote poverty status, which allows for the detection of nonlinear income effects. “Poverty” status combines family size with family income to indicate family need. Typically measured as a dichotomous variable, or as the number of years within a stage of the child’s life in which the family lived in poverty, a significant coefficient reveals the extent to which living in need is detrimental.

Higher income is associated with improved educational outcomes, (Haveman, Wolfe, and Wilson, 1997; Hill and Duncan, 1987; Duncan et al., 1998), although the effect disappears when controlling for family wealth (Conley, 1999). The detrimental impact of living in poverty increases with duration (Teachman et al., 1997; Haveman, Wolfe and Wilson, 1997). Studies that examine stage of development disagree as to when the negative effect of living in poverty was strongest. It may be most acute when occurring during the early stages of a child’s life (Duncan et al., 1998), ages 9-11 (Haveman and Wolfe, 1994), or during adolescence (Haveman, Wolfe and Spaulding, 1991; Teachman et al., 1997).

Family income and parents’ socioeconomic status during childhood seems to play a very strong role in predicting children’s later income. Several studies found a positive relationship between parents’ and children’s earnings and wages (Kiker and Condon 1981a; Corcoran et al., 1990; Behrman and Taubman, 1990; Altonji and Dunn, 1990; Altonji and Dunn, 1994; Hill and Duncan, 1987; Eide and Showalter, 1999; Conley, 1999). The role of family income in predicting idleness is less clear. Higher family

income may discourage idleness *and also* hours worked (Conley, 1999), or it may be irrelevant (Haveman and Wolfe, 1994; Vartanian, 1999b).

Assets represent the accumulation of excess income over a period of time. Liquid assets can be used to stabilize a household's finances in the short run, although persons most likely to suffer disruptions in income are the least likely to have savings to cover the bad times (Ruggles and Robertson, 1989). The possession of wealth may also contribute to the emotional stability of a family if it fosters a sense of mutual trust through co-ownership and demonstrates a commitment to planning for the family's future. However, children may not be aware of family assets (other than an owned home) and may only benefit indirectly, to the extent that their parents benefit from these stabilizing effects. Many types of accumulated wealth can be used to create more wealth, as well as to secure loans and mortgages to make possible more spending or other investments, including investments in the children. There is some debate over whether the significance of family wealth is related to the intergenerational transfer of capital or its role in facilitating investments in the child (see Hofferth et al., 1999; Henretta, 1984).

Several authors have explored the reasons that black families possess sharply fewer assets than do white families (Sherraden, 1991; Conley, 1999; Oliver and Shapiro, 1995; Massey and Denton, 1993, among others), yet the role of family wealth in the adult outcomes of children has been largely overlooked in the literature. Conley (1999) interprets the positive relationship between family wealth and both high school and college graduation as the consequences of families using wealth to finance their children's education, and greater property wealth in a community can mean higher property tax revenues available for spending on schools. Conley also found that parental

wealth reduces the likelihood of idleness and encourages hours worked, but depresses wages.

Henretta (1984) considered whether certain aspects of family background, in addition to several variables measuring own family structure and economic resources, affect the probability that children will later own a home and the value of the homes owned. Among the family background variables, the number of siblings while growing up influences homeownership, while the value of the parents' home influences the value of the child's home for white children. For black children, parents' homeownership is significant for the child's homeownership and the value of parental gifts is significant for the worth of the child's home. Parents' income was not significant for child's homeownership and was only significant for the value of the child's home when parents' home value was excluded from the model.

Yet parents' resources may not be as important in the decision to purchase a home as the characteristics of the housing market in which an individual is contemplating residing, as well as their own financial resources (Clark and Mulder, 2000).

Educational Attainment of Parents

Parents' educational attainment may reflect some underlying personal characteristics, such as initiative, tenacity and ambition, as well as the resources that their parents (i.e., the child's grandparents) were able to devote to them as they were growing up. More education can have a positive impact on children's outcomes by teaching their children to value education and indirectly by allowing parents to set a good example for their children. Better-educated parents also tend to have higher incomes and better jobs, both of which also have a positive impact on children's outcomes.

Mother's education is consistently found to have a positive impact on her children's education (Haveman, Wolfe, and Wilson 1997), especially her daughters (D'Amico, Haurin and Mott, 1983). Studies that examine the impact of both parents also find a positive relationship (Keane and Wolpin, 2001; Conley, 1999), although there is disagreement as to whether the effect of the mother's education is greater (Teachman et al., 1997) or the father's (Axinn, Duncan and Thornton, 1997). Conley (1999) found that the educational attainment of the head of the household is positively associated with hours worked and wages, and negatively associated with idleness.

Parents' Behaviors and Attitudes

Parenting practices, such as styles of discipline, granting of responsibility and privileges, family climate, and support for children's independence shape the skills, abilities, and psychological well-being of children, directly influencing the competencies that allow them to succeed during the teen years. Parents set limits for their children, convey their expectations, and set an emotional tone for the household. In response, children develop their own sense of efficacy, well-being, and competence (Furstenburg et al., 1999). Studies that examine parenting behaviors tend to focus on their immediate or near-term impact, such as behaviors and scholastic achievement while in school, rather than the impact on children's eventual outcomes (see Furstenburg et al., 1999; National Research Council and Institute of Medicine, 2000; Mayer, 1997b).

Parents' behaviors (such as watching television, reading the newspaper, engaging in self-improvement activities) may serve as proxies for underlying characteristics that can predict their own and their children's success. Parents' behaviors reflect their

- values, by using their time and energy in ways which they feel are important;

- self-discipline, through pursuit of goals;
- self-value, by engaging in activities that improve themselves;
- opportunities, subject to a variety of constraints.

These factors are little studied in the literature, perhaps because of the lack of theory to suggest how many of these factors might influence their children. For instance, are children better off if their parents watch some television? Are the parents better informed or more relaxed? If parents watch no television, is it because they do not have the time or because they do not have the interest? Does all television viewing have the same impact on the family?

Similarly, parental attitudes (such as feelings of self-efficacy, expectations, trust) contribute to the psychological development of the children and can color many of the decisions that the parents make in their own lives and with respect to their children. Yet these factors are rarely used in longitudinal studies, perhaps because of the volatility of the measures¹.

HOMEOWNERSHIP STATUS AND RESIDENTIAL STABILITY

Though there is a considerable literature on the private and social benefits of homeownership for such things as community participation, life satisfaction, home maintenance, and wealth accumulation (Rossi and Weber, 1996; Rohe, McCarthy and Van Zandt, 2000; McCarthy, van Zandt and Rohe, 2001), only a handful of studies has attempted to link any of these effects to later-life outcomes for children. The work of Green and White (1997), Boehm and Schlottmann (1999), Aaronson (2000), Boyle

¹ The early years of the PSID included numerous questions on parental attitudes, from which indices of efficacy, trust, ambition, risk avoidance, among others, were created. The correlations of these indices from 1968 to the same index in 1972 was demonstrated to be as low as 0.11 (Duncan and Hill, 1975).

(2002), Harkness and Newman (2002, 2003), Haurin, Parcel, and Haurin (2002a, b), Haurin, Dietz and Weinberg (2002), and Kauppinen (2004) is suggestive that homeownership status matters for children, though it typically is unclear whether the effect is an independent one or is commingled with residential stability, neighborhood conditions, or both.

The literature consistently finds a positive impact of homeownership status on children, ranging from early childhood cognitive and social development (Haurin, Parcel and Haurin, 2002a, b; Boyle, 2002); educational attainment (Green and White, 1997; Boehm and Schlottmann, 1999; Aaronson, 2000; Harkness and Newman, 2002, 2003; Kauppinen, 2004); teen childbearing (Green and White, 1997; Harkness and Newman, 2002, 2003); earnings and welfare usage (Harkness and Newman, 2002, 2003); and buying a home as a young adult (Boehm and Schlottmann, 1999), though Harkness and Newman (2003) find stronger effects for children from lower-income households. Two primary causal mechanisms have been advanced through which parental homeownership status may produce these felicitous outcomes for children living in the home—direct (path D in Figure 1) and indirect (via mobility, paths E and F).²

The direct effects that have been posited include:

- Homeowners maintain their dwellings to higher standards than otherwise identical households who are renting (Galster, 1983, 1987; Mayer, 1981), which may affect differentially the health, cognitive and social development of resident children (Parcel and Menaghan, 1994a, b)
- Homeowners may acquire a distinctive set of skills, such as those related to do-it-yourself home repairs, negotiating with contractors, plumbers, etc., seeking

² See Dietz and Haurin (2003) for a comprehensive review of the consequences of homeownership.

refinancing. Insofar as these may be transferable to children, the latter will benefit (Green and White, 1997; Boehm and Schlottmann, 1999)

- Homeowners may have more financial stake in the occupied residence, and thus more motivation to monitor and control activities of children (both their own as well as neighbor's) that might threaten the neighborhood's property value (Haurin, Parcel, and Haurin, 2002a, b; Hoff and Sen, 2005)
- Homeowners may invest more in developing social capital and participating actively in the neighborhood, from which their children may benefit in a variety of ways (Hunter, 1975; Cox, 1982; Jeffers and Dobos, 1984; Coleman, 1988, 1990; Austin and Baba, 1990; Rohe and Stegman, 1994; Verba et al., 1995; Rossi and Weber, 1996; DiPasquale and Glaeser, 1999)
- Buying a home may yield gains in satisfaction and self-esteem, which in turn translate into a more supportive, positive socio-psychological environment for children (Balfour and Sith, 1996; Rossi and Weber, 1996)
- Homeowners may gain a superior equity position than renters (to the extent that home appreciation outperforms other financial instruments; but see Nesslein, 2000), and thus would be able to invest more in the educational and nurturing aspects of the children's environment³
- Homeowners may experience lower levels of stress because of greater security of tenure, which produces more positive behavioral and cognitive outcomes in the household (Cairney and Boyle, 2004)

³ Haurin, Parcel and Haurin (2002a, b) find that wealth was unrelated to either cognitive or emotional dimensions of the home environment, children's math and reading test scores, or an index of children's behavioral problems, controlling for homeownership status and other parental characteristics.

The indirect consequences putatively transpire through the effect of homeownership status on residential stability. The argument proceeds as follows. Due to the high transactions costs of home sale and purchase (Haurin, Hendershott and Ling, 1988), owners typically reside in any given unit longer than renters (Lee, Oropesa, and Kanan, 1994; Rohe and Stewart, 1996). In turn, this enhanced residential stability can have numerous positive impacts on children in the areas of educational achievement and credential attainment, substance use, social functioning, mental health, and sexual and deviant behaviors (Buerkle, 1997; DeWitt, 1998; Huffines, 2003; Potter et al., 2001; Richmond, 2003; Rumberger and Larson, 1998; Stack, 1994; Temple and Reynolds, 1999). At least one potential reason for this relationship is that as children remain longer in a neighborhood they are likely to become better known to adult neighbors, thus rendering them more subject to behavioral modifications through the exercise of neighbors' "collective efficacy" (Sampson, Morenoff, and Earls, 1999).

Unfortunately, it is not possible to distinguish among the above hypotheses definitively from extant empirical work. The earliest study in this area, by Green and White (1997), found that current parental homeownership was associated with a reduced probability of a resident 17 year-old dropping out from high school or giving birth. Past residential mobility and homeownership status were not controlled, however, and subsequent analyses by Aaronson (2000) and Harkness and Newman (2002) showed that most of the relationships were explained by the greater residential stability associated with homeownership. Boyle's (2002) study of longitudinal samples of children in Ontario, Canada, revealed significantly lower rating for emotional-behavioral problems for children of homeowners, controlling for a variety of family and neighborhood

characteristics. Haurin, Parcel and Haurin (2002a, b) provide the strongest support for a direct relationship between homeownership and child outcomes, controlling for residential stability and wealth. They find that homeownership is positively related to both indices of the cognitive/stimulative and emotional/supportive dimensions of the home environment, in a well-controlled, treatment-effects model. These two indices, in turn, prove strongly predictive of children's math and reading test scores and an index of children's behavioral problems. Moreover, homeownership still proves significant in predicting test scores (though not behaviors) when these home environment indices (and other parental and neighborhood characteristics) are controlled.

Though provocative, this literature on how homeownership status may affect children remains limited in several regards. Several studies omit key parental and children control variables and overlook selection effects that may bias upwards the apparent impacts of homeownership. Indeed, Barker and Miller (2005) find that many of the reported effects of homeownership disappear when more controls and alternative estimation techniques are introduced. No prior studies have collected information about multiple dimensions of context over the entirety of childhood, and thus have not tested for duration effects. Moreover, prior work has taken only a partial view of the causal patterns embodied in Figure 1; none have modeled tenure status, mobility and neighborhood choices as mutually causal.⁴ This potential simultaneity bias provides an additional reason why the accuracy of the relationships they measure between outcomes and key predictors of interest may be questioned.

⁴ While other studies have discussed the issue of "simultaneity bias," they used the term to refer to the reflection problem (Manski 1995) of people in the neighborhood tautologically causing the aggregate neighborhood characteristics to be what they are as well as the neighborhood causing constituent residents' behaviors (Duncan and Raudenbush 1999).

NEIGHBORHOOD CHARACTERISTICS

Neighborhood mechanisms are thought to operate through various individual-, family-, school-, peer-, and community-level processes. Scholars have proposed various theoretical models, typically highlighting different underlying processes, to explain potential pathways of neighborhood influences (Jencks and Mayer, 1990; Leventhal and Brooks-Gunn, 2000; Sampson, Morenoff, and Gannon-Rowley, 2002). Several not-mutually exclusive possibilities have been offered to explain why highly disadvantaged neighborhood conditions experienced during childhood could influence young adult outcomes. Included among these explanations are the following:

- Lower-quality public schools and other institutional infrastructure (health clinics, recreational areas, family support services, etc.) that offer less skill-building resources for their students to complete high-school and move successfully into either post-secondary education or higher-paying employment
- Higher levels of exposure to violence, which lead to stresses inhibiting ability to concentrate on their studies or work
- Social norms that are less supportive of educational attainment and regular employment, and more supportive of teen fertility
- Seemingly attractive forms of income generation through illegal and quasi-legal activities in the neighborhood that require little educational credentialing or participation in the mainstream labor force
- Less information about and geographic access to places of higher-quality, post-secondary education and higher-wage employment

- Spatial stigmatization of residents in disadvantaged neighborhoods by prospective employers and gatekeepers of post-secondary educational institutions

Studies that consider neighborhood effects generally find some significance, but there is wide variation and even contradictory evidence as to which aspect of neighborhood quality is most important. Moreover, prior empirical research has thus far been unable to sort out definitively the competing explanations identified above (Ellen and Turner, 1997, 2003; Brooks-Gunn, Duncan, and Aber, 1997; Leventhal and Brooks-Gunn, 2000; Duncan and Raudenbush, 2001; Sampson, Morenoff and Rowley, 2002; Dietz, 2002; Friedrichs, Galster and Musterd, 2003).

Ellen and Turner (1997) point out that “neighborhood effects (may) differ for families with different characteristics,” suggesting that seemingly objective neighborhood conditions may not have the same influence on all people. Along these lines, several studies have found that there is a systematic difference by race, controlling for other characteristics, in response to various neighborhood conditions. One of the more surprising results emerges from a recent study by Ginther et al. (2000), which looked at percentage of households with low income, high income, white, headed by a female, percentage of young adults who are high school dropouts, and average adult unemployment rate. The study found that for the full sample, the percentage of youths in the neighborhood who are dropouts, the percentage of white residents, and the percentage of residents with high income are significant for high school graduation and total years of education. An unexpected finding, though, is that a higher percentage of affluent families tends to *depress* high school graduation, while a higher percentage of low income families has a *positive* effect on total years of attainment. When the sample was

restricted to black individuals, none of the neighborhood variables was found to be significant for high school graduation, and only percentage white is significant for total years of education.

Brooks-Gunn et al. (1993) also demonstrated the importance of affluent neighbors in deterring girls from dropping out of high school, with the effect being stronger for white teenage girls than black teenage girls. Other neighborhood measures included in the model (percentage poor, black, female-headed households, families receiving public assistance, men not employed in the previous year) were not found to be significant. In a study of a single school district in Scotland, Garner and Raudenbush (1991) also found a negative association between deprivation (an index of 12 deleterious neighborhood conditions) in the neighborhood and educational attainment. Halpern-Felsher et al. (1997) found that high socioeconomic status is important for white males' and females' and black females' total years of education, while ethnic diversity is important for black males and females. The magnitudes of the coefficients associated with these variables imply that neighborhood is less important for black males than others.

Regarding completed schooling, the racial composition of neighborhoods appeared to affect black but not white children (Duncan, 1994). Datcher (1982) finds that average family income, along with percentage white, influence years of sons' educational attainment.

Solon, Page and Duncan (2000) sidesteps the difficulty of measuring neighborhood characteristics by simply examining children who grew up in the same neighborhood. This study found that the correlation of the eventual educational attainment of children who grew up in the same neighborhood, once background

characteristics were taken into account, was only 0.1. They take this figure to be an upper bound on neighborhood influences, noting that other family similarities would also be reflected in this figure.

Other studies demonstrate that neighborhood effects diminish or disappear when a wide range of family and individual variables are included as controls. Using an extensive set of family and personal background variables, Haveman and Wolfe (1994) find that percentage of female-headed households does not help explain high school graduation or total years of attainment, and percentage of high school dropouts only helps to explain high school graduation, but not total years of attainment; no other neighborhood variables were included in their study. Living in a poor neighborhood did not seem to influence the likelihood of high school graduation or school leaving for males or females over and above the impact of family and individual characteristics. (Ensminger, Lamkin and Jacobson, 1996). Using a wide array of family and personal background variables, Evans et al., (1992) did not find that neighborhood, as measured by the percentage of students in the child's school that were termed "disadvantaged" per federal guidelines, is significant for teen pregnancy or dropping out of high school in a simultaneous equation model.

Alternative methodological approaches also call into question the power of neighborhood effects. Sibling studies exploit the availability of two individuals within the same family who are presumably exposed to the same family and neighborhood conditions, albeit at slightly different stages of development (for siblings born at different times). This application of this "fixed effects" approach allows the researcher to control for unobservable family characteristics that almost certainly influence children. It should

be noted that sibling studies are only possible for families that have more than one child, so the results would miss any systematic differences of families with only one child.

Putting this approach to use, Aaronson (1997) examined percentage youth not employed or in school during a child's age 10 to 18, in addition to a wide range of family variables as controls in order to determine whether neighborhood characteristics are influential in an individual's attainment of a high school diploma. The coefficient was relatively small and only found to be significant at the $p \leq 0.10$ level. In a later article, Aaronson (1998) presented several variations on this basic model, adding percentage households in poverty as a second neighborhood variable, and concluded that neighborhood matters, although neither neighborhood variable was significant in all of the specifications, and the extent of the influence varies by race and gender.

Contagion models explore the extent to which neighborhood influence varies by severity of neighborhood conditions. The premise is that neighborhood effects are nonlinear, typically becoming much more detrimental to the individual (sometimes precipitously so) as neighborhood quality erodes. Several studies typify this approach.

Using a cross-sectional data set, Crane (1991) found that neighborhoods with the lowest percentage managerial/professional workers had substantially higher high school dropout rates than neighborhoods with even slightly higher percentages of managerial/professional workers. The effect is particularly pronounced for black males living in neighborhoods of concentrated disadvantage.

Gleason and Vartanian (1999) concluded that neighborhood conditions during ages 14 to 18 are influential, but in different ways for blacks as for whites. For black teens, a higher percentage of affluence, two-parent families, and managerial/professional

workers leads to a substantial decrease in the high school dropout rate, but has no effect on college graduation. These effects are stronger for black teens from relatively disadvantaged family backgrounds. Conversely, for white teens, neighborhood conditions are significant for college graduation but not dropping out of high school, and these effects are stronger among white teens from relatively advantaged backgrounds.

Duncan et al. (1997) found a nonlinear relationship between socioeconomic status and educational attainment for white women and black men and women (only significant for relatively high status neighborhoods), while high socioeconomic status was consistently beneficial for white males.

A few studies have attempted to examine the role of neighborhood in labor market outcomes. The low socioeconomic status of the neighborhood can depress wages and earnings (Datcher, 1982; Vartanian, 1999a), and contribute to economic inactivity at age 24, yet the prevalence of single mothers and high school dropouts may not be significant in predicting a child's economic inactivity at age 24 (Haveman and Wolfe, 1994).

Most of the neighborhood studies that examine teen pregnancy focus on the role of socioeconomic status. Brewster (1994) argues that the observed differences by in teen sexual activity can be attributed to differences in the communities in which black and white girls live, as measured by the female full-time employment rate. Roughly twice as many girls from high socioeconomic status neighborhoods used contraception at first intercourse as girls from low socioeconomic status neighborhoods, although neighborhood status was insignificant for boys' use of contraception at first intercourse, (Hogan, Astone and Kitagawa, 1985). Living in a low socioeconomic status

neighborhood also contributes to teen pregnancy (Crane, 1991; Hogan and Kitagawa, 1985), while neighborhood unemployment rates contributes to teen fatherhood, despite a positive relationship between teen fatherhood and own hours worked (Ku et al., 1993).

Meanwhile, other studies call into question the importance of socioeconomic status for teen pregnancy. Mayer (1991) finds that high school socioeconomic status is not significant in explaining pregnancy among black teenage women. Plotnick and Hoffman, (1999) come to the same conclusion for a racially diverse sample, using a sibling model. With an extensive set of family and personal background variables as controls, Haveman and Wolfe (1994) find that neither percentage of female-headed households nor percentage of high school dropouts helps explain teen pregnancy.

4. DATA AND METHODS

Disentangling the myriad factors in childhood that influence adult outcomes is a difficult undertaking. Our analysis relied upon data provided on the Panel Study of Income Dynamics (PSID). Three sets of analyses were conducted. The first set of analyses *describes* the outcomes that the most disadvantaged children achieved as adults. The second set of analyses uses a series of regression models to identify the *causal relationships* between characteristics of the families, households and neighborhoods in which children grow up, on the one hand, and adult outcomes on the other hand. The third set of analyses consists of a series of policy simulations that are based on the results of these regression models. Through these policy simulations we attempt to estimate the effect that changing the characteristics of the families, households and neighborhoods in which children grow up would have on adult outcomes.

In this section we describe the PSID and the data we obtained from it. We then describe the statistical analyses we performed in order to attempt to gain insight into the effects of key components of childhood experience of young adult outcomes.

DATA

To study the complex relationships between neighborhoods, parental characteristics, childhood experiences and subsequent outcomes in adulthood, we make use of unique data provided by the Panel Study of Income Dynamics (PSID). The PSID is unique because it provides the only large, publicly available, and representative sample of American families followed for a period of more than 30 years. Because our goal is to

understand how experiences beginning at birth affect outcomes into adulthood, the PSID provides the only basis for the sort of detailed analyses we seek to carry out.

Beginning in 1967, the PSID began interviewing 5,000 American families. In each year until 1997, those families have been interviewed, as have all families subsequently formed by individuals in those families and by future spouses and children of those individuals. Since 1997, these families have been interviewed every other year. At the time of the 1999 interview, the PSID was following more than 8,000 families.

Originally, the PSID over-sampled poor households. However, the poverty over-sample was subsequently dropped in the early 1990s for budgetary reasons. As a result, our analysis is based on the sample designed to be nationally representative of the U.S. population in 1967. To draw our analytic sample, we selected all children born into PSID sample households between the years 1967 and 1974. We focus our analysis on the PSID cohort of 1,283 children born during the period 1968-1973 because it provides us with data on their first 18 years as well as a variety of outcomes measured in 1999 when they were young adults (ages 26-31) who most likely had completed their education and had the opportunity to enter the labor force.

We limited our analyses to those children who remained in the PSID sample as of the 1999 interview. While limiting our analysis to sample children who remain in the sampling frame at the 1999 interview may introduce attrition bias, it is a necessary restriction, because of our central interest in young adult outcomes. To attempt to limit the effects of attrition over the course of the panel, we adjust individuals' PSID sampling weights by the inverse of the reciprocal of the attrition rate of PSID sample members with the same race, gender and poverty status at birth.

We do not, however, limit our analyses to children whose families were interviewed in *all* interview years from the time of the child's birth to 1999. Even among respondents who remain in the sampling frame in 1999, information is not available in all years. To limit the problems caused by missing data during childhood, we measure childhood experiences, such as living with two parents, as proportion of observed childhood years that the child lived with two parents, rather than an actual count of years. For continuous variables during childhood, such as household income, we measure the mean of that variable over the years in which that characteristic was observed.

To measure neighborhood characteristics, we make use of the PSID geo-matched file, which appends information about the child's census tract and county of residence to each observation. We then append information about neighborhood poverty rates, income, and homeownership rates from the Neighborhood Change Database (GeoLytics, 2003). We also make use of county level data provided by the PSID where necessary.⁵ We interpolate values of census tract variables for observations between census years. As in the case of household characteristics, we calculate means over the childhood years in which the variable was observed. We are thus able to observe annually the household and (approximate) neighborhood environments in which our sample individuals spend their childhood.

Operationally, to measure childhood experiences, we make use of annual information from the PSID family file. These data provide extensive information about the head of the household and any spouse of the household head in which our sample children resided during childhood. In each year we are able to observe the family and

⁵ Wherever possible, we utilize census tract data to represent neighborhood characteristics. However, until 1990 rural areas were not divided into census tracts. For such pre-1990 non-tracting areas, we are forced to use county-level data to represent "rural neighborhood" data.

household structure, including whether the head was married, whether the family moved since the previous interview, and whether the household head owned the home in which the family resided. We are also able to observe a host of economic characteristics of the head. We can observe whether or not he or she was employed. If so, the PSID interviewer then asked the head about earned income, occupation, whether self-employed, and other features of his or her employment.⁶ Similar information was also collected annually about the head's spouse, if present.

We also made use of information on a variety of background and social characteristics of household heads and spouses, including their level of education, religion, whether they had ever served in the armed forces, or had any physical disability. Further, we made use of a variety of measures of expectations, and behavior. Between 1968 and 1972, household heads were asked about their planning for the future, and participation in social clubs, neighborhood organizations, among other things. We use responses to these questions to develop fixed measures of head's planning and social connectivity.

VARIABLES

The PSID permits us to look at several young adult outcomes for the cohort selected. The young adult outcomes on which we focused included:

- Probability of not having a child prior to age 18;
- Probability of completing high school;
- Probability of completing college;
- Probability of being employed in 1999;

⁶ In order to make them comparable across years, all dollar values were converted to 2004 terms, using the GDP-Implicit Price Deflator.

- Probability of being employed or in school in 1999;
- Hours worked in 1998;
- Earned income during 1998 (expressed in 2004 dollars); and
- Probability of owning a home in 1999.

These outcomes are a result of individual characteristics as well as circumstances experienced during childhood. Circumstances experienced during childhood include family and household characteristics as well as neighborhood characteristics. Several family and household characteristics were of particular concern. The first is household income. This was operationalized in two related ways. First, we considered the mean household income during childhood (i.e., between ages 0 and 18). Arguably, however, there is a strong nonlinear effect of household income on young adult outcomes. Hence, we also considered the fraction of years during childhood that the individual lived in a household whose income was below the poverty line. The second household characteristic whose effect we focused on was the fraction of years during childhood that the head of household was married. This is intended as a surrogate for the fraction of years during childhood that the individual lived with two parents. The third household characteristic of particular concern was parental education. We also considered the proportion of years during childhood that the individual's family lived in a home that they owned. Finally, we considered closely the effect of household residential stability, i.e., the fraction of years the family did *not* change its residence.

Two neighborhood characteristics were of particular concern. The first is the mean neighborhood owner-occupancy rate (i.e., the fraction of housing units in the

neighborhood that were owner-occupied) during childhood. The second is the mean neighborhood poverty rate during childhood.

DESCRIPTIVE ANALYSIS

Our first set of analyses rely on cross-tabulations of descriptive statistics. In particular, we divide our sample on the basis of levels (typically quartiles⁷) of each childhood characteristic of concern. For example, we consider those whose mean family income during childhood was less than or equal to \$13,900; between \$13,901 and \$25,600; between \$25,601 and \$34,800; and greater than or equal to \$34,801. For each group we calculate: the fraction who did not give birth to a child prior to age 18; the fraction who attained at least a high school diploma; the fraction who attained at least a four-year college degree (among those who attained at least a high school diploma); the fraction who were employed or enrolled in school in 1999; the mean annual hours worked during 1998 (among those who were employed during 1998); the earnings during 1998 (among those who were employed during 1998); and the fraction who owned their home in 1999. By comparing the levels of the outcome of concern across the different groups into which we divide our sample, we can gain insight into both the magnitude of effect of that characteristic and whether that characteristic has a linear or nonlinear effect on the outcome of concern.

⁷ Quartiles are the values that divide the distribution of a variable into four equal parts. Specifically, the first quartile of a distribution is the number such that 25% of the sample lies below that value; the second quartile or median is the number such that half of the sample lies below that value and half of the sample lies above it; the third quartile is the number such that 75% of the sample lies below that value.

MULTIVARIATE MODELS

Relying on descriptive statistics has an important limitations, however. The analysis of the effect of each variable does not control for other characteristics, so that the apparent relationship between two variables might be misleading. For instance, the effect of home ownership on outcomes may actually be due to the effect of household income, which is associated with both home ownership and outcomes. Consequently, they cannot be relied upon to ascertain the extent to which specific childhood characteristic *causes* those outcomes.

To overcome these limitations, we estimated several multivariate models for each of the early adult outcomes of concern. For continuous dependent variables (namely, natural logarithm of income earned in 1998, number of hours worked during 1998), OLS models were estimated. For dichotomous dependent variables (namely, whether the individual lived in a home that his or her family owned in 1999; whether the individual completed high school; whether the individual completed college, whether the individual did not have a child before age 18, whether the individual was employed in 1999; whether the individual was employed or in school in 1999), logit models were estimated.

Each model included the following key independent variables:

- the mean of the natural logarithm of deflated annual household income during childhood (expressed in 2004 dollars);
- the proportion of years during childhood that the individual lived with two parents;
- education of the household head (averaged over childhood);

- household residential stability, i.e., the fraction of years during childhood that the individual's family did not change residence;
- the proportion of years during childhood that the individual's family lived in a home that they owned; and
- the mean neighborhood owner-occupancy rate during childhood *or* mean neighborhood poverty rate during childhood.

We also controlled for a set of individual characteristics (gender/race, order of birth, age in 1999). In addition, some early adult outcomes were included as a determinant of other early adult outcomes. Specifically, whether the individual had a child before age 18 was included as a determinant of all other outcomes. Also, our two measures of educational attainment (whether the individual completed high school and whether the individual completed college) as well as whether the individual was married in 1999 were included as determinants of home ownership in 1999, whether the individual was employed during 1999, whether the individual was engaged in work or education during 1999, number of hours worked during 1998 and income earned during 1998. Finally, the number of hours worked during 1998 was also included as a determinant of income earned during 1998.

The multivariate models also controlled for additional childhood family and household characteristics. In order to test the sensitivity of the key coefficient estimates to the specification of the model, several variants of our multivariate models were estimated. Specifically, models varied in terms of the childhood household head characteristics included as independent variables (see Table 1). Model 1 contained only the key independent variables plus basic family and head of household characteristics

during childhood. Model 2 augmented this “basic” set of family and head of household characteristics during childhood with additional economic characteristics of the household head. Model 3 included all of the preceding variables along with a series of attitudes and behaviors of the household head⁸. In our results section we focus on model 3 since it is the most complete specification. However, as discussed below, the different model specifications did not materially affect the coefficient estimates of key independent variables.

We also estimated model 3 with two small, but important, variations. First, because of the possibility that neighborhood owner-occupancy rate is a proxy for neighborhood poverty, we estimated a variant of model 3 that included both of these variables. Second, we replaced the mean of the natural logarithm of deflated annual household income during childhood (expressed in 2004 dollars) with the fraction of years during childhood that the individual lived in a household whose income was below the poverty line. Again, as discussed below, these variations did not materially affect the coefficient estimates of key independent variables.

The overall goodness-of-fit statistics (F-statistic for continuous outcomes and Wald chi-square for dichotomous outcomes) are statistically significant at the 1% level for model 3 for all outcome variables except hours worked. For this outcome variable the overall F-statistic is not even significant at the 10% level. Relatedly, the R^2 for this outcome variable is substantially lower than the R^2 or pseudo- R^2 obtained for each of the other outcome variables.

⁸ These attitudes and behaviors are not measured annually in the PSID. Indeed, for most variables the questions were asked only during the years 1968-1972. However, some were asked again in 1975 and a question about union membership was collected from 1968 through 1981. For each head of household, we averaged each of these variables over all years for which they were available.

TABLE 1: ADDITIONAL CHILDHOOD FAMILY AND HOUSEHOLD
CHARACTERISTICS CONTROLLED FOR

VARIABLE	INCLUDED IN MODEL		
	1	2	3
Mother First Gave Birth as a Teen	✓	✓	✓X
Household Head Ever Served in the Armed Forces	✓	✓	✓
Household Head Self-Identified as Protestant, Catholic or Jewish	✓	✓	✓
Household Head's Place of Birth (City, Suburb, Rural)	✓	✓	✓
Occupational Status of Household Head		✓	✓
Self-Employment Status of Household Head		✓	✓
Annual Hours Worked by Household Head		✓	✓
Employment Status of Head's Spouse		✓	✓
Residence Located in a Metropolitan Area		✓	✓
Household Head Belonged to a Union			✓
Household Head Did Not Participate in Social Clubs			✓
Household Head Read a Newspaper Every Day			✓
Household Head Did Not Attend Religious Services Weekly			✓
Extended Family Lived Within Walking Distance			✓
Number of Neighbors Household Head Knew by Name			✓
Household Head "Planned His/Her Life Ahead"			✓
Household Head "Trusted Most People"			✓

POLICY SIMULATIONS

It is somewhat difficult to determine from the estimated model coefficients alone the magnitude of the change that would be expected in each of the outcome variables if the value of a key independent variable were exogenously changed (by, for instance, some sort of policy intervention). There are two reasons for this. First, since many of the outcomes of concern are dichotomous, we used logit models in our analysis of them. Unfortunately, the coefficients in such models are not directly interpretable as the amount of change in the dependent variable per unit change in the independent variable. Second, the estimated regression coefficients represent direct effects of the key independent variables only. These independent variables can also *indirectly* contribute to early adult outcomes. Two general types of indirect effects are possible. First, the recursive model of childhood conditions that we have formulated (left-hand side of Figure 1) implies that one childhood condition might affect another childhood condition that, in turn, influences early adult outcomes. For example, having a higher household income during childhood might not only directly affect the probability of not having a child prior to age 18, but it might also increase the proportion of years during childhood that the family owned its home, which might also affect the probability of not having a child prior to age 18. A second type of indirect effect results from the recursive model of early adult outcomes that we have formulated (right-hand side of Figure 1). This portion of our model implies that one childhood condition (e.g., household income during childhood) affects an early adult outcome (e.g., the probability of graduating college) which, in turn, affects another early adult outcome (e.g., earned income).

In order to help interpret the results of the multivariate models, therefore, we conducted a series of simulations. These simulations are intended gain a clearer sense of the magnitude of the change that would be expected in each of the outcome variables if the value of a key independent variable were exogenously changed (by, for instance, some sort of policy intervention), holding all other things, including the values of all other independent variables, constant.⁹

These policy simulations were conducted by first computing predicted values of each outcome variable for a hypothetical individual for whom the value of each childhood variable is set equal to the sample mean. Based on these values, we computed the predicted probability of reaching age 18 before having any children. This predicted value was then used along with the sample mean of each childhood variable to generate predicted probabilities of graduating high school and graduating college, respectively. The sample mean of each childhood variable along with the predicted probabilities of reaching age 18 before having any children, graduating high school and graduating college were then used to generate predicted probabilities of home ownership in 1999, being employed in 1999, and being engaged in work or education during 1999 as well as the predicted value of hours worked during 1998. Finally, the sample mean of each childhood variable along with the predicted value of hours worked during 1998 and the predicted probabilities of reaching age 18 before having any children, graduating high school and graduating college were then used to generate the predicted value of income earned during 1998.

⁹ It should be noted that while these simulations account for the recursive model of early adult outcomes that we have formulated (right-hand side of Figure 1), they do not account for the recursive model of childhood conditions (left-hand side of Figure 1). In other words, these simulations capture only one of the two sources of indirect effects we have hypothesized and, therefore, probably understate the actual total (direct plus indirect) effect of an exogenous change in the value of each of the key independent variables.

We then exogenously altered the value of one of the key independent variables (e.g., household income during childhood) and re-computed predicted values of each outcome variable in the manner described above. In addition to the sample mean, the different values to which each key independent variable was set included:

- the value of the 10th percentile of the sample for that variable;
- the value of the lower quartile (i.e., 25th percentile) of the sample for that variable;
- the value of the upper quartile (i.e., 75th percentile) of the sample for that variable; and
- the value of the 90th percentile of the sample for that variable.

This was repeated for each of the key independent variables. The results of these simulations are discussed in section 7.

5. ADULT OUTCOMES AND INTERGENERATIONAL MOBILITY OF DISADVANTAGED CHILDREN

Children who grow up in relative advantage tend to be more successful as adults.

Yet children who grow up in relative disadvantage, even concentrated disadvantage, sometimes find a way to succeed. One of the primary objectives of this study is to uncover the factors that are critical in ensuring that success.

To do this, we explore a series of relationships between specific childhood characteristic and particular outcome. These simple bivariate relationships reveal the average prospects of a group of children who all experienced a single condition or circumstance without controlling for any other factors. They are thus descriptive (i.e., they accurately describe the adult outcomes of individuals who grow up with a specific childhood background characteristic such as, for example, a low-income household), but they are not causal (i.e., the childhood characteristic is not necessarily the cause of the adult outcome). In effect, the findings provide a “marker” – the probability that an individual with a specific background characteristic will *have* a particular outcome, but do not necessarily mean that the background characteristic *causes* the outcome. Subsequent analysis will address causality by examining specific background characteristics while controlling for a wide range of other factors that might also influence a child’s prospects for success.

The discussion below centers on the outcomes (success rates) of the most disadvantaged children, where the “most disadvantaged” children are those:

- whose parents (head of household while growing up) did not complete high school;

- whose households' income was in the lowest quartile;
- who were born to teen parents;
- who lived in poverty for at least 75% of their childhood years;
- who never lived with two parents¹⁰;
- who never lived in an owner-occupied house;
- who moved house more than 1/3 of their childhood years; or
- who lived in neighborhoods with the lowest rate of homeownership (in the bottom quartile).

To what extent did children who grew up in each of these disadvantaged circumstances succeed in achieving outcomes above the lowest category of outcome? If there were no association between a childhood disadvantage and an adult outcome, then we would expect children experiencing a particular disadvantage to be more or less evenly distributed across outcome categories. For example, if spending more than 75% of their childhood in households below the poverty line did not have an adverse impact on adult income, then we would expect such children to be distributed more or less equally among the four income quartiles as adults, that is 25% in each category. In fact, we do not; 58.8% of children who grew up in such circumstances achieved only the lowest quartile of income as an adult, which is 33.8 percentage points higher than would have been expected. This figure demonstrates an association between childhood poverty and low earnings in adulthood, though *not* controlling for any other factors.

The outcomes we examine in this section are:

- adult earnings;
- Probability of being engaged in work or educational activity;

¹⁰ Technically, who never lived in a household in which the head and the head's spouse were present.

- Probability of not having a child before the age of 18;
- Probability of graduating from college;
- Probability of graduating from high school.

How are each of the childhood disadvantages associated with the adult outcomes with which we are concerned?

This section examines the important determinants of our major outcome variables. We focus on the likelihood that children growing up in the most disadvantaged portion of the population (e.g., bottom quartile of income or parent with less than a high school education) succeed in achieving outcomes above the lowest category of outcome.

ADULT EARNINGS

In general, children who suffered from the most severe disadvantages while growing up were disproportionately located in the lowest earnings quartile as adults (see Table 2).

- Of children whose grew up in households in the lowest income quartile, 46.2% ended up in the lowest earnings quartile as adults (rather than the expected 25%) and 72.0% ended up below the median earnings.
- 58.8% of children who spent more than 75% of their childhood years in poverty ended up in the lowest earnings quartile as adults.
- Of children who grew up in a household in which the head had less than a high school education, 38.2% ended up in the lowest earnings quartile as adults and 65.6% ended up with earnings below the median.
- Of children whose parents never owned a home while the child was growing up, 46.0% had earnings in the lowest quartile as an adult.

- 28.9% of children who moved six or more of their childhood years ended up in the lowest earnings category as adults (slightly more than would have been expected if there were no relationship between moving and adult earnings)..
- 41.7% of children who were born to a mother who first gave birth as a teen had earnings in the lowest quartile as an adult.
- 50.0% of children who never lived with two parents during their childhood years ended up in the lowest income quartile as an adult.
- 30.8% of children from neighborhoods with the lowest owner-occupancy rates ended up in the bottom quartile of earnings as adults.

However, severe disadvantage as a child did not inevitably condemn children to low-income as adults. More than 30% of children whose parents who never lived in an owner-occupied house, who moved more than 6 times during their childhood years, whose mother was a teenage parent, or whose parents had less than a high school education had earnings *above the median* as an adult, and 28.18% of those whose family income as a child was in the lowest quartile also had above median earnings as an adult. While this is far below the expected 50%, it nonetheless provides evidence of success for some children. Indeed, 9.0% of children who never lived in an owner-occupied house during childhood, 5.9% who spent at least 75% of their childhood years in poverty, 6.6% who never lived with two parents during their childhood, 6.9% who were born to teenage parents, and 17.5% who grew up in a household where the head had not completed high school *nonetheless* ended up in the top income quartile as adults!

Another way of looking at the relative importance of childhood disadvantage is to compare the adult success rates (achieving the top quartile of adult earnings) of individuals who grew up in the most disadvantaged versus the least disadvantaged of childhood conditions. While there are always a non-trivial proportion of individuals who were able to move into the top quartile of earnings despite starting out in the most disadvantaged of childhood conditions, nonetheless the differences between those who started out in the most disadvantaged position compared to those who started out in the most advantaged position is striking. Thus, for example, 40.7% of children who grew up in households that were in the highest quartile of income as children achieved the highest quartile of earnings as adults compared to 9.5% who grew up in households with income in the bottom quartile, clearly indicating that family income as a child is associated with adult earnings outcomes. (Note, however, that 16.7 % of children in households in the top quartile as children actually were in the bottom quartile of earnings as adults in 1998.) Great disparities existed with respect to all of the other childhood characteristics as well:

- 36.5% of individuals who grew up in households that always lived in an owner-occupied home ended up in the top income quartile compared to 9.0% who grew up never living in an owner-occupied home.
- 31.2% of individuals who grew up in households that never moved ended up in the top income quartile compared to 14.9% who grew up in households that moved more than 1/3 of the years while growing up.
- 35.4% of individuals who grew up in households that were never in poverty ended up in the top earnings quartile compared to 5.9% who grew up in

households that were in poverty for at least 75% of the child's years while growing up.

- 43.2% of individuals who grew up in households in which the head had two or more years of post-high school education ended up in the highest adult earnings quartile compared to 13.2% who grew up in households in which the head had not completed high school.
- 37.0% of individuals who always lived in two-parent households while growing up ended up in the top quartile of adult earnings compared to 6.6% who never lived with two parents.
- 35.0% who grew up in neighborhoods with the highest (top quartile) homeownership rates were in the top earnings quartile as adults compared to 18.8% who grew up in neighborhoods with the lowest homeownership rates.
- 27.0% who grew up in a household where the mother was not a teen parent ended up in the top earnings quartile as adults compared to 6.9% who grew up in households where the mother was not a teen parent.

ENGAGING IN WORK OR SCHOOL ACTIVITY

The probability of being engaged in some kind of work or school activity as an adult varied with many of the childhood characteristics, although in many cases perhaps not as much as might have been expected (see Table 3).

- Children whose family income during childhood was in the lowest quartile had a probability of .69 of being engaged in work or school activity as an adult compared to .81 for those whose family income during childhood was in the top quartile.

- Children who spent 75% or more of their childhood in poverty had a probability of only .69 of being engaged in work or school activity as an adult compared to .83 for children who spent none of their childhood years in poverty.
- Children who never lived in an owner-occupied home growing up had a probability of .64 of being engaged in work or school activity as an adult compared to .83 for children who had spent all of their youth in owner-occupied homes.
- Children who grew up in a household in which the head had less than a high school education had a .72 probability of being engaged in work or school activity compared to .83 for children who grew up in a house in which the head had a college education.
- Children who never lived with two parents during their childhood had a probability of about .75 of being engaged in work or school activity as an adult compared to a probability of about .81 for those who lived with two parents during their entire childhood.

The difference in success rates varied much less or not at all for other types of childhood disadvantage.

- Of those children who never moved house during childhood, the probability of work or school activity was .76 compared to .74 for those who had moved more than 33% of their childhood years.
- Children who grew up in a neighborhood in the lowest quartile with respect to neighborhood homeownership rate had a .78 probability of being engaged in

work or school activity compared to .82 for those whose neighborhood homeownership rate was in the top quartile.

AVOIDING TEEN PARENTHOOD

Approximately 12.0% of the children in our sample themselves had children before they reached the age of 18 (see Table 3). The percentage who came from the most disadvantaged backgrounds who avoided teenaged parenthood was considerably higher, usually by between 10-15 percentage points for the various childhood characteristics.

Thus, for example, the percentage of those not having a child before age 18 was:

- 75.6% of those who grew up in a household with family income in the lowest quartile.
- 72.0% for those who spent at least 75% of their childhood years in a poverty household
- 74.7% who never lived in an owner-occupied house while growing up.
- 76.0% who never lived with two parents while growing up, and
- 73.0% whose mother herself first gave birth as a teenager.

The difference between the most disadvantaged and most advantaged background was sometimes substantial.

- Of those who grew up in a household with family income in the lowest quartile 75.6% did not have a child before the age of 18 compared to 95.4% who grew up in a family with household income in the top quartile.
- Of those who spent 75% or more of their childhood years in a poverty household, 72.0% did not have a child before the age of 18 compared to 94.6% who never spent a year in poverty as a child.

- Of those who grew up in a household whose head had less than a high school education, 79.2% did not have children prior to the age of 18 compared to 98.6% who grew up in a household where the head had two or more years of higher education.
- Of those who never lived in an owner-occupied home while growing up, 74.7% did not have children prior to the age of 18, compared to 92.5% who lived in an owner-occupied home all years while growing up.
- Of those who lived in a neighborhood with relatively low proportion of owner-occupied homes (the lowest quartile) while growing up, 79.2 did not have children prior to the age of 18, compared to 94.5% for those who grew up in a neighborhood with a relatively high proportion of owner-occupied homes (the top quartile).
- Of those who never lived with two parents while growing up, 76.0% did not have children prior to the age of 18, compared to 93.0% for those who lived with two parents the entire time while growing up.
- Of those whose mother first gave birth as a teenager, 73.0% themselves did not have a child prior to the age of 18 compared to 89.5% for those whose mother did not give birth as a teen.

HIGH SCHOOL GRADUATION

Overall 85.7% of our sample graduated from high school (see Table 5). However those who grew up in the most disadvantaged circumstances had a disproportionate tendency (more than double for most childhood characteristics) to fail to graduate from high school. Completion rates were lowest among those who spent more than 75% of

their childhood in poverty households (graduation rate of 59.6%), never lived in an owner-occupied house (graduation rate of 65.4%), grew up in households in the lowest income quartile (graduation rate of 69.6%), and grew up in households where the head had failed to finish high school (graduation rate of 71.8%).

The difference in high school dropout rates among those from the most disadvantaged and most advantaged households in terms of childhood characteristics was particularly striking.

- Children who spent more than 75% of their childhood years in poverty households had a 59.6% graduation rate compared to 93.9% for children who had never lived in a poverty household..
- Of those children who grew up in households with family income in the lowest quartile, 69.6% graduated from high school compared to 96.8% who grew up in households where the family income was in the top quartile).
- Children who grew up in households that never lived in an owner-occupied home graduated high school at the rate of 65.4% compared to 94.6% for those who lived in an owner-occupied home for all of their childhood.
- Of those who grew up in a household where the head him/herself had never graduated from high school, 70.8% graduated from high school compared to 98.6% for those who grew up in a household where the head had at least two years of post-secondary education.

Other childhood characteristics exhibited similar, though less severe, variation between the least and most disadvantaged group (although there was relatively little variation

among dropout rates for those who grew up in neighborhoods with varying levels of homeownership).

COLLEGE GRADUATION

In our full sample, 14.5% graduated from college (see Table 6): However, college graduation rates were half or less than half of that for children who grew up in households where the household head did not graduate from high school or in which the family income was in the lowest quartile, who spent more than 75% of their childhood in poverty households, whose mother first gave birth prior to the age of 18 or who moved more than 1/3 of the years while growing up.

The difference between the most advantaged and least advantaged childhood backgrounds in terms of college graduation were quite dramatic for education and income childhood characteristics.

- Of those children who grew up in households in which the head had two or more years of college education, 30.5% graduated from college compared to only 7.3% for those who grew up in households where the household head has less than a high school education.
- Of those children who grew up in households in the highest quartile of family income, 26.9% graduated from college compared to only 7.1% for those who grew up in households in the lowest quartile of family income.
- Of those children who always lived in an owner-occupied home while growing up, 23.7% graduated from college compared to only 8.2% for those who never lived in an owner-occupied home while growing up.

- Of those children never moved house while growing up, 21.6% graduated from college compared to only 6.5% who moved more than 1/3 of their childhood years.

The above examination of adult outcomes by childhood characteristics demonstrates that, for most outcomes, the achievement of children varies substantially depending upon how disadvantaged were the circumstances of the child while growing up. Children growing up with the greatest degree of disadvantage clearly did more poorly, on average, in terms of adult outcomes than the average child, and, in many cases the disparity in outcome between the most disadvantaged and the least disadvantaged groups with respect to childhood characteristics were extreme. The extraordinary importance of several childhood characteristics – particularly the income and education characteristics of households of the child – across all or nearly all of the outcomes is apparent.

However, it is also well to keep in mind that childhood disadvantage did not inevitably doom all children who experienced it to poor adult outcomes; even in the most disadvantaged categories, some children did well and some did very well indeed. Thus, for example, in terms of adult earnings, 27.0% of those who grew up in households with family income in the lowest quartile ended up with earnings above the median as an adult and 9.5% ended up with earnings in the top quartile. Similarly, 27.3% of children who never had two parents present in their household as a child nonetheless, had above median earnings as an adult and 6.6% had earnings in the top quartile. Of those who spent more than 75% of their childhood years in poverty, 7.3% nonetheless graduated

from college, as did 10.2% of those who never lived with two parents while growing up, and 7.3% of those who grew up in a household in which the head had not completed high school.

TABLE 2: ADULT EARNINGS BY CHILDHOOD CHARACTERISTICS

	Percent Achieving Outcome as Adults			
	Adult Earnings			
Childhood Characteristics	Quartile			
	1	2	3	4
<i>Family Income</i>				
Lowest quartile	46.2	25.8	18.6	9.5
Second quartile	23.6	31.4	25.9	19.1
Third quartile	12.2	27.2	28.5	32.1
Top quartile	16.7	18.1	24.4	40.7
<i>Years Lived in Poverty</i>				
More than 75%	58.8	29.4	5.9	5.9
25%-75%	37.6	29.1	22.7	10.6
Less than 25%	27.9	27.0	26.6	18.5
None	15.5	23.4	25.8	35.4
<i>Years Lived with Two Parents</i>				
None	50.0	22.4	20.7	6.9
Some	30.6	31.4	24.5	13.5
All	16.9	21.4	24.7	37.0
<i>Education of Household Head</i>				
Less than high school	38.2	27.4	21.2	13.2
High school grad.	21.9	28.8	27.4	21.9
< 2 years higher ed.	18.8	26.0	27.1	28.1
> 2 years higher ed.	18.8	18.2	19.9	43.2
<i>Born to Mother Who First Gave Birth as a Teen</i>				
Yes	41.6	31.9	19.4	6.9
No	23.3	25.1	24.5	27.1
<i>% of Childhood Years Moved</i>				
> 33%	28.9	31.8	24.4	14.9
No Years	21.5	19.4	28.0	31.2
<i>Lived in Owner-Occupied Home</i>				
No years	46.0	22.5	22.5	20.6
Some years	24.3	27.9	24.1	25.7
All years	17.3	20.6	23.8	36.5
<i>% of Owner-Occupied Units in Childhood Neighborhood</i>				
Lowest quartile	30.9	26.8	23.2	19.1
Second quartile	24.9	26.2	25.3	23.5
Third quartile	22.3	27.7	26.4	23.6
Top quartile	20.9	21.8	22.3	35.0

TABLE 3: ENGAGED IN WORK OR EDUCATIONAL ACTIVITY BY
CHILDHOOD CHARACTERISTICS

Childhood Characteristics	Percent engaged in work or educational activity as adult
<i>Family Income</i>	
Lowest quartile	69.0
Second quartile	76.7
Third quartile	83.3
Top quartile	81.1
<i>Years Lived in Poverty</i>	
More than 75%	69.4
25%-75%	74.2
Less than 25%	71.7
None	83.4
<i>Years Lived with Two Parents</i>	
None	75.0
Some	74.2
All	80.9
<i>Education of Household Head</i>	
Less than high school	72.4
High school grad.	78.3
< 2 years higher ed.	78.9
> 2 years higher ed.	83.0
<i>Born to Mother Who First Gave Birth as a Teen</i>	
Yes	67.1
No	78.6
<i>% of Childhood Years Moved</i>	
> 33%	74.2
No years	76.6
<i>Lived in Owner-Occupied Home</i>	
No years	63.8
Some years	78.1
All years	83.1
<i>% of Owner-Occupied Units in Childhood Neighborhood</i>	
Lowest quartile	77.8
Second quartile	78.3
Third quartile	73.1
Top quartile	82.2

TABLE 4: DID NOT HAVE A CHILD BEFORE AGE 18 BY
CHILDHOOD CHARACTERISTICS

Childhood Characteristics	Percent Not Having a Child Before Age 18
<i>Family Income</i>	
Lowest quartile	75.6
Second quartile	87.7
Third quartile	93.2
Top quartile	95.5
<i>Years Lived in Poverty</i>	
More than 75%	72.0
25%-75%	76.1
Less than 25%	88.2
None	94.7
<i>Years Lived with Two Parents</i>	
None	76.0
Some	83.8
All	93.0
<i>Education of Household Head</i>	
Less than high school	79.2
High school grad.	88.5
< 2 years higher ed.	90.3
> 2 years higher ed.	98.6
<i>Born to Mother Who First Gave Birth as a Teen</i>	
Yes	73.0
No	89.5
<i>% of Childhood Years Moved</i>	
> 33%	83.8
No Years	88.5
<i>Lived in Owner-Occupied Home</i>	
No years	74.7
Some years	89.0
All years	92.5
<i>% of Owner-Occupied Units in Childhood Neighborhood</i>	
Lowest quartile	79.2
Second quartile	89.0
Third quartile	89.2
Top quartile	94.5

TABLE 5: ADULT OUTCOMES: GRADUATE FROM HIGH SCHOOL
BY CHILDHOOD CHARACTERISTICS

Childhood Characteristics	Percent Graduated from High School
<i>Family Income</i>	
Lowest quartile	69.6
Second quartile	85.1
Third quartile	91.3
Top quartile	96.8
<i>Years Lived in Poverty</i>	
More than 75%	59.6
25%-75%	74.2
Less than 25%	86.5
None	93.9
<i>Years Lived with Two Parents</i>	
None	74.5
Some	80.3
All	91.5
<i>Education of Household Head</i>	
Less than high school	70.8
High school grad.	87.0
< 2 years higher ed.	93.0
> 2 years higher ed.	98.6
<i>Born to Mother Who First Gave Birth as a Teen</i>	
Yes	72.6
No	87.0
<i>% of Childhood Years Moved</i>	
> 33%	76.2
No Years	94.2
<i>Lived in Owner-Occupied Home</i>	
No years	65.4
Some years	86.3
All years	94.6
<i>% Of Owner-Occupied Units in Childhood Neighborhood</i>	
Lowest quartile	80.9
Second quartile	83.8
Third quartile	88.0
Top quartile	90.0

TABLE 6: ADULT OUTCOME: GRADUATE FROM COLLEGE BY
CHILDHOOD CHARACTERISTICS

Childhood Characteristics	Percent Graduated from College
<i>Family Income</i>	
Lowest quartile	7.1
Second quartile	12.0
Third quartile	12.0
Top quartile	26.9
<i>Years Lived in Poverty</i>	
More than 75%	7.3
25%-75%	5.2
Less than 25%	11.2
None	20.5
<i>Years Lived with Two Parents</i>	
None	10.2
Some	10.3
All	18.3
<i>Education of Household Head</i>	
Less than high school	7.3
High school grad.	9.5
< 2 years higher ed.	18.6
> 2 years higher ed.	30.5
<i>Born to Mother Who First Gave Birth as a Teen</i>	
Yes	6.2
No	15.4
<i>% of Childhood Years Moved</i>	
> 33%	6.5
No Years	21.6
<i>Lived in Owner-Occupied home</i>	
No years	8.2
Some years	12.3
All years	23.7
<i>% of Owner-Occupied Units in Childhood Neighborhood</i>	
Lowest quartile	11.3
Second quartile	11.4
Third quartile	12.0
Top quartile	23.3

6. RESULTS OF MULTIVARIATE ANALYSES

In this section, we report the results of our regression models. We focus first on the results of what we refer to as Model 3 since it is the most complete specification. We then briefly discuss how the alternative model specifications affected our results.

This set of models included the following key independent variables:

- the mean of the natural logarithm of deflated annual household income during childhood (expressed in 2004 dollars);
- the proportion of years during childhood that the individual lived with two parents;
- education of the household head (averaged over childhood);
- household residential stability, i.e., the fraction of years during childhood that the individual's family did not change residence;
- the proportion of years during childhood that the individual's family lived in a home that they owned; and
- the mean neighborhood owner-occupancy rate during childhood *or* mean neighborhood poverty rate during childhood.

This model controls for a set of individual characteristics (gender/race, order of birth, age in 1999) as well as additional characteristics of the household in which the child grew up and a series of attitudes and behaviors of the household head. (see Table x in methods section).

In addition, some early adult outcomes were included as a determinant of other early adult outcomes. Specifically, whether the individual had a child before age 18 was

included as a determinant of all other outcomes. Also, our two measures of educational attainment (whether the individual completed high school and whether the individual completed college) as well as whether the individual was married in 1999 were included as determinants of home ownership in 1999, whether the individual was employed during 1999, whether the individual was engaged in work or education during 1999, number of hours worked during 1998 and income earned during 1998. Finally, the number of hours worked during 1998 was also included as a determinant of income earned during 1998.

Table 7 shows the coefficient estimates of key independent variables in model 3 for each outcome. Full results from model 3 are contained in Appendix A. Not surprisingly, income during childhood is the most consistent predictor of early adult outcomes. Controlling for other background characteristics, this variable has a positive, significant (at the .10 level or lower) effect on five of the eight early adult outcomes we examined (all outcomes except probability of home ownership, probability of being employed and annual hours worked). The only other key independent variable that has a significant direct effect on earned income in 1999 is the percent of years during childhood that the individual lived with two parents. Somewhat surprisingly, however, this variable has a significant ($p < .10$), *but negative*, effect on the probability of completing college.

Parental education has a positive, significant effect on both the probability of completing high school and the probability of completing college, while residential stability during childhood has a positive, significant effect on the probability of not having a child prior to age 18. Parental home ownership has a positive, significant effect on the child's probability of owning a home in 1999 as well as the child's probability of

completing high school. The mean neighborhood owner occupancy rate during childhood has a positive, significant effect on the probability of not having a child prior to age 18.

Several early adult outcomes considered (not having a child prior to age 18, graduation from high school, graduation from college) may also influence other early adult outcomes. We refer to early adult outcomes that are also a determinant of other outcomes as “intermediate outcomes.” As Table 7 shows, not having a child prior to age 18 has a positive, significant effect on the probability of graduation from high school and the log of earned income in 1998. Specifically, based on the coefficient estimates shown in Table 7, not having a child prior to age 18 increases the probability of graduation from high school by 7.3 percentage points and increases earned income by 54.4%. Graduation from college has a positive, significant effect on three of the four economic outcomes considered. Based on the coefficient estimates shown in Table 7, as compared to those who have not graduated college, college graduates are 7.7 percentage points more likely to be employed, 6.4 percentage points more likely to be engaged in school or work, and, on average, earn 44.6% more. However, graduation from high school did not have a significant relationship of any of the economic outcomes we considered. The non-significant relationship between graduating from high school and adult earnings deserves some additional discussion. First, the relationship was *nearly* significant at the 10 percent level (the p-value was 0.12) We applied the 10 percent standard as our criteria for statistical significance. This means that there is only a 10% chance that the findings would have occurred by chance alone. A p-value of 0.12 means that there is a 12% chance that the finding could have occurred by chance. However, even if we were to

expand our criteria and accept the finding as likely a real one, it is also important to note that the effect was quite small. This is consistent with the existing research literature that suggests graduating from high school has a small positive effect on adult earnings, but going on to post-secondary education has a much greater impact.

Most other household characteristics have statistically significant effects on two or fewer outcomes. Perhaps most interestingly, after controlling for other household characteristics, being born to a mother who first gave birth as a teen does not have a statistically significant effect on any early adult outcome we considered. In contrast, whether the household head read a newspaper every day has a positive and statistically significant (at least $p < .10$) effect on four outcome variables: the probability of completing high school; the probability of being employed in 1999; the probability of being engaged in work or education in 1999; and (the natural logarithm of) earned income in 1998. Whether the household head “trusted most people” has a statistically significant (at least $p < .10$) positive effect on the probability of home ownership in 1999 and a statistically significant negative effect on the probability of completing high school and the number of hours worked in 1998.

TABLE 7: ESTIMATED COEFFICIENTS FOR KEY INDEPENDENT VARIABLES (ROBUST STANDARD ERRORS IN PARENTHESES)

INDEPENDENT VARIABLE	OUTCOME							
	Probability of Not Having a Child Prior to Age 18	Probability of Completing High School	Probability of Completing College	Probability of Being Employed, 1999	Probability of Being Engaged in Work or Education, 1999	Annual Hours Worked, 1998	Log of Earned Income, 1998	Probability of Home Ownership, 1999
Mean of Log of Deflated Income During Childhood	0.954 (0.281)	0.650 (0.313)	0.409 (0.234)	0.181 (0.188)	0.534 (0.182)	-62.08 (87.71)	0.266 (0.0767)	0.0137 (0.159)
Proportion of Years During Childhood That Individual Lived with Two Parents	-0.974 (0.803)	-0.278 (0.626)	-1.147* (0.680)	0.463 (0.575)	0.209 (0.538)	-257.35 (231.24)	0.778 (0.288)	0.727 (0.454)
Individual's Mother First Gave Birth As a Teen	-0.0228 (0.548)	0.611 (0.395)	-0.230 (0.673)	-0.075 (0.413)	0.129 (0.395)	-68.20 (181.30)	-0.234 (0.256)	-0.0598 (0.384)
Mean Years of Schooling of Household Head During Childhood	0.103 (0.159)	0.359* (0.194)	0.319*** (0.088)	-0.060 (0.086)	-0.0565 (0.0930)	32.48 (37.56)	-0.0420 (0.0387)	-0.0994 (0.0731)
Residential Stability During Childhood	2.335** (1.168)	-0.144 (0.802)	0.786 (0.983)	0.046 (0.754)	-0.456 (0.829)	494.17 (315.12)	-0.0363 (0.294)	-0.163 (0.631)
Proportion of Years During Childhood That Family Lived in Own Home	-1.121 (0.689)	1.331*** (0.446)	0.259 (0.596)	0.318 (0.397)	0.630 (0.417)	93.22 (183.86)	-0.0820 (0.173)	1.093*** (0.399)
Mean Neighborhood Owner Occupancy Rate During Childhood	0.0399*** (0.0153)	-0.000692 (0.0130)	0.015 (0.0112)	-0.002 (0.010)	-0.00937 (0.0107)	-0.52 (4.25)	0.00465 (0.00424)	-0.00414 (0.00882)
Individual Did Not Have a Child Prior to Age 18		1.156*** (0.376)	0.191 (0.484)	0.549* (0.324)	0.513 (0.347)	-81.20 (189.43)	0.434 (0.214)	0.266 (0.367)
Individual Graduated from High School				-0.355 (0.323)	-0.250 (0.352)	-54.21 (153.32)	0.182 (0.116)	0.065 (0.297)
Individual Graduated From College				0.609* (0.325)	0.793** (0.328)	-62.00 (125.35)	0.369 (0.0941)	0.197 (0.244)

* p<.10; ** p<.05; *** p<.01

SENSITIVITY ANALYSIS

As noted in section 4, several alternative model specifications were estimated in order to test the sensitivity of the key coefficient estimates to the specification of the model. Specifically, models 1-3 varied in terms of the childhood household head characteristics included as independent variables. We also estimated model 3 with two small, but important, variations. In model 3' we included the mean neighborhood poverty rate during childhood as well as the mean neighborhood owner-occupancy rate during childhood. In model 3'', we replaced the mean of the natural logarithm of deflated annual household income during childhood (expressed in 2004 dollars) with the fraction of years during childhood that the individual lived in a household whose income was below the poverty line.

Appendix B contains the coefficient estimates for key independent variables obtained for models 1-3. The estimated effects of the key independent variables were generally insensitive to the exact model specification. That is, they did not, in general, change dramatically as the model specification was altered. With only three exceptions, if a key independent variable had a statistically significant effect on a particular outcome variable in one of the three models, it had a statistically significant effect on that outcome variable in all three specifications with the same sign and approximate magnitude. All three of the exceptions involved the effect of the mean level of education of the household head during childhood.

The first of these is the effect of the mean level of education of the household head during childhood on the probability that the individual lived in a home that his or

her family owned in 1999. While the estimated coefficient of this variable is relatively consistent across the three model specifications, it is significant at the 10% level in model 1, but insignificant in models 2 and 3. Introducing additional economic characteristics of the household head to the model significantly inflates the standard error of the coefficient that represents the effect of the mean level of education of the household head during childhood on the probability that the individual lived in a home that his or her family owned in 1999.

The effect of the mean level of education of the household head during childhood on the probability that the individual did not give birth to a child prior to age 18 was also sensitive to the model specification. In model 1, this coefficient was 0.288, which was statistically significant at the 5% level. In models 2 and 3, however, this coefficient was 0.103 and not statistically significant.

Finally, the effect of the mean level of education of the household head during childhood on the probability that the individual completed high school was also sensitive to model specification. In model 1, this coefficient was 0.558, which was statistically significant at the 1% level. In models 2 and 3 the coefficient, although still statistically significant at the 5% level and the 10% level, respectively, was considerably smaller, namely 0.376 in model 2 and 0.359 in model 3.

Appendix C contains the coefficient estimates for key independent variables obtained for models 3, 3', and 3''. Again, the coefficient estimates were generally insensitive to whether we included the mean neighborhood poverty rate during childhood in addition to mean neighborhood owner-occupancy rate during childhood (i.e., model 3' as compared to model 3) and to whether the model included average household income

during childhood or fraction of years during childhood that the individual lived in a household whose income was below the poverty line (i.e., model 3 as compared to model 3'').

The mean neighborhood poverty rate during childhood did not have a statistically significant effect on any of the outcome variables examined. The probability of not having a child before age 18 was the only outcome studied that according to model 3 was significantly affected by the mean neighborhood owner-occupancy rate during childhood. In the model that also included the mean neighborhood poverty rate during childhood in the model (i.e., model 3') the magnitude of this coefficient estimate was somewhat smaller (0.029 in model 3' [$p < .10$] as compared to 0.040 [$p < .01$] in model 3).

With two exceptions, coefficient estimates any of our independent variables of interest that were significant in models 3, 3' or 3'' at the 5% level of significance or lower were significant at least at the 10% level in all three models. First, while the estimated effect of household income during childhood on the probability of not having a child prior to age 18 is highly significant ($p < .01$) in both models 3 and 3', the estimated effect of the proportion of years prior to age 18 that the child's household was below the poverty level on this outcome is not statistically significant in model 3''. Conversely, the estimated effect of the proportion of years prior to age 18 that the child's household was below the poverty level on the probability of being employed as a young adult is highly significant ($p < .01$) in model 3'', but the estimated effect of household income during childhood on this outcome is not statistically significant in either model 3 or 3'.

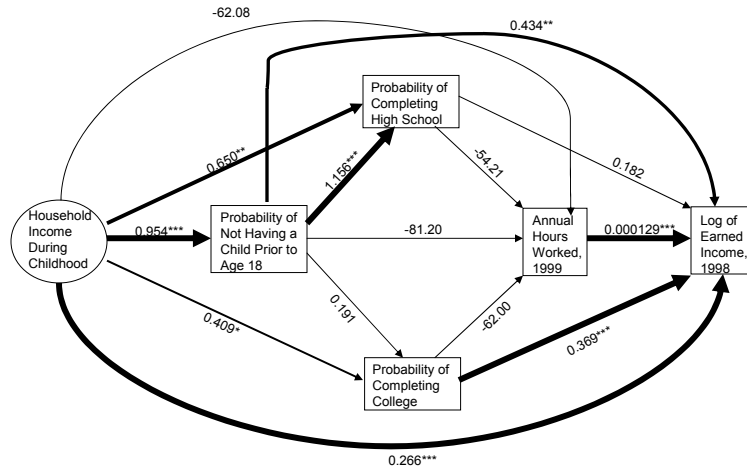
7. SIMULATION RESULTS

Common sense suggests that changing some of the characteristics of the families, households and neighborhoods in which children grow up would have a beneficial effect on the child's outcomes as an adult. The two previous sections of this report support that intuition. However, the full magnitude of the effects of changes in childhood characteristics on early adult outcomes cannot be directly inferred from the regression coefficients contained in Table 7. In particular, the household and neighborhood in which a child grows up influence children in complex ways. They can have a direct effect on one or more outcomes. In addition to direct effects, however, these independent variables can *indirectly* contribute to early adult outcomes as well.

Two general types of indirect effects are possible. First, one childhood condition might affect another childhood condition that, in turn, influences early adult outcomes. For example, having a higher income during childhood might not only directly affect the probability of not having a child prior to age 18, but it might also increase the proportion of years during childhood that the family lived in a home that they owned, which might also affect the probability of not having a child prior to age 18. Unfortunately, we were unable to account for this type of indirect effect.

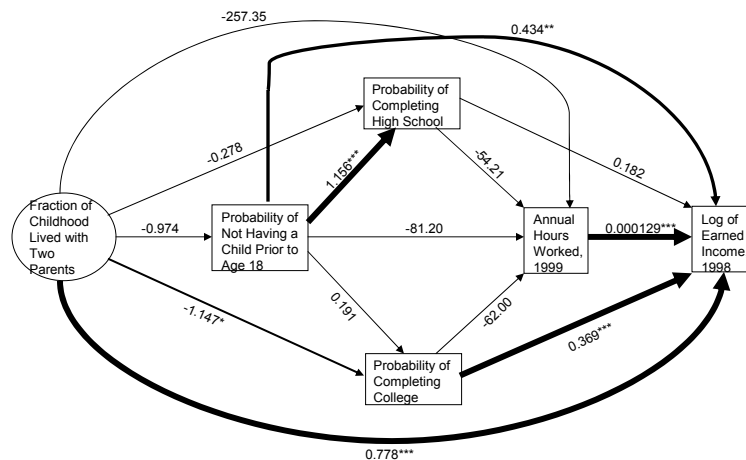
A second type of indirect effect occurs when a childhood condition (e.g., income during childhood) affects an early adult outcome (e.g., the probability of graduating college) which, in turn, affects another early adult outcome (e.g., earned income). Figures 2-7 contain graphical representations of the complex pathways that result from this type of indirect effect for one key outcome, namely earnings as a young adult.

FIGURE 2: DIRECT AND INDIRECT EFFECTS OF HOUSEHOLD INCOME DURING CHILDHOOD ON EARNED INCOME AS YOUNG ADULT



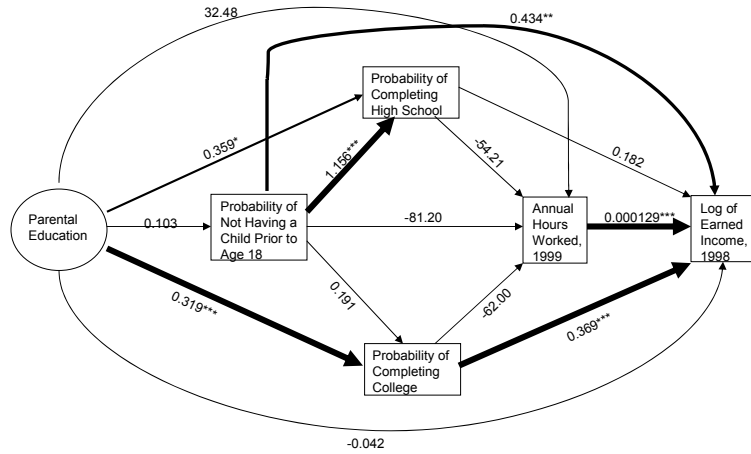
Numbers shown are estimated regression coefficients.
 * p<.10; ** p<.05; *** p<.01

FIGURE 3: DIRECT AND INDIRECT EFFECTS OF FRACTION OF CHILDHOOD LIVED WITH TWO PARENTS ON EARNED INCOME AS YOUNG ADULT



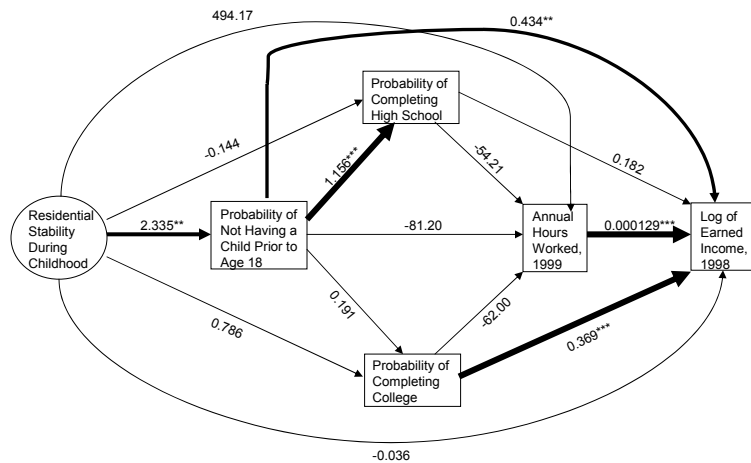
Numbers shown are estimated regression coefficients.
 * p<.10; ** p<.05; *** p<.01

FIGURE 4: DIRECT AND INDIRECT EFFECTS OF PARENTAL EDUCATION ON EARNED INCOME AS YOUNG ADULT



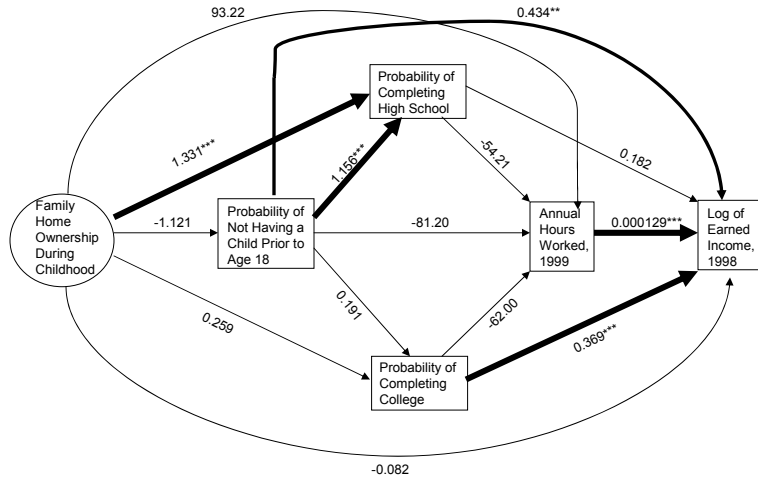
Numbers shown are estimated regression coefficients.
 * p<.10; ** p<.05; *** p<.01

FIGURE 5: DIRECT AND INDIRECT EFFECTS OF RESIDENTIAL STABILITY DURING CHILDHOOD ON EARNED INCOME AS YOUNG ADULT



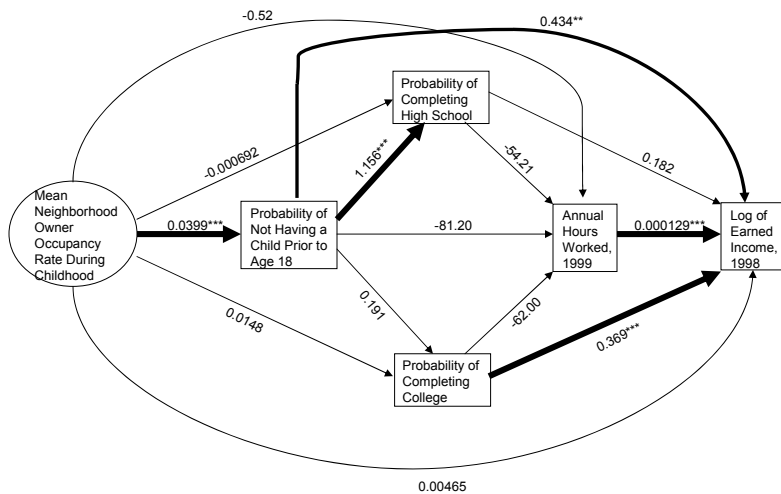
Numbers shown are estimated regression coefficients.
 * p<.10; ** p<.05; *** p<.01

FIGURE 6: DIRECT AND INDIRECT EFFECTS OF FAMILY HOME OWNERSHIP DURING CHILDHOOD ON EARNED INCOME AS YOUNG ADULT



Numbers shown are estimated regression coefficients.
 * p<.10; ** p<.05; *** p<.01

FIGURE 7: DIRECT AND INDIRECT EFFECTS OF MEAN NEIGHBORHOOD OWNER OCCUPANCY RATE DURING CHILDHOOD ON EARNED INCOME AS YOUNG ADULT



Numbers shown are estimated regression coefficients.
 * p<.10; ** p<.05; *** p<.01

The total change in early adult outcomes due to a specified change in a childhood condition is the sum of direct effects plus indirect effects. The coefficients presented in Table 7 reflect the direct effects only and, therefore, do not represent the total effect of a specified change in a childhood condition. In order to estimate the total magnitude of these effects we conducted a series of simulations that trace through the effects of the change we impose on intermediate as well as more ultimate outcomes.¹¹ The results of these simulations are shown in Tables 8 and 9 as well as Figures 8-15.

Varying household income during childhood showed a substantial positive impact on each outcome we examined except home ownership in 1999 and number of hours worked in 1999. Shifting from the 10th percentile (\$13,398 in 2004 dollars) to the 25th percentile (\$22,255) on this variable is estimated to increase the probability of not being a parent before age 18 by 8.1 percentage points, the probability of completing high school by 6.6 percentage points, the probability of graduating college by 0.8 percentage points, the probability of being employed in 1999 by 2.5 percentage points, the probability of being engaged in work or an educational activity by 6.8 percentage points and earned income by \$5,932.

Varying the proportion of years that the individual lived with two parents during childhood had the largest effect of any of the independent variables on earned income in 1999 and also had substantial positive effects on the probability of being employed in 1999 and the probability of owning a home in 1999. Shifting from the 10th percentile (11% of childhood years) to the 25th percentile (55% of childhood years) on this variable is estimated to increase earned income by nearly \$9,400, the probability of being

¹¹ Note that we did not simulate the effect of the change of a background characteristic (e.g., household income while the child was growing up) on another background characteristic (proportion of time living with two parents, for example) which might, in turn, affect intermediate or more ultimate outcomes.

employed in 1999 by 3.6 percentage points and the probability of owning a home in 1999 by 7.0 percentage points.

Somewhat surprisingly, our estimate of the total effect of increasing the proportion of years that the individual lived with two parents during childhood on the probability of graduating from college is negative. Shifting from the 10th percentile to the 25th percentile on this variable is estimated to decrease this probability by 3.6 percentage points.

The total effect of increasing parental education from the 10th percentile (11.0 years of schooling) to the 25th percentile (11.3 years) on most outcomes is modest. This is due, in large part, to the relatively small absolute difference in educational attainment associated with moving from the 10th percentile to the 25th percentile. However, the total effect of increasing parental education from the 25th percentile to the sample mean (12.7 years of schooling) is more substantial. Of particular note, increasing parental education from the 25th percentile to the sample mean increases the probability of high school completion by 6.9 percentage points and the probability of college graduation by 1.6 percentage points.

The total effect of residential stability during childhood (as measured by proportion of years in which the child did *not* move) on most outcomes is quite small. Varying this variable does, however, have a relatively large, positive impact on the probability of not having a child before age 18. Shifting from the 10th percentile (52.7% of childhood years) to the 25th percentile (68.4% of childhood years) on this variable is estimated to increase the probability of not having a child before age 18 by 5.7 percentage points.

TABLE 8: ESTIMATED EFFECT OF MOVING FROM 10TH TO 25TH PERCENTILE

CHILDHOOD CONDITION	OUTCOME							
	Probability of Not Being a Parent Prior to Age 18	Probability of High School Graduation	Probability of College Graduation	Probability of Being Employed, 1999	Probability of Being Engaged in Work or Education, 1999	Number of Hours Worked, 1999	Earned Income, 1999	Probability of Home Ownership, 1999
Household Income	8.1%	6.6%	0.8%	2.5%	6.8%	-41.2	\$5,932	0.8%
% of Years Living with 2 Parents	-3.6%	-1.6%	-3.6%	3.6%	1.0%	-107.2	\$9,384	7.0%
Parental Education	0.4%	1.8%	0.3%	-0.4%	-0.3%	8.0	-\$227	-0.6%
Residential Stability	5.7%	0.5%	0.5%	0.8%	-0.8%	72.4	\$1,270	-0.2%
Family Home Ownership	-2.7%	6.3%	0.3%	1.4%	3.8%	28.1	-\$942	7.4%
Neighborhood Owner Occupancy Rate	8.9%	1.1%	0.8%	0.3%	-1.5%	-15.2	\$3,924	-0.7%

TABLE 9: ESTIMATED EFFECT OF MOVING FROM 25TH PERCENTILE TO MEAN

CHILDHOOD CONDITION	OUTCOME							
	Probability of Not Being a Parent Prior to Age 18	Probability of High School Graduation	Probability of College Graduation	Probability of Being Employed, 1999	Probability of Being Engaged in Work or Education, 1999	Number of Hours Worked, 1999	Earned Income, 1999	Probability of Home Ownership, 1999
Household Income	5.1%	4.0%	0.7%	1.9%	5.0%	-31.5	\$5,271	0.6%
% of Years Living with 2 Parents	-2.2%	-0.9%	-1.2%	1.6%	0.5%	-50.5	\$5,481	3.5%
Parental Education	1.7%	6.9%	1.6%	-1.7%	-1.4%	38.4	-\$1,129	-3.1%
Residential Stability	3.1%	0.2%	0.4%	0.5%	-0.6%	48.5	\$738	-0.2%
Family Home Ownership	-3.5%	4.7%	0.3%	1.3%	3.5%	28.6	-\$1,146	7.8%
Neighborhood Owner Occupancy Rate	3.8%	0.4%	0.5%	0.1%	-0.9%	-7.4	\$2,147	-0.5%

Figure 8: Estimated Change in Probability of Not Being a Parent Prior to Age 18 Due to Moving from 10th to 25th Percentile of Key Childhood Characteristics

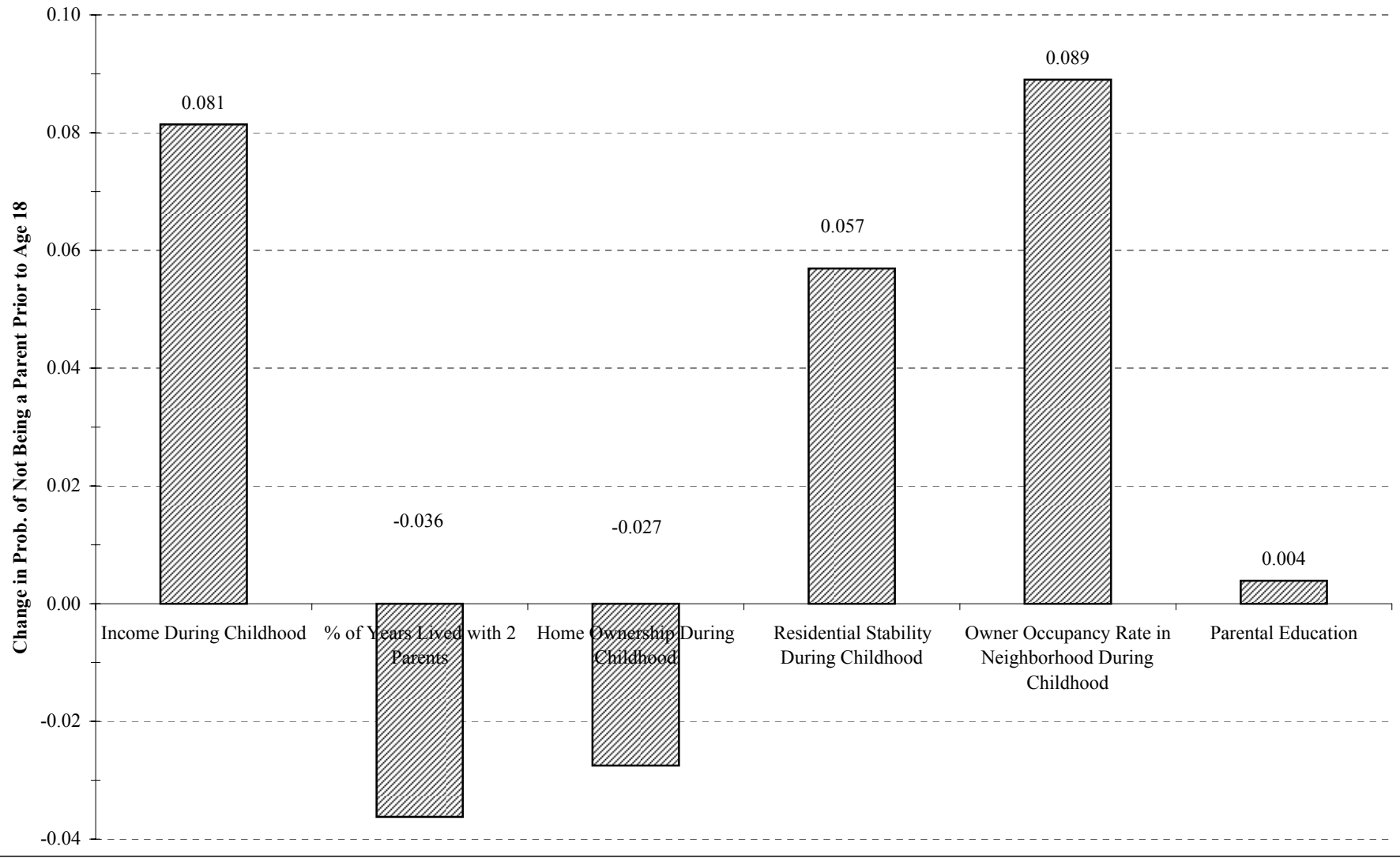


Figure 9: Estimated Change in Probability of High School Graduation Due to Moving from 10th to 25th Percentile to Mean of Key Childhood Characteristics

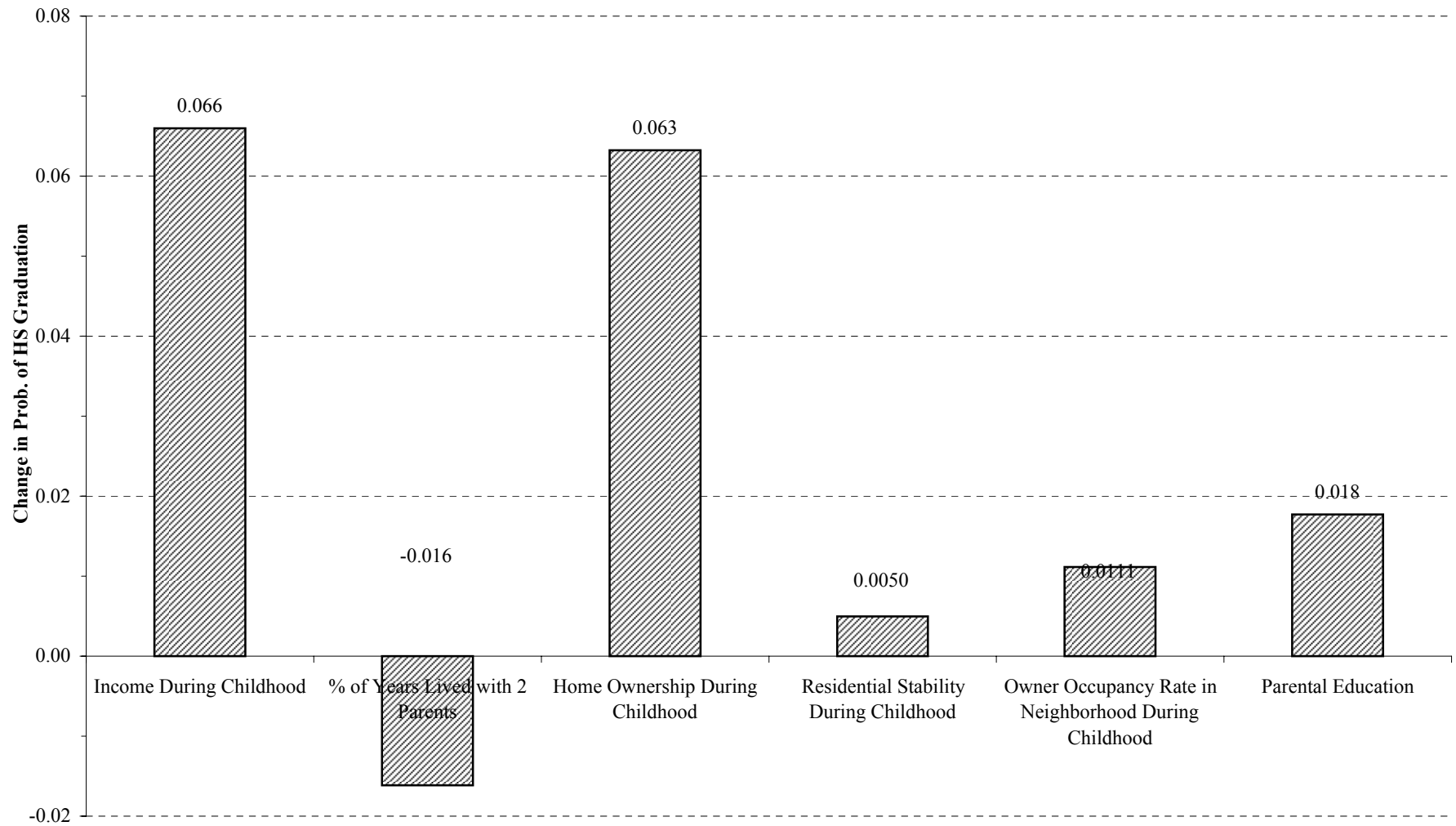


Figure 10: Estimated Change in Probability of College Graduation Due to Moving from 10th to 25th Percentile of Key Childhood Characteristics

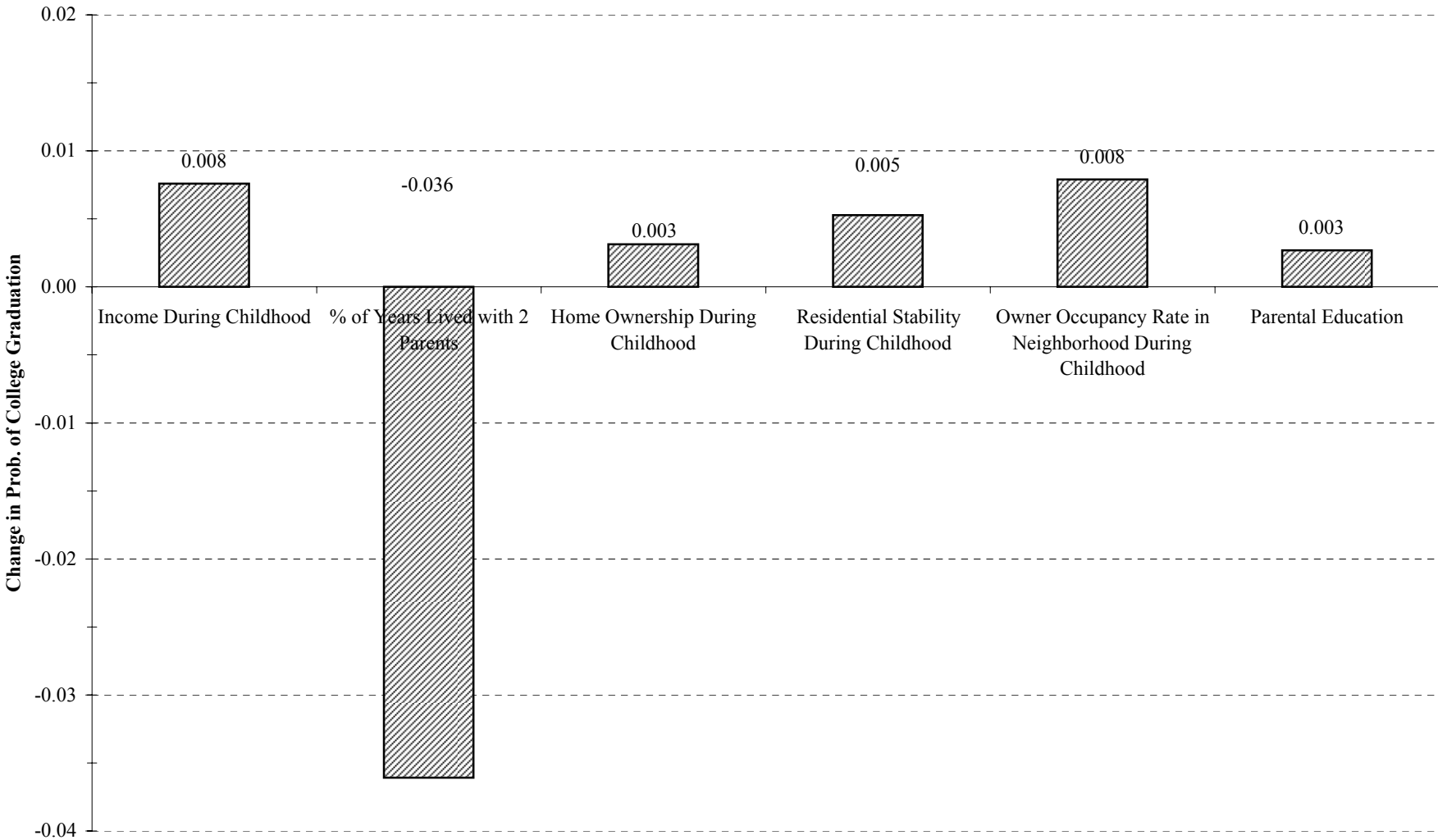


Figure 11: Estimated Change in Probability of Being Employed in 1999 Due to Moving from 10th to 25th Percentile of Key Childhood Characteristics

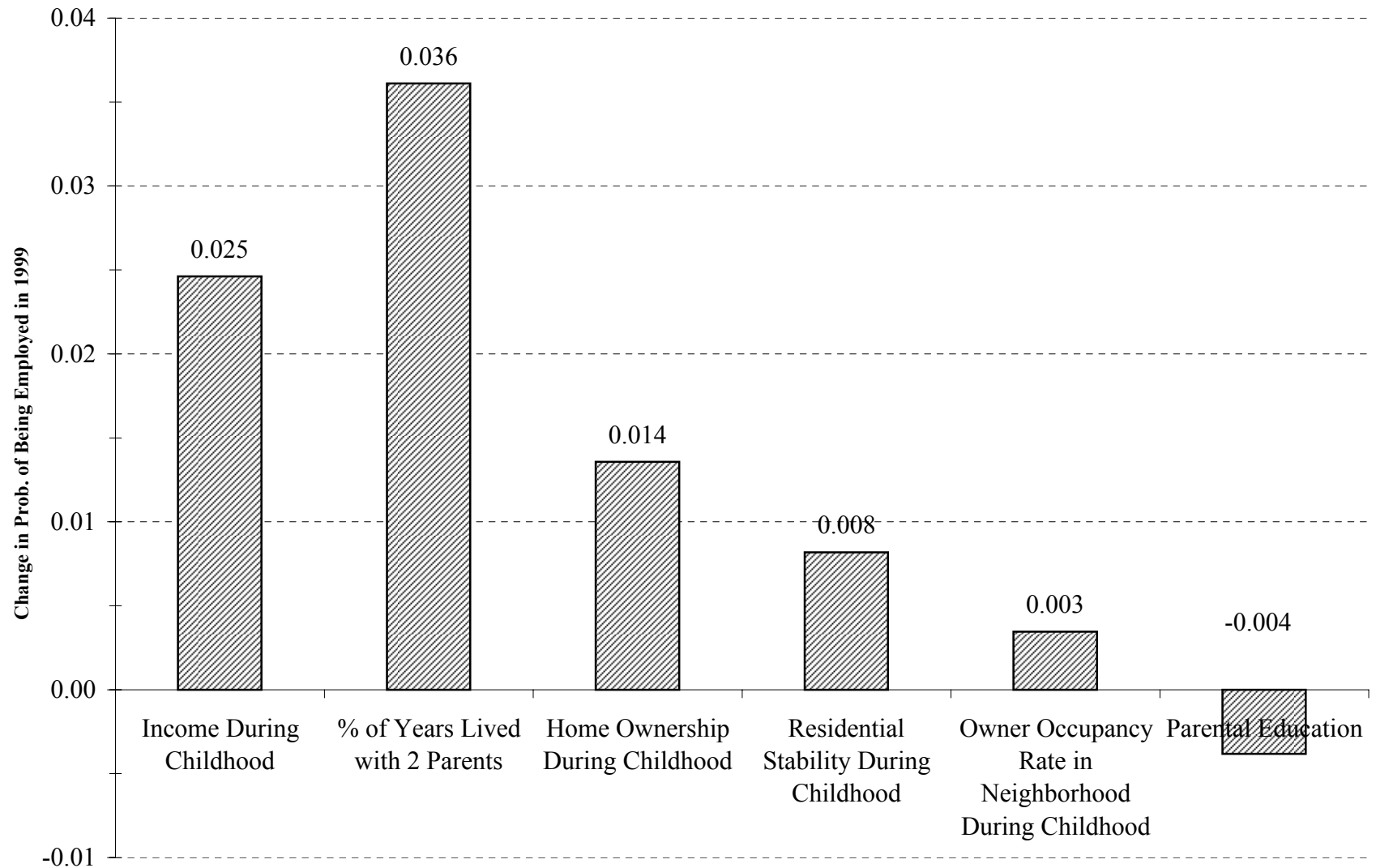


Figure 12: Estimated Change in Probability of Being Engaged in Work or an Educational Activity in 1999 Due to Moving from 10th to 25th Percentile of Key Childhood Characteristics

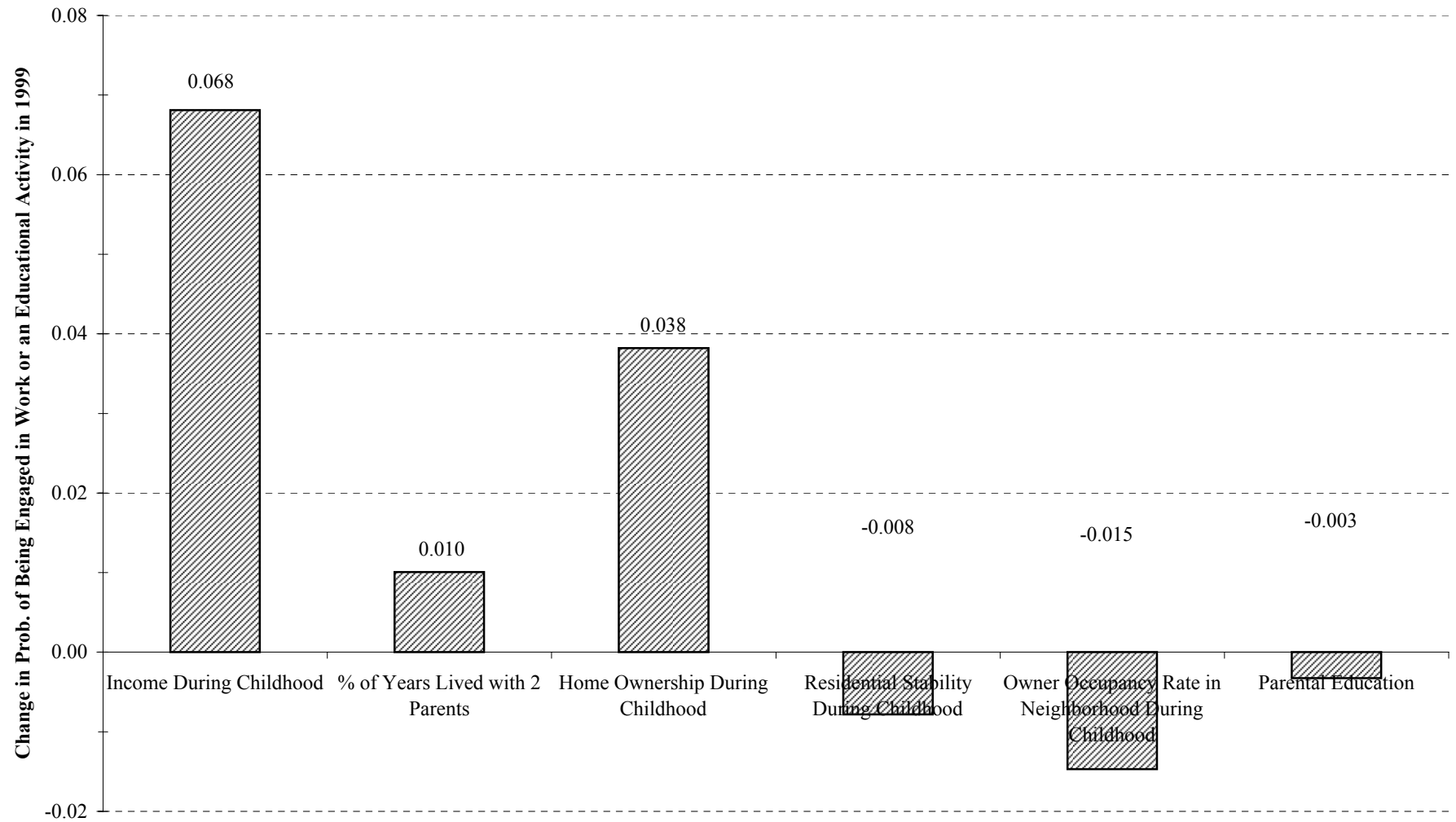


Figure 13: Estimated Change in Number of Hours Worked in 1999 Due to Moving from 10th to 25th Percentile of Key Childhood Characteristics

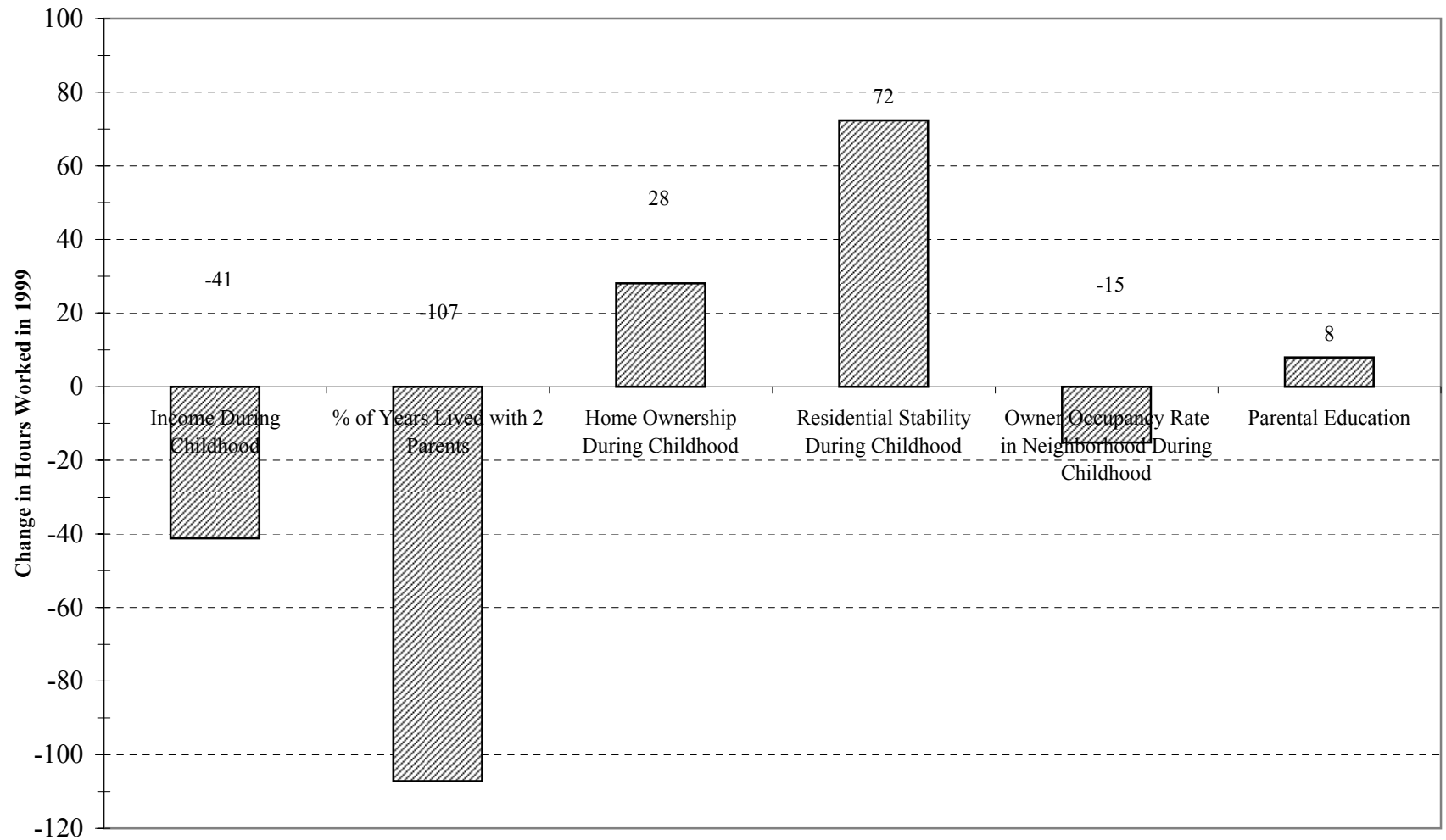


Figure 14: Estimated Change in Earned Income in 1999 Due to Moving from 10th to 25th Percentile of Key Childhood Characteristics

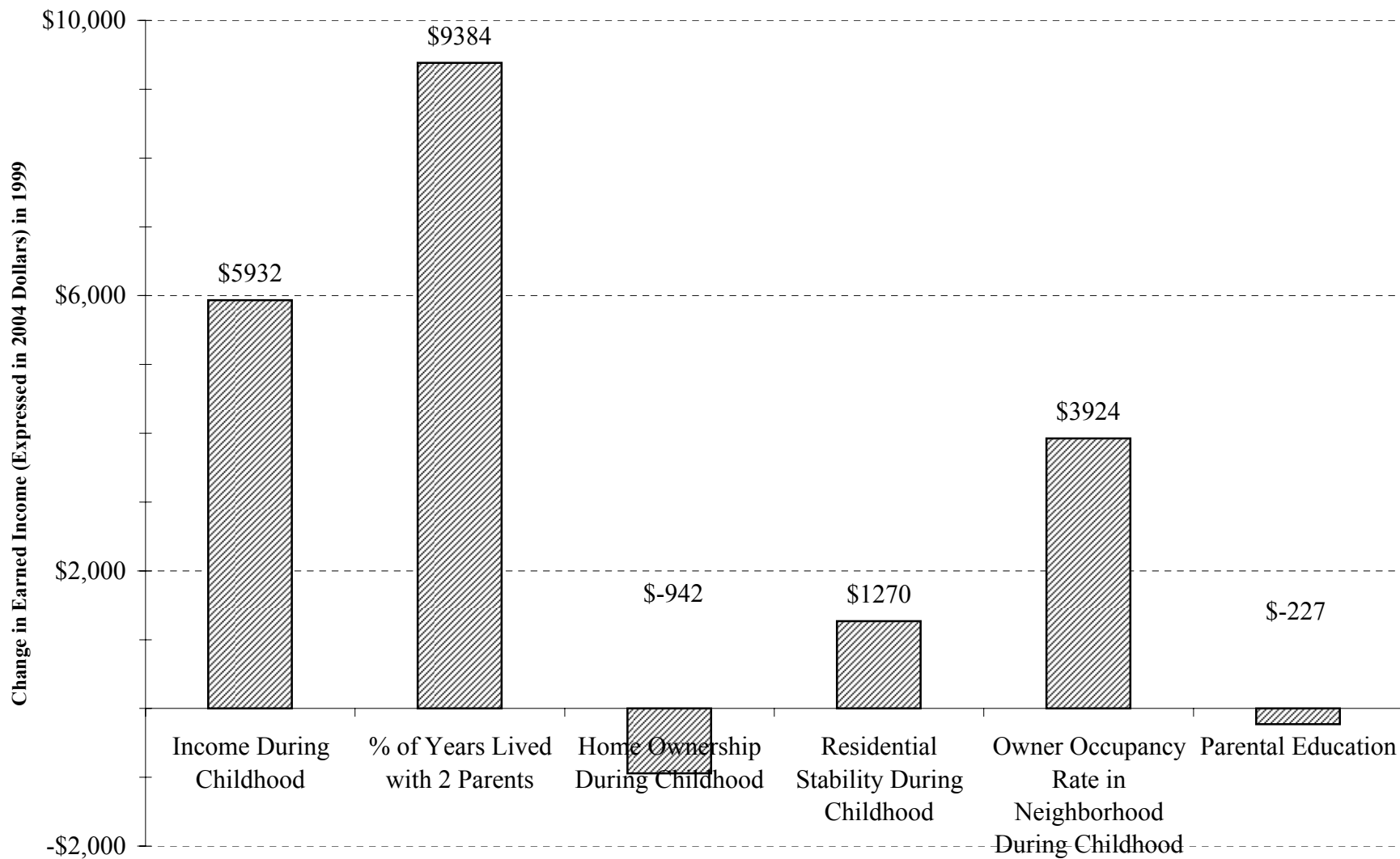
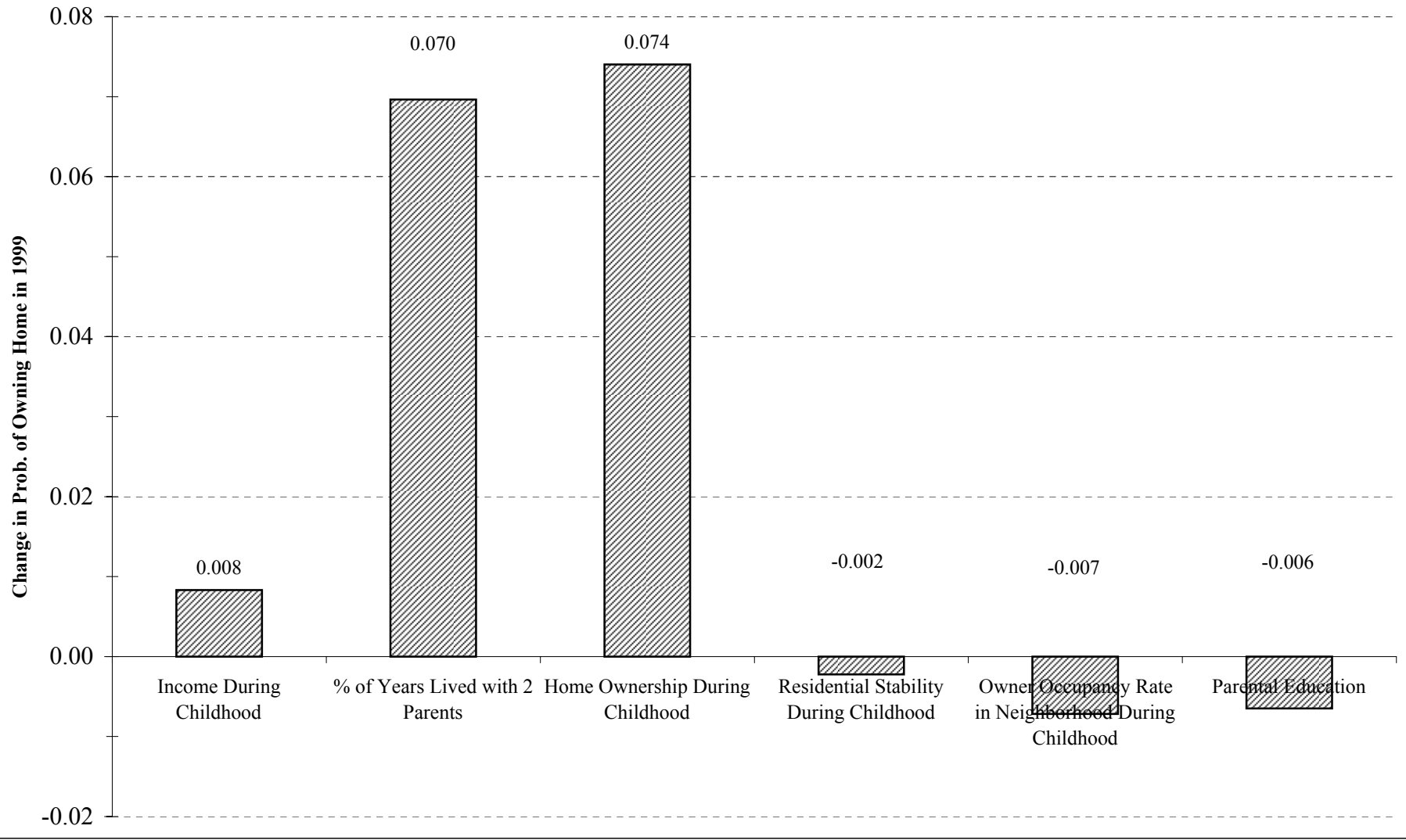


Figure 15: Estimated Change in Probability of Home Ownership in 1999 Due to Moving from 10th to 25th Percentile of Key Childhood Characteristics



The proportion of years during childhood that the person's family lived in a home that they owned had the largest total effect of any of the independent variables on the probability of home ownership in 1999. Shifting from the 10th percentile (0% of childhood years) to the 25th percentile (31.6% of childhood years) on this variable is estimated to increase the probability of home ownership in 1999 by 7.4 percentage points. It also had a large positive effect on the probability of being employed in 1999, the probability of being engaged in work or an educational activity in 1999 and the probability of high school completion. Shifting from the 10th percentile to the 25th percentile on this variable is estimated to increase the probability of being employed in 1999 by 1.4 percentage points, the probability of being engaged in work or an educational activity in 1999 by 3.8 percentage points and the probability of high school completion by 6.3 percentage points

Somewhat surprisingly, our estimate of the total effect of increasing the proportion of years during childhood that the person's family lived in a home that they owned on the probability of not having a child before age 18 is negative. This is consistent with the fact that the estimated direct effect of family home ownership during childhood on the probability of not having a child before age 18 is negative. However, since this direct effect is not statistically significant, it is plausible that the total effect we have estimated is an artifact.

The total effect of neighborhood owner occupancy rate during childhood on most outcomes is quite small. Increasing this variable does, however, have a relatively large, positive impact on two outcomes, namely the probability of not having a child before age 18 and earned income. Shifting from the 10th percentile (44.3%) to the 25th percentile

(57.6%) on this variable is estimated to increase the probability of not having a child before age 18 by 8.9 percentage points and to increase earned income by \$3,924.

8. POLICY IMPLICATIONS

Our findings suggest that interventions that would change some key elements of a disadvantaged child's life could make an important difference in the child's outcomes as a result. We focus particularly on income support policies, housing policy, education policy, policies designed to reduce teen pregnancy and policies designed to encourage children spend a greater proportion of their childhood with two parents. Our findings also highlight that pathways from background characteristics to outcomes are quite complex. This complexity should be considered in designing research that aims to estimate the determinants of outcomes, and more importantly, in program evaluations.

The central role of household income during childhood in promoting success is striking. Higher income during childhood leads to higher earnings as an adult and a higher likelihood of working or engaging in school activities. Higher income during childhood is also associated with a greater likelihood of finishing high school, finishing college, and avoiding teen pregnancy, all of which in turn also promote earnings and increase the likelihood of working or engaging in school activities. The direct effect of income on the final outcomes is independent and in addition to its effect on the intermediate outcomes.

Numerous other background characteristics are found to have a direct effect on the final outcomes. These include the portion of childhood spent with two parents as well as growing up in a home where literacy and curiosity about the world are present (as evidenced by daily newspaper reading on the part of the head of household) and in which the household head is more likely to plan ahead, which we take to be a proxy for effective parenting.

Two intermediate outcomes, namely avoiding teen parenthood and graduating from college were also found to have positive effects on earnings and the likelihood of working or being in school. In addition to household income during childhood, important determinants of these intermediate outcomes include the rate of owner occupancy in the neighborhood in which the child grew up, residential stability and knowing people in the neighborhood. These findings suggest that being able to draw upon neighborhood social capital contributes to successful adult outcomes.

The most obvious and direct contribution we can make to a consideration of the policy implications of our results is to simply call attention to our findings as summarized above. These are the points of intervention to which, if successful policy could be designed and implemented, would make a difference. They are, therefore, the areas around which policy deliberation, discussion and debate should focus.

Clearly, some of these background characteristics are more easily influenced by public policy than others. The public sector has a long history of designing public policies to increase the income of disadvantaged households, both through the tax system and through income transfers. Similarly, public policy at all levels of government has been directed towards housing (and homeownership in particular) and education (often focused directly on preventing high school dropouts and promoting college). Income transfer programs are likely to succeed in transferring income pretty much as intended. The same cannot necessarily be said of housing and education policy, since their success depends, to some extent, on changing the behavior of the intended beneficiaries as well as providers and the institutions within which they work (although to the extent that college attendance and graduation are related to financial aid available to students, the effect is

more straight-forward). Public policy efforts to discourage teenage pregnancy and to encourage that children be brought up in two parent household are more recent, more controversial, and likely to be more difficult. Efforts to affect parenting and family behavior, expectations, and motivations are even more problematic.

The above discussion suggests that efforts to increase the income of the poor are likely to be a particularly effective type of policy intervention. It is sometimes argued that efforts to increase the income of the disadvantaged are, though well-intentioned, ineffective. We disagree. Our findings strongly suggest that increasing the income of poor households is likely to have a major positive impact on the employment and earnings prospects for their children.

Our findings also have implications for housing policy. We have observed that increasing the average owner occupancy rate of the neighborhoods a child grows up in from the 10th percentile (44.3%) to the 25th percentile (57.6%) has a payoff in terms of the annual earnings of the child as an adult of nearly \$4,000 (in 2004 dollars).

At first glance the current policy of encouraging homeownership for the poor would appear to address this concern directly. There is substantial agreement in the literature on the contributing factors to gaps in homeownership between low-income and minority households and middle- and upper-income white households. The major barrier to homeownership identified is a lack of wealth and income constraints (Linneman and Wachter 1989; Herbert et al., 2005: viii; Katz et al. 2003: 38; Rosenthal 2002; Belsky and Duda 2002). Additional constraints include poor credit, lack of information, discrimination, and a shortage of adequate affordable housing (Collins, Crowe and Carliner 2002; Katz et al. 2003). Freddie Mac also identifies the prevalence of abusive

sub-prime lending practices as threatening to homeownership gains in low-income and minority neighborhoods. Key demographic characteristics that contribute to differences in homeownership rate are age, household type, and education level, as well as immigration status (Herbert et al., 2005: vi; Belsky and Duda 2002).

A variety of policy initiatives have recently been addressed to the wealth and income constraints. In addition to traditional mortgage insurance programs, these include down payment assistance through Mortgage Revenue Bonds, Individual Development Accounts (IDAs), lease-purchase ownership programs, direct mortgage subsidies and second mortgages (Collins and Dylla 2001: 6-9), the use of flexible underwriting, and relaxing borrowing constraints (Rosenthal 2002; Quercia et al. 2002). To address the additional barriers, homeownership counseling, federal regulation, and policies to encourage the rehabilitation or creation of affordable housing have been used or suggested.

However, all of these programs are non-spatial in design. If the key factor is not homeownership per se (or solely homeownership per se), but the rate of owner occupancy in the neighborhood, perhaps policy responses should be directed either to increasing neighborhood owner occupancy rates or encouraging disadvantaged households to move to neighborhoods with higher rates of owner occupancy. The current set of programs to encourage homeownership might achieve much higher payoffs if they are targeted on neighborhoods with modest owner occupancy rates.

Our results also make clear what we already know – that college graduation has a substantial payoff. Perhaps less understood is the penalty imposed on adult outcomes from having a child before the age of 18. Having a child before the age of 18 (controlling

for all other variables) reduces the estimated value of the child's 1998 adult earnings by \$16,380 (from \$44,656 to \$28,277 expressed in 2004 dollars) and the probability of being engaged in work or an educational activity as an adult by 10.3 percentage points (from 73.4% to 62.9%). Teenage pregnancy is widely viewed as socially undesirable, and the teenage pregnancy rate has been a substantial concern of public policy. Fortunately, the teenage pregnancy rate has been falling. According to Child Trends (http://www.childtrends.org/Files/Facts_2005.pdf), "Preliminary data for 2003 from the National Center for Health Statistics show the teen birth rate continues to decline, reaching historic lows for teens in each age group. The 2003 rate of 41.7 births per 1,000 females 15-19 was 33% lower than the 1991 peak of 61.8." Yet the problem remains serious. As the Child Trends report continues, "based on age-specific birth rates, an estimated 17% of current 15 year old girls will give birth before they reach age 20."

It is clearly the case that many children brought up in single-parent families have not suffered in terms of adult outcomes. However, *on average*, and controlling for a host of other variables, including the most obvious such as household income and parent's education, spending a substantial proportion of childhood without two parents also imposes, on average, severe penalties on adult earnings. Specifically, controlling for all other variables, average earnings as an adult for a child who grew up living in a two parent family during their entire childhood is 83% higher than that of those who spent 10% of their childhood in a two-parent household (\$49,416 in 2004 dollars as compared to \$27,000).

Policies designed to encourage children spend a greater proportion of their childhood with two parents have appeared on the policy agenda more recently. Because

they directly address family structure, an area which government has traditionally approached delicately if at all, such policies are more controversial. Recent efforts to address policy to this problem have focused on marriage promotion or on responsible fatherhood. Whatever the approach, our findings suggest that the potential payoff from increasing the proportion of children who spend more time with two parents is large enough to be worth devoting a substantial amount of intellectual, policy, and political energy to designing effective policy.¹² The above discussion, in conjunction with our findings on parental behavior (reading and planning ahead) also suggest the importance of effective parenting and of efforts to address policy attention to that end.

Finally, our findings have important implications for education policy. While high school graduation has some importance, post-secondary education (and particularly college graduation) has a much greater impact on adult earnings. The policy implications of this are that efforts to increase the high school graduation rate by themselves will likely have only a quite limited effect on earnings and employment.¹³ Policy needs to focus on *both* high school graduation *and* then continuation of the high school graduate's education at the post-secondary level, and, if possible, through college graduation. This suggests policies to make post-secondary education more available through financial assistance and through breaking down other barriers that prevent or discourage high school graduates to pursue post-secondary education.

¹² Our findings relate to households in which the household head and his/her spouse were present. It is, of course, possible, that the same or similar desirable effects might occur with two adults present regardless of whether they are married and, indeed, might also occur in a single parent household in which the absent spouse visited frequently and was engaged in active parenting. Unfortunately, our research sheds no light on these possibilities.

¹³ It is important to emphasize, however, that our findings do not take *quality* of high school education into account. It is possible that graduation from a high school that provides a high quality education might have substantively greater impacts on adult earnings and employment.

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APPENDIX A: FULL REGRESSION RESULTS:
MODEL 3A

**APPENDIX B: COEFFICIENTS OF KEY
INDEPENDENT VARIABLES: MODELS 1-3**

APPENDIX C: COEFFICIENTS OF KEY
INDEPENDENT VARIABLES: MODELS 3, 3', 3''
