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ABSTRACT

The Impact of Family Homeownership on Children's Educational Attainment and Earnings During Early Adulthood

Previous studies attempting to estimate the relative importance of family, neighborhood, residential stability, wealth, and homeownership status characteristics of childhood environments on young adult outcomes have: (1) treated these variables as though they were independent, and (2) employed inadequate methods to control for household selection effects. Our study offers advancements in both areas. First, it treats the key explanatory variables above as endogenously determined (sometimes simultaneously so). Second, to deal both with this endogeneity and the selection problem, we compute instrumental estimates for childhood average values of endogenous explanatory variables and use them to estimate relationships with young adult educational and labor market attainments.

We analyze data from the Panel Study of Income Dynamics (PSID) that are geocoded to Census tract data. Using this panel data set, we follow children born between 1968 and 1974 and observe their adult outcomes as of 1999 when they are between 25 and 31 years of age. We are thus able to document a wide range of background and circumstantial characteristics for the first 18 years of children's lives. We find via OLS that, compared to children who *never* experience a home owned by parents, those who spend *half* of their first 18 years in home(s) owned by their parents (which corresponds to the average experience in our sample) would be predicted to have, all else equal, a 17.3 percentage point (19 percent of the mean)-higher high school completion rate. Our preliminary instrumental variable explorations suggest that these relationships may actually be even stronger.

Introduction and Context

Much recent literature—both popular and academic—has focused our attention on the plight of children growing up in families that lack even minimal economic and other resources, especially those living in neighborhoods of concentrated poverty. Our research project seeks to improve our understanding of successful escapes from childhood poverty. We focus on success rather than failure to learn which characteristics of the individual, family, housing (i.e., ownership status), mobility, and neighborhoods mitigate the substantial and well-known negative effects of growing up in poor families residing in poor neighborhoods. By success we have in mind young adult outcomes that are the conventional hallmarks of middle class life, such as stable employment, decent income, accumulation of assets, educational attainment of a high school degree or beyond, limited or no contact with the criminal justice system, and stable adult family formation, including marriage and the absence of out-of wedlock births during adolescence.

Broadly, our research is designed to discern statistically the extent to which the success of children in young adult life is related to characteristics of their: families (education, income, attitudes, values, family structure), neighborhoods, connections of the family to neighborhood institutions, and parents' homeownership status and residential mobility). In this, the first in a planned series of papers, we focus on the relationship between one particular aspect of the residential environment, parental homeownership status, and two particular outcomes, earnings and educational attainments. This establishes the focus for our literature review, theoretical development, and discussion of findings, with the other background characteristics of young adults essentially being treated as control variables.

The statistical literature seeking to identify the predictors of various social, economic, and psychological outcomes for children and adults is voluminous and has been subject to several recent comprehensive reviews (Robert 1999, Leventhal and Brooks-Gunn 2000, Earls and Carlson 2001, and Sampson, Morenoff and Gannon-Rowley 2002.). Suffice it to note in summary, therefore, that 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, ranging from pre-school to adolescence. However important such outcomes are, we believe it is also crucial to examine factors

that account for success as adults. In this regard there is an established literature examining negative adult outcomes, such as welfare usage (e.g., Moffitt, 1992; Gottschalk, McLanahan, and Sandefur, 1994; Gottschalk, 1996; Vartanian, 1999; and Pepper, 2000) school dropouts (e.g., Clark, 1992; Mayer, 1997, Gleason and Vartanian, 1999; and 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), and economic idleness (Payne, 1987; Haveman and Wolfe, 1994; Mayer, 1997; Sawhill and Chadwick, 1999). The literature that examines factors that account for success as adults is sparse by comparison (but see Haveman and Wolfe, 1994 and Corcoran et al. 1992, Vartanian, 1999) and does not address many of the questions with which we are concerned.

Of particular note for this paper is an emerging literature examining effects of the homeownership status of a family during child-rearing stages. Though there is a considerable literature on the 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), Harkness and Newman (2002), Haurin, Parcel, and Haurin (2002a, b), and Haurin, Dietz and Weinberg (2002) 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 wealth.

As we shall amplify below, previous studies attempting to estimate the relative importance of family, neighborhood, stability, wealth, and homeownership status characteristics on adult outcomes have: (1) treated these variables as though they were independent, and (2) employed inadequate methods to control for household selection effects. Our study offers what we hope will be advancements in both areas. First, it treats the key explanatory variables above as endogenously determined (sometimes simultaneously so). Thus, for example, neighborhood conditions during childhood may not only influence later adult outcomes directly but also indirectly through their effect on family characteristics and parental choice of homeownership status during childhood. Second, to deal both with this endogeneity and the selection problem, we employ a

variant of two-stage least squares to estimate a comprehensive, structural equation system. We compute instrumental variables for childhood average values of all endogenous explanatory variables and use them to estimate relationships with young adult educational and labor market attainments.

We analyze data from the Panel Study of Income Dynamics (PSID) that are geocoded to Census tract data. Using this panel data set, we follow children born between 1968 and 1974 and observe their adult outcomes as of 1999 when they are between 25-31 years of age. We are thus able to document all our sample children's household environments annually for all 18 years of childhood.

Our paper is organized as follows. We first offer a holistic framework for understanding how the homeownership status of parents might influence outcomes for their children when they are young adults, then employ it as a vehicle for evaluating a range of previous work and establishing a foundation for our modeling efforts. Second, we describe the two pre-eminent challenges that must be overcome if one is to gain accurate measurements of the above relationship: selection bias and simultaneity bias. Third, we describe our dataset and the multi-step estimation procedure we employ in an attempt to meet the aforementioned challenges. Fourth, we present our statistical results of the key relationships between parental homeownership status and subsequent education and income outcomes of their children, building from bivariate to ordinary least-squares to instrumental variables estimates. Finally, we discuss tentative conclusions and implications.

How Might Homeownership Status Influence Young Adult Outcomes?

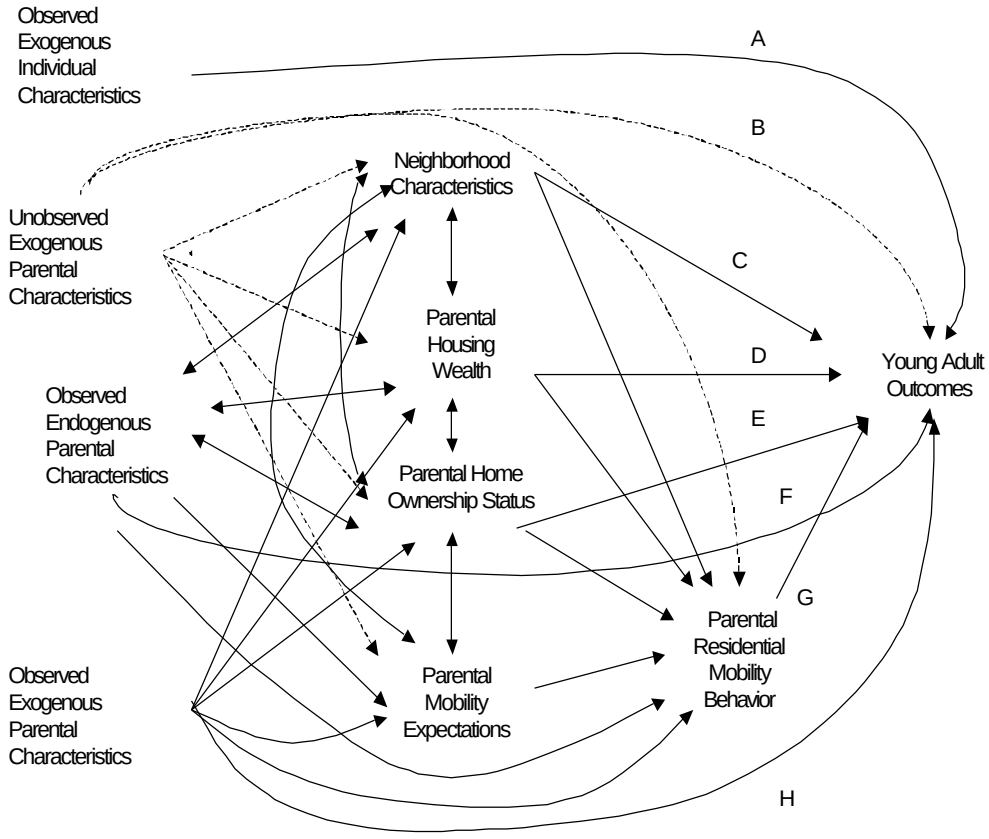
A Holistic Framework

We advance the structural model portrayed in Figure 1. We posit that young adult outcomes of interest are determined by three sets of exogenous or predetermined variables: characteristics of individual children (path A: gender, race, e.g.), observed parental characteristics (path H: education, age, e.g.), and unobserved parental characteristics (path B: ambition, morality, e.g.). They are also influenced by a set of parental characteristics that may more properly be modeled as endogenous to the residential context (path F: parental work history, marital status, e.g.). Finally, we see young adult outcomes as influenced by a set of intervening endogenous variables:

neighborhood characteristics (path C), parental housing wealth (path D), parental homeownership status (path E), parental mobility expectations and actual mobility behavior (path G).

Figure 1

A Structural Model of Young Adult Outcomes



The key innovation of this model is the specification of neighborhood / homeownership status / housing wealth / mobility expectations / household socioeconomic status as *mutually causal phenomena*. Put differently, we argue that accurately measuring the relationship of *any one of these phenomena* with young adult outcomes requires that its relationship *with all the others* be taken into account, a key point to which we shall return below. We first offer brief, heuristic rationales for these bi-directional causal relationships portrayed in Figure 1, then key references.

- *Homeownership status and neighborhood*: if economic status constrains a household to a set of "affordable" neighborhoods, but in all these there are numerous social

problems and concomitant expectations of property value deflation, there will be little motivation to buy a home; if a household would like to buy, certain neighborhoods may not be selected if they hold the prospect for little property appreciation

- *Homeownership status and neighborhood* AND *mobility expectations* (expected duration of stay): if one expects to remain long in a dwelling, given one's employment and life-cycle stage situation, one may be more likely to bear the high transactions costs of buying; *and* will try harder to avoid declining neighborhoods; in turn, if one can purchase a home, and succeed in doing so in a good neighborhood, one will probably expect to move less in the future
- *Housing wealth and homeownership status*: homeowners have the option of acquiring wealth through appreciation of their home; conversely, housing equity will affect the likelihood of households remaining homeowners (i.e., avoiding default) during difficult financial periods
- *Homeownership status and parental characteristics*: income, stability of employment, and non-housing wealth will influence the ability to purchase a home; homeownership, in turn, may provide a sense of security and control over environment that promote parental efficacy and marital stability, as well as a key financial resource for parents facing college tuition bills.
- *Housing wealth and parental characteristics*: non-housing wealth will influence the amount of home downpayment; housing wealth, in turn influences (through home equity lines of credit, e.g.) opportunities for further education, consumption, and activities of parents
- *Neighborhood and parental characteristics*: income, non-housing wealth, education, age and race will influence the choice of neighborhood; neighborhood location, social milieu, and environmental features can influence parents' access to employment, behaviors, and health

Homeownership status, Residential Stability, and Child Outcomes: Prior Work

Inasmuch as this paper focuses on the impact of homeownership status, we review only the (scanty) literature on this aspect of the structural model above. This literature (Green and White, 1997; Boehm and Schlottmann, 1999; Aaronson, 2000; Haurin, Dietz, and Weinberg, 2002; Harkness and Newman, 2002; Haurin, Parcel and Haurin, 2002a, b) suggests several causal mechanisms—direct (path E) and indirect (via mobility path

G)—through which parental homeownership status may affect later-in-life outcomes for children living in the home. The direct effects posited are:

- Housing maintenance and repairs: evidence has shown that 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 of resident children
- Homeowners may acquire a distinctive set of skills, such as those related to do-it-yourself home repairs, negotiating with contractors, plumbers, etc., seeking 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)
- Buying a home may yield gains in satisfaction and self-esteem, which in turn translate into a more supportive, positive environment for children (Balfour and Sith, 1996; Rossi and Weber, 1996)

Though it is not possible to distinguish among the above hypotheses from extant empirical work, Haurin, Parcel and Haurin (2002a, b) provide the strongest extant 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.

Most homeownership effects on children cited in the literature, however, putatively transpire indirectly through the effect of homeownership status on residential stability (path G in figure 1) and wealth (path D). The argument regarding indirect effects via stability 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 two impacts on children. First, homeowners will be more willing to invest in building positive relationships and helping networks (i.e., "social capital") among neighbors. This claim is supported by a series of empirical observations: homeowners are more likely than renters to participate in local political activities (Rossi and Weber, 1996), informal social participation (Jeffers and Dobos, 1984; Hunter, 1975), and commitment to neighborhood (Austin and Baba, 1990). Such greater social capital among homeowners may assist them in raising their children in a variety of ways, from material support in time of emergency to informal monitoring and control of their children's activities by neighbors (Coleman, 1988, 1990). Second, as children remain longer in a neighborhood they are likely to become better known to other adults in the neighborhood, thus rendering them more subject to behavioral limitations through neighbors' "collective efficacy" (Sampson, Morenoff, and Earls, 1999). There is consistent empirical support for the claim that a large part of the observed positive impacts of homeownership on children transpires indirectly through its effect on residential stability (Aaronson, 2000; Harkness and Newman, 2002).

As for indirect homeownership status effects via wealth, the conventional argument is that homeowners will typically increase their equity position through the appreciation of their housing asset, a financial option unavailable to renters. Were this true, homeowners would then be able to invest more in the educational and nurturing aspects of the children's environment, thereby improving various outcome measures. Of course, the presumption of this argument is that, by purchasing a home, a household makes a superior financial investment choice. This presumption clearly is violated in certain neighborhoods and in certain metropolitan areas during particular periods, and it may be questioned for the nation as a whole for an extended period (Nesslein, 2000). Unfortunately, Green and White (1997), Boehm and Schlottmann (1999), and Harkness and Newman (2002) did not control for wealth. Interestingly, 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.

In sum, the existing literature on how homeownership status may affect children is limited in several regards. Few studies consider young adult outcomes. Many omit key control variables that may bias upwards the apparent impacts of homeownership. None

collect information over the entirety of childhood. And none meet fully the fundamental statistical challenges posed by an investigation of this sort, a topic to which we now turn.

Challenges in Measuring Determinants of Young Adult Outcomes

We believe that there are two pre-eminent challenges that must be overcome if one is to gain accurate measurements of the relationship between young adult outcomes and key predictors of interest, such as neighborhood, homeownership status, mobility, and certain parental characteristics. These challenges are: selection bias and simultaneity bias.

Selection Bias

Selection bias in the neighborhood-outcome relationship is now a well-known challenge. The basic issue is that certain types of parents who have certain (unmeasured) motivations and skills related to their children's upbringing would move to certain types of neighborhoods. Any observed relationship between neighborhood conditions and child or young adult outcomes may therefore be biased because of this systematic spatial selection process, *even if all the observable characteristics of parents are controlled* (Manski, 1995, 2000; Duncan et al., 1997). Flipped on its head, the problem can be formulated as omitted variables bias. Is the observed statistical relationship between outcomes and neighborhood indicative of neighborhood's independent effect, or merely unmeasured (unobserved, uncontrolled) characteristics of parents that truly affected child outcomes but also (spuriously, in the extreme) led to neighborhood choices as well?[1]

When analyzing a sample of households who have chosen their neighborhoods through the private market process, this selection bias is likely severe indeed (Tienda, 1991; Manski, 1995). A variety of econometric techniques, including sibling studies and instrumental variables, have been employed in an attempt to overcome this neighborhood selection bias, but with incomplete success and/or limited general applicability thus far (see review in Galster, 2003). In addition, a few studies have

[1] The direction of the bias has been the subject of debate, with Jencks and Mayer (1990) and Tienda (1991) arguing that neighborhood impacts are biased upwards, and Brooks-Gunn, Duncan, and Aber (1997) arguing the opposite.

attempted to model explicitly the selection process into owner and rental tenures (Green and White, 1997; Haurin, Parcel and Haurin, 2002a,b).

However, were Figure 1 to be adopted as a working premise, the selection process becomes much more complicated than merely the parents' *independent* selection of neighborhood or tenure. In our view, the holistic challenge embodies the *interdependent* selections of neighborhood, homeownership status, and expected mobility. We portray the implicit omitted variables' relationships in this selection problem as dashed lines in Figure 1.

Simultaneity Bias

Previous statistical studies have taken only a myopic view of the causal patterns embodied in Figure 1. Some have omitted one or more of the intervening variables. But of more import here, none have modeled these variables as mutually endogenous. This simultaneity bias provides an additional reason why the accuracy of the relationships they measure between outcomes and key predictors of interest may be called into question.

Meeting the Challenges through an Instrumental Variables Approach

We believe that both selection and simultaneity biases can be overcome through the application of instrumental variables techniques. These techniques are well known as a solution to the simultaneity challenge, typically applied in the form of two-stage least squares. In the case of the selection challenge, instrumental variables have rarely been used, and only in the case of neighborhood selection (Evans, Oates, and Schwab, 1992; Foster and McLanahan, 1996). In the first stage of this application, a regression is estimated wherein the dimension of neighborhood in question is regressed on one or more explanatory variables that, hopefully, are highly correlated with the neighborhood characteristic but uncorrelated with unmeasured parental characteristics. The predicted values for the neighborhood characteristic yielded by this first stage regression, which presumably are purged of spurious correlation with unmeasured parental characteristics, are employed in a second-stage regression explaining outcomes.

The challenge of this method, of course, is identifying first-stage variables that reasonably meet the aforementioned correlation criteria. In the seminal example of instrumental variables applied to the neighborhood selection problem, Evans, Oates, and Schwab (1992) used metropolitan-level variables for unemployment rate, median family income, poverty rate, and percentage of adults completing college as identifying variables predicting the "neighborhood variable:" proportion of students in the local school who are economically disadvantaged. Analogously, Foster and McLanahan (1996) used citywide labor market conditions as identifying variables predicting neighborhood high school dropout rates. We believe that this strategy for instrumenting not only neighborhood-level but individual-level variables with corresponding variables measured at larger geographic scales is fruitful, and employ it in our work.

Data to be Analyzed

A brief overview of the Panel Study of Income Dynamics (PSID) data we analyze is a prerequisite for understanding our particular instrumental variables approach. Beginning in 1967, the PSID began interviewing 5,000 American families. In each year since then, 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. So, by 1998, the PSID was following nearly 10,000 families. While the PSID over sampled poor households in order to obtain relatively large sample sizes for such households, the poverty over-sample was subsequently dropped in the 1990s. Consequently, our analysis is limited to a sample designed to be nationally representative of the U.S. population in 1967. We account for differential attrition over the course of the panel by adjusting 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 employ a PSID geo-matched file, which appends information about the child's census tract to each observation. We interpolate values of census tract variables for observations between census years. We are thus able to observe annually the household and (approximate) neighborhood environments in which our sample individuals spend their childhood.

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. Descriptive statistics for various aspects of the sample of children we analyzed—themselves, their households, the heads of their households, and their neighborhoods as they were growing up—are provided in Table 1.

Of particular interest to our inquiry are statistics for parental home ownership status. On average, children in our sample spent half of their years in households where the head owned the dwelling. Only six percent of children in the sample grew up in a household in which the head never owned the home in which they lived. Almost one in five (18%) lived up to nine years in an owner-occupied home, almost one in three (31%) lived between nine and seventeen years in an owner-occupied home, and almost half (45%) lived all eighteen years in a home that was owned by the head.

TABLE 1
Characteristics of Sample and Their Average Circumstances During Ages 0-18

	Mean	Std Dev
Characteristics of Individuals in 1999		
Black Female	0.213	0.409
Black Male	0.132	0.339
White Female	0.308	0.462
Order of birth (1=first)	2.451	2.085
Age in Years	28.712	2.679
Married	0.481	0.499
No Child before age 18	0.881	0.324
Characteristics of Their Households (Ave. During Ages 0-18)		
Ln Deflated Family Income*	8.276	4.261
Per Capita Income in Household*	5616.43	4020.24
Proportion of years lived in poverty*	0.135	0.257
Proportion of years when moved residence*	0.173	0.179
Proportion of years when head owned the home*	0.497	0.412
Deflated Net Asset Value of Home (if head owned)*	57363.74	61785.45
Proportion of years lived with two parents	0.607	0.435
Characteristics of Their Household Heads (Ave. During Ages 0-18)		
Education of Household Head*	12.733	1.615
Occupational Prestige of Household Head*	30.873	18.901
Proportion of Years Head was self employed	0.086	0.206
Proportion of Years Wife of Head employed	0.388	0.344
Annual Hours Head Worked*	1403.21	931.92
Proportion of Years Head Had No Limitation on Working	0.618	0.437
Proportion of Years Head Visited Bars or Taverns at least Weekly	0.134	0.243
Proportion of Years Head Usually Watched TV 3+ Hrs. Daily	0.323	0.339
Proportion of Years Head Read Newspaper Every Day	0.539	0.417
Proportion of Years Head Belonged to a Union	0.192	0.294
Proportion of Years Head Did Not Attend Religious Service Weekly	0.51	0.419
Proportion of Years Head Never Participated in Social/Neigh. Clubs	0.492	0.393
Proportion of Years Head "Planned His/Her Life Ahead."	0.408	0.377
Proportion of Years Head "Carried Out Things As Expected."	0.451	0.371
Proportion of Years Head "Trusted Most People."	0.389	0.385
Head is Jewish	0.024	0.154
Head is Catholic	0.161	0.368
Head is Protestant	0.721	0.448
Head is a Veteran	0.323	0.468
Mother first gave birth as teen	0.095	0.293
Head raised in large city (not suburb)	0.307	0.461
Head raised in rural or small town	0.326	0.469
Characteristics of Their Neighborhood (Ave. During Ages 0-18)		
Ave. Number of Neighbors Head Knew by Name	12.327	8.765
Proportion of Years Lived With Extended Family in Walking Distance	0.401	0.397
Percent Population below poverty*	9.438	7.813

Note: *signifies variable considered endogenous and IV used in final estimation.

Our goal here is to relate parental homeownership status, controlling for all the other characteristics of the child's environment listed in Table 1, to school attainment and labor market outcomes (personal earnings, total family income, poverty status) as of 1999. Descriptive statistics for these outcomes for our analysis sample are presented in Table 2.

TABLE 2
Young Adult Outcomes for Individuals in Analysis Sample, 1999

	Mean	Std Dev
Educational Outcomes		
Completed High School or More	0.881	0.352
Attended Some Post High School or More	0.461	0.499
College Degree or More	0.144	0.351
Labor Market Outcomes		
Ln Annual Earnings, 1998	9.826	1.102
Ln Total Family Income, 1998	10.456	0.934
Not in Poverty, 1998	0.846	0.362

By 1999, 88 percent of the children born 1968-1973 had graduated from high school or obtained a GED, 46 percent had undertaken some post-secondary education, and 14 percent had graduated from a four-year college. The PSID only collects income information from PSID respondents who have formed their own household, so income statistics we report refers only to these members of our cohort. On average, in 1998 this group earned $18,509 and had total family income of $34,752. Eighty-five percent had a family income during 1998 sufficient to keep them out of poverty.

Estimation Procedure

Overview of our Approach

Because our structural equations operationalizing Figure 1 contain many endogenous variables on the right-hand side, which are also subject to selection, it is necessary to use an instrumental variables approach to obtain consistent, unbiased coefficient estimates. Our approach represents a variant of the common two-stage least

squares technique, and proceeds in the following steps. First, for each endogenous variable we estimate an OLS regression in which the left-hand side is the observed value of the endogenous variable in question in a given PSID year and the right-hand side contains observed values of *every exogenous (including predetermined) variable in the system of structural equations*. These exogenous variables are too numerous to list individually, but include: (1) lagged values of household characteristics, (2) contemporaneous values of countywide characteristics corresponding to the endogenous variables[2]. Dummy variables for calendar year are also included on the right-hand side of these equations.

In this first step, regression equations are estimated based on all observations from age 0 to 18 of each child in our initial sample.[3] Thus, in the absence of missing data, eighteen sets of observations are used for each child in our initial sample.[4]

In the second step of our approach, the aforementioned regressions are employed to generate predicted values of all endogenous variables for each of the first 18 years of each child's life, based on values of all exogenous and predetermined variables used in the prior step's regressions. We use these predicted values as the basis of our instrumental variables (IV) estimate of the effect of parental homeownership during childhood on adult outcomes. It is important to note that what is of prime importance here is how well the prior regressions predict the values of the endogenous variables, not their coefficient estimates in and of themselves.

The third step of our procedure consists of estimating the coefficients of exogenous variables and IVs in the education and the labor market outcome equations, using OLS. The sample for estimating these coefficients includes all children in our initial 1967-1973 PSID cohort who have "survived" in the sample to the point at which the outcome in question is observed: 1999. Equations for both education and labor market outcomes have many variables on the right-hand sides that are identical. Both sets employ (exogenous or predetermined) characteristics of the individual, the individual's household (including exogenous and IV estimates of endogenous parental characteristics, wealth, homeownership status, and mobility) and (IV estimates of

[2] Note that lagged values of neighborhood characteristics are not included in this list of right-hand side variables. This is because neighborhood characteristics are interpolated among different census years and hence would be almost perfectly correlated with the current value of neighborhood characteristics.
[3] Because each first-stage equation includes lagged variables, we cannot estimate a first-stage equation for age 0.
[4] As a form of sensitivity analysis, we will (at a later point) re-estimate the first-stage equations by using [available] observations from age 0 to 18 of each child *who remains in the sample to the point at which the outcome measure in question is observed.*

endogenous) neighborhood during childhood; descriptive statistics of these variables were presented in Table 1. For all of these variables, we use averages calculated over the first 18 years of the child's life (or for however many years we have data).[5] If the right-hand side variable is endogenous, we use instrumental variables (i.e., predicted values) for each year generated from the prior step, rather than the observed values of the variable, in computing these averages.[6]

The set of labor market outcome equations includes the three educational attainment ("intermediate" outcome) variables and annual hours worked on the right hand side. Observed values of these variables will be used because they are assumed to be predetermined from the perspective of labor market outcomes, thus avoiding simultaneity bias.

Complicating Issues

Four issues require further discussion. The first of these is the operational definition of neighborhood. While imperfect, we employ census tracts as our preferred approximation to neighborhood. However, until 1990 rural areas were not divided into census tracts. For such pre-1990 non-tracted areas, we are forced to use county-level data to represent "rural neighborhood" data.[7]

This creates a complication in our first-stage estimation procedure, though. As noted above, contemporaneous values of countywide characteristics are used on the right-hand sides of all equations, including those in which a neighborhood characteristic is the left-hand side variable. Thus, the same variable would be on both sides of the equation, which is, of course, problematic. To address this complication, in the first stage estimation *for neighborhood characteristics*, we omit observations in which the household lived in a rural area.[8] That is, if during year t, household i lived in a rural area, that observation was not used to estimate the first-stage equations *for neighborhood characteristics*. However, if household i lived in a rural area during year t-1, but in an

[5] We hope in later sensitivity analyses to use averages calculated for each of four conventionally defined (Leventhal and Brooks-Gunn, 2000) developmental periods (ages 1-5, 6-10, 11-14, 15-18 years).

[6] There are two exceptions to this. First, as discussed further below, for those years in which the family lived in a rural area, we use the observed value of neighborhood characteristics. Second, for age 0, we will use observed values since we cannot estimate first-stage equations for age 0. (Alternatively, we can ingnore year 0 in the outcome equations and consider the first developmental period to be ages 1-5.)

[7] In the first step equations we employ a dummy variable to denote whether the observed value for "neighborhood" came from tract or county data.

[8] Alternatively, for years in which the household lived in a rural area, we could obtain fitted values of neighborhood characteristics by regressing the county characteristic on lagged values of household

urban area during year t, the year t observation for household i *is* included in the data used to estimate the first-stage equations *for neighborhood characteristics*. In addition, in averaging neighborhood characteristics over childhood for use in estimating the outcome equations, for years in which the household lived in a rural area, the observed value of county-level data was used in lieu of predicted values of neighborhood characteristics from the first stage regression.

Secondly, the numerous attitudes and behaviors of the household head that we employ as controls (see Table 1) 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.)

Each attitude and behavior we employed as a control was stable over time. Pairwise correlations between responses to the question "carry out plans" over the six points in time at which this question was asked ranged from .17 to .40. Cronbach's alpha, a measure of internal consistency, for a scale consisting of the sum of the responses to this question over the six years, was .70. Pairwise correlations between responses to the question "plan ahead" over the six points at which this question was asked ranged from .20 to .46. Cronbach's alphawas .77. Pairwise correlations between responses to the question "trust" over the five points in time at which this question was asked ranged from .40 to .54. Cronbach's alpha was .81.

The third issue requiring some discussion is the handling of endogenous variables that are dichotomous. As noted in Wooldridge (2002: 478), it is not appropriate to apply probit models to such variables and then use the predicted probability on the right-hand side in second-stage estimation. Hence, in our first stage we applied linear probability models to each dichotomous endogenous variable and used the predicted value obtained from that estimation in our second stage.

Finally, as noted above, our estimation procedure involves the creation of instrumental estimates for endogenous variables in the outcome equations that consist of *multi-year averages of predicted values* of these variables. Given that the distribution of these new “average” instruments is not known, the standard errors yielded by OLS cannot be interpreted in a straightforward fashion. Thus, conventional tests for statistical significance must be interpreted cautiously when examining our IV estimates.

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characteristics only. However, applying different models to the same variable in different years sounds pretty complicated in terms of programming.

Results

Differential Rates of Successful Outcomes as Young Adults, by Parental Homeownership Status

Bivariate cross-tabulations shown in Table 3 indicate that parental homeownership status during childhood is strongly associated with important differences in educational and income outcomes for these children when they are young adults in 1999. Children from households where their parent(s) never owned the home in which they were raised were less likely to finish high school (62 percent) compared to other groups. Some (1-9) years growing up with home-owning parents was associated with 82 percent high school completion rates, whereas more than half or all of childhood spent in an owner-occupied dwelling was associated with a 94 or 95 percent rate of high school completion, respectively.

TABLE 3

CROSSTABULATIONS OF PARENTAL HOMEOWNERSHIP STATUS BY EDUCATIONAL AND EARNINGS* OUTCOMES AS YOUNG ADULTS

	YEARS DURING CHILDHOOD WHEN PARENTS WERE HOMEOWNERS			
OUTCOMES IN 1999	0	1 thru 9	10 thru 17	All
High School Diploma (or G.E.D.) or More	62.4%	82.4%	93.6%	95.5%
College Degree (4-year)	3.3%	8.9%	12.9%	20.7%
Lowest Quartile (< $9,000)	40.9%	19.6%	16.7%	17.5%
Second Quartile ($9,001 - 20,700)	30.8%	26.1%	23.5%	19.9%
Third Quartile ($20,701 - 32,000)	20.4%	29.8%	29.1%	23.5%
Highest Quartile ($32,001 +)	7.8%	24.5%	30.7%	39.2%

Note: Percentages based on weighted data

* 1998 Earnings statistics apply only to heads of household or their spouses during 1999.

Similar patterns are evinced for college completion. Only three percent of children who grew up in never-homeowner households graduated from a four-year college by 1999. By comparison, rates of college graduation were: nine (9) percent for children spending 1-9 years of childhood in an owned home, 13 percent for those spending ten to seventeen years, and 21 percent for those spending all 18 years in a homeownership environment.

Earned income differentials in 1998 among young adults based on differences in parental homeownership status are equally dramatic. Table 3 shows that 41 percent of the children of parents who never owned their own home ended up in the lowest earned income quartile (under $9,000) for their cohort as young adults, and only eight (8) percent ended up in the highest quartile (over $32,000). In comparison, the respective figures for children always raised in a home owned by the parents are 18 percent in the lowest quartile and 39 percent in the highest quartile.

OLS Estimates of the Relationship between Parental Homeownership Status and Outcomes for Young Adults

Do these strong relationships portrayed in Table 3 hold up when we enter numerous control variables for other characteristics of the individual in 1999 and characteristics of their households and neighborhoods as they were growing up, as listed in Table 1? As a first answer to this question, we performed Ordinary Least-Squares regressions on models predicting for 1999: high school completion, completion of at least some years of post-secondary education, completion of a four-year college degree or more, total family income during 1998, individual wage earnings during 1998, and whether the family was above the poverty line during 1998. Parameter estimates for the education models are presented in Table 4, those for the labor market models in Table 5. Below we note some salient findings before focusing attention on the results for parental homeownership status.

TABLE 4
OLS Regression Results for Education Outcomes
(standard errors shown parenthetically)

	At Least High School	*At Least Some Coll*	*College Degree Plus*
	OLS	OLS	OLS
Intercept	-0.300	-2.63	-1.74
	(0.345)	(0.588***)	(0.438***)
Characteristics of Individuals in 1999			
Black Female	0.004	0.170	0.062
	(0.056)	(0.094*)	(0.070)
Black Male	0.093	-0.006	-0.041
	(0.047**)	(0.079)	(0.059)
White Female	0.024	0.106	0.024
	(0.019)	(0.034***)	(0.025)
Order of birth (1=first)	-0.005	-0.006	-0.002
	(0.007)	(0.011)	(0.008)
Age in Years	0.014	0.014	0.040
	(0.005***)	(0.009)	(0.006***)
Married	-0.013	-0.003	-0.023
	(0.019)	(0.032)	(0.024)
No Child before age 18	0.162	0.263	0.091
	(0.044***)	(0.076***)	(0.057)
Childhood Characteristics			
Ln Deflated Family Income	0.022	0.090	0.022
	(0.029)	(0.050*)	(0.037)
Proportion of years lived in poverty	-0.057	0.380	0.056
	(0.091)	(.155**)	(0.116)
Proportion of years when moved	-0.082	-0.040	0.012
	(0.075)	(0.128)	(0.096)
Proportion of years head owned home^	0.144	0.123	0.061
	(0.048***)	(0.069)	(0.051)
Deflated Net Asset Value of Home	-1.58E-07	-3.47E-08	9.61E-08
	(2.1-E-07)	(3.53E-07)	(2.63E-07)
Proportion of years lived with two parents	-0.086	-0.032	-0.151
	(0.049*)	(0.084)	(0.062**)
Proportion of years lived in SMSA	-0.021	-0.013	0.0001
	(0.026)	(0.044)	(0.032)
Childhood Characteristics of Hhld Heads			
Education	0.012	0.069	0.017
	(0.008)	(0.014***)	(0.010)
Occupational Prestige	0.0006	0.003	-0.001
	(0.001)	(0.002)	(0.002)
Proportion of Years Self Employed	-0.042	0.163	-0.046
	(0.041)	(0.070**)	(0.052)
Proportion of Years Wife of Head Employed	0.048	0.186	0.078
	(0.039)	(0.066***)	(0.049)
Annual Hours Worked	0.00005	0.00003	0.00003
	(0.00002**)	(0.00004)	(0.00003)
Prop Yrs No Limitation on Working	0.129	0.186	0.034
	(0.035***)	(0.060***)	(0.045)

^ = IV employed here for IV regression
* p<.10; ** p<.05; *** p<.01 (two-tailed tests)

TABLE 4
OLS Regression Results for Education Outcomes (continued)
(standard errors shown parenthetically)

	At Least High School	*At Least Some Coll*	*College Degree Plus*
	OLS	OLS	OLS
Childhood Characteristics of Hhld Heads (Continued)			
Prop Yrs Usually Watch TV 3+ Hrs. Daily	0.018	0.056	-0.103
	(0.030)	(0.052)	(0.039***)
Prop Yrs Read Newspaper Every Day	0.070	-0.026	0.028
	(0.034**)	(0.057)	(0.043)
Prop Yrs Belonged to a Union	-0.035	0.039	-0.012
	(0.030)	(0.051)	(0.038)
Prop Yrs Not Attend Relig Service Weekly	-0.012	-0.037	0.014
	(0.027)	(0.045)	(0.034)
Prop Yrs Never Particip Social/Neigh. Clubs	-0.045	0.069	0.059
	(0.029)	(0.049)	(0.037)
Prop Yrs "Planned His/Her Life Ahead"	-0.048	0.006	-0.022
	(0.029)	(0.050)	(0.037)
Prop Yrs "Carried Out Things As Expected"	0.023	0.059	0.078
	(0.034)	(0.058)	(0.043*)
Prop Yrs "Trusted Most People"	-0.057	-0.006	0.048
	(0.030*)	(0.050)	(0.038)
Head is Jewish	0.048	-0.014	0.365
	(0.063)	(0.107)	(0.080***)
Head is Catholic	0.073	0.080	0.109
	(0.039*)	(0.066)	(0.049**)
Head is Protestant	0.085	0.057	0.009
	(0.033**)	(0.056)	(0.042)
Head is a Veteran	-0.052	-0.043	-0.005
	(0.019***)	(0.032)	(0.024)
Mother first gave birth as teen	0.007	-0.138	-0.070
	(0.046)	(0.078*)	(0.058)
Raised large city (not suburb)	0.048	0.142	0.116
	(0.023**)	(0.039***)	(0.029***)
Raised in rural or small town	-0.033	0.074	0.033
	(0.024)	(0.040*)	(0.030)
Childhood Neighborhood Characteristics			
Prop Yrs w/ Family in Walking Distance	0.051	-0.048	-0.064
	(0.026**)	(0.044)	(0.033**)
Ave. # Neighbors Head Knew by Name	0.003	0.004	0.004
	(0.002*)	(0.003)	(0.002**)
Percent Population below poverty	-0.001	-0.009	0.002
	(0.002)	(0.003**)	(0.002)
F (38, 843)	6.23***	7.34***	5.61***
Adjusted R-Squared	0.188	0.219	0.169

* p<.10; ** p<.05; *** p<.01 (two-tailed tests)

TABLE 5
OLS Regression Results for Labor Market Outcomes
(standard errors shown parenthetically)

	Earnings	*Family Income*	*Not In Poverty*
	OLS	OLS	OLS
Intercept	4.445	5.92	-0.636
	(1.465***)	(1.036***)	(0.428)
Characteristics of Individuals in 1999			
Black Female	-0.126	-0.204	-0.103
	(0.223)	(0.167)	(0.068)
Black Male	0.500	-0.176	-0.094
	(0.203**)	(0.139)	(0.057*)
White Female	-0.382	0.028	0.029
	(0.077***)	(0.059)	(0.024)
Order of birth (1=first)	-0.047	-0.003	-0.002
	(0.027*)	(0.020)	(0.008)
Age in Years	0.100	0.06	0.013
	(0.021***)	(.015***)	(0.006**)
Married	0.009	0.329	0.165
	(0.072)	(0.061***)	(0.029***)
No Child before age 18	0.555	0.308	0.071
	(0.192***)	(0.133**)	(0.055)
Childhood Characteristics			
Ln Deflated Family Income	0.219	0.169	0.106
	(0.122*)	(0.080***)	(0.035***)
Proportion of years lived in poverty	-0.700	0.344	0.078
	(0.395*)	(0.290)	(0.112)
Proportion of years when moved	0.247	-0.079	0.020
	(0.301)	(0.222)	(0.092)
Proportion of years head owned home^	0.007	-0.127	0.008
	(0.187)	(0.142)	(0.059)
Deflated Net Asset Value of Home	-0.000001	-3.31E-07	-3.82E-07
	(8.29E-07*)	(6.10E-07)	(2.54E-07)
Proportion of years lived with two parents	0.656	0.156	0.069
	(0.193***)	(0.146)	(0.060)
Proportion of years lived in SMSA	0.019	0.111	0.047
	(0.102)	(0.077)	(0.032)
Childhood Characteristics of Hhld Heads			
Education	-0.046	0.019	0.009
	(0.032)	(0.025)	(0.010)
Occupational Prestige	-0.005	-0.00004	-0.002
	(0.005)	(0.004)	(0.002)
Proportion of Years Self Employed	0.230	0.089	0.006
	(0.164)	(0.122)	(0.050)
Proportion of Years Wife of Head Employed	-0.313	-0.158	-0.024
	(0.152**)	(0.114)	(0.047)
Annual Hours Worked	-0.00007	0.00009	0.00001
	(0.0001)	(0.00007)	(0.00003)
Prop Yrs No Limitation on Working	0.211	-0.321	-0.077
	(0.138)	(0.106***)	(0.044*)

Note: All labor market outcomes refer only to those who have formed own household
^ = IV employed here for IV regression
* p<.10; ** p<.05; *** p<.01 (two-tailed tests)

TABLE 5
OLS Regression Results for Labor Market Outcomes (continued)
(standard errors shown parenthetically)

	Earnings	*Family Income*	*Not In Poverty*
	OLS	OLS	OLS
Childhood Characteristics of Hhld Heads (Continued)			
Prop Yrs Usually Watch TV 3+ Hrs. Daily	0.271	0.291	0.061
	(0.118**)	(0.090***)	(0.037*)
Prop Yrs Read Newspaper Every Day	0.199	-0.152	-0.047
	(0.130)	(0.100)	(0.041)
Prop Yrs Belonged to a Union	0.041	-0.023	0.006
	(0.118)	(0.088)	(0.037)
Prop Yrs Not Attend Relig Service Weekly	-0.130	0.088	-0.011
	(0.160)	(0.079)	(0.033)
Prop Yrs Never Particip Social/Neigh. Clubs	-0.005	-0.138	-0.022
	(0.112)	(0.085)	(0.035)
Prop Yrs "Planned His/Her Life Ahead"	0.191	0.056	0.032
	(0.113*)	(0.087)	(0.036)
Prop Yrs "Carried Out Things As Expected"	0.280	-0.011	-0.033
	(0.136**)	(0.101)	(0.042)
Prop Yrs "Trusted Most People"	-0.179	0.112	0.010
	(0.116)	(0.088)	(0.037)
Head is Jewish	0.450	0.064	-0.081
	(0.251*)	(0.188)	(0.078)
Head is Catholic	-0.115	-0.099	-0.058
	(0.151)	(0.115)	(0.047)
Head is Protestant	-0.148	-0.176	-0.095
	(0.125)	(0.098*)	(0.040**)
Head is a Veteran	0.022	0.014	0.048
	(0.075)	(0.056)	(0.026*)
Mother first gave birth as teen	-0.205	0.080	0.132
	(0.180)	(0.134)	(0.062**)
Raised large city (not suburb)	0.070	0.015	-0.025
	(0.092)	(0.086)	(0.028)
Raised in rural or small town	0.100	-0.143	-0.024
	(0.091)	(0.071**)	(0.029)
Childhood Neighborhood Characteristics			
Prop Yrs w/ Family in Walking Distance	-0.137	0.117	0.069
	(0.099)	-0.076	(0.031**)
Ave. # Neighbors Head Knew by Name	0.003	0.005	0.004
	(0.006)	(0.005)	(0.002*)
Percent Population below poverty	-0.008	0.006	0.00008
	(0.008)	(0.006)	(0.002)
Educational & Other Attainments			
At Least High School Diploma	0.156	0.178	0.12
	(0.141)	(0.106*)	(0.047***)
At Least Some Post-Secondary	-0.035	-0.023	-0.096
	(0.085)	(0.065)	(0.030***)
College Degree Plus	0.240	-0.012	0.037
	(0.111**)	(0.084)	(0.035)
Annual Hours Head Worked During 1998	0.0001	0.0001	0.00005
	(0.00003***)	(0.00003***)	(0.00001***)
Annual Hours Spouse Worked During 1998	NA	-0.0002	-0.00009
	NA	(.00004***)	(.00002***)
F (41, 591)	6.10***	4.78***	2.98***
Adjusted R-Squared	0.257	0.161	0.088

Note: All labor market outcomes refer only to those who have formed own household
* p<.10; ** p<.05; *** p<.01 (two-tailed tests)
NA = Not Applicable

Consistent with previous research, we find several dimensions of family environment that are strongly predictive of educational attainment and labor market success. Average economic status of the household while the child is growing up (measured by average family income) was associated with higher earnings, family income, and chances of avoiding poverty as young adults. Those experiencing poverty as a child evince a greatly reduced chance of later attaining some post-secondary education. Though more years of childhood living with both parents was associated with higher earnings, it (surprisingly) was associated with lower college attainment probability. The household head's education was predictive of the child's educational attainments in the expected manner. Heads that were able to work regularly, with no major illness or other disabilities were associated with better educational outcomes for their children (especially completing high school), though controlling for this they had lower family incomes and chances of avoiding poverty. Heads raised in a metropolitan area were significantly more likely to have children attaining more education than others. Children growing up in households with heads denoting either Catholic or (especially) Jewish as their religion had much higher probabilities of completing college.

Several behaviors of the head measured early in the child's life proved to hold explanatory power as well for educational attainments. Parents reading the newspaper daily and not watching a great deal of TV were associated with greater chances that their children would complete high school and college, respectively. Parental attitudes related to future orientation and efficacy in carrying out plans were only weakly associated with college attainment, though both were associated with the child later having higher earnings. Surprisingly, so was having a parent who watched a great deal of TV, once educational attainment of the child was controlled.

Neighborhood context also appeared to matter. The average percentage of neighbors who were poor while the child was growing up was strongly inversely related to the chances of that child attaining more than a high school education. The more neighbors the head knew by name the greater the chances that the child eventually would finish both high school and college. Interestingly, the more relatives in the neighborhood, the greater the chances of the child finishing high school but the less the chances of the child obtaining a college degree. Children having family in the neighborhood where they were raised evinced considerably higher chances of avoiding poverty as young adults.

Most dramatic was the high predictive power derived from having no children by age 18. This variable was positively associated with secondary and post-secondary educational attainment, earnings, and total family income.

Intermediate outcomes evinced some important relationships. Not surprisingly, educational attainments and annual hours worked were positively associated with earnings, family income and avoiding poverty in the prior year.[9]

The focus of this paper, of course, is upon parental homeownership status. The OLS results (summarized in Table 4) indicate that the proportion of years during childhood that one's parents owned their home was positively associated with higher educational achievements, although only for high school does the estimate have $p < .01$; beyond high school it only evinces $p < .10$ when a one-tailed test is used. These OLS results indicate that every one-tenth of childhood (0-18 years) increase in the time a person was raised in a home owned by parents was associated with a 1.44 percentage points increase in the probability of graduating from high school.

We experimented further with a specification (not shown here) that denoted those who never had lived in a home owned by their parents through age 18 (in addition to the aforementioned variable measuring proportion of years raised in such a home). With this specification, the point estimate of the proportion of years in parental-owned home dropped to .08 (remaining statistically significant only at $p<.10$). However, there also was a statistically strong relationship indicating that high school completion was 13 percentage points (14 percent of the mean) lower at the extreme situation when the child never lived in a home owned by the parents. These two OLS parameters summed imply that the magnitudes of the relationships are substantively important. Compared to children who *never* experience a home owned by parents, those who spend *half* of their first 18 years in home(s) owned by their parents (roughly the sample mean) would be predicted to have, all else equal, a 17.3 percentage point (19 percent of the mean)-higher high school completion rate. Compared to children who *never* experience a home owned by parents, those who spend *all* of their first 18 years in home(s) owned by their parents would be predicted to have a 21.5 percentage point (24 percent of the mean)-higher high school completion rate.

We found no statistically significant association via OLS between parental homeownership status and the wage earnings of children, their total family income, or

their poverty status in 1998. This is consistent with Boehm and Schlottman (1999) and Harkness and Newman (2002). It thus appears that, whatever influence parental homeownership status may have on young adult economic success, is occurs indirectly through an effect on educational attainments, primarily at the high school level.

Of interest are the OLS findings related to residential mobility during childhood, which never proved statistically significantly related to either educational attainments or labor market outcomes here. To experiment further regarding the relationship between mobility and homeownership, we omitted mobility from the outcome equations. The comparative results for the point estimates for proportion of childhood years in home owned by parents are shown in the first two rows of Table 6. Though the coefficient for the proportion of years the parents owned a home grew in statistical significance for all three educational outcomes when mobility was not controlled, the point estimates increased by less than one percentage point in all cases. These findings suggest that the relationship between parental home ownership status and educational outcomes is not mediated in an important way by residential mobility (path G in Figure 1). This result is contrary to the claims of Aaronson (2000) and Harkness and Newman (2002), but they measured variables during a period later in childhood. We plan to investigate this further in the future.

TABLE 6
COMPARISON OF OLS AND IV ESTIMATES FOR PARENTAL HOMEOWNERSHIP STATUS

	At Least High School	*At Least Some Coll*	*College Degree Plus*
Estimated Coefficient for: Proportion of years head owned home			
OLS including Mobility	0.144	0.123	0.061
OLS omitting Mobility	0.150	0.131	0.066
IV including Mobility	0.175	0.066	0.090
	Earnings	*Family Income*	*Not In Poverty*
OLS including Mobility	0.007	-0.117	-0.030
OLS omitting Mobility	-0.135	-0.056	-0.015
IV including Mobility	-0.675	0.673	0.306

[9] In calculating the impact of at least some post-secondary schooling compared to not finishing high school, one must add the coefficients of this variable and the completed high school variable. In the case of a college degree, all three coefficients must be summed.

Finally, in neither education nor labor market outcome equations did we find parental housing wealth to be statistically significant. This suggests that it is ownership tenure itself, not the potential wealth associated with the dwelling, which is more predictive of educational outcomes for children. Although Boehm and Schlottman (1999) find home value positively related to college completion rates, they do not control for residential stability, neighborhood characteristics, or many other parental characteristics, as we do.

IV Estimates of the Relationship between Parental Homeownership Status and Outcomes for Young Adults

Our IV results are at a very preliminary stage at this writing. Our initial experiments with the first step of our instrumentation-generating procedure noted above have proved only partly satisfactory. Though we achieved significant explanatory power, our instruments were often highly correlated. We will experiment more with exclusion restrictions to remedy this situation.

What we will report here is an experiment wherein only our key variable, proportion of childhood years growing up in a home owned by parents, is replaced by an IV. Results are displayed in the last row of Table 6.[10] We note that, as we argued above, IV estimates make a non-trivial difference and they do not make the apparent impact of parental homeownership status disappear. On the contrary, for our only robust result, high school graduation, the IV estimate is three (3) percentage points (22 percent) larger than the OLS point estimate, controlling for residential mobility and all the other variables listed in Table 4. There is no clear relationship between the OLS and IV estimates for the higher two categories of educational attainments.

The IV estimates differ more strongly from the OLS estimates in the labor market outcome equations. See the lower panel of Table 6. In the case of the OLS estimates, there does not appear to be any strong (neither in statistical significance nor magnitude) relationships between parental homeownership status and labor market outcomes that are not mediated by educational attainments. Quite a different implication follows from the IV results, where coefficients of all three labor market outcomes grow much larger in magnitude, and those for total family income and avoidance of poverty have t-statistics approaching significance at $p<.05$ (though recall these may be misleading here). The

implications are murky here, however, inasmuch as the IV estimate for earnings yields a large negative coefficient. We plan additional robustness tests on this critical instrument.

Conclusions, Implications and Next Steps

There is a nascent consensus emerging from several studies, which employ different samples and analytical techniques, regarding the relationship between parents owning their home and educational outcomes (especially high school completion) for their children. Green and White (1997) conducted several analyses of different datasets and concluded for the average income household that owning compared to renting reduced the chances of a 17 year-old in the household dropping out of school by three to four percentage points. Using a PSID sample of children who left their parents' home from 1975-1982, Boehm and Schlottman (1999) found that spending the last seven years in a home the parents owned instead of rented was associated with a 15 percentage-point increase in completing high school, a 14.5 percentage-point increase in completing some post-secondary education, and a 27 percentage-point increase in graduating from college. As noted by Harkness and Newman (2002), these estimates likely severely overstate the independent impact of homeownership because residential stability and neighborhood are not controlled. However, Aaronson (2000) finds that those raised ages 7-16 in a home owned by their parents were four percentage points more likely to have graduated from high school by age 19 than those raised in a rented dwelling, even controlling for residential stability. We find, controlling for childhood residential stability, wealth, neighborhood, and host of other parental characteristics, that parental homeownership status (averaged over all of childhood) is strongly associated with odds of graduating from high school. Our results are robust to both OLS and IV specifications, though the latter are larger in magnitude.

All these findings comport nicely with the work of Haurin, Parcel, and Haurin (2002a, b). They found for the National Longitudinal Survey of Youth that parental homeownership for the six-year period during which the children matured from 5-8 to 11-14 years old was associated with seven to ten percent-higher test scores for children, both directly and indirectly through their relationship with various indices of cognitive and emotional functioning and with lack of behavioral problems. It is a short step of logic to

[10] Recall that standard error are unreliably estimated by our procedure, so we report only coefficients.

suggest that such improvements in achievement test scores are related to staying in school longer, especially graduating from high school.

We view this paper as preliminary, so our conclusions here should be viewed as tentative only. We are planning a variety of further enhancements and experiments in our work, including:

- Testing the sensitivity of our findings regarding parental homeownership status and other key endogenous variables measured over different child developmental stages
- Experimenting with probit instead of OLS in estimating dichotomous outcome equations
- Experimenting with exclusion restrictions and panel estimation procedures in generating our IV estimates
- Probing the degree to which extreme circumstances (such as *never* having lived in a home owned by parents) add additional explanatory power beyond purely linear specifications
- Estimating models with more "intermediate outcome" variables, such as having a child before age 19, participation in labor force, hours worked, to gain a fuller sense of direct and indirect potential causal paths

Of course, our study has identified a statistical association, not proven a causal link. However, we have been careful to purge the measured association of the common confounding elements in a fashion we believe offers an important advance. Moreover, we have noted above several, not mutually exclusive hypotheses that offer plausible causal mechanisms about how owning one's home might provide an independent enhancement to the environment in which children are raised.

Should our findings indeed be the product of causal relationships, provocative policy implications follow. Expanding home ownership has long been a hallowed goal of federal housing policy (Galster and Daniell, 1996; Green and White, 1997; Nesslein, 2000), although its justification has often rested on shaky empirical ground (Rohe, McCarthy and van Zandt, 2000; McCarthy, van Zandt and Rohe, 2001). Our study helps to build a firmer foundation for this initiative.

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