The Impact of Parental Homeownership on Children's Outcomes during Early Adulthood

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Abstract

Whether children benefit from being raised in a home owned by their parents has important policy implications and has been the topic of much scholarly debate. We match Panel Study of Income Dynamics data with census tract data to examine the impact of childhood experiences on adult outcomes for children followed over three decades. This allows us to document a wide range of characteristics.

For children born between 1968 and 1974, we analyze data on their first 18 years and also various outcomes when they are between 25 and 31 in 1999. We control for a comprehensive set of observable parental characteristics and develop a method to control for unobservable child characteristics together with an instrumental variable for the remaining selection problems. Parental homeownership status and children's college education and homeownership status are closely related, although the former is generated partially by the greater residential stability associated with homeownership.

Keywords: Education; Families and children; Homeownership

Introduction and context

Much recent literature—both popular and academic—has focused on conditions under which children are raised and the potential consequences of these contextual factors for a variety of outcomes in later life. Indeed, 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 growing rapidly. It has also been the subject of several recent comprehensive reviews (Earls and Carlson 2001; Ellen and Turner 2003; Galster 2005; Leventhal and Brooks-Gunn 2000; Robert 1999; Sampson, Morenoff, and Gannon-Rowley 2002). The bulk of this literature (e.g., Brooks-Gunn, Duncan, and Aber 1997; Furstenberg et al. 1999) examines factors affecting outcomes at various stages of childhood. However important such outcomes are, we believe that it is also crucial to examine factors that account for young adult outcomes. In this regard, there is an established literature examining such adult outcomes as welfare usage (Gottschalk 1996; Gottschalk, McLanahan, and Sandefur 1994; Moffitt 1992; Pepper 2000; Vartanian 1999); school dropouts (Clark 1992; Gleason and Vartanian 1999; Mayer 1997, Sawhill and Chadwick 1999); crime (Freeman 1991; Grogger 1997; Peeples and Loeber 1994; Sullivan 1989); teen childbearing (Barber 2001; Furstenberg, Levine, and Brooks-Gunn 1990; Haurin 1992; McLanahan and Bumpass 1988; Sawhill and Chadwick 1999); economic idleness (Haveman and Wolfe 1994; Mayer 1997; Payne 1987; Sawhill and Chadwick 1999); and earnings (Corcoran et al. 1992; Haveman and Wolfe 1994; Vartanian 1999).

Of particular note for this article is emerging research that examines the effects of the homeownership status of a family during child-rearing stages. Although there is a considerable literature on the private and social benefits of homeownership for such things as community participation, life satisfaction, home maintenance, and accumulation of wealth (McCarthy, Van Zandt, and Rohe 2001; Rohe, McCarthy, and Van Zandt 2000; Rossi and Weber 1996), only a few studies have attempted to link any of these effects to later outcomes for children. The work of Green and White (1997); Boehm and Schlottman (1999); Aaronson (2000); Boyle (2002); Harkness and Newman (2002, 2003); Haurin, Parcel, and Haurin (2002a, 2002b); Haurin, Dietz, and Weinberg (2003); and Kauppinen (2004) suggests that homeownership status matters for children, although it is usually not clear whether the effect is an independent one or is commingled with residential stability or neighborhood conditions, or both.

As we shall amplify in this article, previous studies attempting to estimate the relative importance of family background, neighborhood characteristics, residential stability, and homeownership status on children's later outcomes as adults typically

1. Treat homeownership as independent of neighborhood characteristics and residential stability

2. Fail to measure homeownership over the whole childhood
3. Provide inadequate controls for children's characteristics
4. Are limited in their ability to control for omitted parental variables (selection effects)

Our study offers what we hope will be advancements in these areas. First, we treat neighborhood, stability, and homeownership as endogenously determined (sometimes simultaneously so). Thus, for example, neighborhood conditions during childhood may influence later adult outcomes directly and also indirectly through their effect on household mobility and parental choice of homeownership status. Second, we measure the cumulative impacts of parental homeownership status during the entirety of childhood on subsequent teen fertility, education, tenure status, and labor market earnings. Third, we measure a host of observable parental characteristics and develop a proxy for the unmeasured characteristics of children that likely affect their outcomes as young adults but are spuriously related to their parents' homeownership status. Fourth, we develop an instrumental variable (IV) for childhood homeownership status as a further way of dealing with potential endogeneity and selection bias problems.

We analyze data from the Panel Study of Income Dynamics (PSID) 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 were between 25 and 31 years of age. We can thus document the household environment of all of our sample children annually for all 18 years of their childhood. In this fashion we can test the cumulative impact of parental tenure status on children.

Our article is organized as follows. We first offer a holistic conceptual framework for understanding how the homeownership status of parents might influence outcomes for their children when they become young adults. Second, we describe the preeminent omitted variables, selection, and endogeneity biases that must be overcome to gain accurate measurements of these relationships. Third, we use our holistic framework as a vehicle for evaluating earlier work and establishing a foundation for our modeling efforts. Fourth, we describe our data set and the various procedures we use to attempt to meet these challenges. Fifth, we present our empirical estimates of the key relationships between parents' homeownership status and children's subsequent outcomes, exploring the sensitivity of results to alternative specifications and controls. Finally, we discuss conclusions, policy implications, and suggestions for further research.

The influence of homeownership status on young adult outcomes: Theory, evidence, and empirical challenges

A holistic framework

To provide a framework for both assessing the limitations of previous studies and guiding our own efforts, we present our structural model in figure 1. We posit that young adult outcomes of interest (shown on the right side of figure 1) are determined by four sets of exogenous or predetermined variables (followed by the appropriate path and examples in parentheses): observed characteristics of individual children (path A: gender, race), unobserved characteristics of individual children (path H: intelligence), observed parental characteristics (path G: education, age), and unobserved parental characteristics (path B: ambition, present orientation). These unobserved parental factors (shown as dotted lines in figure 1) are the source of the omitted variables bias associated with selection, which we shall discuss later. 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 (paths E and F). These variables we see as simultaneously determined, as we will explain later.

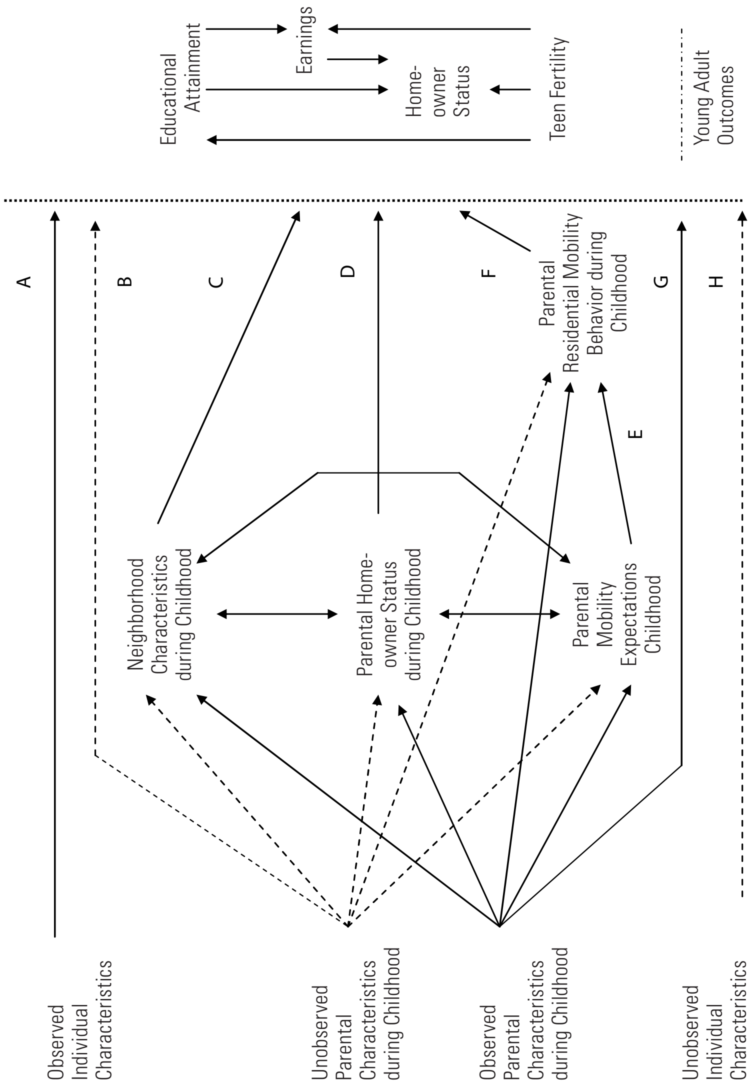
Our conceptual model is distinguished by the specification of homeownership status/neighborhood location/mobility expectations as mutually causal phenomena. Put differently, we argue that accurately measuring the relationship of any one of these phenomena with young adult outcomes requires that its relationship with all of the others be taken into account, a key point to which we will return.[1] Earlier research has often modeled pairs of these phenomena as jointly determined; examples are tenure and mobility (Boehm 1981; Ioannides 1987; Ioannides and Kan 1996; Kan 2000) and tenure and neighborhood (Deng, Ross, and Wachter 2003; Gyourko, Linneman, and Wachter 1997; Painter, Gabriel, and Myers 2001).

We posit the following structural equation system that will guide our empirical work: Italicized acronyms indicate a simultaneous relationship, and each variable is measured for a given household-year (not subscripted for simplicity):

$$HO = \mathrm{f}(N, ME, [\mathrm{X}_1]) \qquad (1)$$

[1]We experimented in prototypes with modeling parental income as endogenous with mobility expectations, neighborhood, and tenure choice and with developing IVs for them. It proved challenging to identify instruments distinct from those used for tenure and neighborhood, so these experiments are not reported here.

Figure 1. A Structural Model of Childhood Determinants of Young Adult Outcomes



$$N = f(HO, ME, [X_2]) \tag{2}$$

$$ME = f(HO, N, \mathrm{M}\text{-}1, [X_3]) \tag{3}$$

$$\mathrm{M} = f(\mathrm{ME}\text{-}1, [X_4]) \tag{4}$$

where

HO = homeownership status (own or rent)

N = neighborhood poverty rate

ME = expectations regarding a potential move during the next year

M = actual mobility observed during the year

$[X_i]$ = vector of exogenous or predetermined predictors appropriate to equation i

-1 = one-year lagged value of the variable

Rationale

We offer the following rationale for positing these simultaneous relationships among HO, N, and ME. For equation (1), if economic status (low income and wealth) constrains a household to neighborhoods with numerous social problems and concomitant expectations of depreciating property values, there will be little motivation to buy a home. The same is true if the household expects to move soon, because people will be unwilling to bear the high transaction costs of buying. However, equation (2) suggests that if a household would like to buy and expects to reside indefinitely, certain neighborhoods may not be selected because little appreciation in property values or a poor quality of life is expected. For equation (3), someone who can purchase a home in a good neighborhood will probably expect to move less in the future. Conversely, current neighborhood conditions (especially if they are declining) may trigger dissatisfaction and expectations of moving out soon, but homeownership tenure may constrain out-migration if a home must be sold to finance an alternative dwelling in a different neighborhood (equation [3]). Recent moves may reduce expectations of moving again in the next year, given the substantial psychological, time, and out-of-pocket costs involved. Equation (4) suggests that an actual move will typically be preceded by the expectation of one.

Challenges in accurately measuring determinants of young adult outcomes

The holistic framework portrayed in figure 1 makes it clear that there are three preeminent challenges in obtaining accurate measurements of the relationship between young adult outcomes and key childhood predictors of interest, such as neighborhood, homeownership status, mobility, and certain parental characteristics. They are selection bias and two sorts of omitted variables bias.

Selection bias is now a well-known factor in determining the relationship between environmental context and children's outcomes. The basic issue is that some parents who have certain (unmeasured) motivations and skills related to their children's upbringing would move to select neighborhoods, choose a certain form of tenure, and manifest distinctive mobility patterns. Any observed relationship between these contextual conditions and child or young adult outcomes may therefore be biased because of this systematic selection process, even if all of the observable characteristics of parents are controlled for (Dietz 2002; Duncan, Connell, and Klebanov 1997; Duncan and Raudenbush 1999; Manski 1995, 2000). The problem can also be formulated as omitted variables bias stemming from unobserved parental characteristics. Is the observed statistical relationship between outcomes and context indicative of an independent effect or merely unmeasured parental characteristics that truly affected children's outcomes but led to the observed context as well?[2] We portray the implicit omitted parental variables' relationships in this selection problem as dashed lines in figure 1.

When analyzing a sample of households that have chosen their neighborhoods, tenure, and mobility through private market processes, this selection bias is likely severe indeed (Manski 1995; Tienda 1991). A variety of econometric techniques, including sibling studies and IVs, has been used in an attempt to overcome selection bias, but with incomplete success and/or limited general applicability (see the reviews in Galster 2003 and 2005). In addition, a few studies have attempted to explicitly model the selection process into owner and rental tenures as part of a larger analysis of children's outcomes (Green and White 1997; Haurin, Parcel, and Haurin 2002a, 2002b).[3]

[2]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 upward and Brooks-Gunn, Duncan, and Aber (1997) arguing the opposite.

[3]Green and White (1997) and Haurin, Parcel, and Haurin (2002b) come to opposite conclusions about whether there are important selection effects between tenure choice and outcomes.

There is yet another possible form of omitted variable bias (also shown as a dashed line in figure 1), stemming from the unobserved characteristics of children whose young adult outcomes are ultimately measured. Such characteristics are, in turn, likely a product of observed and unobserved parental characteristics. If some of these parental characteristics also predict homeownership status, there will be a correlation (albeit spurious) between the unobserved children's characteristics and parental homeownership status, thereby biasing the estimated coefficient of the latter.

However, the challenge is even more complex than measuring all of the relevant characteristics of parents and children. If figure 1 is adopted as a working premise, the selection process becomes much more complicated than merely parents' independent selection of a neighborhood, or a tenure, or a pattern of mobility. In our view, the holistic challenge embodies the simultaneous selections of all three. Previous statistical studies have taken only a partial view of the causal patterns in figure 1 and equations (1) through (4); virtually all have omitted one or more of the intervening variables. To the extent that these variables are mutually causal, they will be correlated with the neighborhood variable. Under these circumstances, the coefficient will be a biased estimate of the effect of neighborhood on outcomes because the neighborhood variable is correlated with the disturbance term in the regression. As in the case of selection, there is an omitted variables bias problem, but here it is due to the causal relationship between the neighborhood variable and other uncontrolled variables that also affect outcomes. However, the solution to this problem may not be as straightforward as including all of the intervening variables in the outcome equation. If the causal relationships are as strong as we have posited, these intervening variables may be so highly correlated that multicollinearity may arise as a new econometric challenge.

Earlier work on homeownership status, residential stability, and child outcomes

The literature consistently finds that parental homeownership status has a positive impact on children, ranging from early childhood cognitive, emotional, behavioral, and social development (Boyle 2002; Haurin, Parcel, and Haurin 2002a, 2002b); educational attainment (Aaronson 2000; Boehm and Schlottman 1999; Green and White 1997; Harkness and Newman 2002, 2003; Kauppinen 2004); teen childbearing (Green and White 1997; Harkness and Newman 2002, 2003); and earnings and welfare usage (Harkness and Newman 2002, 2003) to the purchase of a home as a young adult (Boehm and Schlottman 1999), although Harkness and Newman (2003) find stronger effects for children from lower-income households. Two primary causal mechanisms through which parental homeownership status could produce these felicitous outcomes for children have been advanced—a direct mechanism (path D in figure 1) and an indirect one (via mobility, paths E and F).[4]

The direct effects that have been posited include the following:

1. Homeowners maintain their dwellings to higher standards than otherwise identical rental households (Galster 1983, 1987; Mayer 1981); this may differentially affect the health and cognitive and social development of resident children (Parcel and Menaghan 1994a, 1994b).

2. Homeowners may acquire a distinctive set of skills, such as those related to performing do-it-yourself home repairs, negotiating with contractors or plumbers, and seeking refinancing. Insofar as these may be transferable to children, the latter will benefit (Boehm and Schlottman 1999; Green and White 1997).

3. Homeowners may have more of a financial stake in the residence and thus more motivation to monitor and control the activities of children (both their own and their neighbors') that might threaten local property values (Haurin, Parcel, and Haurin 2002a, 2002b; Hoff and Sen 2005).

4. Homeowners may invest more in developing social capital and participating actively in the neighborhood; their children may benefit in a variety of ways (Austin and Baba 1990; Coleman 1988, 1990; Cox 1982; DiPasquale and Glaeser 1999; Hunter 1975; Jeffers and Dobos 1984; Rohe and Stegman 1994; Rossi and Weber 1996; Verba, Schlozman, and Brady 1995).

5. Buying a home may yield gains in satisfaction and self-esteem, which in turn translate into a more supportive, positive sociopsychological environment for children (Balfour and Smith 1996; Rossi and Weber 1996).

6. To the extent that home appreciation outperforms other financial instruments, homeowners may achieve a better equity position than renters (for a review, see Herbert and Belsky 2006) and thus would be able to invest more in the educational and nurturing aspects of the children's environment.[5]

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

[5]After controlling for homeownership status and other parental characteristics, Haurin, Parcel, and Haurin (2002a, 2002b) 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.

7. 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).

The indirect consequences putatively transpire through the effect of homeownership status on residential stability. The argument proceeds as follows. Because of the high transaction costs involved in buying and selling a home (Haurin, Hendershott, and Ling 1988), owners typically reside in any given unit longer than renters do (Lee, Oropesa, and Kanan 1994; Rohe and Stewart 1996). In turn, this enhanced residential stability can have numerous positive impacts on children's educational achievement and credential attainment, substance use, social functioning, mental health, and sexual and deviant behaviors (Buerkle 1997; DeWit 1998; Huffines 2003; Potter et al. 2001; 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 definitively among these hypotheses 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 that a resident 17-year-old would drop out of high school or give birth. Past residential mobility and homeownership status were not controlled for, 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. After controlling for a variety of family and neighborhood characteristics in his 2002 study of longitudinal samples of children in Ontario, Canada, Boyle revealed a significantly lower rating for emotional-behavioral problems for children of homeowners, but no attempts to control for selection were provided.

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

Though provocative, the literature on how homeownership status may affect children remains limited in many respects. Several studies omit key control variables for parents and children and overlook selection effects that may bias the apparent impacts of homeownership upward. 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 earlier studies have collected information on multiple dimensions of context over the entirety of childhood and thus have not tested for duration effects. But more important here, this work has taken only a partial view of the causal patterns in figure 1; none has modeled tenure status, mobility, and neighborhood choices as mutually causal.[6] This potential source of bias provides an additional reason for questioning the accuracy of the relationships they measure between outcomes and key predictors of interest. Our study attempts to improve on all the aforementioned shortcomings of the literature.

Data to be analyzed and key measures

The PSID

A brief overview of the PSID data we analyze is a prerequisite for understanding our approach. Beginning in 1967, the PSID began interviewing 5,000 U.S. families. Each year since then, those families have been interviewed, as have all families subsequently formed by individuals in those families and by the spouses and children of those individuals. So, by 1999, the PSID was following nearly 10,000 families. While at first it oversampled to obtain relatively large sample sizes for poor households, the oversample was 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 sample members with the same race, gender, and poverty status at birth. We use a PSID geomatched file, which appends the child's census tract identifier

[6]While other studies (Manski 1995) have discussed the issue of "simultaneity bias," they used the term to refer to the reflection problem of people tautologically causing the aggregate neighborhood characteristics to be what they are and the neighborhood causing constituent resident behaviors.

to each observation and interpolates the 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 children born between 1968 and 1974 because it provides us with data on their first 18 years, as well as a variety of outcomes measured in 1999 when they were between 25 and 31—young adults who most likely had completed their education and had had ample opportunity to enter the labor force.[7] Here, as throughout, we present PSID weighted statistics, adjusted for group-specific attrition. Descriptive statistics for the sample of children we analyzed—themselves, their parents/households, and their neighborhoods as they were growing up—are provided in table 1.

Measures of key explanatory variables

Of particular interest to our inquiry are PSID-based statistics for parental homeownership status. On average, our sample spent 72 percent of their childhood in households where the head owned the dwelling unit. Only 6 percent of the 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 percent) lived up to 9 years in an owner-occupied home, almost one in three (31 percent) lived between 9 and 17 years in an owner-occupied home, and almost half (45 percent) lived all 18 years in a home that was owned by the head. Although comparable tenure information is not available from the decennial censuses, it is instructive to note that the national homeownership rate during our cohort's childhood was 59 percent in 1970 and 62 percent in both 1980 and 1990.[8]

To operationalize the neighborhood component of the childhood context, we use information from the census tract, a homogeneous area of roughly 4,000 inhabitants, tabulated in the decennial Census of Population and Housing, with values interpolated for intercensus years.[9] In particular, we report here on results when the neighborhood variable is the percentage

[7]Such a longitudinal analysis has been strongly recommended as the vehicle for overcoming the reflection problem (Manski 1995).

[8]All national census figures quoted here were obtained from the U.S. Bureau of the Census (1972a, 1972b, 1983, 1984, 1992, 1993).

[9]We use the GeoLytics Neighborhood Change Database, which adjusts data in 1970, 1980, and 1990 tracts that have changed their boundary definitions over the years to values that would apply if boundaries had remained at their 1990 specifications (GeoLytics 2007).

Table 1. Characteristics of Sample Individuals and Their Mean Circumstances from Ages 0 to 18

	Mean
Characteristics of individuals observed in 1999	
Black female [blackfem]	0.041
Black male [blackmale]	0.057
White female [whitefem]	0.331
Order of birth (1 = first, 2 = 2nd, etc.) [birthorder]	2.233
Age in years [age99]	28.74
Married [married]	0.481
Exogenous characteristics of parents and household (calculated over ages 0 to 18)	
Proportion of years lived in poverty [pro_live_in_poverty0to18]	0.069
Proportion of years lived with two parents [pro_livew_2_parents0to18]	0.842
Proportion of years lived in a metropolitan area [ave_smsa0to18]	0.731
Average number of neighbors the head knew by name [ave_num_neigh_known]	12.33
Proportion of years lived with family within walking distance [ave_relatives]	0.392
Education of the household head [ave_education_head0to18]	13.24
Occupational prestige of the household head [ave_hdocc_pre0to18]	43.92
Proportion of years the head was self-employed [ave_self_employed0to18]	0.141
Proportion of years the wife of the head was employed [ave_employed_wife0to18]	0.491
Annual hours the head worked [ave_annu_hrs_wkd0to18]	2123
Head self-identified as Protestant, Catholic, or Jewish [religion]	0.901
Proportion of years the head read a newspaper every day [ave_readnewspaper]	0.802
Proportion of years the head belonged to a union [ave_union]	0.285
Proportion of years the head did not attend a religious service weekly [ave_nochurch]	0.226
Proportion of years the head never participated in social clubs [ave_no_socialclubs]	0.538
Proportion of years the head "planned his/her life ahead" [ave_plan_ahead]	0.581
Proportion of years the head "trusted most people" [ave_trust]	0.604
Head is a veteran [veteran]	0.392
Mother first gave birth as a teen [momteen]	0.045
Head raised in a large city (not a suburb) [largecity]	0.41
Head raised in a rural or small town (not a suburb) [farm]	0.174
Endogenous characteristics of the household (calculated over ages 0 to 18)	
Proportion of years when the head owned the home [pro_parents_own0to18]	0.722
Proportion of years when the residence was not changed [pro_stability_year0to18]	0.809
Average percentage of the population below poverty, census tract [ave_neigh_in_pov0to18]	10.25

Source: Authors' analysis of PSID data for a select sample; N = 755 (weighted). The source for Average percentage of the population below poverty, census tract, was GeoLytics 2007.
Note: The variable abbreviations used in the appendixes are shown in brackets.

of persons living in households with incomes below the federal poverty line.[10] This variable has been widely used in the literature as a powerful proxy for neighborhood disadvantage. On average, children in our sample experienced a census tract having a poverty rate of 10.25 percent during their childhood. This compares with a national poverty rate during our cohort's childhood of 12.6 percent in 1970 and 11.7 percent in both 1980 and 1990.

Residential stability and mobility expectations were measured from PSID data. Each year, the respondent is asked whether the household plans on moving within the next 12 months; we code affirmative responses as a dummy variable for that year. Because we also know actual changes in respondent addresses, we can calculate the number of times the household moved during each child's first 18 years. We define a stability variable that denotes the proportion of these 18 years during which the child did not move; the mean for our analysis sample was 81 percent. By contrast, the national percentage of households that did not move was 77 percent in both 1970 and 1980 and 78 percent in 1990.

A necessary condition for the precise measurement of contextual effects is that the widest possible array of the characteristics of children and their household while growing up should be included as controls in the model (Ginther, Haveman, and Wolfe 2000). We believe that our work has met this condition in a way that is superior to what is seen in earlier studies. We can control for a wide range of objective characteristics of the household, such as marital, poverty, and occupational status; education; religion; teen fertility; and location. Moreover, unlike earlier studies, we can control for several attitudinal characteristics (such as trust in others, present orientation) and behavioral characteristics of the head, such as how often newspapers are read, social clubs and religious services attended, and so on).

Finally, we develop an innovative proxy measure for unobserved children's characteristics based on the ability to be a homeowner as a young adult. We begin by positing that our cohort's probability of homeownership status by 1999 (H) can be modeled as function of

1. The individual's observable characteristics [X_6] that are both time-invariant (race, gender) and time-varying (marital status, income, education)
2. The individual's unobservable characteristics [X_u] (future orientation, credit rating, etc.) and exogenous observable characteristics of the parent/

[10] We also experimented with homeownership rates in the neighborhood (Ding and Knaap 2003), but were unable to find an IV that was not highly correlated with the IV for parent's tenure status.

household during the individual's childhood [X_{7c}] (marital status, poverty, etc.)

3. Endogenous observable characteristics of the parent/household during the individual's childhood [X_{8c}] (homeownership, neighborhood poverty, mobility)
4. 1999 characteristics of the individual's metropolitan area [A] that affect the home purchase decision (home prices, rental costs, etc.)

$$\text{prob (H)} = f([X_6], [X_u], [X_{7c}], [X_{8c}], [A]) + \varepsilon \qquad (5)$$

Next, we estimate a preliminary logistic regression model (5) (obviously, excluding [X_u]) for our cohort in 1999. Finally, we save the residuals of this regression and use them as a proxy for [X_u] in our outcome equations for young adult fertility, education, and income.[11] We cannot be certain, of course, what unobserved attributes [X_u] measures. Nevertheless, we think it reasonable to assume that many of the same unobservables that will influence becoming a homeowner will also be predictors of these other outcomes and thus should ideally be controlled for.

Measures of outcomes for children as young adults

Our goal here is to relate the childhood average experience of parental homeownership status, controlling for all the other characteristics of the child's environment noted earlier (and listed in table 1), to the following outcomes: tenure status, teen fertility, school credential attainment, and labor earnings as of 1999. Descriptive statistics for these outcomes for our analysis sample are presented in table 2.

By 1999, 44 percent of the children born between 1968 and 1974 had formed their own household and were residing in a home that they had purchased. A total of 88 percent had graduated from high school or obtained a general equivalency diploma, and 14 percent had graduated from a four-year college. Some 94 percent had reached age 18 without having had a child. The PSID collects income information only from respondents who have formed

[11]An analogous procedure for estimating proxies for time-invariant individual characteristics has recently been used by Musterd et al. (forthcoming).

Table 2. Descriptive Statistics for Outcomes of Young Adult Sample

	Mean	Standard Deviation
Had No Children Before Age 18	0.944	0.107
Completed High School or More, 1999	0.881	0.352
College Degree or More, 1999	0.144	0.351
Owned Home, 1999	0.442	0.162
Ln Annual Earnings, 1998	9.826	1.102

their own household, so the income statistics we report refer only to these members of our cohort. This group earned $18,509 on average in 1998 and had a total family income of $34,752.[12]

Estimation procedures and methodological issues

Model overview

Our models for fertility, education, and earnings outcomes of young adults are as follows:

$$FER = f(HO_c, N_c, M_c, [X_6], [X_{7c}], [X_u]) + \varepsilon \qquad (6)$$

$$HS = f(HO_c, N_c, M_c, [X_6], [X_{7c}], [X_u], FER) + \varepsilon \qquad (7)$$

$$COL = f(HO_c, N_c, M_c, [X_6], [X_{7c}], [X_u], FER) + \varepsilon \qquad (8)$$

$$INC = f(HO_c, N_c, M_c, [X_6], [X_{7c}], [X_u], FER, HS, COL, HRS) + \varepsilon \qquad (9)$$

where

FER = 1 if reached age 18 without having a child, 0 otherwise

HS = 1 if received a high school diploma or equivalency degree by 1999, 0 otherwise

COL = 1 if received a bachelor's (4-year) degree by 1999, 0 otherwise

[12]In 1998, 85 percent had enough family income to keep them out of poverty. In preliminary runs, we experimented with several other measures of labor market outcomes: annual hours worked, employed during the previous year, and not in poverty during that year. None of the endogenous variables in our model ever proved related to these outcomes in a statistically significant way, so for parsimony we omit them from the discussion.

INC = the natural logarithm of 1998 income from earnings (only for those who had formed a household and were employed at some time during 1998)

HO_c = proportion of childhood years that parents owned the dwelling they occupied

N_c = average poverty rate in the census tract in which the child resided between birth and age 18

M_c = proportion of childhood years that the household moved between dwellings

$[X_6]$ = exogenous (observed) characteristics of the individual in 1999; see table 1

$[X_{7c}]$ = exogenous characteristics of parent/household during childhood; see table 1

$[X_u]$ = proxy for unobserved individual characteristics (see the earlier discussion)

HRS = hours worked during 1998

c subscripts = variables computed for the entire childhood

We estimate the coefficients of variables in this model using ordinary least squares (OLS) when the outcome is continuous (equation [9]) and logit when the outcome is dichotomous (equations [5] through [8]). The sample for estimating these coefficients includes all children in our initial cohort who have "survived" in the sample to the point at which the outcome in question is observed: 1999. Equations for fertility, education, and earnings outcomes have virtually identical right-hand sides measuring (exogenous or predetermined) characteristics of the individual and the individual's household and (endogenous) aforementioned childhood conditions. Descriptive statistics of these last variables are presented in table 1. For all of these variables, we use proportional figures calculated over the first 18 years of the child's life (or for however many years we have data).

We model our set of outcomes as causally interrelated, as shown on the right side of figure 1. Educational attainment is a function of fertility before age 18. Earnings are a function of fertility and education. Homeownership is a function of income, fertility, and education.

Instrumentation procedure

We suspect that HO_c will be correlated with the disturbance terms in equations (5) through (9) because of the issues we have discussed. Therefore, we will experiment with IVs. Our approach for estimating IVs proceeds through the following three steps.

First, we estimate an OLS regression based on observations of individual child-years. In this regression, the left-hand side is the observed value of the census tract poverty rate in a given child's neighborhood in a particular PSID year, and the right-hand side contains observed values of every exogenous variable [X] in the system of equations (1) through (4). These exogenous variables include contemporaneous values of countywide characteristics corresponding to the HO_c, N_c, and M_c variables, additional exogenous predictors for each outcome, and dummy variables for the calendar year. The complete listing is shown in appendix A. In this first step, the regression is estimated based on all annual observations from age 1 to age 18 for each child in our sample.[13] We included all observations of children having data for at least 10 years of their childhood. What is of prime importance here is how well the first-stage linear probability model regressions predict the values of HO_c, not their estimated parameters in and of themselves, because this will determine the power of the instrument (Murray 2006). As a result, for this first stage we use OLS, not needlessly complicated panel estimation procedures.

In the second step, the regression is used to generate predicted values of household homeownership probability for each of the first 18 years of each child's life, based on values of all exogenous variables appropriate for the given year. Now we must switch from a child-year unit of observation to a child-childhood average unit, which necessitates a step not normally required in two-stage least squares. In the third step, we compute the average of these predicted values over all observed years of childhood. These averages for each sampled individual become our IV measures for the duration of homeownership experienced during childhood.

Identifying and evaluating instruments for homeownership status during childhood

To satisfy the rank condition in performing two-stage least squares, there must be at least as many exogenous variables excluded from equations (1) through (4) as there are endogenous variables included in each one. We meet

[13]We begin with age 1, not birth, because some explanatory variables are lagged.

this condition; indeed our equation system (1) through (4) is overidentified. Moreover, each equation must have one or more clearly exogenous variables that appear only in the given equation as strong predictors. In the case of household homeownership status during childhood, we use the following as unique identifying instruments:

1. Index of owner-occupied housing prices in the metropolitan area (lag 1 year)
2. Index of owner-occupied housing prices in the metropolitan area (lead 1 year)
3. Index of gross rents paid by renter occupants in the metropolitan area (lag 1 year)
4. Item 3 times renter status in the preceding year
5. Home mortgage interest rate for a 30-year fixed-rate loan
6. Item 5 times renter status in the preceding year
7. Ratio of the costs of renting to the costs of owning in the metropolitan area (lag 1 year)
8. Item 7 times renter status in the preceding year
9. Cases where the household head received a lump-sum monetary payment since the child's birth (e.g., inheritance: 1 = yes; 0 = no)
10. Item 9 times renter status in the preceding year
11. Difference in the household's real income from the preceding year to the current one (if greater than 0; 0 otherwise)
12. Item 11 times renter status in the preceding year
13. Homeownership rates in the county (lag 1 year)

The rationales for these variables are straightforward. We would expect that households would be more willing and able to own their dwelling in a metropolitan area with lower absolute prices of owner-occupied dwellings, lower relative prices of owner-occupied versus renter-occupied dwellings, higher expected dwelling appreciation (for which we use leading values as a proxy), and lower mortgage interest rates. They should also be more able to own if they received a lump-sum payment during the child's lifetime (our only proxy for down payment constraints) and experienced a growth in income. Homeownership rates in the county serve as a proxy for unobserved characteristics of the area's housing stock and the household's preferences for homeownership.[14] We allow coefficients of most of those variables to differ between households that rent and those that own.

Additional exogenous variables coming from equations (2) through (4) and used in the first stage are presented in appendix A. Overall, our first-stage linear probability model for household homeownership status during a given year performed only moderately well (the R^2 was 0.29), although we had 12,500 child-year observations in this first-stage regression and only 31 regressors.

Complicating issues

Five issues require further discussion. The first is the operational definition of neighborhood. Although census tracts are imperfect, we use them as our preferred approximation to neighborhood, as is common in U.S. studies. However, until 1990, rural areas were not divided into census tracts. To avoid the potential problems of missing data and a mixture of urban and rural scales of "neighborhood," we confine our analysis to children who spent at least 12 of their first 18 years in tracted, metropolitan-area neighborhoods.

Second, the attitudes and behaviors of the household head that we use as controls (see table 1) are not measured annually in the PSID. Indeed, for most variables, the questions were asked only from 1968 through 1972.[15] Each attitude and behavior we used as a control proved stable over time. Pair-wise correlations between responses to the question "carry out plans" over the six points in time at which this question was asked ranged from 0.17 to 0.40. 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 0.70. Pair-wise correlations between responses to the question "plan ahead" over the six points at which this question was asked ranged from 0.20 to 0.46; Cronbach's alpha was 0.77. Pair-wise correlations between responses to the question "trust" over the five points in time at which this question was asked ranged from 0.40 to 0.54; Cronbach's alpha was 0.81.

The third issue requiring some discussion is the handling of homeownership status in a given year—a dichotomous variable. As noted in Wooldridge (2002), it is not appropriate to apply probit or logit 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 a linear probability model to

[14]The instrumentation strategy follows from the seminal works by Evans, Oates, and Schwab (1992) and Foster and McLanahan (1996).

[15]However, some were asked again in 1975, and a question about union membership was collected from 1968 through 1981.

this dichotomous endogenous variable and used the predicted value obtained from that estimation in our second stage.

Fourth, given our conceptual model in figure 1, it would have been desirable to simultaneously instrument not only for HO_c but also for all of the endogenous variables in equations (5) through (9), including N_c, and M_c. This would have permitted the estimation of less biased parameters for these variables as well. Unfortunately, in our preliminary experiments, it proved challenging to identify instruments that uniquely identified all of these variables. The result was that the resulting instruments for HO_c, N_c, and M_c proved too intercorrelated to be meaningfully employed in the same regression.

Finally, as noted, our instrumentation procedure involves estimates for HO_c that are multiyear averages of predicted values. Given that the distribution of this new, "average" instrument is not known, the standard errors yielded by conventional OLS or logit procedures cannot be interpreted in a straightforward fashion. Thus, as is standard practice under these circumstances, we will report "bootstrapped" parameter values as estimated by Stata when examining our IV estimates.

Estimates of the relationship between parental homeownership status and outcomes for young adults, with and without controls for residential stability

Overview and discussion of control variables

We estimated logit models for equations (5) through (8) and an OLS model for equation (9). Before turning to the results for the homeownership variable, we will briefly highlight some of the more interesting relationships involving other variables; the details are presented in table A.1. As an overarching assessment, all outcome equations had decent explanatory power according to the criteria appropriate for logit and OLS estimations (see table A.1). Moreover, there is strong support for our specification of recursive relationships between teen fertility, educational attainments, subsequent earnings, and homeownership status. Not surprisingly, having a child before age 18 clearly appears to reduce the chances of graduating from high school. Educational attainments, especially a college degree, are strongly related to earnings and homeownership in turn. Finally, there is strong support for our claim that the intervening variables (which we argue are mutually causal with homeownership) are important predictors of young adult outcomes. This reinforces our contention that models of homeownership effects that do not control for these contexts likely suffer from severe omitted variables bias.

Owning a home in 1999 was associated with living more childhood years with both parents, especially if the mother did not work outside the home (see table A.1). Ownership was also more likely if the mother did not give birth while a teen, the young adult was already married and college educated, and the parent or parents were more trusting of others.

As for predictors of not having a child before age 18, growing up with a mother who did not give birth as a teen and with a household head who ascribed to "planning ahead" proved efficacious. The former result may be due to unmeasured characteristics of the mother related to norms and values surrounding teen childbearing. Future-oriented parents may be more prone to instill these same attitudes in their children, thereby encouraging them to avoid future prospect-stunting actions like teen child-rearing.

Consider next the educational attainment equations. Not surprisingly, having a well-educated parent or parents was strongly correlated with greater chances of later graduating from high school and college. The same pattern held for children raised by parents who knew more neighbors by name. We cannot be sure why this greater degree of parental neighborhood social integration (controlling for mobility) seemingly translates into greater educational achievements, although it may be due to the implied intensification of neighbors' "bonding social capital" and monitoring of children's behaviors, both pro- and anti-educational (Brisson and Usher 2007). This explanation would also be consistent for the finding that children of parents who never belonged to social organizations were less likely to graduate from high school. Older members of our cohorts evinced higher achievements, probably because they had more time to obtain graduate equivalency exams and complete college coursework.

Other statistically significant relationships do not have obvious explanations. Children from homes where the head was more trusting of other people, was a veteran, or was not a union member were less likely to graduate from high school. Children who were raised in a large city (instead of a suburb) and came from homes where parents were not members of social clubs were more likely to get a college degree.

Finally, in the wage earnings equation, we observe that all else being equal, children raised by a head who was more future-oriented earned more, suggesting that these children learned attitudes and behaviors that are related to delayed gratification and longer-term strategizing and have substantial labor market payoffs. Children from households experiencing longer spells of poverty and/or single parenting earn less, consistent with the hypothesis that the material and psychological deprivation associated with these circumstances creates developmental disadvantages with a lasting impact on earnings. Older cohorts earn more, as would be expected from their typically longer tenure in the workforce. Also as expected, employees earn more if they are better-educated white males and work more weeks during the year. It is less clear precisely why children raised in dual-parent homes with mothers who worked more earned more as young adults, although role modeling, familial resources, and/or intrafamily social dynamics of unspecified content may be at work.

Baseline estimates of parental homeownership and effects of successively adding controls

Earlier we explained how the potential impacts of parental homeownership on children can be either direct or indirect through the impact on increasing residential stability. To get our initial estimate of the full effect of homeownership through both means, we estimated models where the residential stability variable was omitted. Our approach involved entering blocks of control variables to ascertain the sensitivity of the estimated coefficient of parental homeownership. These parameter estimates are presented in the top panel of table 3.

Our baseline estimates control for all of the observed characteristics of individual children as listed in table 1, plus the basic (exogenous) socioeconomic characteristics of their parents and their neighborhood.

When only these rather rudimentary controls are used, our results indicate that parental homeownership is related in a statistically significant way only to the education and homeownership outcomes. The logit model results (summarized in the first row of the top panel of table 3) indicate that, all else being equal, the proportion of years during childhood that parents owned their home was positively associated with the probability that children would earn a high school diploma, obtain a college degree, and own a home as young adults. When controlling for education, we found no statistically significant association between parental homeownership status and teen fertility or children's subsequent wage earnings. This is consistent with findings from Boehm and Schlottman (1999) and Harkness and Newman (2002). It thus appears that whatever influence parental homeownership status may have on young adults' economic success occurs indirectly through an effect on educational attainments.

Do the two statistically significant relationships persist when we add more controls? The second row of results in the top panel of table 3 shows the effect of adding all remaining observed parental control variables (attitudes and behaviors) from table 1. Several of the behaviors and attitudes of

Table 3. Estimated Parameters for Childhood Average Parental Homeownership as a Predictor of Young Adult Outcomes in 1999, by Model Specification

Controls	High School Diploma or More	College Degree or More	No Child before Age 18	Owner of Home	Ln (Wage Earnings)
Stability not controlled					
Individual characteristics and parental SES and neighborhood	0.943 (0.404)**	1.223 (0.473)***	0.474 (0.453)	1.045 (0.281)***	0.096 (0.147)
Above plus parental attitudes and behaviors	0.833 (0.421)**	1.15 (0.524)***	0.350 (0.501)	1.065 (0.360)***	0.02 (0.156)
Above plus proxy for unobserved individual characteristics	0.834 (0.387)**	1.115 (0.543)**	0.343 (0.482)	NA	0.051 (0.136)
Above, using IV	1.278 (1.194)	0.851 (1.258)	1.116 (1.409)	2.226 (0.937)**	0.342 (0.498)
Stability controlled					
Individual characteristic and parental SES and neighborhood	0.765 (0.467)	0.927 (0.513)*	–0.056 (0.509)	1.195 (0.337)***	0.087 (0.160)
Above plus parental attitudes and behaviors	0.767 (0.468)	0.983 (0.524)*	–0.001 (0.508)	1.158 (0.366)***	0.61 (0.186)
Above plus proxy for unobserved individual characteristics	0.756 (0.538)	0.842 (0.544)	–0.283 (0.640)	NA	0.041 (0.159)
Above, using IV	0.993 (1.217)	0.285 (1.228)	0.360 (1.446)	2.157 (1.014)**	0.330 (0.541)

Note: Robust standard errors estimated by bootstrapping are shown in parentheses. Ln(wage) parameters are estimated by OLS; all others are estimated by logit.
NA = not applicable; SES = socioeconomic status.
Full results are reported in tables A.1 and A.2.
*$p < 0.10$. **$p < 0.05$. *** $p < 0.01$ (two-tailed tests).

the head that were measured early in the child's life (which have been omitted from previous studies) prove to hold statistically significant explanatory power, as noted earlier. The addition of these controls attenuates the magnitude of the parental homeownership coefficient only slightly in the case of college degree and high school attainment, but has no effect on homeownership parameters.

The third row in the top panel of table 3 shows the effect of adding our proxy for the unobserved characteristics of the young adults along with all previous controls. This proxy performs powerfully as a predictor of young adult earnings (see table A.1) and employment status (not shown), thereby giving us confidence that it is indeed serving as a measure of unobserved characteristics that deserve to be controlled in the outcome equations.[16] As before, however, its inclusion in the model does not substantially alter the results for parental homeownership and educational attainments.

Thus, even when an extensive set of controls is added, a statistically significant relationship persists between parental homeownership status and children's later educational and homeownership attainments. As for the economic significance of these relationships, the college parameter indicates that every additional year that children lived in a home owned by their parents is associated with a 0.008 (or 5 percent from the mean) increase in the probability of obtaining a college degree. The relationship is much weaker in the case of a high school diploma, however, with the added year associated with only a 0.005 increase (0.005 percent of the mean) in the probability of graduating. The ownership parameter is the largest, indicating that an added year in a home owned by parents is associated with a 0.013 (2 percent of the mean) increase in the probability that the person will become a homeowner in early adulthood.

Effect of controlling for residential stability

What happens to the relationship between parental homeownership and children's outcomes when residential mobility is taken into account? We reran all the foregoing models but included the proportion of childhood years the young adult did not change residence as an additional explanatory variable. Results for the parental homeownership parameters are presented in the bottom panel of table 3; the full model results are shown in table A.1.

Residential stability during childhood is positively associated with the probability of not having a child before age 18. The estimated coefficient indicates that every additional year during which a child did not move is associated with a 0.008 (or 0.8 percent from the mean) increase in the probability of not having a child before adulthood. Once fertility is controlled for, however, stability never proves statistically significantly related to educational attainments, tenure status, or earnings; see table A.2. This suggests that the common observation of a direct relationship between residential stability and a child's educational performance (Hanushek, Kain, and Rivkin 2004; Pribesh and Downey 1999) may be largely due to the intervening teen fertility relationship.

[16]Results are available from the first author.

The inclusion of stability in the model dramatically alters the basic conclusions about the apparent effects of parental homeownership. By including residential stability in the most completely controlled model, the coefficient of the parental homeownership variable is reduced by 9 percent in the high school attainment model and 24 percent in the college degree model, and in both models the coefficients are no longer statistically significant (see the bottom panel of table 3). These findings suggest that the relationships between parental homeownership status and educational outcomes for children are mediated in a important way by residential mobility (paths E and F in figure 1). This result is consistent with the conclusions reached by Aaronson (2000) and Harkness and Newman (2002), although they measured parental homeownership only during one short period late in childhood, not cumulatively as we have done. However, the relationship between parental and children's homeownership status is virtually unaffected by the addition of childhood stability; in fact, the coefficient grows slightly higher.

Housing tenure or housing wealth?

We investigated the extent to which the strong correlations between parental homeownership and children's later college attainments and tenure status might have been due to the superior wealth of the parents. For no outcomes did we find proxies that parental housing wealth was statistically significant (results not shown). This suggests that it is owner-occupancy tenure itself, not the potential wealth associated with the dwelling, that is more predictive of children's educational and tenure outcomes. Although Boehm and Schlottman (1999) found home value positively related to college completion rates, they did 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

Finally, we report a model wherein our key variable of interest—proportion of childhood years spent in a home owned by parents—is replaced by an IV produced by the aforementioned procedure. Results are displayed in the last rows of the two panels of table 3, with runs where stability is both controlled for and not controlled for; all other controls are entered.

Examination of these results indicates that IV point estimates are of roughly comparable magnitudes to those obtained in the rows above, with the exception of the homeownership outcome, where IV estimates are twice as large. Unfortunately, they are estimated much less precisely; the standard errors are on the order of three times larger for the IV results. This is to be expected, because IV estimation focuses only on the change in the potentially endogenous variable that can be explained by exogenous factors employed in the first stage. In our case, the relatively weak power of the instruments leaves us with little variation to exploit. As a result, we cannot detect even the sizable effects. Thus, our IV results should be treated as suggestive only. Nonetheless, the relationship between parental homeownership and housing tenure remains substantial and statistically significant. Indeed, the IV point estimates of the association between parental homeownership and education, fertility, and housing tenure are larger than the noninstrumented estimates.

In sum, we view our attempts to instrument by use of exogenous variables in our structural model as appropriate but, ultimately, only partially successful. We are not confident that we have removed all the selection effects. We believe that progress in estimating more robust and precise IV estimates in the current application will require additional information at the individual level beyond what is available from the PSID.

Conclusions, caveats, and implications

An emerging empirical consensus

A nascent consensus on the relationship between parental homeownership and children's educational outcomes is emerging from several studies using different samples and analytical techniques. Green and White (1997) conducted several analyses of different data sets and concluded that for the household with an average income, owning rather than renting reduced the chances that a 17-year-old in the household would drop out of school by 3 to 4 percentage points. Using a PSID sample of children who left their parents' home from 1975 to 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 postsecondary education, and a 27 percentage point increase in graduating from college.

Using an unusually wide array of controls for parental socioeconomic characteristics, attitudes and behaviors, unobserved individual characteristics, and neighborhood conditions, we find that parental homeownership status cumulated over childhood remains a statistically significant predictor of children's educational attainments. Further, the magnitude of these relationships is not systematically eroded when we use IV estimation techniques. However, the magnitude of the implied impact on high school completion is very small, whereas the effect on college completion is large. Our smallest parameter estimate over all of our model specifications indicates that those spending all of their childhood in a home owned by their parents would be predicted to have a 0.19 higher probability of obtaining a college degree than children with otherwise identical backgrounds whose parents always rented. Given that the mean college completion rate in our sample was 0.14, this predicted difference is large indeed. Nevertheless, some doubt remains over whether these apparent impacts follow from homeownership itself or from associated residential stability (Aaronson 2000; Newman and Harkness 2002).

When we control for the proportion of years during childhood when the child did not move, the magnitude of the college effect drops by roughly one-fourth and barely falls below the minimal criterion for statistical significance. Of course, to the extent that the choice of owning a home is simultaneously a choice of longer tenure, to add residential stability is to overcontrol the model. We therefore conclude that parental homeownership is related to the probability that a child will eventually graduate from college to a statistically and economically significant extent.

These conclusions comport nicely with the earlier work of Haurin, Parcel, and Haurin (2002a, 2002b), who found that parental homeownership for the six-year period during which the children matured from 5 to 8 to 11 to 14 years old was associated with test scores that were 7 to 10 percent higher, both directly and indirectly through their relationship with various indexes of cognitive and emotional functioning and with lack of behavioral problems. Boyle (2002) also identified an association between parental homeownership and improved emotional and behavioral outcomes for children. Logically, it is a short step to suggest that such improvements in achievement test scores, emotional states, and behaviors are related to staying in school longer and eventually graduating from college.

In addition, we have explored the relationship between growing up in a home owned by parents and the likelihood that children will own their own homes by young adulthood. Unlike the case with education, this strong relationship was not mediated by childhood residential stability. Again, using the smallest of the point estimates our various models obtained, we calculate that a person who spent an entire childhood in a home owned by parents had a 0.09 (or 16 percent from the mean) higher probability of owning a home in 1999 than an otherwise identical person who never lived in a home owned by parents. This result can be interpreted in several ways that are not mutually exclusive.

On the one hand, it may indicate that children raised by homeowners come to uncritically view this tenure as normative (Helderman and Mulder 2007) or perhaps more consciously perceive the value of control over environment and mobility and the potential for generating wealth associated with homeownership. On the other hand, many of the same positive cognitive and behavioral outcomes associated with homeownership noted here may lead children to save and plan for the future in a distinctive way that promotes this tenure for them. Moreover, they may acquire from their parents certain skills and experiences that are associated with buying and maintaining a home and reduce the informational and psychological costs of homeownership (Green and White 1997).

Of course, our study has identified statistical associations, not proven causal links. However, we have tried to purge the measured association of the common confounding biases—from omitted variables, selection, and endogeneity—in a fashion that we believe offers important methodological advances. Further, we have noted several hypotheses that are not mutually exclusive and that offer plausible causal mechanisms to explain how owning one's home might provide an independent enhancement to the environment in which children are raised, thereby producing several favorable outcomes during young adulthood.

Caveats and directions for future research

Although we believe that our study offers many advances in the measurement of homeownership effects, there are several areas in which our work falls short and implicitly points to where future research would be especially productive. First, our measure of homeownership using the childhood average experience, although a reasonable measure of cumulative impacts, is not the only measure that might be used. An alternative could be that homeownership has different effects depending on the developmental stage of the child. Unfortunately, when we tried such a specification, our results were not robust enough to report. Second, we treated only one aspect of the neighborhood—poverty rate—as endogenous, and clearly the neighborhood is a more complex, multidimensional bundle of attributes than that. Future work could productively explore the extent to which other aspects such as racial-ethnic composition or homeownership rates might contribute to children's well-being in ways other than neighborhood poverty. Third, while we believe that an IV strategy is called for here, further effort in developing more powerful instruments is warranted, with a goal of estimating the full structural equation system of endogenous neighborhood, mobility, and tenure choices. Fourth, our analysis investigated parental homeownership effects from 1968 through 1992, an era predating the numerous reforms and innovations in the mortgage market that we have since witnessed. There is no assurance that results from this earlier era apply equally today, especially with regard to lower-income households that have been able to attain homeownership only because of these changes. Finally, our approach does not permit us to look inside the "black box" of homeownership to discern the specific causal processes at work. Qualitative work that probes more deeply into uncovering the differential environments, attitudes, and behaviors between homeowner and renter households is thus called for.

Should policy makers care about expanding homeownership opportunities?

For many decades, federal housing policy has encouraged owner-occupancy over rental tenure (Shlay 2006). There have been two, non–mutually exclusive, categories of rationales for this encouragement. The first is that homeownership is essentially a "merit good," one that has certain intrinsic, private benefits that all members of society deserve a chance to consume on the grounds of distributive justice. This rationale considers such reputed benefits as increased wealth, social status, security of tenure, control over dwelling, pride, and life satisfaction (McCarthy, Van Zandt, and Rohe 2001; Rohe, McCarthy, and Van Zandt 2000;

The second category is that homeownership conveys external benefits—or positive externalities—on the greater society over and above the benefits accrued by the homeowners themselves. The externalities typically cited include enhanced home maintenance, social and political participation, and attachment to community (McCarthy, Van Zandt, and Rohe 2001; Rohe, McCarthy, and Van Zandt 2000). On the basis of our study and the earlier literature we have cited, the benefits to children—future workers and citizens—who live in homes owned by their parents can be added to this list.

Thus, we believe that there is a substantial and growing body of research that provides justification for some public sector intervention to enhance opportunities for homeownership. Indeed, federal, state, and local governments and nonprofit and philanthropic organizations have been engaged for many years in a dizzying array of initiatives designed to lower barriers to attaining and sustaining homeownership, especially for lower-income households. (See Collins 2004, Cortes et al. 2006, Herbert and Belsky 2006, Herbert et al. 2005, Lubell 2005, and Retsinas and Belsky 2002 for thorough reviews.) Our position should not be interpreted, however, as a blanket endorsement of the present mélange of instruments aimed at this goal or of the position that homeownership is best for every household in every circumstance.

On the contrary, our reading of the literature (for details, see Galster and Santiago 2007) leads us to the conclusion that the advantages of homeownership are highly contingent on changes in the local housing, mortgage, and labor markets and on the unforeseen familial challenges that may befall homeowners after their purchase. To the extent that these changes force more vulnerable households to leave homeownership prematurely (especially through default), substantial economic penalties ensue. Thus, the rationale for public support of expanding homeownership must be weighed soberly against the associated risks of putting vulnerable households into untenable homeownership situations.

Appendix A

Exogenous and predetermined variables [x] from equations (1) through (5) used in the first stage of instrumentation procedure

1. Index of owner-occupied housing prices in the metropolitan area (lag 1 year)
2. Index of owner-occupied housing prices in the metropolitan area (lead 1 year)
3. Index of gross rents paid by renter occupants in the metropolitan area (lag 1 year)
4. Item 3 times renter status in the preceding year
5. Home mortgage interest rate for a 30-year fixed-rate loan
6. Item 5 times renter status in the preceding year
7. Ratio of costs of renting to owning in the metropolitan area (lag 1 year)
8. Item 7 times renter status in the preceding year
9. Whether the family's oldest child reached age 5 in the preceding year (1 = yes; 0 = no)
10. Whether the family's oldest child reached age 13 in the preceding year (1 = yes; 0 = no)
11. Whether any other child in the family reached age 5 in the preceding year (1 = yes; 0 = no)
12. Whether any other child in the family reached age 13 in the preceding year (1 = yes; 0 = no)

13. Age of the household head
14. Whether the household head received a lump-sum monetary payment since the child's birth; (e.g., inheritance; 1 = yes; 0 = no)
15. Item 14 times renter status in the preceding year
16. Difference in the household's real income from the preceding to the current year (if greater than 0; 0 otherwise)
17. Item 16 times renter status in the preceding year
18. Poverty rate of the county (lag 1 year)
19. Homeownership rate of the county (lag 1 year)
20. Whether the household expects to move next year (lag 1 year)
21. Whether the household owns the home it occupies (lag 1 year)
22. Logarithm of deflated household income (lag 1 year)
23. Year (denoted by a set of dummy variables, 1968 = excluded year)

Table A.1. Estimated Parameters for the Full Model (Excluding Stability)

	Young Adult Outcomes				
Explanatory Variables	Own Home	High School Diploma or Higher	College Graduate	No Child before Age 18	ln (wage) 1999
blackfem	–0.06	0.823	–0.13	–1.577	0.199
	(0.351)	(0.661)	(0.879)	(0.716)**	(0.353)
blackmale	0.232	1.703	–0.957	0.492	0.519
	(0.386)	(0.797)**	(0.801)	(0.973)	(0.342)
whitefem	–0.28	0.218	–0.439	–1.727	–0.431
	(0.208)	(0.383)	(0.283)	(0.498)***	(0.098)***
birthorder	–0.102	0.059	0.009	0.041	–0.084
	(0.059)*	(0.098)	(0.106)	(0.108)	(0.043)**
age99	0.044	0.145	0.41	–0.193	0.081
	(0.042)	(0.078)*	(0.065)***	(0.094)**	(0.025)***
pro_live_in_poverty0to18	0.534	–1.804	1.216	–1.033	–1.375
	(0.606)	(1.118)	(1.668)	(1.189)	(0.474)***
pro_livew_2_parents0to18	1.126	0.163	–1.753	0.692	1.066
	(0.409)***	(0.858)	(0.810)**	(0.958)	(0.286)***
pro_parent_own0to18	1.071	0.56	1.396	–0.286	–0.151
	(0.316)***	(0.622)	(0.616)**	(0.809)	(0.183)
(pro_live_in_poverty0to18)	–0.003	–0.064	–0.04	–0.085	–0.023
	(0.016)	(0.029)**	(0.032)	(0.036)**	(0.013)*
religion	0.441	–0.713	–0.545	0.104	–0.038
	(0.340)	(0.532)	(0.584)	(0.745)	(0.167)
largecity	0.029	0.46	0.989	0.719	0.01
	(0.202)	(0.463)	(0.308)***	(0.464)	(0.122)
farm	–0.069	–0.164	0.423	0.424	–0.028
	(0.237)	(0.462)	(0.421)	(0.514)	(0.138)
veteran	0.204	–0.905	0.238	–0.7	0.023
	(0.189)	(0.466)*	(0.295)	(0.411)*	(0.113)

Table A.1. Estimated Parameters for the Full Model (Excluding Stability) *Continued*

	Young Adult Outcomes				
Explanatory Variables	Own Home	High School Diploma or Higher	College Graduate	No Child before Age 18	ln(wage) 1999
momteen	–0.709	0.83	–0.618	–0.48	–0.548
	(0.347)**	(0.509)	(0.873)	(0.682)	(0.332)*
married	1.644	N/A	N/A	N/A	0.104
	(0.179)***	N/A	N/A	N/A	(0.091)
at_least_hs	0.468	N/A	N/A	N/A	0.179
	(0.293)	N/A	N/A	N/A	(0.155)
collgrad	0.456	N/A	N/A	N/A	0.435
	(0.249)*	N/A	N/A	N/A	(0.117)***
no_child_before_18	0.218	1.235	–0.056	N/A	0.062
	(0.304)	(0.461)***	(0.560)	N/A	(0.240)
ave_education_head0to18	–0.102	0.648	0.343	0.19	–0.029
	(0.081)	(0.286)**	(0.105)***	(0.194)	(0.048)
ave_hdocc_pre0to18	0.007	0.031	0.005	0.038	–0.009
	(0.011)	(0.034)	(0.017)	(0.023)	(0.007)
ave_self_employed0to18	–0.488	–0.356	0.547	–0.038	0.189
	(0.428)	(1.353)	(0.550)	(0.999)	(0.266)
ave_employed_wife0to18	–0.79	–0.622	0.683	0.146	–0.462
	(0.360)**	(0.721)	(0.526)	(0.804)	(0.200)**
ave_smsa0to18	0.231	–0.336	0.961	–0.089	–0.023
	(0.273)	(0.510)	(0.483)**	(0.555)	(0.147)
ave_annu_hrs_wkd0to18	0	0	0	0	0
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
ave_readnewspaper	–0.794	0.735	0.13	–0.446	0.21
	(0.305)***	(0.570)	(0.541)	(0.597)	(0.191)
ave_union	–0.521	1.025	0.017	–0.717	0.075
	(0.292)*	(0.513)**	(0.464)	(0.582)	(0.149)
ave_nochurch	0.467	0.391	–0.674	0.625	0.136
	(0.325)	(0.660)	(0.579)	(0.711)	(0.201)
ave_no_socialclubs	–0.256	–1.234	0.891	0.063	0.051
	(0.288)	(0.664)*	(0.405)**	(0.652)	(0.134)
ave_relatives	0.273	–0.008	0.099	–0.11	–0.07
	(0.255)	(0.540)	(0.374)	(0.527)	(0.135)
ave_num_neigh_known	0.009	0.055	0.043	0.024	0.012
	(0.013)	(0.032)*	(0.019)**	(0.032)	(0.007)*
ave_plan_ahead	0.137	–0.273	0.639	1.312	0.306
	(0.268)	(0.491)	(0.461)	(0.542)**	(0.155)**
ave_trust	0.63	–1.107	–0.008	–0.591	–0.133
	(0.285)**	(0.525)**	(0.438)	(0.699)	(0.123)
wage1000s	0	N/A	N/A	N/A	N/A
	(0.001)				
proxy_ unobs. child charact	–0.594	–0.396	0.064	0.407	N/A
	N/A	(0.363)	(0.348)	(0.420)	(0.103)***
annu_hrs_wkd99	N/A	N/A	N/A	N/A	0
	N/A	N/A	N/A	V	(0.000)**
Constant	–3.179	–10.39	–19.68	5.021	9.328
	(1.797)*	(4.131)**	(2.670)***	(4.135)	(1.151)***
Observations	775	755	755	755	541
Wald Chi–squared *(d.f.)*	217.1 (33)	194.8 (30)	96.4 (30)	104.7 (29)	NA
Pseudo R^2/R^2	0.21	0.26	0.19	0.29	0.34

Note: All parameters areestimated by logit except for the natural log (wage) model, which was estimated by OLS. Robust standard errors are in parentheses.
*$p < 0.10$. **$p < 0.05$. *** $p < 0.01$ (two–tailed tests).

Table A.2. Estimated Parameters for the Full Model (Including Stability)

	Young Adult Outcomes				
Explanatory Variables	Own Home	High School Diploma or Higher	College Graduate	No Child before Age 18	ln (wage) 1999
blackfem	–0.041	0.861	–0.132	–1.516	0.196
	(0.352)	(0.674)	(0.877)	(0.699)**	(0.349)
blackmale	0.245	1.713	–0.954	0.784	0.516
	(0.386)	(0.816)**	(0.803)	(0.903)	(0.336)
whitefem	–0.29	0.194	–0.437	–1.724	–0.424
	(0.208)	(0.377)	(0.282)	(0.514)***	(0.097)***
birthorder	–0.091	0.075	0.006	–0.015	–0.091
	(0.060)	(0.101)	(0.102)	(0.101)	(0.044)**
age99	0.045	0.148	0.41	–0.21	0.081
	(0.042)	(0.078)*	(0.066)***	(0.095)**	(0.025)***
pro_live_in_poverty0to18	0.527	–1.769	1.222	–1.395	–1.397
	(0.609)	(1.098)	(1.659)	(1.233)	(0.473)***
pro_livew_2_parents0to18	1.138	0.155	–1.756	0.664	1.059
	(0.410)***	(0.842)	(0.809)**	(0.939)	(0.282)***
pro_parents_own0to18	1.227	0.832	1.354	–1.293	–0.26
	(0.367)***	(0.675)	(0.741)*	(0.912)	(0.236)
pro_stability0to18	–0.528	–0.804	0.149	2.802	0.33
	(0.621)	(1.040)	(1.254)	(1.332)**	(0.375)
ave_pert_inc_below_pov0to18	–0.001	–0.062	–0.041	–0.101	–0.023
	(0.016)	(0.029)**	(0.032)	(0.035)***	(0.013)*
religion	0.478	–0.701	–0.558	0.067	–0.057
	(0.343)	(0.534)	(0.562)	(0.715)	(0.168)
largecity	0.027	0.471	0.989	0.655	0.011
	(0.202)	(0.464)	(0.308)***	(0.452)	(0.122)
farm	–0.073	–0.174	0.423	0.426	–0.023
	(0.238)	(0.461)	(0.421)	(0.518)	(0.138)
veteran	0.2	–0.95	0.241	–0.599	0.031
	(0.189)	(0.466)**	(0.294)	(0.439)	(0.115)
momteen	–0.715	0.872	–0.617	–0.63	–0.559
	(0.347)**	(0.520)*	(0.873)	(0.636)	(0.331)*
married	1.645	N/A	N/A	N/A	0.103
	(0.179)***	N/A	N/A	N/A	(0.092)
at_least_hs	0.464	N/A	N/A	N/A	0.179
	(0.293)	N/A	N/A	N/A	(0.155)
collgrad	0.464	N/A	N/A	N/A	0.436
	(0.249)*	N/A	N/A	N/A	(0.116)***
no_child_before_18	0.246	1.269	–0.063	N/A	0.053
	(0.305)	(0.471)***	(0.571)	N/A	(0.234)
Eave_education_head0to18	–0.099	0.659	0.343	0.199	–0.031
	(0.081)	(0.285)**	(0.106)***	(0.212)	(0.048)
ave_hdocc_pre0to18	0.008	0.03	0.005	0.032	–0.01
	(0.011)	(0.034)	(0.017)	(0.026)	(0.007)
ave_self_employed0to18	–0.481	–0.289	0.54	–0.042	0.185
	(0.428)	(1.367)	(0.562)	(0.977)	(0.267)
ave_employed_wife0to18	–0.796	–0.639	0.685	0.275	–0.451
	(0.360)**	(0.717)	(0.526)	(0.812)	(0.203)**
ave_smsa0to18	0.247	–0.334	0.95	–0.115	–0.037
	(0.274)	(0.507)	(0.496)*	(0.583)	(0.145)
ave_annu_hrs_wkd0to18	0	0	0	0	0
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
ave_readnewspaper	–0.771	0.801	0.125	–0.662	0.197
	(0.307)**	(0.587)	(0.540)	(0.615)	(0.190)
ave_union	–0.497	1.108	0.011	–0.99	0.051
	(0.293)*	(0.517)**	(0.461)	(0.618)	(0.150)

Table A.2. Estimated Parameters for the Full Model (Including Stability) *Continued*

	Young Adult Outcomes				
Explanatory Variables	Own Home	High School Diploma or Higher	College Graduate	No Child before Age 18	ln (wage) 1999
ave_nochurch	0.476	0.377	–0.682	0.618	0.125
	(0.325)	(0.647)	(0.578)	(0.693)	(0.201)
ave_no_socialclubs	–0.269	–1.273	0.894	0.112	0.064
	(0.288)	(0.659)*	(0.404)**	(0.645)	(0.134)
ave_relatives	0.292	0.001	0.098	–0.147	–0.071
	(0.257)	(0.545)	(0.373)	(0.542)	(0.135)
ave_num_neigh_known	0.009	0.054	0.043	0.02	0.012
	(0.013)	(0.032)*	(0.019)**	(0.031)	(0.007)*
ave_plan_ahead	0.138	–0.26	0.642	1.351	0.306
	(0.269)	(0.489)	(0.460)	(0.569)**	(0.155)**
ave_trust	0.641	–1.122	–0.011	–0.542	–0.145
	(0.286)**	(0.531)**	(0.439)	(0.693)	(0.122)
wage1000s	0	N/A	N/A	N/A	N/A
	(0.001)	N/A	N/A	N/A	N/A
residown	N/A	–0.602	–0.407	0.045	0.417
	N/A	(0.361)*	(0.354)	(0.435)	(0.104)***
annu_hrs_wkd99	N/A	N/A	N/A	N/A	0
	N/A	N/A	N/A	N/A	(0.000)**
Constant	–3.097	–10.308	–19.715	5.008	9.279
	(1.801)*	(4.050)**	(2.697)***	(4.123)	(1.161)***
Observations	775	755	755	755	541
Wald chi–squared *(d.f.)*	217.1 (33)	194.8 (30)	96.4 (30)	104.7 (29)	NA
Pseudo R^2/R^2	0.21	0.26	0.19	0.29	0.34

Note: All parameters are estimated by logit except in(wage) model, which was estimated by OLS. Robust standard errors are in parentheses.
* $p < 0.10$. ** $p < 0.05$. *** $p < 0.01$ (two-tailed tests).

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