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THE INTERACTIVE EFFECTS OF HOUSING ASSISTANCE AND FOOD STAMPS

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The Interactive Effects of Housing Assistance and Food Stamps

Abstract

This paper examines whether the effects of housing assistance on food expenditures are different for recent food stamp recipients versus non-recipients. Since housing absorbs a large share of low-income household budgets, it is plausible to expect that housing assistance could free up substantial income to be spent on other basic necessities, such as food. On the other hand, if the disincentive inherent in the two programs amplify each other, there could be strong adverse effects on income, which could result in flat, or even reduced, expenditures on food. Two types of housing assistance are examined: public housing, and federally-subsidized privately-owned housing. Although both types of housing assistance are found to increase participation in the food stamp program, they have distinct effects on food spending. Public housing reduces food spending among those who were receiving food stamps before they moved in. But among those not formerly receiving food stamps, public housing tends to raise food spending. Privately-owned assisted housing has no statistically significant effects on food spending.

Introduction

Federal housing and food stamp programs are two of the largest in-kind transfer programs for the poor, each representing roughly a \$28 billion share of the federal budget.¹ There is considerable overlap in the recipients of the two programs. About 38 percent of Food Stamp Program (FSP) participants also receive housing assistance, and 30 percent of housing assistance recipients use food stamps (authors' tabulations using 1999 American Housing Survey data). While the effects of the FSP on the work effort, food expenditures, and dietary adequacy of food stamp recipients have been subjected to considerable scrutiny, housing assistance has received far less attention. And virtually nothing is understood about the combined effects of the two programs.

The goal of this research is to examine whether the effects of housing assistance on dietary adequacy are the same, or different, for recent FSP program participants, compared to non-participants, using food expenditures as a rough proxy for dietary sufficiency. Because the effect of housing assistance on food expenditures is hypothesized not only to depend on whether a household receives food stamps, but also to operate through its effects on family income, the impact of housing assistance on income is also examined. The analysis is restricted to women with children, a group that is particularly relevant to the upcoming debates about the re-authorization of the 1996 TANF legislation. These women are all married or unmarried heads of households at the time outcomes are measured.

Conceptual Framework

Very little empirical research offers insights into the effects of housing assistance on consumption in general, and on food consumption in particular. Meyers et al. (1995) find a strong positive impact of housing assistance on children's nutrition in a single high-cost housing market (Boston). Several other studies indicate that housing assistance increases its recipients' non-housing expenditures by 10-20 percent (Kraft and Olsen 1977; Olsen and Barton 1983; U.S. Department of Housing and Urban Development 1974; Reeder 1985). The studies in this latter group do not isolate food spending from other expenditures, however, and they are all at least 15 years old.

Theoretically, the effects of housing assistance on food spending are likely to depend on whether, and how much, housing assistance affects family income, because a family's total family income will determine how much disposable income is left over after housing is paid for. But the effect of housing assistance on income is unknown. A substantial body of research on public assistance programs other than housing assistance, including food stamps, indicates "nontrivial effects" on labor supply and earnings (Moffitt 1992), and in the most likely scenario, housing assistance could have similar effects. Yet the research findings on the incentive effects of housing assistance are limited and inconsistent. Currie and Yelowitz (1998) and Fischer (2000) find that federal housing subsidies discourage work effort. In contrast, Reingold (1997)

¹By comparison, AFDC spending by state and federal governments combined reached \$23 billion at its 1994 peak.

and Reingold et al. (2001) detect no statistically significant effects of public housing, and Miller (1998), Riccio and Orenstein (1999), and Ong (1998) find positive effects of housing assistance on labor supply for AFDC recipients.

These positive effects could arise because affordable housing may provide a foundation for greater self-sufficiency. Housing instability may disrupt work schedules and hinder job search activities, and moving may drain energy and resources. Not having a stable address may also limit a job seeker's prospects. Poor housing quality may contribute to adverse health conditions, particularly for children, thereby also burdening parental resources and interrupting work. Finally, unaffordable rent burdens can absorb funds needed to pay for employment-related expenses such as child care, transportation, and clothing. By providing stable, decent, and affordable housing, housing assistance could remove these various barriers to work. Thus, although economic theory suggests that housing assistance would reduce work effort, there is no firm evidence on this relationship.

Because the impacts of housing assistance on household income are so uncertain, it is worth considering what its effect on food spending might be under the simplest scenario assuming no effect on income. In this case, the effect of housing assistance on the food spending of FSP non-participants would seem clear. Because housing costs consume by far the largest budget share of low-income families who do not receive housing assistance, housing assistance could free up substantial income to spend on other necessities, including food.

Since food stamp recipients supplement their food stamp benefits with out-of-pocket spending on food, FSP participants who obtain housing assistance could also re-allocate some of their income to food, resulting in increased food spending for them as well. However, housing assistance could reduce their food stamp allocation, because the FSP shelter expense deduction may shrink when a family obtains housing assistance.² This decline in food stamp benefits could result in a disproportionate drop in food expenditures, since research has consistently identified a stronger marginal propensity to consume out of food stamps than out of cash (Levedahl 1995; Senauer and Young 1986; Smallwood and Blaylock 1985; Wilde and Ranney 1996).

Alternatively, if housing assistance affects family income, the difference between its impacts on the food spending of food stamp recipients and non-recipients could be substantial. A central hypothesis motivating this research is that any disincentive effects of housing assistance on the earnings or family income of food stamp recipients may be greater than on non-recipients. This speculation is based on two considerations. First, both programs impose marginal tax rates of 30 percent on earnings. The joint disincentive to increase earnings of the

² In computing the net income used for benefit determination, the FSP subtracts housing costs in excess of 50 percent of income after other deductions up to a cap of \$250 (for the 48 contiguous states in 1998; see U.S. House of Representatives Committee on Ways and Means 1998). Sixty-three percent of food stamp recipients qualify for the deduction, and 21 percent take the maximum (Castner and Russo 2000). Because families with housing assistance are required to pay only 30 percent of their income for housing, this deduction should be substantially reduced for most housing assistance recipients. It would not be eliminated entirely for all households because it is taken after other deductions, including the standard deduction of \$134 per month (in the 48 contiguous states in 1998). Thus, for example, a housing assistance recipient with a monthly unearned income of \$300 would pay \$90 for housing, which is larger than 50 percent of \$166 (\$300 minus \$134).

two programs is thus much greater than either individually. Second, as indicated by Murray (1994), the cash-equivalent value of the two subsidy programs to the participant, taken jointly, may be much greater than either program by itself, because with both food and housing subsidized, there may be substantially less need for cash to pay for basic needs.

In the only existing empirical study of this topic, preliminary results of Schone (1994) suggest that the joint effects of housing assistance and food stamps on labor supply are roughly additive. She finds that food stamps alone reduces weekly work hours by 44 percent (from 16 to 7), housing assistance alone reduces weekly work hours by 27 percent (from 37 to 26), and food stamps and housing assistance together reduce weekly work hours by 64 percent (from 25 to 9).³

If housing assistance reduces income, effects on food spending are unpredictable. The fraction of income that a family spends on food should still rise, but because the income pie is smaller, food spending may not increase, and it may even fall. And if these negative income effects of housing assistance were compounded for FSP participants (i.e., the incomes of FSP participants were reduced even further by receipt of housing assistance relative to the incomes of non-participants), food spending of FSP participants could fall even more. However, some of the negative income effect on food spending may be offset by an increase in food stamp benefits, which would increase food spending, because food stamps are known to have a larger marginal effect on food spending than cash.

Generating plausible hypotheses is further complicated because the effect of housing assistance on FSP participation is unknown. It may be that by freeing up income formerly spent on housing, housing assistance could reduce the need for food assistance and participation in the FSP. But if housing assistance reduces family income, FSP participation could rise. Housing assistance could also entail greater FSP participation if the managers or residents of assisted housing provided information to new tenants about their food stamps eligibility, or if the community were more accepting of food stamp use.

A final theoretical consideration is that different types of housing assistance may have different effects (Newman and Harkness 1999). Housing assistance is not a uniform program, but rather several distinct programs, each with its unique set of features. These can be categorized into three main types. Privately-owned, publicly-subsidized developments account for about half of all assisted units. Public housing constitutes about 20 percent, and Section 8 certificates and vouchers make up the rest. These types of assistance are not only administratively different, but their resident and locational characteristics differ dramatically as well (Newman and Schnare 1994;1997; Kingsley and Tatian 1999). For example, public housing is much more likely to be located in highly distressed neighborhoods than privately-owned assisted housing, and its residents are much more disadvantaged. To the extent that the behavior or life-chances of individuals are affected by the social context of their neighborhoods, public housing may exacerbate the difficulties of its residents. The different features of housing assistance programs could plausibly entail different incentive effects and consequences for food spending. In this research, we distinguish between public housing and privately-owned developments with federal and/or state subsidies. Because of data limitations, Section 8

³ Schone's preliminary estimates of the disincentive effects of programs are considerably larger than those reported elsewhere in the literature. For example, she finds that AFDC reduces work effort to virtually zero, and her estimate of the disincentive effect of food stamps is considerably larger than that reported by Fraker and Moffitt (1988).

certificates and vouchers are excluded.

Methods

Approach

Multivariate statistical methods are used to gauge the effects of housing assistance on the following outcomes: (1) out-of-pocket food spending per household member for food consumed at home;⁴ (2) whether any and amount of food stamp benefits per person; (3) total out-of-pocket food spending plus food stamp benefits per person; and (4) total family income and its natural logarithm.

To estimate the effect of housing assistance, we compare changes in these outcomes that occurred when a family moved into assisted housing with changes that occurred over the similar period for families who did not move into assisted housing, statistically controlling for other characteristics.⁵ Symbolically, the model is:

$$Y_{2i} - Y_{1i} = b_H H_{2i} + b_F F_{1i} + b_1 F_1 H_{2i} + \mathbf{b}_X \mathbf{X}_{1i} + \varepsilon_i + \varepsilon_{1i} \quad (1)$$

where Y represents an outcome, H and F are the key analytical variables representing the receipt of housing assistance and food stamps, respectively, and \mathbf{X} is a vector of other covariates thought to affect outcomes. For housing assistance recipients, the subscripts 1 and 2 refer to the two-year periods just before and just after a move into assisted housing, respectively. The transitional year of the move itself is excluded. For a matched set of non-recipients of housing assistance, these subscripts refer to two corresponding periods, as defined more precisely below. The subscript i refers to household. The error term, $\varepsilon_i + \varepsilon_{1i}$, has two components, the first representing an individual effect, assumed to be invariant over time, and the second a random effect, assumed to be independently, identically, and normally distributed. The key parameter b_H represents the average effect of moving into assisted housing on outcome Y for FSP non-participants; the parameter $(b_H + b_F)$ is the effect of housing assistance for FSP participants.

This model estimates the change in outcome Y as a function of a family with characteristics \mathbf{X} and FSP participation F_1 moving into assisted housing between time periods 1 and 2. Except for housing assistance receipt, no other household characteristic from the later period is included. This approach makes sense because, unlike most other forms of federal assistance, housing assistance is not an entitlement. Only 27 percent of income-eligible families actually receive it (Casey 1997), and in many areas, families spend years on waiting lists until an assisted unit or a rent voucher becomes available.⁶ Consequently, although the assignment of

⁴ We also tested for effects on spending for food consumed outside the home, but because the effects are negligible and such spending constitutes only a very small fraction of total food spending for the population examined here, these results are not reported in this paper.

⁵ A simple pre-post comparison of outcomes from the time before to the time after the move into assisted housing, using a sample of housing assistance recipients alone, would not identify the effects of housing assistance, because outcomes such as income or food expenditures could tend to increase naturally over time. Thus, a finding that food expenditures or income rose for housing assistance recipients could not be attributed to the receipt of housing assistance itself.

⁶Data on waiting lists pertains mostly to the lists maintained by public housing authorities for public

housing assistance is certainly not a lottery, there is probably a good deal of uncertainty for most families concerning when, and if, they will actually receive housing assistance, once they enter the queue. Therefore, while it is conceivable that households could adjust their work effort, earnings, and consumption in anticipation of the receipt of housing assistance in the near future, the possibility is fairly remote, particularly in the time frame used in this study, which covers years, not months, before the receipt of housing assistance. This makes it possible to treat family characteristics and FSP participation in the period prior to housing assistance receipt as relatively exogenous to actually receiving it.

A major concern in measuring the effects of virtually all social programs is that participants may self-select into the program based on unmeasured characteristics, potentially biasing estimates. In equation (1), these characteristics are assumed to be captured in the individual specific error term ε_i . If these individual unmeasured features are associated with whether a family receives housing assistance, either because people with these features are more likely to apply for housing assistance or because assisted housing managers are more likely to offer apartments to them, the estimated effects of housing assistance will be distorted. To obtain estimates free of this potentially biasing effect, we subtract from (1) a similar model describing change in outcomes from an earlier period:

$$Y_{1i} - Y_{0i} = b_F F_{0i} + \mathbf{b}_X \mathbf{X}_{0i} + \varepsilon_i + \varepsilon_{1i}, \quad (2)$$

where the subscript 0 refers to the two-year period that ended four years before the receipt of housing assistance. Note that there is no term for housing assistance receipt or its interaction with FSP participation in this equation because, by the way in which the sample is drawn (described below), no one receives housing assistance in this earlier phase. Subtracting (2) from (1) yields the following “first-difference” model:

$$(Y_{2i} - Y_{1i}) - (Y_{1i} - Y_{0i}) = b_H H_{2i} + b_F (F_{1i} - F_{0i}) + b_I F_1 H_{2i} + \mathbf{b}_X (\mathbf{X}_{1i} - \mathbf{X}_{0i}) + (\varepsilon_{1i} - \varepsilon_{0i}). \quad (3)$$

In this model, changes in outcome Y between the periods before and after the move into assisted housing are treated as a function of past changes in outcome Y during an earlier period (preceding the two years before the move into assisted housing), plus whatever other measured changes occurred during this period. This model can be intuitively understood as using a family’s past history to predict her future trajectory. For example, the income of families that grew rapidly in the past is more likely to continue to continue to grow rapidly, especially after controlling whatever happened in the meantime (e.g., marriage, work-limiting illness). By using each family’s past to predict its future, rather than simply a set of generic characteristics, the results should be less susceptible to the effects of idiosyncratic, unobserved features.

We estimate both the simple change model (1) and the first-difference model (3). The important distinction between them is that the ordinary regression model results could register the effects of similar, but unmeasured, characteristics of families who move into assisted

housing or Section 8 rental assistance certificates and vouchers. The owners or managers of privately-owned federally-subsidized developments are also required to maintain waiting lists, although we know of no data on how much time typically elapses before applicants move to the top of the list.

housing. The first-difference results, presumably, do not, and may therefore be considered a more accurate estimate of the true effects of housing assistance. We present both because comparison of the two may indicate how the unmeasured features of families that move into assisted housing affect their outcomes.

Data

This study uses the Panel Study of Income Dynamics-Assisted Housing Database (PSID-AHD), which was developed by matching the sample addresses of the PSID to the addresses of assisted housing units across the nation for the period 1968-1993. The AHD constitutes the closest approximation to a national census of housing that we are aware of. It is based on eight sources, including several of HUD's administrative databases and our own surveys of state and local housing agencies across the nation. Programs covered in the AHD include public housing, other HUD project-based programs (privately-owned housing developed using federal subsidies), Farmer's Home Section 515, the Low-Income Housing Tax Credit, and state rental programs. Data on Section 8 certificates and vouchers are excluded, because historical records on these addresses are not retained by HUD. Because the PSID-AHD uses address-matches, it does not suffer from the documented inaccuracies in respondent self-reported housing assistance status (Shroder and Martin 1996).

The PSID has collected data on cash food expenditures (at home and away from home), food stamp receipt, earnings, work hours, and receipt of public assistance since 1968. Food expenditure questions were skipped in 1973 and 1988-1989; food stamp benefit questions were skipped in 1973. Prior to 1973, but not after, respondents were explicitly asked to exclude spending on alcohol and cigarettes. Prior to 1980, the cost of food stamps was neither explicitly included nor excluded from either food expenditures or the value of food stamps. Dummy variables for calendar years were included in the models to control for these various anomalies and for other possible temporal trends. All cash values are expressed in 2001 dollars. Food expenditures were adjusted to 2001 values using the food component of the CPI, while earnings and income were adjusted using the general CPI.

Sample

The core of the analysis sample consists of PSID-AHD women with children observed two years before and two years after moving into assisted housing (excluding the year of the move itself). This represents a "pseudo cross-sectional" sample, consisting of women observed moving into assisted housing across all 25 years of the 1968-1993 PSID-AHD. There are 353 such women, with 42 percent observed moving into public housing, 52 percent into privately-owned federally-subsidized developments, and 6 percent into other programs (low-income housing tax credits, Farmer's Home, and state housing programs). We combined the two latter groups together for this analysis and designate it as privately-owned assisted housing. All women were married or unmarried heads of households after they moved into assisted housing.

Because the calendar years of observation for the core sample of housing assistance recipients are not fixed, but vary depending on when the respondent moved into assisted housing, the control sample of women who did not receive housing assistance cannot be defined simply by choosing all those income-eligible for housing assistance over a pre-specified set of years. Instead, matching techniques were used to select a sample of unassisted women with

characteristics similar to those of the assisted sample prior to the move into assisted housing. To match the population ratio of families with housing assistance to income-eligible but unassisted families, the control sample is three times larger than the assisted sample. This ratio approximates the roughly one-quarter of income-eligible households that receive housing assistance and mitigates the bias inherent in the choice-based sampling scheme (Heckman and Robb 1985). A brief description of the matching procedure is contained in an appendix. (Complete details are available from the authors upon request.)

It should be noted that the quality of the match is not critical to the validity of the results, because multivariate statistical techniques are used to control for baseline (i.e., pre-move) differences between assisted and unassisted sample members. That is, although raw differences between assisted and unassisted groups are examined, they are not used as the only indicator of the effects of housing assistance, as they would be if the data were generated using a random-assignment experimental design. However, as shown in Table 1, the control samples closely match the assisted samples on a range of base-period indicators.⁷ The race, age, marital status, household size, disability status, and homeownership rates of the assisted and control groups are statistically indistinguishable. On a few measures, recipients of housing assistance were different from their controls, however.⁸ They had total family incomes roughly \$3,800 (or 13 percent) less, were about 25 percent more likely to have changed residences, and were 17 percent more likely to have received food stamps, compared with the control group. Relative to their controls, those who moved into public housing also had 16 percent smaller out-of-pocket food expenditures and 34 percent higher food stamps benefit levels per family member.

Model Specification and Estimation Techniques

All models included controls for the following individual characteristics, measured over the two-year base period: age, sex, race, year born, whether disabled, educational attainment, marital status, whether head of household, whether married, and number of work hours lost due to illness. In addition, the following family characteristics, again measured over the base period, are also included: total income, number of family members, whether any children less than six years old, fraction of family members who are children less than six years old and fraction six or older, out-of-pocket food spending per family member, whether and amount of AFDC benefits received, whether and amount of food stamp benefits received, whether changed residences, and the population of the place where they lived (logged).

The interaction of housing assistance and food stamps could be tested in one of two ways: either splitting the sample between FSP participants and non-participants, or pooling the

⁷ It is worth pointing out that, because of the way the sample was drawn, the following comparison does not pertain to any meaningful population groups. For example, the control groups do not represent those income-eligible for housing assistance, but who are unassisted.

⁸ None of the variables mentioned earlier with marked differences between assisted and comparison samples (e.g., total family income, residential moves) were used in the match procedure. It may be worth testing whether the quality of the match is improved by including them, although an improved match quality on one variable tends to be offset with decreased match quality on others. Since multivariate methods are used to control for all variables, it does seem that results would depend strongly on these differences.

sample with a multiplicative interaction term between housing assistance receipt and FSP participation (the earlier discussion of the models used presented only the second of these). Theoretically, the concern is that FSP participants may be different from non-participants in unobserved ways, and that the two groups cannot be legitimately pooled. Therefore, instead of including an interaction term in a model estimated using the whole sample, separate models on the two subsamples should be estimated. Chow tests confirm this suspicion, strongly rejecting the pooling of the FSP participants and non-participants for most outcomes. However, as a practical matter, the coefficients on the key policy variables (housing assistance and its interaction with food stamp receipt) obtained from split-sample models and single-sample interaction models are almost identical in nearly every case, and they are always statistically indistinguishable.⁹ In addition, neither set of estimates is consistently more precise than the other. Therefore, we adopted the interaction technique for examining the differences between the effects of housing assistance on FSP participants and non-participants, because it conserves sample size. This provides samples large enough to test split-sample models for the two types of housing assistance.

Ordinary least squares (OLS) is used as the estimation techniques for all outcomes except for FSP participation, which is binary. For FSP participation, we transform the models by moving Y_{1i} from the left- to the right-hand side in equation (1) and $(Y_{1i} - Y_{0i})$ from the left- to the right-hand side in equation (3). The coefficients obtained after such a transformation are the same, but the dependent variable is simpler: binary in the case of the simple change model (eq. (1)) and a three-valued rather than five-valued categorical variable for the first-difference model (eq. (3)). This enables us to use probit to estimate the simple change model, which will produce more readily interpretable results than a multinomial estimation technique such as ordered probit. The first-difference model requires use of a multinomial estimation technique even after the transformation, but estimates obtained with the three-valued dependent variable are again easier to interpret. In the case of FSP participation, the three values represent moving off food stamps, no change in FSP participation, and moving onto food stamps, respectively.¹⁰

Results

Sample Characteristics

As reviewed earlier (Table 1), features of the assisted sample and the control sample in the period prior to the move into assisted housing are quite similar. Turning next to the two types of housing assistance (also shown in Table 1), the characteristics of mothers in families that moved into public housing are virtually the same as those who moved into privately-owned assisted housing. They average about the same age (30 years), and they are equally likely to be

⁹ These preliminary tests did not distinguish between different types of housing assistance. Results are available from the authors.

¹⁰ Obviously, FSP non-participants cannot move off food stamps, nor can FSP participants move on. Unfortunately, the ordered probit coefficients cannot be transformed into an interpretable form in a way that takes these restrictions into account. We therefore present them in their raw form, with the warning that they have a qualitative meaning only.

married (50 percent), to be disabled (20 percent), to be living independently (85 percent), and to have recently changed residences (59 percent). Beyond these similarities, however, there are notable differences between the groups that received the two different types of housing assistance, with those who moved into public housing exhibiting the more disadvantaged profile. About 40 percent of the public housing sample were high school graduates, compared with 60 percent for privately-owned assisted housing. Those who moved into public housing were much more likely to have received food stamps (54 percent versus 44 percent) and AFDC (41 percent versus 27 percent). Families that moved into public housing averaged three children, while those who moved into privately-owned assisted housing averaged two. Families who moved into public housing spent less out-of-pocket on food eaten at home, but when their higher food stamp benefit levels are factored in, food spending for the two assisted housing groups is nearly identical.

Total family income of assisted housing recipients averaged close to \$25,000, somewhat lower for those who moved into public housing, and somewhat higher for those who moved into privately-owned assisted housing. The distribution of incomes is right-skewed, so the median family income over the whole sample is about \$22,000. For those who moved into public housing, it is \$19,000, and for those who moved into privately-owned assisted housing, it is \$24,000. The average family incomes of unmarried women is \$21,000, and for married women, it is \$28,500. The median family incomes of unmarried and married women are \$17,000 and \$28,000, respectively.

Unadjusted Differences in Changes in Outcomes: Assisted Versus Controls

Table 2 displays the means of outcomes in the base and outcome periods for FSP participants and non-participants in the two assisted housing groups. All of the key results that emerge from the multivariate analyses are already found in these simple comparisons. It is therefore worth examining them closely.

Total spending (out-of-pocket plus food stamps) on food consumed at home

Changes in food spending differ between those who move into public housing versus privately-owned assisted housing. Food stamp recipients who move into public housing reduce their annual food spending by nearly \$200, relative to controls, while food stamp non-recipients who move into public housing increase their food spending by almost \$200, again relative to controls. In contrast, there are no discernible differences in food spending changes between households that move into privately-owned assisted housing, whether they were receiving food stamps or not, and their controls.

Out-of-pocket food spending and food stamps

Reductions in out-of-pocket food spending account for most of the decline in total food spending among food stamp recipients who move into public housing. In contrast, large increases in FSP participation and food stamp benefit underlie the gains in food spending among food stamp non-recipients who move into public housing. Roughly half of former food stamp non-recipients began to receive food stamps after they moved into public housing, compared to a fifth of controls. Average annual food stamp benefits per person among former food stamp non-recipients were \$322 for the public housing group, compared to \$90 for controls. Some of these

increased food stamp benefits may have merely replaced out-of-pocket spending, but it appears that most did not.

Increases in FSP participation and food stamp benefits are also evident among former food stamp non-recipients who move into privately-owned assisted housing, but they are less dramatic than for those who move into public housing. There is no gain in total food spending for food stamp non-recipients moving into privately-owned assisted housing because their increased food stamp benefits appear to be largely offset by decreased out-of-pocket food spending.

Neither type of housing assistance is associated with significant changes in FSP participation rates or benefit levels among those who were already receiving food stamps when they moved into assisted housing.

Family income

A pronounced decline in the family incomes of those who move into assisted housing appears to underlie the failure of most groups to increase food spending. While the family incomes of controls rose by more than \$2,000 between base and outcome periods, it dropped by \$3,000 for families who moved into assisted housing, with the disparity being somewhat larger for the public housing than for the privately-owned assisted housing. We are currently conducting further analyses to determine what underlies this strong and provocative result.

Regression Results

Regression results for equations (1) and (3) are presented in Table 3. Models were estimated separately for women who moved into public and privately-owned assisted housing, along with their associated controls. Overall, the results of the simple comparisons are borne out when the full set of base-period characteristics is controlled for.

Public housing and privately-owned assisted housing have distinct effects on food spending. Public housing reduces the total food spending of families who were receiving food stamps before they moved in, but it has a more positive effect on the food spending of those who not receiving food stamps. In contrast, privately-owned assisted housing has no effect on total food spending of former food stamp recipients or non-recipients.

Public housing reduces total food spending of former food stamp recipients because it shrinks their annual out-of-pocket food spending per person by more than \$200, with no offsetting increase in food stamp benefits. Public housing increases the FSP participation rates of former food stamp non-recipients, which tends to raise their total food spending because the increased food stamp benefits are not offset by reductions in out-of-pocket food spending.^{11, 12}

¹¹ We say “tends to increase total food spending” because the effect of public housing on the total food spending of former food stamp non-recipients is large, but it is not statistically significant because the effect on out-of-pocket food spending, which is the largest component of food spending, is imprecisely estimated.

¹² These observations apply only to the first difference results. The simple change model indicates that public housing prolongs FSP participation among those already receiving food stamps when they moved in, while the first difference model does not. Similarly, the simple change model shows that public housing shrinks out-of-pocket food spending of families not receiving food stamps in the base period,

Privately-owned assisted housing also raises FSP participation and benefit levels among those not formerly receiving food stamps. Unlike public housing, however, the effects of privately-owned assisted housing on FSP participation and benefit levels among former food stamp non-recipients do not result in increased total food spending, partly because the effects on food stamp participation are weaker than for public housing, and partly because the increased food stamp benefits are offset with reduced out-of-pocket food spending.¹³

Estimated effects of housing assistance on family income remain negative in the regression results. In only one case, FSP non-participants moving into privately-owned assisted housing using the first-difference specification, is the negative effect of housing assistance on family income statistically insignificant.¹⁴ But in a supplementary analysis (results not shown), privately-owned assisted housing was also found to sharply increase AFDC participation and benefit levels for this group. It is therefore unclear how to interpret the results on the effects of privately-owned assisted housing on the family incomes of FSP non-participants.

Conclusions

Public and privately-owned assisted housing have distinct effects on food spending. Public housing reduces out-of-pocket and total food spending among those who were already receiving food stamps when they moved in. But among those not formerly receiving food stamps, public housing tends to raise food spending, because it increases FSP participation rates. Privately-owned assisted housing also raises FSP participation rates among former food stamp non-recipients, but it has no statistically significant effects on total or out-of-pocket food spending.

The greater disadvantage of those who move into public housing may explain why it has different effects on food stamp recipients and non-recipients. Food stamp recipients who move into public housing have the lowest base period incomes of all groups, and their incomes drop sharply after they move. Gunderson and Gruber (2001) report that negative income shocks are an important determinant of food insufficiency. It may be that the income loss of food stamp recipients who move into public housing is cutting into their food budgets.¹⁵ On the other hand,

offsetting the effect on increased food stamp receipt, but the first difference model does not. Both of these disparities can be attribute to unobserved family characteristics biasing the simple change estimates. Our discussion focuses on the results of first difference models because these are theoretically superior estimates of causal effects.

¹³ The effect of privately-owned assisted housing on reduced out-of-pocket food spending among former food stamp non-recipients is not statistically significant. Nonetheless, it offsets the effect of increased food stamp receipt in the regression model.

¹⁴ When the log income specification is used, the coefficient on privately-owned assisted housing for FSP participants is actually positive, but statistically no different than zero.

¹⁵ This possible explanation is valid even though income is controlled for in the statistical models, because it represents a complex effect (i.e., sharp income decline that cuts into food spending only when prior income is below a certain threshold) not controlled for by simply including base-period income.

food stamp non-recipients who move into public housing have the lowest base-period food spending of any group, which suggests that their food spending may have been inadequate. The fact that the simple change model detected reductions in out-of-pocket food spending associated with moving into public housing for food stamp recipients, but the first difference model did not, indicates that unobserved family characteristics are responsible for the depressed food spending of this group. The large increase in their food stamp benefits associated with the move into public housing may have been necessary to insure adequate spending.

The failure of privately-owned assisted housing to affect food spending could be attributed to its detrimental impact on income. Another possibility is that these families were already spending an adequate amount on food before they received housing assistance. As seen in Table 1, the annual average base-period food spending of families who moved into privately-owned assisted housing was more than \$1,450 per person, above average annual per capita spending for food consumed at home for the U.S. during the period covered in this study.¹⁶

Housing assistance increases FSP participation and benefit levels for those not receiving food stamps, but does not prolong or increase it for those already receiving food stamps. We earlier offered two reasons to expect housing assistance to increase FSP participation and benefit levels: managers or residents of assisted housing could provide information to new tenants about their food stamps eligibility, or the community could be more accepting of food stamp use. The finding that housing assistance reduces family income suggests a third explanation: housing assistance could increase FSP participation by reducing incomes and rendering families eligible who were not before. The first explanation is more consistent with the results presented here. If community acceptance of food stamp use were an important factor, we would expect to find that housing assistance prolongs FSP participation, particularly in light of the negative effect of housing assistance on family income. If negative income effects were a key factor, we would also expect housing assistance to prolong FSP participation, because the impact of housing assistance on incomes was equally strong for FSP participants and non-participants. Information availability is, therefore, likely to be the most important factor. The expectation that housing assistance would shrink FSP benefits for FSP participants by reducing their shelter expense deductions is not supported. It may be that the benefit levels of FSP participants who received housing assistance were maintained because their family incomes declined.

Consistent with what has been found for other public assistance programs, the receipt of housing assistance appears to retard family income growth. There are many possible explanations for this result. One explanation is that housing assistance may entail negative incentive effects on work effort and earnings. If this disincentive interpretation is correct, then there is no evidence that these disincentive effects are exacerbated by the use of food stamps. Thus, the disincentive effects of the two programs appear to be roughly additive, not multiplicative as hypothesized. Another possible reason for the income loss is that housing assistance could allow women to exit difficult or abusive relationships with men. This speculation derives from the work of Hannan, Tuma, and Groeneveld (1977) who found an “independence effect” associated with an assured income stream for low-income women. A third explanation is that the move into assisted housing may have been precipitated by a major event, such as the onset of a serious illness or injury, which limited work activity and reduced the

¹⁶ Authors’ calculations based on data from the USDA’s Economic Research Service (USDA 2001).

waiting time required between applying for and obtaining housing assistance.¹⁷ In future work, we hope to evaluate these explanations.

¹⁷ The statistical models controlled for the presence of a work-limiting disability in the base period, but the onset of disability and the receipt of housing assistance could be nearly simultaneous if the disability moved the family to the top of the waiting list for housing assistance. The statistical models did not control for this possibility.

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*Interactive Effects of Housing Assistance and Food Stamps
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Table 1: Base-Period Sample Characteristics (Means)

	Full Sample			Public housing			Privately-owned assisted housing		
	Assisted (N=353)	Controls (N=1058)	Equal? (p values)	Assisted (N=147)	Controls (N=441)	Equal? (p values)	Assisted (N=206)	Controls (N=617)	Equal? (p values)
Black	0.79	0.77	0.550	0.88	0.86	0.493	0.72	0.71	0.780
Age	30.1	31.1	0.113	31.1	32.8	0.113	29.4	29.9	0.479
Married	0.49	0.49	0.963	0.50	0.50	1.000	0.48	0.48	0.951
HS grad	0.51	0.55	0.288	0.38	0.43	0.335	0.61	0.63	0.544
Household size	4.42	4.54	0.422	4.97	4.98	0.970	4.03	4.22	0.255
Number of children	2.44	2.47	0.760	3.11	2.87	0.219	1.96	2.19	0.071
Any children <6	0.63	0.62	0.627	0.64	0.60	0.435	0.63	0.63	0.979
Disabled	0.21	0.20	0.545	0.22	0.21	0.773	0.20	0.19	0.581
Own household	0.85	0.86	0.666	0.87	0.88	0.829	0.84	0.85	0.705
Home owner	0.16	0.17	0.962	0.13	0.15	0.633	0.19	0.18	0.762
Total family income	24,655	28,497	0.001	22,358	25,733	0.041	26,295	30,472	0.011
Out-of-pocket food \$/person	1,235	1,319	0.069	1,112	1,319	0.002	1,327	1,319	0.903
Used food stamps	0.48	0.41	0.018	0.54	0.46	0.078	0.44	0.38	0.103
Value of food stamps/person	223	198	0.221	286	214	0.027	178	187	0.718
Total food \$/person	1,446	1,506	0.152	1,391	1,521	0.034	1,487	1,495	0.883
Used AFDC	0.33	0.32	0.801	0.41	0.36	0.326	0.27	0.29	0.585
Changed residence	0.59	0.47	0.000	0.59	0.44	0.003	0.59	0.49	0.012
Housing expenses	3,551	3,580	0.845	3,232	3,268	0.859	3,789	3,814	0.907
Place population (log)	11.94	11.75	0.210	12.30	12.14	0.465	11.66	11.47	0.332

Source: PSID-Assisted Housing Database

Notes:

1. Food spending, value of food stamps, and income are all annual figures.
2. Monetary values adjusted to 2001 dollars.

Table 2: Means of Outcome Measures in Base and Outcome Periods

	Public Housing				Privately-owned assisted housing			
	Received food stamps in base period		Did not receive food stamps in base period		Received food stamps in base period		Did not receive food stamps in base period	
	Base period	Outcome period	Base period	Outcome period	Base period	Outcome period	Base period	Outcome period
Annual total spending on food eaten at home per person								
Assisted	1482	1386	1308	1538	1422	1343	1567	1436
Controls	1490	1584	1576	1623	1452	1375	1553	1484
Annual out-of-pocket spending on food eaten at home per person								
Assisted	980	839	1308	1216	1062	927	1567	1264
Controls	1058	1119	1576	1536	993	972	1553	1377
Percent receiving food stamps								
Assisted	100	89	0	52	100	65	0	37
Controls	100	73	0	21	100	64	0	23
Annual food stamp benefits per person								
Assisted	512	550	0	322	386	413	0	164
Controls	449	463	0	90	478	400	0	99
Annual total family income								
Assisted	18,807	15,812	27,064	19,584	19,839	19,343	31,605	28,532
Controls	18,993	22,506	32,010	34,274	20,399	21,701	37,104	39,325

Source: PSID-Assisted Housing Database

Notes:

1. Monetary values adjusted to 2001 dollars.

Table 3: Regression Estimates for Effects of Housing Assistance

	Public Housing					Privately owned assisted housing				
	Received food stamps in base period		Did not receive food stamps in base period		Equal? (p values)	Received food stamps in base period		Did not receive food stamps in base period		Equal? (p values)
	Coef.	p	Coef.	p		Coef.	p	Coef.	p	
<i>Simple change models</i>										
Total food \$/person	-205	0.049	-69	0.497	0.359	-20	0.818	-28	0.671	0.938
Out-of-pocket food \$/person	-268	0.016	-242	0.026	0.867	-44	0.637	-104	0.157	0.627
Used food stamps	0.17	0.004	0.25	0.000	0.386	-0.03	0.628	0.14	0.008	0.048
Value of food stamps/person	71	0.180	172	0.001	0.185	36	0.419	76	0.031	0.499
Total family income	-8,937	0.000	-9,882	0.000	0.767	-2,751	0.305	-7,961	0.000	0.136
Log family income	-0.36	0.000	-0.45	0.000	0.522	-0.17	0.073	-0.24	0.001	0.585
<i>First difference models</i>										
Total food \$/person	-271	0.036	193	0.222	0.019	21	0.842	29	0.743	0.955
Out-of-pocket food \$/person	-215	0.108	26	0.875	0.241	-27	0.810	-93	0.325	0.653
Used food stamps	0.01	0.966	1.31	0.000	0.000	-0.66	0.001	0.77	0.000	0.000
Value of food stamps/person	-20	0.744	178	0.025	0.044	56	0.240	123	0.002	0.267
Total family income	-14,725	0.000	-12,369	0.001	0.617	-17,018	0.000	-1,241	0.704	0.002
Log family income	-0.58	0.000	-0.53	0.005	0.833	-0.70	0.000	0.03	0.790	0.000

Source: PSID-Assisted Housing Database

Notes:

1. Food spending, value of food stamps, and income are all annual figures.
2. Monetary values adjusted to 2001 dollars.
3. Simple change models for whether used food stamp were estimated using probit. Coefficients from these models are transformed to indicate effect on probability of food stamps receipt in outcome period with all independent variables set to their means.
4. First-difference models for whether used food stamps were estimated using ordered probit. Coefficients from these models are not directly interpretable.
5. The “Equal?” column contains the p-values of test statistics for the equality of coefficients between base-period food stamp recipients and non-recipients.

Appendix: Matching Procedures Used for Sample Construction

Candidates for the comparison sample consist of women with children for whom there is complete PSID data over a five-year span. That is, candidates consisted of person-time span pairs. For example, an unassisted person observed between 1968-1972 might be one “candidate,” and the same person observed between 1969-1973 could be another. Persons were permitted to appear in the assisted or comparison pool only once. Thus, persons who received housing assistance at some point were excluded from the comparison pool, even if they had a five-year span without housing assistance at a different time.

The initial comparison pool consisted of roughly 7,000 observations, or about 20 potential matches for each member of the assisted group. We screened this down to about 5,000 observations by matching on: (1) calendar year of observation; (2) sex; (3) marital status; and (4) earnings " \$5,000. The three “closest” candidates from the comparison pool were then drawn for each member of the assisted sample, with closeness measured by a distance metric using the following 10 characteristics: (1) race; (2) relation to head-of-household; (3) age; (4) education; (5) disability; (6) housing tenure; (7) number of children age 5 or less; (8) earnings; (9) state of residence; and (10) population of place of residence. The basic algorithm consists of sorting the assisted sample three times in random order and, proceeding from top to bottom, allowing each assisted person to “select” her closest match from the candidate pool. The selected person was then excluded from further matches. Note that because each member of the assisted sample is explicitly matched to three members of the comparison sample, it is possible to identify comparison groups of the two major forms of housing assistance. That is, it is known who is matched to public housing residents and who is matched to other assisted housing.

In constructing the distance metric, a variety of weighting schemes were tested by examining the quality of match produced. The final weighting scheme used the reciprocals of the means of the squared components, with heavier weights on race, tenure, and earnings, and reduced weights on population of the place of residence. To further improve the fit, we tested a pairwise-interchange heuristic, but the additional effort yielded little progress, largely because there was an 80 percent overlap between draws of the comparison sample using the basic algorithm alone.