URBAN HOMEOWNERSHIP AND MENTAL HEALTH:
Mediating Effects of Perceived Sense of Control and Community Trust

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Abstract

This research examines whether the relationship between homeownership and mental health is mediated by perceived sense of control or trust in neighbors. Drawing on social disorganization theory, I propose that homeownership increases trust and perceptions of control, which mediate the impact homeownership has on mental health. This hypothesis is tested using data collected from respondents in thirty low-wealth urban areas. Using propensity score matching and regression models, I find that homeowners report a greater sense of control and trust in their neighbors. Homeownership likewise has an impact on mental health, but the effect is entirely mediated by perceived sense of control. On the other hand, I find no relationship between the increased sense of trust among homeowners and their mental health outcomes. These findings are discussed in light of the need for a cohesive theory of homeownership, particularly in light of changing economic realities.

Introduction

Several recent studies have examined the relationship between homeownership and outcomes related to mental health such as self-esteem or life satisfaction, but the findings have been mixed (Rossi and Weber 1996). One possible reason for these inconsistent results is that researchers have generally failed to examine the potential mechanisms that associate homeownership with mental health. It is crucial to move beyond simply linking homeownership to individual outcomes and ask why homeownership is (or is not) producing an observed outcome. What is it specifically about the homeownership experience that produces the outcome? Answering this question allows us to expand our theoretical understanding of homeownership and suggests potential ways to improve the rental experience as well.

In this study, I test two potential mediating effects that may explain a link between homeownership and mental health. My hypothesis is that homeownership reduces the risk of mental health concerns by increasing perceptions of being in control of the important aspects of one's life and trusting one's neighbors. In this way, I look inside the proverbial "black box" to gain traction not only on how homeownership affects mental health but why. This advances research on theories of homeownership and contributes to scholarship on the sociology of mental health by examining how perceptions of social stability and trust are linked to psychological well-being.

This study also makes a second contribution to research on urban homeownership. With few exceptions, past research in this area has failed to account for selection bias. People self-select whether to buy or rent a home, and it is likely that this selection effect

resulted in some overestimation of the impact of homeownership in many prior studies (Dietz 2003). It is probable that some of the same resources which facilitate buying a home, such as having higher education or income, also decrease the risk of untreated mental health difficulties. In this study, I explicitly model selection bias using propensity score analysis to account for socio-demographic differences between homeowners and renters. Because this study employs a rich data set with a wide range of measures, I am able to efficiently model selection and derive robust estimates of the effects of homeownership, perceptions of trust, and sense of control.

Finally, this study offers a valuable contribution to current debates about the costs and benefits of homeownership in lower-wealth urban communities. Until the recent boom and bust in the housing market, homeownership had been a central element of American social policy since the 1930's and considered an integral part of wealth-building and urban revitalization (Herbert and Belsky 2006), although questions were raised even before the downturn as to whether the supposed benefits of homeownership had been oversold (Shlay 2006). These questions became even more urgent in light of the housing market downturn which began in 2007 which has generated negative financial and social consequences for vulnerable homeowners. Homeowners have lost a total of over $7 million in housing wealth (Federal Reserve Flow of Funds Report), and there is emerging evidence that homeowners facing foreclosure or negative equity situations are at greater risk for depression, chronic health problems, and risky health behaviors such as smoking and drug use (Bennett, Scharoun-Lee, and Tucker-Seeley 2009). These findings provide a stark reminder that homeownership is not always good

for everyone and call us to critically re-examine the costs and benefits of homeownership for less affluent households. This study uses data collected in 2009, well after the housing market downturn began, to examine the relationship between homeownership and mental health in light of the new economic reality of the post-downturn environment. This unique data set and offers an unparalleled opportunity to analyze the social impacts of homeownership among lower-wealth households during and after the financial crisis.

Social Disorganization Theory

Research on the sociology of mental health has developed strong evidence to support the claim that external social factors can play a significant role in one's risk of experiencing mental health difficulties. People who live in disadvantaged neighborhoods with little stability or shared trust are at a greater risk of experiencing mental health impairments (Roach and Gursslin 1965; Sampson, Morenoff, and Gannon-Rowley 2002). However, even within the most disadvantaged communities there is great variation in outcomes. It remains unclear what protective factors serve to reduce the risk of mental health difficulties for some residents. In this research, I draw on social disorganization theory (Sampson and Groves 1989; Sampson 1991; Sampson and Raudenbush 1999) to derive hypotheses about the relationship between homeownership, an individual decision with structural significance, and mental health outcomes in low-wealth urban neighborhoods. This emphasis on within-neighborhood variation highlights the importance of understanding how diverse outcomes can emerge from similar neighborhood contexts.

Social disorganization theory has widely been used to explore community-level differences in crime and delinquency (Sampson and Groves 1989; Shaw and McKay 1942). Originally proposed by Shaw and McKay in 1942, social disorganization theory posits that the instability and economic deprivation which characterize disadvantaged urban neighborhoods lead to an inability to solve shared problems or accomplish common goals. This lack of regulatory capacity, in turn, causes increases in crime. This theoretical model has been supported across a variety of settings including public housing projects (Roncek, Bell, and Francik 1981), neighborhoods in Chicago (Sampson and Groves 1989; Sampson and Raudenbush 1999), and rural communities (Lee and Bartkowski 2004).

Since its initial formulation, social disorganization theory has also been shown to effectively explain outcomes other than crime rates. In research examining child development, for example, Sampson (1991) found that children who lived in neighborhoods with high levels of disorder were at greater risk of experiencing health problems. Sampson proposed that community instability matters because it prevents the development of social capital – the shared sense of trust and support for common goals that underlie cohesive and efficacious communities. Without social capital, it becomes difficult for communities to maintain social controls and sustain pro-social behavior, whether it be refraining from crime or obtaining medical care for a child (Bursik 1988; Kornhauser 1978; Sampson 1988).

There have been some attempts to link perceptions of social disorganization with mental health outcomes. Latkin and Curry (2003) found that people who thought their

neighborhoods had problems with crime were more likely to subsequently experience an increase in symptoms of depression. Ross (2000) found that the increase in depression associated with poverty was entirely mediated by perceptions of neighborhood disorder. Other researchers have linked perceptions of neighborhood instability to feeling a lack of control (Geis and Ross 1998), and mistrusting others (Ross, Mirowsky, and Pribesh 2001). However, none of these studies explored factors which may be associated with perceptions of social disorganization. What factors affect whether someone feels that their neighborhood is stable or not, or the extent to which they trust their neighbors? In this study, I test whether homeownership is one such factor.

Homeownership and Perceptions of Trust

Residential instability is a key component of social disorganization theory. Institutions of control and regulation are difficult to maintain when people are not invested in remaining in a given community (Kornhauser 1978, p.78). People who do not expect to remain in an area very long have few incentives to devote their resources towards community institutions since they would not benefit from them in the long term. Interpersonal connections likewise are not durable when people expect to be leaving a neighborhood (Berry and Kasarda 1977). It is difficult for people to feel trusting of their neighbors if they have new neighbors every few months, or if they themselves plan to move. This is one way homeownership status may color perceptions of a neighborhood. There is simply less reason to "get to know the neighborhood" if one does not expect to stay.

In fact, we know from prior research that homeowners are much less mobile than renters; one study found the median length of time a household stayed in any given dwelling was two years for renters but eight years for homeowners (Rohe, Van Zandt, and McCarthy 2000). However, research has also found that long-term renters and homeowners shared similarly favorable assessments of their neighborhoods (Rohe and Stegman 1994). One study of homeowners in the Midwest found that people became more satisfied with their neighborhoods the longer they lived in them (Galster 1987). It is possible that homeowners will feel more trusting of their neighbors because they expect to live there longer and therefore have more to gain by forming social ties to others in the neighborhood.

It is not only residential stability that may generate homeowners' favorable perceptions on their neighborhoods and neighbors. Owning a home means also owning part of a neighborhood. Brown, Perkins, and Brown (2003) refer to this as "place attachment" – a sense of attachment and commitment to the home and those in the immediate neighborhood. Overall, place attachment is stronger for homeowners and long-term renters than for more transient residents. Woldoff (2002) found that the strongest predictor of place attachment is homeownership; it was even more influential than the actual attributes of the neighborhood. Thus homeownership creates a strong attachment to one's home and neighborhood, leading to more favorable perceptions of the neighborhood. In addition to residential stability, place attachment may also generate feelings of trust towards one's neighbors among homeowners.

Sense of Control

In addition to trust, I also test a second potential mechanism which may mediate the relationship between homeownership and mental health – sense of control. In much the same way that social disorganization erodes trust within a community, it also diminishes residents' sense of being in control of their lives. Conversely, people who live in neighborhoods with low crime rates and strong social ties to others are more likely to feel empowered to control and direct the important aspects of their lives (Furstenberg and Hughes 1995).

Homeownership is linked to sense of control in two ways. First, Rohe, Van Zandt, and McCarthy (2000) theorized that homeowners have higher self-efficacy than renters because they have more actual control over the physical structure of their residence, as well as more control over if and when they move from the property. This actual control over one's living space and tenure leads to a generalized sense of control over important life events (Rohe and Basolo 1997).

Rohe, Van Zandt, and McCarthy (2002) expanded their theory linking homeownership to sense of control by also focusing on the normative nature of homeownership. Owning a home is a goal of the majority of Americans and is, rightly or otherwise, viewed as a symbol that one has achieved financial security or social status (Doling & Stafford 1989, Perin 1977). Some research has found that people who become homeowners experience a greater sense self-esteem and control over their lives due to accomplishing the goal of purchasing a home (Rohe and Basolo 1997; Rossi and Weber 1996). Having successfully completed the often-difficult task of purchasing a home, homeowners may feel more empowered to take on other major life events.

Hypotheses

The goal of this research is two-fold. First, I aim to contribute towards a general theory of homeownership by moving towards an understanding of both if and why homeownership is related to mental health. Second, the study investigates two potential linking mechanisms - trust in neighbors and sense of control - which may mediate the relationship between homeownership and mental health.

Social disorganization theory suggests that homeowners will be more likely to report feeling that they can trust their neighbors because their lower mobility enables them to form social ties within the neighborhood. Likewise, theories of homeownership indicate that homeowners will feel a greater sense of control over their lives as a result of their actual control over their living spaces and their experiences having successfully accomplished the goal of purchasing a home. Therefore, my first two hypotheses are:

H1a: Homeowners will report a greater sense of control over their lives than renters.

H1b: Homeowners will be more likely to feel that they can trust their neighbors than renters.

Social disorganization theory suggests that both trust in neighbors and sense of control are related to mental health. The second two hypotheses are therefore:

H2a: People who feel a greater sense of control over their lives will be less likely to experience mental health difficulties.

H2b: People who feel that they can trust their neighbors will be less likely to experience mental health difficulties.

The final focus of this study is to evaluate, if the four prior hypotheses are confirmed, to what extent the relationship between homeownership and mental health is mediated by either sense of control or trust in neighbors. Because there is no basis to hypothesize a link between homeownership and mental health beyond that which is rooted in the two mediators, the final hypothesis is:

H3: Homeownership has only an indirect effect on mental health which is entirely mediated by sense of control and trust in neighbors.

Data

This research uses the Community Advantage Panel Study (CAPS) data set. CAPS began in 2004 as a random survey of homeowners who received mortgages funded by the Community Advantage Program (CAP), a secondary mortgage market program, and renters living in the same neighborhoods as the selected CAP homeowners. The goal of CAP was to underwrite 30-year fixed-rate mortgages for borrowers who otherwise likely would not have qualified for prime mortgages. All borrowers met one of the following criteria: 1) have an annual income of no more than 80% of the area median income (AMI), 2) be a minority with an income not in excess of 115% of AMI, 3) purchase a home in a high-minority (>30%) or low-income (<80% of AMI) census tract and have an income not in excess of 115% of AMI. By the end of 2004, CAP had funded 28,573 mortgages.

In 2004, 3,743 CAP homeowners were randomly selected to participate in CAPS, as were 1,530 renters who lived in the same neighborhoods as the homeowners. The renters met the same income criteria that the owners met in order to qualify for a CAP

mortgage. The sample was limited to the 30 metropolitan areas in the United States with the highest number of CAP owners. The renter sample was obtained by randomly calling households who lived within the same census blocks as selected CAP homeowners, based on public telephone directory lists.

Since 2004, CAPS participants have responded to annual surveys on a wide range of topics. While a small core set of questions are asked annually, most of the questions change from year to year. The data used in this research comes from questions asked only in the 2009 survey. The analytic sample is therefore comprised only of respondents who participated in that survey and had valid data on all variables of interest – a total of 2,180 homeowners and 893 renters. The majority of attrition, around 30% for both groups, occurred between the year one and year two surveys. As with most surveys, attrition is higher among minorities, respondents with less education, and those over age 40. The vast majority of attrition was due to respondents who could not be located; very few participants declined to be re-interviewed.

In order to assess how CAPS compares to a random national sample, Riley and Ru (2009) compared the 2004 CAPS sample of homeowners with a sample of low-income homeowners who participated in the 2004 Current Population Survey (CPS). The socio-demographic composition of CAPS is very similar to the CPS sample. The CAPS sample of homeowners includes a greater percentage of minority respondents than the CPS sample of homeowners since one of the goals of the original program was to increase minority access to homeownership. The other notable difference between CAPS and CPS is that over 90% of CAPS homeowners are employed compared to only 70% of

CPS low-income homeowners. We presume this is because all CAPS owners purchased their homes fairly recently and therefore had to have a steady source of income at that time, while the CPS owners likely include more retirees who purchased their homes much earlier.

Measures

The independent variable of interest is homeownership. Homeownership is measuring using a dichotomous variable coded 1 for homeowners and 0 for renters. Respondents were coded based on their primary residence; people who lived in a rental property but owned another property were coded as renters.

Both sense of control and trust are mediating variables which mediate the relationship between homeownership and mental health. Sense of control is measured using Cohen's Perceived Stress Scale (PSS), a scale designed to measure the degree to which people feel they have control over the important aspects of their lives (Cohen, Kamarck, and Mermelstein 1983). The scale contains 4 items, two of which are reverse coded. The four items in the PSS are: 1) in the last month, how often have you felt that you were unable to control the important things in your life, 2) in the last month, how often have you felt confident about your ability to handle your personal problems, 3) in the last month, how often have you felt that things were going your way, and 4) in the last month, how often have you felt difficulties were piling up so high that you could not overcome them? Each of the 4 items comprising the scale have the following response options: 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often. Scores range from 0 (no stress/high control) to 16 (high stress/low control), and the scale

is descriptive rather than diagnostic. A lower PSS score therefore indicates a greater sense of control. The second mediating variable is trust in one's neighbors. Respondents were asked, "How much would you say you can trust your neighbors: a lot, some, or none?" Respondents who said they trusted their neighbors a lot were coded 1, and all others were coded 0.

The dependent variable is mental health. We measure this using the question, "During the past four weeks, have you accomplished less than you would like to as a result of any emotional problems, such as feeling depressed or anxious?" People who answered yes were coded 1, all others 0. Just over 14% of the sample reported that they had experienced a mental health problem in the prior month.

Our models include the following control variables: age, education, marital status, employment, race, the presence of children in the home, and dwelling type. In the first model presented, these variables are used to predict homeownership and calculate the propensity scores. In subsequent models, these variables are controls in the models predicting perceived stress, trust, and mental health. These variables have been shown in past research to be correlated with homeownership (Manturuk, Lindblad, and Quercia 2009; Manturuk, Lindblad, and Quercia 2010).

Age is measured as a continuous variable. Education is measured as a categorical variable with the following categories: high school degree or less, some college, 2-year degree, 4-year degree, and advanced degree. The reference group is high school degree or less. Marital status is also measured categorically with the following categories: married, divorced/separated, widowed, single, and cohabiting. The reference group is

married. Employment is measured with the following five categories: employed full-time, employed part-time, unemployed, retired, and not in the labor force. The reference category is employed full-time. Race is measured using the categories white, black, Asian, and other race. The reference is white. We include an indicator variable for whether there are any children under age 18 in the home. Finally, I include dwelling type as a categorical variable with the following three categories: single-family detached dwelling, multi-family dwelling, and other dwelling type. The reference is single-family house.

Methods

I use propensity score analysis, OLS regression, and logistic regression models to evaluate the relationship between homeownership, sense of control and trust, and mental health. Propensity score analysis aims to address the selection bias that is inherent in observational studies (Guo and Fraser 2009). There are two primary flaws in traditional regression analysis. First, the selection variable is specified by these models as exogenous but is actually endogenous. In this research, for example, a traditional covariate control model would model homeownership as exogenous when it is not. In order to derive robust estimates, selection needs to be explicitly modeled (Heckman 1978; Heckman 1979).

Second, traditional regression models assume that selection is independent from the outcome of interest. When this assumption is violated, as it often is, regression models yield biased and inconsistent estimation of the regression coefficients (Berk 2004; Imbens 2004; Rosenbaum and Rubin 1983). In the present study, respondents selected

whether to purchase or rent their homes, and this selection must be modeled in order to obtain unbiased results.

This study uses the Neyman-Rubin counterfactual framework (Morgan and Winship 2007; Neyman, Iwaszkiewicz, and Kolodziejczyk 1935; Rubin 2006; Rubin 1974) to guide the theoretical model of causality. Within this framework, a *counterfactual* is a potential outcome that is not observed in the data. In order to evaluate the causal effect of a treatment, we must be able to evaluate the counterfactuals - what outcomes the treated participants would have manifested if they had not received treatment. In this study, there are the following three counterfactuals: 1) the risk of mental health issues a homeowner would have if s/he were renting, 2) the level of perceived stress s/he would have, and 3) the likelihood of trusting his/her neighbors. A key assumption of the Neyman-Rubin counterfactual framework is that we can not assume that the counterfactual for the homeowners is the same as the observed outcome for the renters. If the homeowners in this study had remained renters, they might still have a different risk of mental health issues or report a different level of perceived stress.

I employ propensity score within-caliper one-to-one matching (Rosenbaum and Rubin 1983; Rosenbaum and Rubin 1985) which uses binary logistic regression to estimate propensity score of receiving treatment (i.e., owning a home). By definition, a propensity score is a conditional probability of a participant receiving treatment given observed covariates. In this study, the propensity score represents the probability a respondent is a homeowner given the following covariates: age, education, marital status, employment status, race, the presence of children in the home, and the dwelling type.

Following Rosenbaum and Rubin (1985), this study employs the logit of the predicted probability:

$$\hat{q}(x) = \log[(1 - \hat{e}(x)) / \hat{e}(x)]$$

where $\hat{e}(x)$ is the predicted probability from the logistic regression because the distribution of $\hat{q}(x)$ approximates to normal.

After calculating the propensity score for each participant, we matched the homeowners to renters based on the estimated propensity scores. The matching algorithm, nearest neighbor within caliper matching (Rosenbaum and Rubin 1985), selects a control participant *j* as a match for treated participant *i*, if and only if the absolute distance of propensity scores between the two participants (i.e., the difference between propensity scores P_i and P_j) meets the following condition:

$$|| P_i - P_j || < \varepsilon,$$

where ε is a pre-specified tolerance for matching, or a caliper. Rosenbaum and Rubin (1985) suggest using a caliper size of a quarter of a standard deviation of the sample estimated propensity scores (i.e., $\varepsilon \leq .25\sigma_P$, where σ_P denotes standard deviation of the estimated propensity scores of the sample). For this analysis, the caliper is 0.31.

Results

Descriptive statistics for all variables, before matching, are shown in Table 1. The overall sample is about 70% homeowners and 30% renters. Almost 15% of the sample reported that they had a mental health concern in the prior month, although the

mean PSS score was a fairly low 9.5. A total of 46% of people reported that they felt a great deal of trust in their neighbors. The sample shows an even distribution of education, and almost half the respondents were married in 2009. Just over 65% of the sample was employed full-time, and no other employment category was over ten percent. Almost 60% of the sample was white, and almost half the respondents had children under of the age of 18 living at home. The majority of respondents lived in single-family detached dwellings, although almost 23% lived in apartments, townhouses, condominiums, or other attached housing.

As discussed previously, I used propensity score matching to account for selection bias. The homeowners and renters differ significantly on many socio-demographic measures, and failing to account for these differences could bias the results. As examples, 14% of renters have a 4-year college degree compared to 19% of homeowners, and 36% of the renters are black compared to 19% of the homeowners.

Table 2 shows the logistic regression model predicting homeownership, from which I calculated the propensity scores. The model indicates that three of the covariates were not significant; age, having some college, and having children in the home did not predict whether someone was a homeowner within this sample. All the other variables were significant and had the expected effects. Using the matching procedure described above, 655 owners were matched to renters, resulting in a matched sample of 1310 owners and renters. Table 3 presents descriptive statistics on all variables after matching. As shown, the distribution of the sample is very similar before and after matching

Table 4 presents the coefficients from OLS regression models predicting sense of control with lower scores indicating a greater sense of control. Model 1 is a bivariate model which includes only the homeownership indicator variable. The results show that being a homeowner is associated with feeling a greater sense of control over one's life; homeowners score 0.59 points lower on the stress scale. Even with the inclusion of a full set of demographics, shown in model 2, the effect size is consistent. Very few of the control variables are significant, as we would expect given the propensity score matching. The largest effects are seen for employment; unemployment is associated with a 1.56 point decrease in sense of control (increase in perceived stress) and being out of the labor force is associated with a 1.1 point decrease.

Having established a link between homeownership and perceived control, the next stage of the analysis tests whether there is a similar link between homeownership and perceived trust in neighbors. My hypothesis is that both stress/control and trust are mechanisms which link homeownership to mental health outcomes. Table 5 shows the results of the logistic models predicting trust. The initial bivariate model finds that homeownership is associated with a 15.8% increase in the likelihood that a respondent trusts his/her neighbors. In model 2, the full model with controls, the homeownership effect is much larger at 68.9% higher likelihood. The variable is significant at the $p<0.001$ level in both models.

Having established an association between homeownership and both perceived control and trust in neighbors, the final step in the analysis is to determine whether either of these two mechanisms translates to a decreased likelihood of mental health difficulties.

Table 6 presents the logistic odds ratios from models predicting whether a respondent reported having experienced a mental health concern in the prior four weeks. Model 1 includes only the homeownership variable and the set of control variables. As shown, homeowners are 65.8% as likely as renters to have experienced a mental health issue. Again due to the propensity score matching, very few of the control variables are significant. People who are divorced are more likely to have mental health concerns, as are people who are not working full time.

Model 2 tests whether people who feel a great deal of trust in their neighbors are less likely to report mental health concerns. Interestingly, this variable is not significant indicating that trust in neighbors does not decrease a respondent's risk of mental health difficulties. While prior models documented an association between homeownership and trust, and homeownership and mental health, model 2 indicates that the outcomes of mental health and trust are unrelated to each other.

Model 3 tests whether there is a relationship between feeling in control of one's life and experiencing a mental health problem. As hypothesized, people who have higher levels of perceived stress, or who feel less in control, are more likely to report a mental health impairment. The effect is fairly substantial; each 1-point increase in stress is associated with a 46.9% increase in one's risk of mental health difficulties. Having determined that both homeownership and perceived control decrease the risk of mental health issues, I run a final model testing whether perceived control mediates the homeownership effect.

Model 4 includes the variables for both homeownership and sense of control. With the inclusion of the perceived stress measure, homeownership is not a statistically significant predictor of mental health. However, perceived stress was again significant; each 1-point increase in stress was associated with a 46.1% increase in the risk of a mental health difficulty. This supports the hypothesis that giving people a sense of control over their lives in the mechanism that links homeownership with decreased mental health issues.

The models have thus far confirmed the following four relationships which satisfy the criteria for mediation: 1) homeownership predicts sense of control, 2) homeownership predicts mental health when sense of control is excluded, 3) sense of control predicts mental health, and 4) the effect of homeownership on mental health is reduced upon including sense of control in the model. In order to measure the extent of mediation, I conducted the Sobel-Goodman mediation test which indicated that sense of control mediated 72.36% of the effect of homeownership on mental health.

Discussion

Based on the results described above, it is now possible to assess whether or not the findings support my initial hypotheses. Hypotheses *H1a* and *H1b* were that homeowners would report feeling a greater sense of control in their lives, and they would be more likely to feel they could trust their neighbors. The findings support both these hypotheses; homeowners had statistically significantly lower stress scores and were almost 70% more likely to trust their neighbors.

Hypotheses *H2a* and *H2b* linked sense of control and trust to mental health outcomes; I hypothesized that both factors would reduce a person's likelihood of experiencing a mental health problem. The results showed mixed support for these hypotheses. Consistent with *H2a*, sense of control was linked with fewer mental health difficulties, but trust (*H2b*) was not. This indicates that sense of control may be a mediating link between homeownership and mental health, but trust is not.

Hypothesis *H3* was that that trust and sense of control mediate the relationship between homeownership and mental health; they explain why homeownership has the observed effect. The lack of support for *H2b* limits *H3* to focus only on sense of control and not trust. The findings show that the homeownership variable is significant when sense of control is not in the model, but it is not significant once the sense of control variable is included. Furthermore, people with low levels of sense of control (high scores on the PSS) are 46% more likely to experience mental health difficulties. Mediation analysis further supports this finding.

There are some limitations worth noting. First, it is possible that some unmeasured factors still differentiate homeowners from renters. Propensity score matching is most efficient for handling selection on observed variables, but does not address selection on unobserved variables. I have sought to minimize this possibility by using a comprehensive set of covariates in the model which generated the propensity scores, but it is possible that some selection bias remains. Future studies may test this by using a method such as instrumental variable regression which can adjust for unobserved selection.

Second, it is also important to note, especially in light of the recent housing downturn in the United States, that all of the homeowners who participated in the CAP program initially received 30-year fixed-rate prime mortgages with a maximum 38% debt-to-income ratio. The homeowners in this study have also accumulated overall positive equity returns, even through the 2007-2010 market downturn. It is likely that homeowners who purchased properties with less-favorable mortgage terms or at over-inflated prices not only might experience different outcomes, they could even experience more mental health difficulties and feel less in control of their lives than renters or other homeowners. These findings are therefore not generalizable to homeowners with sub-prime mortgages, negative equity, or those facing foreclosure, although this is an important avenue for future research.

In spite of these minor limitations, this research answers several important questions and contributes towards an understanding of how homeownership affects individual outcomes. Much of the previous research in this area has focused on exploring what impacts homeowners has on people by asking whether homeowners are more or less likely to manifest some outcome (Dietz and Haurin 2003). My study not only looks at the particular outcome of mental health, but also looks inside the proverbial "black box" to consider why homeownership has the observed effect. I find evidence to support the theory that homeownership empowers people with a sense of control over their lives which, in turn, reduces their risk of mental health problems. This is a valuable step towards developing a comprehensive theory of homeownership and specifying the linking mechanisms that connect homeownership with a range of social outcomes.

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Table 1: Descriptive Statistics – Full Sample (N=3073)

	Percent	Freq.	Mean	SD	Min.	Max.
Mental health impairment	14.7%	453			0	1
Homeowner	70.9%	2180			0	1
Renter	29.1%	893			0	1
Sense of control score			9.52	2.91	4	20
Trust in neighbors	46.4%	1426			0	1
Age			43.14	11.46	28	94
Male	42.8%	1317			0	1
HS degree or less	27.5%	844			0	1
Some college	23.0%	706			0	1
2-year degree	17.9%	550			0	1
4-year degree	17.5%	538			0	1
Advanced degree	13.4%	411			0	1
Married	48.3%	1485			0	1
Divorced/separated	21.6%	663			0	1
Widowed	3.8%	115			0	1
Single	19.2%	589			0	1
Cohabiting	6.9%	211			0	1
Employed full-time	65.8%	2021			0	1
Employed part-time	9.8%	300			0	1
Retired	6.3%	192			0	1
Unemployed	8.3%	255			0	1
Not in labor force	9.9%	305			0	1
White	59.6%	1831			0	1
Black	23.9%	735			0	1
Hispanic	13.1%	402			0	1
Other race	3.4%	105			0	1
Children in home	48.3%	1484			0	1
Single-family house	71.8%	2207			0	1
Multi-family housing	22.8%	701			0	1
Other dwelling type	5.2%	160			0	1

Table 2: Odds Ratios from Logistic Regression Model Predicting Homeownership

	Odds Ratio	z-statistic
Age	1.009	1.61
Some college	1.226	1.6
2-year degree	1.495**	2.82
4-year degree	1.543**	2.88
Advanced degree	2.155***	4.54
Divorced/separated	0.555***	-4.54
Widowed	0.368***	-4.07
Single	0.455***	-5.93
Cohabiting	0.535***	-3.41
Employed part-time	0.605***	-3.27
Retired	0.279***	-6.03
Unemployed	0.421***	-5.54
Not in labor force	0.228***	-10.18
Black	0.483***	-6.59
Hispanic	0.566***	-3.94
Other race	0.588*	-2.17
Children in home	1.187	1.5
Multi-family dwelling	0.194***	-15.42
Other dwelling type	0.357***	-5.64
Log-likelihood	-1457.41	
N	3073	

Table 3: Descriptive Statistics – Propensity Score Matched Sample (N=1310)

	Percent	Freq.	Mean	SD	Min.	Max.
Mental health impairment	17.63%	231			0	1
Homeowner	50%	655			0	1
Renter	50%	655			0	1
Sense of control score			9.8	2.98	4	20
Trust in neighbors	40.61%	532			0	1
Age			44.83	12.07	28	92
Male	31%	406			0	1
HS degree or less	30.76%	403			0	1
Some college	24.73%	324			0	1
2-year degree	14.96%	196			0	1
4-year degree	15.57%	204			0	1
Advanced degree	13.13%	172			0	1
Married	33.97%	445			0	1
Divorced/separated	27.40%	359			0	1
Widowed	5.11%	67			0	1
Single	25.11%	329			0	1
Cohabiting	7.79%	102			0	1
Employed full-time	55.04%	721			0	1
Employed part-time	11.37%	149			0	1
Retired	8.40%	110			0	1
Unemployed	11.83%	155			0	1
Not in labor force	13.36%	175			0	1
White	49.62%	650			0	1
Black	31.83%	417			0	1
Hispanic	14.43%	189			0	1
Other race	4.12%	54			0	1
Children in home	38.32%	502			0	1
Single-family house	57.40%	752			0	1
Multi-family housing	34.35%	450			0	1
Other dwelling type	8.24%	108			0	1

Table 4: Coefficients from OLS Regression Predicting Sense of Control Score – Propensity Score Matched Sample (N=1310)

	Model 1	Model 2
Homeowner	-0.586***	-0.595***
	(-3.58)	(-3.68)
Age		0.011
		(-1.18)
Male		-0.099
		(-0.54)
Some college [1]		0.05
		(-0.23)
2-year degree [1]		-0.225
		(-0.88)
4-year degree [1]		-0.223
		(-0.86)
Advanced degree [1]		-0.950***
		(-3.37)
Divorced/separated [2]		0.363
		(-1.59)
Widowed [2]		-0.202
		(-0.49)
Single [2]		0.376
		(-1.63)
Cohabiting [2]		0.312
		(-0.96)
Employed part-time [3]		0.838**
		(-3.16)
Retired [3]		0.098
		(-0.27)
Unemployed [3]		1.562***
		(-6.02)
Not in labor force [3]		1.103***
		(-4.32)
Black [4]		0.167
		(-0.89)
Hispanic [4]		0.736**
		(-2.87)
Other race [4]		0.374
		(-0.91)
Children in home		0.221
		(-1.12)
Multi-family housing [5]		0.04
		(-0.22)
Other dwelling type [5]		0.288
		(-0.96)
r2	0.01	0.079

* p<0.05, ** p<0.01, *** p<0.001; t-statistics in parentheses

Notes: [1] Reference is high school degree or less, [2] reference is married, [3] reference is employed full-time, [4] reference is white, [5] reference is single family dwelling

Table 5: Odds Ratios from Logistic Regression Models Predicting Trust in Neighbors – Propensity Score Matched Sample (N=1310)

	Model 1	Model 2
Homeowner	1.158***	1.689***
	(4.04)	(4.42)
Age		1.013
		(1.91)
Male		0.821
		(-1.47)
Some college [1]		1.239
		(1.32)
2-year degree [1]		1.495*
		(2.15)
4-year degree [1]		1.222
		(1.06)
Advanced degree [1]		1.836***
		(2.97)
Divorced/separated [2]		0.742
		(-1.79)
Widowed [2]		1.594
		(1.56)
Single [2]		1.001
		(0.01)
Cohabiting [2]		0.905
		(-0.42)
Employed part-time [3]		0.789
		(-1.22)
Retired [3]		0.927
		(-0.30)
Unemployed [3]		0.629*
		(-2.35)
Not in labor force [3]		1.029
		(0.16)
Black [4]		0.574***
		(-4.01)
Hispanic [4]		0.774
		(-1.37)
Other race [4]		0.484*
		(-2.29)
Children in home		0.889
		(-0.82)
Multi-family housing [5]		0.566***

				(-4.18)
Other dwelling type [5]				0.921
				(-0.38)

* p<0.05, ** p<0.01, *** p<0.001; t-statistics in parentheses
Notes: [1] Reference is high school degree or less, [2] reference is married, [3] reference is employed full-time, [4] reference is white, [5] reference is single family dwelling

Table 6: Odds Ratios from Logistic Regression Models Predicting Mental Health Impairment – Propensity Score Matched Sample (N=1310)

	Model1	Model 2	Model 3	Model 4
Homeownership	0.658**			0.807
	(-2.64)			(-1.22)
Trusts neighbors a lot		0.763		0.921
		(-1.66)		(-0.45)
Sense of control score			1.469***	1.461***
			(11.32)	(11.12)
Age	1.017	1.017	1.015	1.016
	(1.92)	(1.88)	(1.52)	(1.61)
Male	0.919	0.862	0.931	0.96
	(-0.46)	(-0.82)	(-0.36)	(-0.20)
Some college [1]	0.987	1.013	0.904	0.904
	(-0.07)	(0.06)	(-0.44)	(-0.44)
2-year degree [1]	1.04	1.07	1.159	1.158
	(0.16)	(0.28)	(0.57)	(0.56)
4-year degree [1]	0.95	0.95	1.044	1.045
	(-0.19)	(-0.19)	(0.15)	(0.15)
Advanced degree [1]	0.751	0.751	0.954	0.975
	(-0.98)	(-0.98)	(-0.15)	(-0.08)
Divorced/separated [2]	1.886**	1.798**	1.639*	1.652*
	(2.89)	(2.68)	(2.09)	(2.12)
Widowed [2]	0.82	0.82	0.778	0.797
	(-0.50)	(-0.50)	(-0.58)	(-0.53)
Single [2]	1.792*	1.730*	1.533	1.562
	(2.47)	(2.33)	(1.66)	(1.72)
Cohabiting [2]	1.701	1.632	1.445	1.451
	(1.67)	(1.54)	(1.07)	(1.08)
Employed part-time [3]	2.155**	2.062**	1.619	1.641
	(2.89)	(2.73)	(1.68)	(1.72)
Retired [3]	2.904***	2.843***	3.135**	3.174***
	(3.40)	(3.32)	(3.28)	(3.31)
Unemployed [3]	5.417***	5.260***	3.576***	3.578***
	(7.51)	(7.38)	(5.11)	(5.10)
Not in labor force [3]	7.609***	7.376***	6.354***	6.497***
	(9.16)	(9.06)	(7.65)	(7.69)
Black [4]	1.064	0.995	1.09	1.103
	(0.33)	(-0.03)	(0.42)	(0.48)
Hispanic [4]	2.180**	2.079**	1.908*	1.939*
	(3.27)	(3.08)	(2.48)	(2.53)
Other race [4]	1.496	1.392	1.733	1.715
	(1.05)	(0.85)	(1.34)	(1.31)
Children in home	0.773	0.765	0.705	0.701
	(-1.28)	(-1.34)	(-1.60)	(-1.63)

* p<0.05, ** p<0.01, *** p<0.001; t-statistics in parentheses
Notes: [1] Reference is high school degree or less, [2] reference is married, [3] reference is employed full-time, [4] reference is white, [5] reference is single family dwelling