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The unequal housing and neighborhood outcomes of displaced movers

Megan Evans

The Pennsylvania State University

Abstract

Involuntary housing displacement is a stress-inducing life event that can cause and exacerbate both psychological and material hardship. Forced moves may invoke a disattainment process, whereby displaced movers move into lower quality housing and neighborhoods, placing them in a precarious housing position. Employing propensity score analyses, this study uses data from the recent mover module of the American Housing Survey to match recent movers whose moves were voluntary to recent movers whose moves were forced. Results show that moves caused by displacement compared to voluntary moves generally lead to worse housing and neighborhood outcomes. However, these results are dependent on the type of displacement experienced. Movers forced to leave their homes due to eviction move into worse housing and neighborhoods while forced moves caused by private action and foreclosure do not. Meanwhile, forced moves caused by natural hazards or government action result in worse housing, but not neighborhoods.

Introduction

Much of the literature on residential mobility takes a human capital and life course approach, where household moves are understood as a response to changing life cycle needs. These households enter a decision-making process where they assess which units may fit their preferences and/or changing circumstances. Said moves are generally considered a part of a residential attainment process, where the household's subsequent housing and neighborhood is either of similar or better quality than their previous residence (Clark, Deurloo, & Dieleman, 2003; Lee & Hall, 2009; Logan & Alba, 1993). Hence, the residential attainment model treats residential mobility as a way to meet life cycle needs, either sustaining social status or increasing it through the attainment of higher quality housing and neighborhoods.

However, some moves are not voluntary, but rather involuntary and forced. Residential displacement can be interpreted through a residential instability model, where it is often low-income, already disadvantaged households who disproportionately experience forced moves (Desmond, Gershenson, & Kiviat, 2015; Newman & Owen, 1982). Finding new housing in often unexpected and unplanned-for circumstances is an added burden on already distressed households which may result in the household moving into a poorer quality housing unit

Contact Information: Megan Evans, Department of Sociology, The Pennsylvania State University, 701 Oswald Tower, University Park, PA 16802. mme5163@psu.edu.

due to both time and monetary constraints (Posthumus & Kleinhans, 2014). Therefore, it is less likely that a household that is forced to move will be able to move into a better or even similar quality housing unit or neighborhood as their previous residence. Indeed, a displaced household may be more likely to move into poorer quality housing, especially compared to a household whose move is a result of their own volition (Desmond et al., 2015; Desmond & Shollenberger, 2015). There are multiple implications for displaced movers who end up in poorer quality housing. They are more likely to face additional health problems (Shaw, 2004) and experience further material hardship as a result of housing repairs. Additional barriers to opportunities and resources will also exist for displaced movers in lower quality neighborhoods (Sampson, 2012). All of these negative consequences are likely to induce further moves (Desmond et al., 2015), adding to displaced movers' residential instability.

If displaced movers experience downward housing mobility, operationalized here as a move into poorer quality housing and neighborhoods, then residential displacement would fall under a residential *disattainment* process (Lee, Matthews, Iceland, & Firebaugh, 2015). Such a downward move may cause or perpetuate existing inequalities, especially if it is the already disadvantaged who disproportionately experience displacement. Examining how forced moves compared to voluntary moves align with the residential attainment versus disattainment process is therefore important for our understanding of the perpetuation of inequality. However, much of the work done thus far on the housing and neighborhood outcomes of displaced movers has been limited in scope. Prior work has often focused on single metropolitan areas and examined only one type of residential displacement. Although these studies have provided compelling findings as to the negative consequences of forced mobility (Desmond et al., 2015; Desmond & Shollenberger, 2015; Allen, 2013), there are several limitations that researchers need to address. For one, while the literature proposes that displaced movers experience more negative housing outcomes than nondisplaced movers, each metropolitan area has its own unique housing market. Hence, it is not clear if these findings hold for most metropolitan and nonmetropolitan areas within the United States. What is more, most recent studies of residential displacement examine only one type of displacement, i.e., displacement caused either by eviction or foreclosure. Therefore, we cannot tell whether the results of current work apply to persons displaced more generally– (i.e., by a number of causes) or whether the housing and neighborhood outcomes depend on the type of forced move experienced. A final concern is that past research has not examined a sample of both renters and homeowners when detailing the consequences of residential displacement.

To address these limitations, I expand upon prior work by conceptualizing residential displacement as a forced move resulting from any of the five consistently studied definitions of displacement (i.e., private market and public forces, natural hazards, eviction, and foreclosure). This approach allows me to capture displacement as a broader phenomenon, encompassing all of the widely defined ways a household may be forced to move. In addition to examining displacement as one measure encompassing all five types of forced moves, I examine each type of forced move separately to examine how the consequences of residential displacement may be dependent on the forced move experienced. I take this additional step because not all forced moves are created equally. For example, a household whose forced move resulted from government action or a natural hazard may be able to

receive compensation. Further, households moving because of either eviction or foreclosure may have already been in a precarious housing situation.

My study relies upon data from the 2013 wave of the American Housing Survey (AHS), a nationally representative sample of the U.S. housing stock. Using propensity score analyses, I address the following three research questions with the AHS data:

1. Are displaced movers more likely than nondisplaced movers to move into poor quality (a) housing units and/or (b) neighborhoods?
2. Are displaced movers more likely to think that their current (a) housing unit and/or (b) neighborhood is of worse quality than their residence pre-move?
3. Do the housing and neighborhood outcomes of displaced movers compared to other recent movers vary depending on the type of forced move experienced?

The next sections of this paper review the differences between voluntary and forced moves and discuss who is most susceptible to experiencing residential displacement. This paper also discusses the implications of living in poorer quality housing and neighborhoods for the perpetuation of inequality.

Background

Mobility as residential attainment

The residential mobility literature posits that most housing and neighborhood outcomes of residential moves, while contingent on the mover's economic and information constraints, respond to a household's changing needs and desires. Rossi's foundational text on residential mobility, *Why Families Move* (1955), proposes residential moves are deliberate responses to needs which arise from life course transitions and changing family compositions. Other scholars subsequently distinguished the importance of satisfaction with one's current housing situation in determining whether or not a family follows through with a decision to move (Clark, 1986; Speare, 1974; Speare, Goldstein, & Frey, 1975). Essentially, households weigh the costs and benefits of staying in their current unit compared to potential alternative units. For a large majority of those individuals who do choose to move, they consider their newer unit and neighborhood as being better than their previous residence (Lee & Hall, 2009). This finding is also consistent when examining a person's housing career, with mobility most often aligning with an attainment perspective (Clark et al., 2003).

However, not all households have the same ability to translate their socioeconomic status into equivalent housing and neighborhood quality (Rosenbaum, 1996). Perspectives of assimilation and racial stratification inform the literature on racial/ethnic differences in homeownership, housing quality, and neighborhood quality (Alba & Logan, 1992; Logan & Alba, 1993). The assimilation model posits that overtime with capital accumulation and assimilation into the American culture, minority households' moving patterns eventually bring them into majority neighborhoods (Massey & Mullen, 1984). The racial stratification model describes how minority families often face many barriers of discrimination that prevent them from escaping poor quality neighborhoods and housing (Korver-Glenn, 2018;

Turner et al., 2013), and transitioning to homeownership (Shapiro, 2006). However, even with the acknowledgement that not all households receive the same returns on their moves, these models still rely on a locational attainment perspective, assuming that a household's voluntary move is beneficial and desired. Not all moves follow an upward housing mobility trajectory, however, nor are they all of the household's own volition. This paper suggests that the precarious situation of losing one's home from residential displacement may result in a *disattainment* process, where their subsequent residence is representative of a downward move.

Defining residential displacement

The causes and consequences of residential displacement have been studied since the mid-20th century, initially in response to concern over the government's role in displacing low-income, minority communities, but subsequently in a desire to understand both the public and private market causes and consequences of forced moves (Atkinson, 2000; Hartman, Keating, & LeGates, 1982; Lee & Hodge, 1984; National Urban Coalition, 1978; Newman & Owen, 1982). The initial literature largely focused on forced moves in response to three overarching sources. First, government programs in inner-city neighborhoods such as urban renewal and highway construction projects forced many residents out of their housing (Fried, 1973; Hartman, 1964; Wolfe & Lebeaux, 1969; Hartman et al., 1982). Second, growing levels of absentee landlords and general neighborhood disinvestment resulted in owner abandonment and subsequent displacement (LeGates & Hartman, 1981, 1982; Sternlieb, 1972). Third, researchers examined how the 'back to the city' movement, or gentrification, often had negative consequences for low-income incumbent residents. Reinvestment in urban neighborhoods caused rising rents which displaced many residents (Clay, 1979; Grier & Grier, 1978; Newman & Owen, 1982; Marcuse, 1985, 1986). Hence, much of the early work on residential displacement focused on forced moves as a result of private market forces and government programs.

Contemporary work on residential displacement still examines involuntary mobility as a result of gentrification (Atkinson, 2000; Ding, Hwang, & Divringi, 2016; Freeman, Cassola, & Cai, 2016; Sims, 2016) and government programs, such as the planned destruction of large-scale public housing projects (Lelevrier, 2013; Lopez & Greenlee, 2016; Oakley, Ruel, & Reid, 2013; Posthumus, Bolt, & van Kempen, 2013). In addition, more recent work by Desmond and his colleagues examines how formal and informal evictions are a large source of residential displacement (Desmond, 2012; Desmond et al., 2015; Desmond & Kimbro, 2015; Desmond & Shollenberger, 2015). The housing crisis has also spurred additional research on displacement as a result of foreclosure (Allen, 2013); and an increasing number of natural hazards across the United States has motivated researchers to look at housing loss resulting from disaster related causes (Elliott, 2015; Elliott & Howell, 2017). I examine each type of forced move independently, due to the potential exogeneity of being displaced by either government action or a natural hazard compared to displacement caused by eviction and foreclosure. However, to examine displacement more generally, I also define it as a forced moved caused by any of the aforementioned reasons previously examined in the literature: private market forces, government action, natural hazards, eviction, and foreclosure.

Residential displacement and the already disadvantaged

Scholars are interested in residential displacement because of the lack of choice involved in the process. However, measuring residential displacement is difficult; as Atkinson (2000) rightly points out, it is "measuring the invisible" (p.163). This notion is reflected in the incompleteness of our knowledge about the prevalence of residential displacement, with different studies constructing different rates based on the type of displacement they are measuring as well as the location in which their study takes place (Zuk et al., 2018). Despite these limitations, current research shows that forced moves tend to cluster in neighborhoods of higher disadvantage and occur more frequently among low-income and minority households (Desmond, 2012; Desmond & Shollenberger, 2015; Elliott & Howell, 2017; Newman & Owen, 1982). In Desmond's (2012) study of urban Milwaukee renters, he finds, "In poor black neighborhoods, what incarceration is to men, eviction is to women: a typical but severely consequential occurrence contributing to the reproduction of urban poverty" (p. 120). Elliott and Howell's (2017) study of counties throughout the U.S. similarly finds that it is low-income and minority households who are more likely to experience displacement as a result of damage from natural hazards. While one might assume that natural hazards would be randomly distributed, Elliott's work demonstrates how selection into risk-prone environments is not random, but rather based on one's position in the social structure, with persons at the bottom living in less desirable areas (Fothergill & Peek, 2004). These more recent results are consistent with the older literature which finds that households that are relatively disadvantaged are more susceptible to displacement than the more well-off (LeGates & Hartman, 1981, 1982; Newman & Owen, 1982).

Forced moves thus provide a unique form of housing insecurity more often found among the already disadvantaged. This is of particular concern because studies consistently show that experiencing residential displacement is associated with a host of negative consequences, including material hardship, worse self-rated health for parents and their children, depression, and higher levels of stress (Burgard, Seefeldt, & Johnson, 2012; Currie & Tekin, 2011; Desmond & Kimbro, 2015; Hartman & Robinson, 2003; Osypuk, Caldwell, Platt, & Misra, 2012). More recent findings also indicate that displaced movers are more likely than nondisplaced movers to end up in poor quality housing and neighborhoods (Desmond et al., 2015; Desmond & Shollenberger, 2015). Desmond and his colleagues (2015) find with a sample of urban Milwaukee renters that displaced movers are more likely to experience long-term housing problems than urban renters who voluntarily left their previous residence. Desmond and Shollenberger (2015) use the same sample of urban Milwaukee renters and find that renters displaced through eviction are more likely to move into poorer neighborhoods with higher crime rates. Although these results are important for illuminating the housing and neighborhood consequences of eviction among urban renters in Milwaukee, they do not shed any information on what the housing and neighborhood consequences of overall displacement and its many forms look like across the variety of metropolitan and nonmetropolitan areas within the U.S., nor do they examine a population of owners in addition to renters.

In my study, I expand upon Desmond's work by defining residential displacement as a consequence of public and private forces, natural hazards, eviction, and foreclosure, while

also examining each of these forms of displacement separately. When it is the already disadvantaged who are more susceptible to experiencing residential displacement, a move which results in disattainment through the form of lower quality housing and neighborhoods becomes even more consequential due to its implications for the perpetuation of inequality. However, because the more disadvantaged are more likely to experience residential displacement, and because they are also less able to access better quality housing and neighborhoods, the potential for selection bias exists. A propensity score analysis allows me to adjust for the fact that a household's propensity to experience displacement is likely not random. Households who are already disadvantaged are likely to be overrepresented in the displacement group, which may bias the comparison of housing and neighborhood outcomes with the nondisplaced mover group. The propensity score accounts for the selection of households into experiencing residential displacement based on a set of observed covariates. This method is described in more detail below.

Importance of housing and neighborhood quality

Housing is a central social determinant of health (Krieger & Higgins, 2002; Shaw, 2004). Living in poor quality housing is associated not only with important physical health conditions such as respiratory function, lead poisoning, and heart disease (Leventhal & Newman, 2010; Shaw, 2004), and important aspects of mental health (Suglia, Duarte, & Sandel, 2011), but also with children's cognitive and behavioral development (Evans, 2006). Youth growing up in poor quality housing are more likely to become asthmatic, which causes them to miss more days of school (Pacheco et al., 2014), and also will be exposed to higher levels of lead and other toxins which impairs their development (Rosin, 2009). This exposure in combination with other structural housing qualities (Prins & Schafft, 2009) all affect academic achievement and externalizing behaviors. In addition to the effect of poor-quality housing on youth, many forms of injury can occur in housing units (Krieger & Higgins, 2002; Shaw, 2004). A housing unit which is not structurally sound causes its residents to have more accidents within the home, and will also have a higher likelihood of catching fire (Gielen et al., 2012). One's housing quality, which manifests these aforementioned relationships, can be measured through deficits in the utilities and sanitation of the unit (e.g., plumbing, electrical system, presence of pests, and unsafe drinking water) and also through deficits in the structure itself, reflected in the physical unsoundness of the unit and the presence of leaking.

Living in poorer quality neighborhoods is linked to increased rates of victimization, teenage childbearing, and lower levels of educational attainment, to name but a few (Graif & Matthews, 2017; Sampson, 2012; Sharkey, 2013). Neighborhoods with higher levels of collective efficacy have fewer instances of violence (Sampson, Raudenbush, & Earls, 1997). Collective efficacy is an important neighborhood theory which describes the level of social cohesion and trust people feel is present in their neighborhood as well as the extent to which they feel their neighbors share their same values. Collective efficacy captures a neighborhood's collective power to exert informal social control and intervene to stop potential crime from occurring within the neighborhood's boundaries (Sampson, 2012). While structural disadvantage and access to resources are an important aspect of

neighborhood quality (Wilson, 1987), a neighborhood's ability to exert informal social control as well as its level of social capital is also important.

Methodology

The American Housing Survey

To examine the housing and neighborhood outcomes of displaced and nondisplaced movers, I use the national sample of the American Housing Survey (AHS). The AHS is a longitudinal, nationally representative survey of the nation's housing stock, sponsored by HUD and collected by the U.S. Census Bureau since 1973. The AHS is a comprehensive dataset with information not only on the housing unit but also on the occupying householders. The national surveys use a panel design and follow the same housing units every two years. Important for my purposes, each survey includes a recent movers module to track new residents of these units. Any household which did not take part in the previous survey (i.e., two years prior), or which had at least one new member is defined as a recent mover and given this additional supplement in order to obtain background information on the new residents and keep track of residential turnover. For this study, I use the 2013 survey year which allows me to take advantage of not only the recent mover module, but also a topical module which was randomly assigned to half of the survey respondents. The topical module includes information on neighborhood collective efficacy and other neighborhood characteristics.

As a nationally representative sample of housing units in the U.S., and with the inclusion of the recent mover module, the AHS is a valuable dataset for understanding whether or not displaced movers are more likely to end up in poorer quality housing than voluntary movers. The 2013 wave includes approximately 61,000 households. My analysis is constrained to the 13,259 households defined as recent movers, meaning that approximately one-fifth of the sample moved during the 2-year period. Of these households, 3.8% (N=502) include displaced movers. Because of my methodological approach and limited missing data, I use listwise deletion to handle missing data on the covariates. This creates a final sample of 12,011 movers, 455 of which have experienced some form of displacement (private=127; government=20; natural hazard=95; eviction=66; foreclosure=147). A comparison of the sample before and after listwise deletion is included in the supplementary material.

As previously noted, the topical module which includes the neighborhood outcome variables was only given to half of all AHS participants. As a result, the sample used to examine neighborhood outcomes is smaller. In my subsample of recent movers, 5,918 of them responded to any one of the topical module questions, 218 of which have been displaced (private=65; government=7; natural hazard=53; eviction=34; foreclosure=59). It is important to note, however, that while I use listwise deletion on the observed covariates included in the propensity score, I do not use listwise deletion for my outcome variables. Because a propensity score is only concerned with the cases that match within an outcome, it is unnecessary to account for all missing cases on the outcomes. This being the case, while the subsample for the housing outcomes consistently totals 12,011 movers, with 455 experiencing displacement, the subsample for the neighborhood outcomes ranges between a total of 5,920 to 5,648 movers, with 218 to 211 experiencing displacement.

A strength of the AHS is that it allows me to examine a recent mover population of renters and homeowners across a variety of metropolitan and nonmetropolitan areas of the United States. Yet, there are important data limitations which come with this dataset. For one, it is only a nationally representative sample of the U.S. housing stock, not the U.S. population. Inherently this means I will not capture any moves of a household onto the street, into a shelter, or out of the country. Further, housing units considered eligible to be sampled within the AHS must have direct access to their living quarters and be separate from others within a building. This restriction excludes group quarters and hence limits my sample to a relatively more privileged group of displaced movers, given that they have successfully secured new housing. Additionally, because the AHS survey takes place every two years and is only reporting on the household's most recent move, I cannot know either the frequency of residential turnover within the housing unit or how often the most recent household has moved during the 2-year time period. Due to the limitations just described, the study findings are not generalizable to all forced moves within the United States. These limitations also mean that my displacement measure is likely downwardly biased.

A further concern with the dataset is the small number of forced moves reported. The specific survey question asked recent movers to indicate the main reason they have moved, which may cause problems in the accuracy of reporting. The respondents could only choose one of seventeen reasons for moving which was, in their opinion, the main reason. Respondents may not have understood their move as being forced, or they may have been embarrassed to report it as such. In fact, Desmond and Shollenberger (2015) find that the AHS does not adequately capture informal evictions when compared to the Milwaukee Area Renters Study. This may also be the case for other types of forced moves. In sum, the downwardly biased displacement measures available in the AHS suggests that my results are likely conservative estimates of the housing and neighborhood consequences of forced moves.

Variables

Outcomes—My first outcome is housing quality, which is computed from a total of twenty-four housing problems that respondents or the AHS surveyor report being present in the unit. These twenty-four measures represent two underlying dimensions of inadequacies in utilities and sanitation or the physical structure of the unit. A housing unit is considered to have inadequate utilities and sanitation if the respondent householder/AHS surveyor reports any problems in the unit regarding the plumbing or electric, if there is any evidence of pests in the unit, or if the unit has unsafe drinking water. A housing unit is considered to have an inadequate physical structure if the respondent householder/AHS surveyor reports any leaking within the unit or if the roof, foundation, walls, or flooring are at all physically impaired. See Table A for the detailed list and coding scheme of the twenty-four problems classified in each category. I treat both types of housing inadequacies, i.e., inadequate utilities or sanitation and inadequate physical structure, as dichotomous variables (1= any of the inadequacies exist). In addition to the two types of housing inadequacies investigated, I create a single summary variable which indicates if any of the twenty-four housing problems are present in the unit (1=yes).

The second outcome I investigate is neighborhood quality, which is constructed from a total of twelve neighborhood problems that respondents or the AHS surveyor report being present in the neighborhood. Neighborhood quality is represented with two underlying dimensions: collective efficacy and the presence of nearby amenities. A neighborhood is considered inadequate in its level of collective efficacy if the respondent householder reports any issues with the social cohesion of their neighborhood or if there is a lack of informal social control in their neighborhood. A neighborhood is considered to have inadequate amenities if there is not a drug store or full-service grocery store within 15-minutes of their neighborhood. Similar to how I operationalize housing quality, I treat these two dimensions of the neighborhood as dichotomous variables (1= any of the inadequacies exists). In addition, I create a single variable which indicates if any of the twelve neighborhood problems are present (1=yes). See Table A for the detailed list and coding scheme of the twelve problems classified in each category.

The final two outcomes are also dichotomous variables indicating the respondent's opinion of their current housing unit and neighborhood. They are based on self-reports from the respondent householder of whether they think their current housing unit is better or worse than their previous one (1=worse), and if they think their current neighborhood is better or worse than their previous one (1=worse).

Treatment—The treatment variable in this study is residential displacement. I utilize the recent mover module's inclusion of the following question: *What is the MAIN reason you moved?* Of the seventeen possible responses, five responses capture whether or not the move was a result of displacement from the housing unit. These five responses are as follows: *private company or person wanted to use it; forced to leave by the government; disaster loss (fire, flood, etc.); evicted from residence;* and *foreclosure*. Each of these five responses are treated as unique types of displacement. Additionally, with these five responses a single dichotomous indicator is created to represent whether or not the sample of recent movers experienced overall displacement (1=displaced for any of the five reported reasons). In total, I examine six different measures of displacement.

Analytic plan

To compare the housing and neighborhood outcomes of displaced and nondisplaced movers, this study utilizes propensity score matching techniques. This quasi-experimental method helps to address some of the methodological issues which come with studying the outcomes of uncommon events that are highly selective (Dehejia & Sadek, 2002; Frisco, Muller, & Frank, 2007; Rosenbaum & Rubin, 1983). The approach simulates a natural experiment by allowing the researcher to estimate whether respondents who experience a certain *treatment* have different outcomes than respondents who did not experience the treatment, yet who are matched based on their propensities for experiencing the said treatment.

Estimating the propensity of being displaced—The analysis involves two stages. In the first stage, I estimate the propensity for displacement for all respondents who were and were not displaced using a logistic regression model. The propensity score is defined by the following equation,

$$\log\left[\frac{T}{1-T}\right] = \alpha + \beta S \quad (1)$$

where T is the propensity to experience residential displacement, S represents a vector of covariates used to balance the propensity score, α is the intercept, and β a vector of parameter estimates. This equation is adapted from Rosenbaum and Rubin's (1983) propensity score equation,

$$p(T) = \Pr\{T = 1|S\} = E\{T|S\} \quad (2)$$

where *p(T)* is the propensity of experiencing residential displacement, T represents whether or not a household did or did not get displaced, and S is a vector of covariates which influences experiencing residential displacement.

I estimate the propensity to be displaced using several observables that lead those that move as a result of displacement to be qualitatively different than those who move for other reasons. Based on past research, I include variables which help capture vulnerability to displacement such as age, sex, race, marital status, and socioeconomic status (Desmond, 2012; Newman & Owen, 1982). The resulting propensity score predicted from this model is used to match the control and treatment groups. In total, I create six propensity scores, one for each type of treatment (displacement) that I examine. The logistic regression models used to predict the propensity scores all includes the same variables: respondent's *age*, measured as a set of dummy variables which capture seven 10-year age groupings: 13 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64, 65 to 74, and 75 to 93; *sex* (1=female); *nativity* (1= foreign-born); *race/ethnicity*: white, black, Hispanic, Asian, or other; *marital status*: married, widowed, never married, or divorced/separated; *citizenship status*: native-born, naturalized, and non-citizen; and *education status*: less than a high school degree, a high school diploma or equivalent, some college or other two-year degree, and a college education or higher.

With regard to overall household characteristics, multiple measures of socioeconomic status (SES) are used to predict the propensity to be displaced. Total *family income* is included as a continuous variable. Additionally, the analysis incorporates several dichotomous variables which indicate whether or not the household receives *food stamps* (1=yes) or *welfare* (1=yes), and also if anyone in the household has a *disability* (1=yes). Other important household characteristics are the *total number of residents* in the unit, and then more specifically the total *number of elderly residents* in the unit, the number of *non-relative residents* in the unit, and the number of *children under the age of 18* in the unit. To account for the location of the household, I include two categorical variables. The first represents the household's location in a *metropolitan area (MSA)*: central city of MSA, inside MSA urban, inside MSA rural, outside MSA urban, or outside MSA rural. The second represents which *region* of the country the household is located within: Northeast, Midwest, South, or West.

Finally, characteristics of the previous housing unit are included. The *total number of persons* in the previous unit is included as a continuous variable, along with a categorical variable which indicates the *type of residence*: house, apartment, or mobile home. The

tenure status of the previous household is also included as a nominal variable to designate previous owners, previous renters, and previous non-payers.

The validity of the propensity score analysis relies on two major assumptions not being violated. These are the conditional independence assumption and the assumption of common support, or strong ignorability. The conditional independence assumption requires that all observed variables that would influence the treatment (i.e., residential displacement) and the outcomes (i.e., housing and neighborhood quality) are used to estimate the propensity score. (For a methodological discussion on whether all related variables are included in the analysis, or only theory-driven ones, reference Dehejia & Sadek, 2002; Frisco et al., 2007; and Rubin & Thomas, 1996.) The assumption of common support, or strong ignorability, requires that there is substantial overlap of cases in both groups with similar propensities of experiencing the treatment (i.e., displacement) for matching. My propensity score analyses meet both of these assumptions. I include all theory-driven observables which are available in the AHS to create the propensity scores and I find good common support between my two groups.

For this first step, the analysis uses Stata 15's *pscore* command to estimate the propensity score because it automatically assesses whether the score is balanced (Becker & Ichino, 2002). Being balanced is not a strict requirement because of the difficulty of the task (see Morgan et al., 2017 for an example of an unbalanced propensity score paper), but nevertheless a highly recommended one. Balance is important to ensure that the treatment and control cases within the same block, i.e., the treatment and control cases with similar propensities of experiencing displacement, have no significant differences, or biases, on the set of covariates used to estimate the propensity score. If the propensity score is not balanced within a select block, that means that a certain covariate or set of covariates is significantly different between those who experienced the treatment and those who did not. Because I create six propensity scores with the exact same covariates, I only achieve perfect balance for four of my six propensity scores. More detail on each propensity score's balance is provided in the results section.

Calculating the average treatment effect for the treated using propensity score matching techniques—The propensity scores estimated from my models are then used to match households who did and who did not experience residential displacement but have a similar propensity for doing so based on the observed covariates included in the propensity score. This is the second stage of analysis, which also involves the estimation of the mean difference in housing and neighborhood quality between the treatment group (i.e., those movers who were displaced) and control group (i.e., those movers who were not displaced), or the average treatment effect on the treated (ATT). The ATT represents the effect of residential displacement on housing and neighborhood outcomes among recent movers who do and who do not experience residential displacement, but have similar propensities of experiencing displacement on the basis of the observable characteristics included in the estimation of the propensity score.

There are multiple methods that can be used for matching, each of them having both strengths and weaknesses which make certain techniques more suitable depending on

the data and application (Becker & Ichino, 2002; Frisco et al., 2007). In the second step, I use Stata 15's *att* commands, developed by Becker and Ichino (2002) for nearest neighbor matching and for kernel density matching (StataCorp, 2017). I use the *attnd* command for nearest neighbor matching with replacement, applying the common support and bootstrapping with 1000 reps options. Nearest neighbor matching is the most common and straightforward matching technique. The technique matches a household from the control and treatment group based on their similar propensity to experience displacement. By using nearest neighbor matching with replacement, observations in the control group will be matched to more than one case in the treatment group if the control case is a better match than other controls. Observations with no matches are not used in my analysis. This technique makes nearest neighbor matching relatively unbiased.

I use the *attk* command for kernel density matching with a bandwidth of .01 specified, applying the common support and bootstrapping with 1000 reps options.[1] Kernel density matching is a more complicated matching technique which uses all of the available observations. The kernel density matching technique creates a weighted mean of the control observations based on their distance from the treated observation. This constructs a counterfactual outcome with which the treated observations are then matched. This technique is especially useful when there is a larger sample of control cases than treated, as is the case here in my subsample of movers.

One concern with propensity score matching as it relates to my dataset is the interpretation of results which model infrequent outcomes. The housing and neighborhood results matching those displaced by the government are based on treated sample sizes of 20 and 7, respectively. The results for the neighborhood outcomes of those displaced by eviction is based on a treated sample of 34. There is no precedent in the literature to support the interpretation of propensity score matching results with finite sample sizes smaller than 20 (Frolich, 2004; Pirracchio, Resche-Rigon, & Chevret, 2012). Hence, results pertaining to the neighborhood outcomes of households displaced by the government must be interpreted with caution. However, there is precedent in the literature to use propensity score matching in clinical studies which use small sample sizes of between 20 and 50 (e.g., Fernández-Nebro et al., 2010; Karlin et al., 2011; Pirracchio et al., 2012). Using Monte Carlo simulations, Pirracchio and his colleagues (2012) confirm that sample sizes as small as 40 still produce relatively unbiased estimates of the treatment effect. In an examination of an observational dataset of 23 treatment cases they find similar results (Pirracchio et al., 2012). Hence, less caution can be taken when interpreting the housing outcomes of those displaced by the government and the neighborhood outcomes of those displaced by eviction.

Results

Descriptive statistics

The frequency of displacement differs among each type of forced move. Foreclosure is the largest contributor to the overall displacement measure (N=147, 32.3%) with private action coming in a close second (N=127, 27.9%). Disaster loss makes up one-fifth of the overall

1. Kernel density findings were consistent, unless otherwise notes in the results section.

measure (N=95, 20.9%), and displacement from eviction and government action make up the smallest percentages of the subsample (N=66, 14.5%; N=20, 4.4%). While the housing and neighborhood quality ATT results for all six displacement measures are presented in Table 3, I will only present the descriptive statistics in Table 1 and the logistic regression predicting the propensity score in Table 2 using the overall or aggregate displacement measure. Descriptive statistics and the logistic regression predicting the propensity score for the five type-specific measures of displacement can be found in the supplementary material. When reviewing the results, I discuss where notable differences arise.

Table 1 presents the descriptive statistics for the covariates used to estimate the propensity score as well as the housing and neighborhood outcomes comparing overall displaced movers to voluntary movers. These analyses show that there are significant differences between displaced households and households who moved of their own volition on multiple dimensions. Not only do they significantly differ along social stratifiers such as socioeconomic, racial, and gender lines, but also along indicators of life stage such as marital status, age, the presence of children in the home, and the total number of persons and types of persons within the home. Other differences between the two groups fall along housing dimensions such as their location within a metropolitan area, and their previous housing tenure, and housing unit type. Many of the housing and neighborhood outcomes also significantly differ between displaced movers and nondisplaced movers. These significant differences between the two groups validate my use of a propensity analysis because I am able to match households within these two groups with similar propensities to experience displacement based on the observed covariates.

Propensity score

Table 2 presents the logistic regression model estimating the propensity to experience overall residential displacement. The standardized coefficients are presented for comparability across predictors. Significant predictors of experiencing residential displacement include respondent householder's age and level of education, age appearing to be one of the strongest predictors of experiencing residential displacement. Household variables associated with displacement include family income, food stamp assistance, and the number of persons currently living in the unit. Lastly, all three pre-move variables are significant, with the previous unit type, previous tenure status, and previous number of persons in the unit all being associated with experiencing residential displacement. Across all five types of displacement, different covariates proved significant. (See supplementary material for details.) Age was not a significant predictor of experiencing eviction or displacement by the government, and socioeconomic indicators were not predictors of private displacement. The only consistent predictors across all six displacement measures include the total number of persons in the current household and the presence of the elderly.

The estimated propensity score for overall, private, government, and natural hazard displacement achieved balance. The predicted propensity to experience eviction and foreclosure did not balance. Eviction did not achieve balance in block 5 with the food stamp covariate and in block 7 with the number of nonrelative persons in the household. Foreclosure did not achieve balance in block 1 with the food stamp covariate and in

block 2 with the welfare covariate. This means that there is a significant difference between the treatment (i.e., displaced) and control (i.e., not displaced) households within the respective blocks on the covariates that did not achieve balance. However, due to the need for consistency in the covariates used to predict my six propensity scores, I use these unbalanced propensity scores to predict the housing and neighborhood outcomes. Further, my models still provide a good level of balance, both balancing in 5 of the 7 blocks. This level of covariate balance is similar to other studies (e.g., Morgan et al., 2017) and still reduces potential selection bias in experiencing displacement.

Predicting residential displacement remains an imperfect practice. This phenomenon is represented in the propensity score distribution. The predicted propensity to experience any of the six displacement measures does not exceed .35 for any household within the sample. Reference the supplementary material for more information on the propensity to experience displacement between the treatment and control group across all six measures. This material includes graphs displaying the overlap between the groups and tables showing the average propensity score, standard deviation, and number of treated and control households within each balanced block.

Table 3 presents the ATT results comparing the two propensity score matching techniques. I use the results from Table 3 to answer my three research questions. My first research question asks if experiencing residential displacement results in worse quality housing and neighborhoods, while my third asks if there is variation in these results depending on the type of forced move experienced. When matched with their nearest neighbor on their propensity to experience residential displacement, overall displacement significantly affects the quality of housing into which the treated group moves, but not the neighborhood. The mean difference in experiencing housing deficits between the treated and control groups is approximately 10%, with significant differences in both the utilities and sanitation and the housing structure contributing to this relationship. Nearest neighbor matching finds no significant difference in the housing and neighborhood quality of households which have experienced private displacement, government displacement, or foreclosure. While there is no overall housing quality difference between those who experienced displacement by a natural hazard and those who did not, the mean difference in experiencing inadequate utilities and sanitation is 15.8%. Of all of the types of forced moves, eviction by far shows the strongest impact on housing and neighborhood outcomes. The mean difference in experiencing housing deficits between those who have been evicted and those who have not is 21.2%, significant differences occurring on both the utilities and sanitation and the housing structure measures. Additionally, there is a marginally significant mean difference of 22.4% in neighborhood quality, with the neighborhood's collective efficacy showing a significant difference of 26.2%.

Kernel density matching provides slightly different results, finding more significant differences between the housing and neighborhood outcomes of displaced movers. While still showing that overall displaced households are significantly more likely to experience housing inadequacies, this matching technique also finds there is a marginally significant mean difference between the two groups in neighborhood quality and a significant difference for neighborhood collective efficacy, with displaced households 7.4% more likely to live

in neighborhoods lacking in collective efficacy. While private displacement and foreclosure show consistent nonsignificant results for housing and neighborhood quality differences, kernel density matching produces a significant housing quality mean difference of 20.5% for households displaced by the government. Displacement by a natural hazard now also shows a significant mean difference in overall housing quality, and eviction now also results in a significant mean difference in neighborhood quality.

Nearest neighbor matching decreases bias but increases variance while kernel density matching increases bias and decreases variance (Caliendo & Kopeinig, 2005). However, the results presenting the smaller bandwidth of .01 help to reduce the bias of the kernel density matching method. As a result, the answer to my first research question depends on the type of forced move which is experienced, meaning that the answer to my third research question is yes. Overall, households who experience displacement by private action and foreclosure do not end up in worse quality housing or neighborhoods. Households who experience displacement caused by the government or a natural hazard are more likely to end up in worse quality housing but not neighborhoods. It is only households who experience an eviction that are more likely to move into both worse quality housing and neighborhoods. Further, the housing quality difference between those who experience eviction and those who experience displacement by the government is quite high (19.3% and 20.5% respectively).

My second research question asks if displaced movers are more likely to perceive their current housing units and neighborhoods as worse than their previous ones. Both matching techniques consistently demonstrate that overall displaced movers are more likely to be displeased with their current unit and neighborhood when comparing them with their residence pre-move. However, when I break down this displacement measure, I find that those displaced by the government, a natural hazard, or eviction perceive their housing unit as being of worse quality than their previous one. While there is no data available to assess the objective housing and neighborhood quality of their previous residence, these householders are accurately picking up on the deficits which exist in their current units. Results also show that households displaced by a natural hazard or eviction are more likely to believe that their current neighborhood is of worse quality than their previous one. Finally, households displaced by private action or foreclosure are not significantly more likely to perceive their current housing or neighborhood as worse to their previous ones.

Conclusion

The results of this paper expand upon recent work by Desmond and his colleagues which indicate that displaced movers are more likely than non-displaced movers to move into poorer quality housing and neighborhoods. Consistent with Desmond's results, I find that households who experience displacement from eviction are more likely to move into both worse quality housing and neighborhoods (Desmond et al., 2015; Desmond & Shollenberger, 2015). Interestingly, evicted households are the only displaced households who are more likely to end up in worse quality neighborhoods. I find that those displaced by the government and natural hazards are more likely to move into worse quality housing while those displaced by private action and foreclosure are not. These results at first

may appear counterintuitive. Households experiencing displacement by both government action and natural hazards are often offered compensation. However, this study indicates that any compensation which they may receive does not prevent them from being more likely to move into poorer quality housing compared to households who move of their own volition. My work contrasts with other research on displacement, in that I did not find support for movers displaced by foreclosure as being more likely to end up in poorer quality neighborhoods. This may be due to the difference in how neighborhood quality is defined in this study. In contrast to work by Allen (2013), this study does not use objective measures (i.e., with administrative data) of neighborhood disadvantage, but rather relies on self-report measures of neighborhood quality. Lastly, results show that movers displaced by the government, natural hazards, and eviction are more likely to believe that both their current housing unit and neighborhood are worse than their previous one. Overall, these results provide initial support for the notion that residential displacement, broadly defined, contributes to the perpetuation of inequality. It is important to note the differences in outcome, however, by the type of forced move experienced. It is only for those who are forced to move by the government, a natural hazard, or eviction that being forced to move contributes to a process of disattainment, with displaced movers finding themselves in lower quality housing than households who move of their own volition.

This study expands upon past research by using a nationally representative sample of the U.S. housing stock. This allows me to examine a population of households from multiple metro areas and nonmetro areas. This study also uses a more comprehensive measure of displacement by defining displacement as a result of any of five types of causes – private actions, government intervention, natural hazards, eviction, and foreclosure – in addition to examining each type of displacement individually. These two additions are an important contribution to the literature in allowing us to gain a glimpse of the bigger picture of housing displacement beyond single metro areas or single types of forced moves. Despite these contributions there are still several limitations. For one, the AHS is a nationally representative sample of the U.S. housing stock, not of households in the country. As such, any moves that are out of the country or that are into homeless shelters or onto the streets are not included in the sample. Another limitation with the data is the small sample size of displaced movers, especially when the displacement variable is specific to the five types of forced moves. These limitations mean that these findings cannot be generalized to all displaced persons, but are unique to the sample I am using. Further, because the AHS follows housing units and not households, there is limited information on the movers prior to the actual move. As such, this study may not be able to control for all of the variables that would predict residential displacement.

Nevertheless, the AHS data allow me to examine the consequences of forced moves as caused by a number of forms of displacement within the U.S. and among a sample of both homeowners and renters. Trying to understand residential displacement is akin to “measuring the invisible” (Atkinson, 2000, p. 163). Hence, despite the limitations of the dataset, these results present an important contribution in the attempt to understand residential displacement. Further, it is likely that the results presented here are an underestimation of the real problem of residential displacement (Desmond & Shollenberger,

2015). According to Desmond and Shollenberger's comparison of the AHS with the Milwaukee Area Renters Study, the AHS is unable to capture informal evictions because recent movers may not interpret their forced moves as such. This leads me to conclude that the prevalence of displacement is likely larger, making the findings from this study even more concerning.

These results have implications for health as well as future financial burdens which displaced movers may experience as a result of moving into housing with a higher number of inadequacies. Shaw (2004) shows how housing is a central social determinant of health with the ability to not only affect physical health but also mental health. Moreover, Desmond and his colleagues (2015) indicate that if displaced movers are more likely to move into poorer quality housing and neighborhoods, then they may experience an induced move later down the line. A second induced move leads to further residential instability and also a higher level of financial burden. Overall, these results indicate that experiencing residential displacement from government action, natural hazards, or eviction leads to residential disattainment. This disattainment process has negative consequences which could contribute to the perpetuation of inequality. This is especially of concern since much of the literature indicates that it is persons who are already disadvantaged who are more likely to experience residential displacement.

Further research should consider investigating other potential outcomes of displacement. While housing and neighborhood quality contain implications for health, child well-being, financial stress, victimization, and other neighborhood-related outcomes, this study is not able to assess these implications directly. Research should consider following displaced and nondisplaced households over time in order to examine the potential long-term consequences of disattainment. Additionally, research should further investigate the unique causes and consequences of the five forms of displacement. The results from the logistic regressions used to predict the propensity scores as well the propensity score matching results indicate that each type of displacement varies in its causes and consequences. Policymakers should consider how experiencing residential displacement is associated with downward housing mobility and should take measures to counteract this process, especially considering that the two types of displacement for which forms of compensation are available, i.e., government and natural hazards, still result in a move to worse quality housing. Local actors are especially important in helping to address these issues. Hence, further work must be done at the local level to understand how this general trend may differ in various housing markets.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Biography

About the author

Megan Evans is pursuing a Ph.D. in Sociology and Demography at The Pennsylvania State University. Her research focuses on the spatial manifestations of inequality and the role that spatial inequality plays in a person's prospects for social mobility. Her interests include neighborhood change, segregation, voluntary and involuntary residential mobility (displacement), neighborhood reputations, and social network analysis.

Appendix

Table A.

Housing and Neighborhood Quality Outcomes, Coding Scheme

Outcome AHS Variable Names	AHS Variable Description	Coding Scheme
Housing Deficits	=1 if any one of the following problems are present	
Inadequate Utilities & Sanitation	=1 if any one of the following problems are present	
Plumbing	=1 if any one of the following problems are present	
IFTLT	Any toilet breakdowns in last 3 months	1=yes
HOTPIP	Unit has hot & cold running water	1=no
IFSEW	Sewage system broke down since last interview	1=yes
PLUMB	Complete plumbing facilities in unit, meaning the unit has exclusive use of hot and cold running water, a toilet, and a bathtub/shower in the bathroom	1=no
IFDRY	Unit completely without running water	1=yes
Electric	=1 if any one of the following problems are present	
NOWIRE	Flag indicating electrical wiring concealed by walls	1=exposed/no electrical wiring
PLUGS	Flag indicating every room has working electrical plug	1=no
IFBLOW	Fuses blown or circuit breakers tripped	1=yes
Unsafe Water	=1 if any one of the following problems are present	
WATERS	Water safe for drinking & cooking	1=no
Presence of Pests	=1 if any one of the following problems are present	
EVROD	Evidence of rodents in unit	1=yes
EROACH	Evidence of roaches in unit	1=yes
Inadequate Housing Structure	=1 if any one of the following problems are present	
Physical Structure	=1 if any one of the following problems are present	
BIGP	Area of peeling paint larger than 8 × 11	1=yes
ECRUMB	Holes/cracks or crumbling in foundation	1=yes
EHOLER	Roof has holes	1=yes
EMISSR	Roof missing shingles/other roofing materials	1=yes
ESAGR	Roof’s surface sags or is uneven	1=yes
EMISSW	Outside walls missing siding/bricks/etc.	1=yes
ESLOPW	Outside walls slope/lean/slant/buckle	1=yes

Outcome		
AHS Variable Names	**AHS Variable Description**	**Coding Scheme**
EBOARD	Windows boarded up	1=yes
EBROKE	Windows broken	1=yes
HOLES	Holes in floor about 4 inches across	1=yes
CRACKS	Open cracks wider than dime	1=yes
Leaking	=1 if any one of the following problems are present	
LEAK	Any outside water leaks in last 12 months	1=yes
ILEAK	Any inside water leaks in last 12 months	1=yes
Neighborhood Deficits	=1 if any one of the following problems are present	
Lacking Basic Amenities	=1 if any one of the following problems are present	
DRUGSTORE	Drugstore within 15 minutes of your home	1=no
GROCERY	Type of grocery store within 15 minutes of your home	1= no full-service grocery store nearby
Inadequate Collective Efficacy	=1 if any one of the following problems are present	
Social Cohesion Deficits	=1 if any one of the following problems are present	
CEFTRUSTED	People in neighborhood can be trusted	1=somewhat disagree/ strongly disagree
CEFSHARVALS	Neighbors share the same values	1=somewhat disagree/ strongly disagree
CEFHELPNBOR	People in neighborhood are willing to help neighbors	1=somewhat disagree/ strongly disagree
CEFCLOSKNIT	Neighborhood is close knit	1=somewhat disagree/ strongly disagree
CEFGETALONG	People in neighborhood get along	1=somewhat disagree/ strongly disagree
Informal Social Control Deficits	=1 if any one of the following problems are present	
CEFSPRYPNT	Likelihood neighbor would do something about children spray-painting graffiti	1=unlikely/very unlikely
CEFSKIPSCHL	Likelihood neighbor would do something about children skipping school	1=unlikely/very unlikely
CEFDISRSPCT	Likelihood neighbor would scold disrespectful child	1=unlikely/very unlikely
CEFFIRESTA	Likelihood neighbors would do something if neighborhood fire station were threatened by budget cuts	1=unlikely/very unlikely
CEFFIGHTING	Likelihood neighbor would do something if a fight broke out in front of house	1=unlikely/very unlikely
Respondent Opinions		
New Unit Worse	=1 if any one of the following problems are present	
XHRATE	Current unit better/worse than old unit	1=worse

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Outcome		
AHS Variable Names	**AHS Variable Description**	**Coding Scheme**
New Neighborhood Worse	=1 if any one of the following problems are present	
XNRATE	Current neighborhood better/worse than old one	1=worse

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Table 1.

Descriptive Statistics on Subsample of Overall Displaced and Nondisplaced Movers

Characteristics	Mean or %		*p* value if Significant Pearson Chi Square Test or Bivariate Logistic Regression	N for Housing and Neighborhood Outcomes
	Displaced	Nondisplaced		
Sample Size	3.8%	96.2%		
Location				
Metro			$p<.05$	
Central City of MSA	35.2%	40.1%		
Inside MSA Urban	39.6%	36.9%		
Inside MSA Rural	5.9%	7.7%		
Outside MSA Urban	11.2%	8.3%		
Outside MSA Rural	8.1%	7.0%		
Region				
Northeast	21.1%	20.1%		
Midwest	29.5%	27.1%		
South	28.6%	31.6%		
West	20.9%	21.1%		
Householder Demographics				
Age				
13–24	7.0%	17.2%	$p<.001$	
25–34	16.5%	29.1%	$p<.001$	
35–44	22.4%	20.0%		
45–54	26.8%	14.5%	$p<.001$	
55–64	15.8%	9.8%	$p<.001$	
65–74	8.1%	5.4%	$p<.05$	
75–93	3.3%	4.0%		
Foreign-born	16.7%	18.0%		
Citizenship				
Native-Born	83.3%	82.0%		
Naturalized	7.9%	6.8%		
Non-Citizen	8.8%	11.3%		
Race			$p<.01$	
White	59.1%	57.5%		
Black	19.3%	17.8%		
Hispanic	15.8%	16.5%		
Asian	2.2%	5.8%		
Other	3.5%	2.4%		
Education			$p<.001$	
< High School	19.8%	12.8%		
High School	29.2%	24.6%		
Some College	30.3%	31.1%		
College +	20.7%	31.5%		

Characteristics	Mean or %		*p* value if Significant Pearson Chi Square Test or Bivariate Logistic Regression	N for Housing and Neighborhood Outcomes
	Displaced	Nondisplaced		
Marital Status			*p*<.01	
Married	36.7%	35.5%		
Divorced/Separated	26.4%	20.9%		
Never Married	30.3%	38.2%		
Widowed	6.6%	5.4%		
Female	57.4%	53.0%	*p*<.1	
Household SES				
Receives Food Stamps	26.8%	17.1%	*p*<.001	
Receives Welfare	6.4%	3.9%	*p*<.01	
Total Family Income	$39,130	$50,217	*p*<.001	
Household Demographics				
Total Number of Persons	2.8	2.4	*p*<.001	
Elder	0.2	0.1	*p*<.05	
Non-Relatives	0.2	0.2	*p*<.1	
Kids	1.0	0.8	*p*<.001	
Disabled Person Present	25.7%	15.6%	*p*<.001	
Previous Household				
Unit Type			*p*<.001	
House	63.7%	52.2%		
Apartment	32.1%	44.2%		
Mobile Home	4.2%	3.6%		
Tenure			*p*<.01	
Owner	35.8%	30.1%		
Renter	62.0%	65.3%		
Non-Payer	2.2%	4.6%		
Total Number of Persons	3.1	3.1		
Outcomes				
Housing Deficits	58.7%	46.7%	*p*<.001	12,011
Inadequate Utilities & Sanitation	46.8%	37.1%	*p*<.001	12,011
Inadequate Housing Structure	32.8%	22.4%	*p*<.001	12,011
Neighborhood Deficits	77.1%	72.7%		5,920
Lacking Basic Amenities	17.9%	18.3%		5,919
Inadequate Collective Efficacy	74.9%	69.7%		5,648
Respondent Opinions				
New Unit Worse	26.6%	17.0%	*p*<.001	11,962
New Neighborhood Worse	21.7%	13.9%	*p*<.001	11,943

Table 2.

Logistic Regression Model Estimating Propensity to Experience Overall Residential Displacement

Household Characteristic Type	***B***	**SE**
Metro	0.82	(.04)
Region	−0.80	(.05)
Age (ref. <25)		
25 to 34	1.69	(.22)†
35 to 44	4.50	(.22)***
45 to 54	6.89	(.21)***
55 to 64	5.81	(.23)***
65 to 74	2.86	(.36)**
75 to 93	0.91	(.42)
Foreign	1.00	(.39)
Citizenship	−1.33	(.24)
Race	−1.18	(.04)
Education	−2.68	(.05)**
Marital Status	1.26	(.05)
Female	0.32	(.10)
Disability	1.01	(.12)
Family Income	−3.69	(.00)***
Receives Food Stamps	2.17	(.13)*
Receives Welfare	0.75	(.21)
Persons in Household	4.27	(.07)***
Nonrelatives in Household	−1.35	(.12)
Elderly in Household	0.88	(.20)
Children in Household	−0.46	(.08)
Previous Unit Type	−3.40	(.10***
Previous Tenure	−2.21	(.10)*
Previous Persons in Household	−2.99	(.04)**
Constant	−5.54	(.51)***
N	12,011	
Psuedo RR	.0621	

† p<0.1

* p<.05

** p<.01

*** p<.001

BALANCED

Table 3.

Average Treatment Effects of Experiencing Residential Displacement on Housing and Neighborhood Outcomes for Mobile Households (ATT), Analysis Constrained to Area of Common Support

Matching Technique							
Outcome	**Overall Displacement**	**Private Displacement**	**Government Displacement**	**Disaster Loss Displacement**	**Eviction**	**Foreclosure**	**N**
Nearest Neighbor Matching							
Housing Deficits	.099*	.095	−.150	.116	.212*	.061	12,011
Inadequate Utilities & Sanitation	.084*	.087	−.025	.158*	.242**	.034	12,011
Inadequate Housing Structure	.099**	.047	.075	.053	.182*	.048	12,011
Neighborhood Deficits	.047	−.002	−.179	.025	.224†	.075	5,918
Lacking Basic Amenities	−.034	−.062	.000	.052	−.022	−.042	5,916
Inadequate Collective Efficacy	.072	.050	−.107	−.018	.262*	.115	5,648
Respondent Opinions							
New Unit Worse	.077*	.038	.271*	.013	.187*	.082	11,962
New Neighborhood Worse	.072**	.022	.293*	.087	.080	.081	11,943
Kernel Density Matching (.01 Bandwidth)							
Housing Deficits	.112**	.073	.205*	.125*	.193**	.080†	12,011
Inadequate Utilities & Sanitation	.089**	.034	.252*	.148**	.179**	.027	12,011
Inadequate Housing Structure	.093**	.076†	.256*	.061	.206**	.060	12,011
Neighborhood Deficits	.055†	.011	−.035	.020	.153**	.069	5,920
Lacking Basic Amenities	−.041	−.045	.023	−.044	.054	−.071	5,919
Inadequate Collective Efficacy	.074*	.070	.001	.012	.235**	.039	5,648
Respondent Opinions							
New Unit Worse	.087**	.072†	.264*	.093*	.174**	.029	11,962
New Neighborhood Worse	.081**	.040	.226†	.086*	.136*	.048	11,943

** p<0.01

* p<0.0

† p<0.1