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Recession and Recovery Study**

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HOUSING INSTABILITY AND HEALTH: FINDINGS FROM THE MICHIGAN RECESSION AND RECOVERY STUDY

ABSTRACT

The recession of the late 2000s has increased interest in the consequences of housing instability. Previous research has shown poorer health among those experiencing housing instability, but extant studies generally have focused on selected populations (e.g., homeowners or renters) or studied only one type of housing instability (e.g. homelessness). Using new data from the Michigan Recession and Recovery Study, a population-based sample of working-aged adults from Southeastern Michigan in late 2009-early 2010, we found that about one-third of respondents recently experienced some type of housing instability. Many, but not all types of instability were associated with health. Even after adjustment for sociodemographic characteristics and earlier health, individuals who had moved for cost reasons in the past three years were more likely than those with no housing instability to report a recent anxiety attack, while those who experienced homelessness in the past year had a higher likelihood of reporting fair/poor self-rated health and of meeting criteria for major or minor depression. Renters who were behind on rental payments were more likely to meet criteria for depression, while mortgage-holders who were behind on their mortgage or in foreclosure had a higher likelihood of reporting fair/poor self-rated health or a recent anxiety attack. Among respondents who had ever owned a home, those who completed a foreclosure recently were more likely to report an anxiety attack. However, frequent moves were not associated with poorer health, and doubling up and eviction were not associated with poorer health after adjustment for characteristics that sort people into different housing instability experiences. Our findings suggest the importance of distinguishing different types of housing instability and using appropriate risk groups and

comparison categories, as well as considering whether some individuals are experiencing a cascade of housing problems when studying links between discrete types of instability and health.

INTRODUCTION

The “Great Recession” that began in 2007 has raised the profile of housing instability as an important social issue (Bennett, Scharoun-Lee, and Tucker-Seeley 2009; Pollack and Lynch 2009; Robertson, Egelhof, and Hoke 2008). Changes in macroeconomic conditions and increases in instability in other domains, most notably employment (Kalleberg 2009), mean that a broader range of individuals in the United States may face financial risks (Gosselin 2008) that could lead to housing instability. The number of Americans who have lost or otherwise changed their place of residence for financial reasons has increased dramatically in the last few years. Whether due to mortgage problems linked to income loss, problems meeting payments for loans with adjustable interest rates, or other factors, the number of foreclosures increased 127 percent between 2007 and 2009, hitting a record high of 2.8 million foreclosed homes (Wong 2010). While data about renters’ payment difficulties is sparse, an estimated 40 percent of all foreclosures occur to rental properties (The National Coalition for the Homeless 2009). However, the new attention to housing instability is driven in part by the recent spike in mortgage and foreclosure problems faced by homeowners, who traditionally have been relatively unlikely to face housing instability in the United States.

While the potential ramifications of experiencing housing instability are numerous, one important domain to consider is consequences for health. Previous literature has shown poorer health among those with varying forms of housing instability, from foreclosure (Pevalin 2009) to homelessness (Shaw 2004). However, we know relatively little about whether and how different types of housing instability are associated with health and there is reason to expect that not all housing instability experiences are equivalent. For example, moving frequently because of typical educational, employment, and family changes in early adulthood or moving in with

others because of financial problems could both be considered housing instability. However, the first scenario probably involves more voluntary choices and may be less likely to harm health or to be driven by financial hardship. Additionally, while we might characterize both a move to less expensive housing to save money and a spell of homelessness as moves for cost reasons, their relative severity, possibilities for a quick return to stability, and health consequences could differ considerably.

However, it has not been possible to assess the potentially varying associations between different experiences of housing instability and health because many studies (with only a few exceptions, see Pevalin 2009) have been limited by their focus on selected segments of the housing market, such as only homeowners (Pollack and Lynch 2009) or only renters (e.g., March, Ettinger de Cuba, Cook, Bailey, Cutts, Meyers, and Frank 2011). Additionally, many prior studies have examined only those experiencing a particular form of housing instability. The comparison groups in such studies are comprised of people not suffering from the focal type of housing instability, however it is possible that comparison group members may have experienced other types of housing insecurity that are not the focus of the study. Therefore it is difficult to ascertain whether predictors or consequences of housing problems found in these studies apply more generally.

Using new data from the Michigan Recession and Recovery Study (MRRS), a sample of working-aged adults drawn from the general population, we examine the association between many different types of housing instability and several measures of health. Respondents were interviewed at the close of the Great Recession, providing new and timely data for a period in which housing instability has been substantial. We consider instability experiences of individuals from a variety of socioeconomic circumstances and housing statuses, such as mortgage holders

who are behind on payments but who have not yet lost their homes, as well as those who have recently experienced eviction or homelessness and may more consistently struggle to maintain stable housing because of low income and related challenges. Because we measure multiple housing instability experiences of varying severity and prevalence, we consider several distinctive risk groups, from the general population to all renters to those who are currently holding a mortgage. Importantly, for each of these risk groups we are able to construct an appropriate comparison category of individuals with no experiences of housing instability on any of our measures. Finally, the MRRS data also allow us to explore respondents' characteristics including their human capital and prior housing and health problems, as housing instability may be a link on the pathway between these factors and subsequent health, rather than a precipitating factor for health decline.

BACKGROUND

Prior Research

In previous studies, the term “housing instability” has been used to characterize a range of housing disruptions or related problems, from frequent moves or difficulty paying rent to being evicted or being homeless (Gilman, Kawachi, Fitzmaurice, and Buka 2003; Kushel, Gupta, Gee, and Haas 2006; Ma, Gee, and Kushel 2008; Phinney, Danziger, Pollack, and Seefeldt 2007; Tsemberis, McHugo, Williams, Hanrahan, and Stefanic 2007). Prior to the recent recession, much of the research focused on the health consequences of severe forms of housing instability among disadvantaged populations. Previous studies found that homelessness is associated with poorer physical and mental health (Shaw 2004; Van Laere, De Wit, and Klazinga 2009). For instance, Hwang (2001) shows that homeless individuals are at increased risk for earlier death and chronic conditions such as diabetes, chronic obstructive pulmonary disease, and tuberculosis.

A longitudinal study of the newly homeless found that they have significant health problems, which are reduced somewhat by residence in the shelter system and increased access to health services (Schanzer, Dominguez, Shrout, and Canton 2007).

However, not all forms of housing instability that are more common among disadvantaged groups have been linked consistently to poorer health. In studies focused on welfare populations (Phinney, Danziger, Pollack, and Seefeldt 2007; Wood and Rangarajan 2004), moving in with others to save on housing costs, often called “doubling up,” has also been considered housing instability. The extant evidence for an association between doubling up and health is mixed. Some studies report that it does not negatively impact mental health because it is isolation, not crowding, that causes individuals to dwell on their internal struggles (Fuller, Edwards, Vorakitphokatorn, and Semrsri 1996; He, O’Flaherty, and Rosenheck 2010). However, other studies suggest that both subjective and objective measures of crowding show associations with poorer mental health (Evans, Palsane, Lepore, and Martin 1989 ; Gove, Hughes, and Galle 1979; Lepore, Evans, and Schneider 1992) and to a lesser degree, physical health (Gove, Hughes, and Galle 1979).

In the United States, health consequences of foreclosure and the threat of foreclosure have not been studied much until recently, most likely because of their relative rarity until the increase in the recent recession (Edmiston and Zalneraitis 2007). As the mortgage crisis has unfolded, a newer body of literature has shown a negative impact of foreclosure on both physical and mental health (Pevalin 2009), including depression and anxiety (Bennett, Scharoun-Lee, and Tucker-Seeley 2009). Ross and Squires (2011) found that many homeowners who took out subprime loans internalized their foreclosure experience as a reflection of personal failure, increasing levels of anxiety and stress. In Britain, which experienced an increase in foreclosures

during the 1990s, Nettleton and Burrows (1998) found that the onset of mortgage problems was associated with changes in subjective well-being and increased likelihood of visits to general practitioners. In a subsequent qualitative study, they found that families who experienced mortgage repossession reported psychosocial stress, as well as unhealthy coping mechanisms, such as smoking and drinking (Nettleton and Burrows 2000).

These past studies suggest that the stress associated with a housing loss, crowding faced by those who have to share housing save money, or changes in environmental conditions after an involuntary move could link housing instability to changes in health or health behaviors. For example, some studies suggest that loss of housing is a risk factor for anxiety and depression because it reduces feelings of personal control and increases stress (Nettleton and Burrows 1998; Ross and Squires 2011). Negative health behaviors used to cope with the stress of housing instability, such as substance use or unhealthy eating, are related to subsequent physical health outcomes, such as cardiovascular disease (see Bennett, Scharoun-Lee, and Tucker-Seeley 2009 for further review of health conditions that could be associated with housing instability). Finally, moving may disrupt important social networks with neighbors, friends and kin, making it harder for movers to manage their responsibilities by reducing instrumental supports. Movers may also leave important institutions or resources behind, such as trusted health providers, safe spaces to exercise, or healthy eating or shopping options, or they may encounter more hazardous conditions in their new residences, especially if they have to move to less expensive housing or neighborhoods.

Fewer studies have examined the well-being of people who have not yet lost their housing, but are currently behind on their rent or mortgage or in the process of losing their homes. However, some research suggests that those who have problems making mortgage

payments have worse mental health and overall well-being (Nettleton and Burrows 1998; Pevalin 2009; Taylor, Pevalin, and Todd 2007). Pollack and colleagues (2009; 2010) find that homeowners currently experiencing default or foreclosure are significantly more likely to report deterioration of physical and mental health. Children's Health Watch researchers also have found that households behind on rent were more likely to have a mother who experienced depression and parents who gave up health care in order to meet basic expenses, compared with families who resided in the shelter system (March et al. 2011).

Even among those who have not moved, then, the stress of being behind on housing payments and threat of imminent housing loss could have detrimental effects. Those with delinquent housing payments may forego important inputs to health to save money, such as health care or health insurance, a healthy diet, or a gym membership. Nonetheless, while being behind on housing payments could increase stress, it does not involve the consequences of an actual move and change in environmental conditions. Thus, it may be important to distinguish individuals who have actually moved recently from those who are currently facing the threat of a move.

A final, important limitation of most previous studies of housing instability is that they have not examined how preexisting health problems and other social disadvantages may lead to both housing disruptions and subsequent health. While the stress of housing instability could lead to poorer subsequent health, it is also possible that a health problem may interrupt earnings, and paying for medications and other treatments may also drain financial resources, leading to an inability to make housing payments. Phinney and colleagues (2007) found that mental and physical health problems, as well as health behaviors such as drug use, were significantly associated with subsequent homelessness, and research also shows that lower-income households

are more likely to miss mortgage payments or be foreclosed upon (see Quercia and Stegman 1992 for a review), even controlling for characteristics of the loan product (Van Order and Zorn 2002). We begin to explore the role of selection factors in multivariate analyses by controlling for retrospectively-reported past health diagnoses and earlier housing problems and other characteristics that may put individuals at risk of recent housing instability.

Data

We use the Michigan Recession and Recovery Study (MRRS), a new study designed to follow a stratified random sample of non-institutionalized English-speaking adults aged 19-64 who lived in Southeastern Michigan (Macomb, Oakland, and Wayne counties) at the time of the initial data collection in late fall 2009 – spring 2010. This sample excludes individuals living in shelters or other facilities, but other studies have examined the shelter-dwelling population (Schanzer, Dominguez, Shrout, and Canton 2007; Shaw 2004). The MRRS oversampled African Americans and includes mainly African American and non-Hispanic white respondents, reflecting the residential composition of the area. We use data from the first wave of in-person survey interviews, which lasted approximately 60 minutes. Respondents were paid between \$40 and \$120 for their participation, and a total of 914 respondents were interviewed, with a response rate of 82.8%. Restricting the sample to those with complete information on all study variables produces an analytic sample of 894 respondents. Some housing instability measures were only available for current renters (N = 383), renters and those who were not renters or owners (N = 453), those who were currently paying a mortgage (N = 323), or those who had ever owned a home (N = 548).

Health Measures

We examined four measures of health: self-rated health, depression, anxiety attack, and problematic alcohol use. Self-rated health is measured here with the typical item: “Would you say that your health in general is excellent, very good, good, fair, or poor?” We collapsed the item so that poor or fair health =1, while excellent, very good, or good health = 0, a typical cut point. Table 1, which presents percentages or means and standard deviations for all variables used in the analysis, overall and by category of housing instability, shows that about 17% of respondents in the analytic sample reported fair/poor self-rated health. Depression was measured using the Patient Health Questionnaire (PHQ), a validated 9-item scale based on the diagnostic criteria for major depressive disorder in the Diagnostic and Statistical Manual Fourth Edition (DSM-IV) (Kroenke and Spitzer 2002). The PHQ-9 has two components that: (1) assess symptoms and functional impairment over the past 2 weeks to make a tentative diagnosis, and (2) can be used to derive a severity score designed to help clinicians select and monitor treatment. Respondents were classified as meeting symptomatic criteria for major or minor depression according to provided guidelines, so that meeting criteria = 1 and not meeting criteria = 0. Using this measure, about 17% of our sample met criteria for major or minor depression. We also measured recent experience of serious anxiety with an item that asked: “In the last 4 weeks, have you had an anxiety attack – suddenly feeling fear or panic?” This item came from the PHQ-brief instrument, a validated scale (Lowe, Grafe, Zipfel, Spitzer, Herrmann-Lingen, Witte, and Herzog 2003), and about 17% of respondents reported affirmatively. We used the Alcohol Use Disorders Identification Test (AUDIT), a validated ten-item scale of recent alcohol use, alcohol dependence symptoms, and alcohol related problems (Barry and Fleming 1993). A cut point recommended by the scale’s creators was used to distinguish harmful and hazardous use (=1) from less use (=0), with about 22% of our sample meeting these criteria.

To address the possibility that preexisting health problems selected respondents into precarious housing situations and subsequent poor health, we generated a measure of chronic health problems diagnosed at least three years before the baseline interview. Respondents reported whether they had ever been told by a doctor or health professional that they had a specific condition, and if they answered affirmatively, were asked their age at first diagnosis. Conditions included: heart attack; coronary heart disease, angina, or congestive heart failure; high blood pressure or hypertension; asthma; chronic lung disease such as bronchitis, emphysema or chronic obstructive pulmonary disease (COPD); diabetes or high blood sugar; arthritis or rheumatism; cancer or a malignant tumor; and “any other serious, chronic condition.” About 44% of our respondents had been diagnosed with any of these chronic conditions three years ago or more, though they may no longer be suffering symptoms. To address selection on the basis of a previous mental health problem, we created a parallel indicator of being diagnosed with any emotional, nervous, or psychiatric problems at least three years ago. About 11% of MRRS respondents reported an earlier mental health diagnosis.

Housing Instability Measures

Appendix A describes the eight types of *housing instability* we examined, the different groups of respondents at risk of each type, and our coding strategy for each.

– APPENDIX A ABOUT HERE –

All respondents could report on multiple moves – at least three moves in the past three years – and having moved for cost reasons in the past three years. All respondents also reported whether in the past 12 months they had doubled up – moved with others to save on costs – or been homeless. In addition to reporting on these types of housing instability, respondents who were renters at the time of interview also reported whether they were currently behind on their rent.

Respondents who were renters or others – they were not renting and did not own their home or have a mortgage at the time of the interview – reported whether they had been evicted in the past 12 months. Respondents who were paying a mortgage reported whether they were currently behind on payment or in the foreclosure process. A final group – those who had ever or currently owned a home or currently were paying a mortgage – reported on whether they had been through a foreclosure in the past three years. Within each of these five risk groups, MRRS respondents with no recent or current housing instability experiences make up the baseline category of *no housing instability*. This represents a clear reference category for comparison with each distinct type of housing instability experience, and an advance on the extant literature. Some prior studies have used a reference category comprised of individuals who have not experienced a particular housing problem (e.g., not evicted), but these reference individuals may have experienced other types of housing instability that were not considered in that study. Other studies have had no comparison group of stably housed individuals.

As a control for a history of housing problems, we also created a measure of *prior housing instability* that was coded 1 if respondents had been foreclosed upon before 2007 or had been evicted more than a year ago. This measure of past housing problems was generated for all respondents, regardless of their reports of more recent housing instability, and is also described in Appendix A.

Other Measures

We also use measures of the respondent's age in years, gender, race (African American versus not African American), partnership status (married or cohabiting versus not), and educational attainment (at least a Bachelor's degree versus less education). We use a measure combining employment status and employment instability history, with categories for those who

are: currently employed with no employment problems recently; currently employed but have experienced a wage reduction, furlough day(s), or layoff time in the past 12 months, or less than six months of unemployment since January 2007; currently employed but experienced six or more months of unemployment since January 2007; currently unemployed; or not in the labor force. We also include a measure of the household's income-to-needs ratio in 2008 (income divided by the federal poverty line for a household of the size reported by the respondent). Ratios of less than one generally are categorized as "poor," while those from one to two are "near poor" and ratios above two indicate moderate or higher income. We divided respondents with income-to-needs ratios lower than two from those with ratios of two or above. Because of the relatively high incidence of missing data for 2008 income (about 7%), we also include a separate category for missing on income-to-needs ratio.

Methods

We present descriptive bivariate and multivariate analyses. Our general strategy was to compare respondents with no housing instability to those who had a particular type of housing instability, considering each type of instability separately and for the appropriate risk group. For each comparison, we created categories for those who: (1) reported no housing instability of any kind, (2) reported the type of instability of interest (whether or not they reported any other recent housing instability), and (3) a "residual" category for individuals who had experienced some other kind of housing instability, but not the focal kind. We do not show results for this third, residual category, because its composition changes for each comparison. In the multivariate analyses, we also omitted those with any prior housing instability (foreclosed upon before 2007 or evicted more than a year ago) to focus on respondents with more recent housing insecurity and to reduce the influence of those caught in a long term cycle of housing problems. All analyses

account for the complex sample survey design by using survey estimation procedures in Stata/SE 11 (StataCorp 2009), and weights that address selection probability and make the sample representative of adults ages 19 to 64 years old living in the three-county area in Southeastern Michigan. For bivariate comparisons, we present p-values for Pearson chi-square tests of difference across groups (instability versus no instability) that adjust for the survey design.

RESULTS

Tables 1 and 2 present compare the characteristics of respondents who reported each different type of housing instability to others in the appropriate risk group with no housing instability. Table 1 considers the four types of housing instability measured for all respondents, while Table 2 presents findings for the renter-specific, renter-and-other-specific, mortgage-holder-specific, and ever-owner-specific types of instability. The percentage of respondents in the appropriate risk group reporting each specific type of housing instability is shown at the bottom of each column.

– TABLE 1 ABOUT HERE –

The first four rows of Table 1 shows that compared to those reporting no housing instability, those who moved multiple times recently have similar health profiles. However, individuals who moved for cost in the past three years and those who reported being homeless in the past 12 months were significantly more likely than the stably housed to report fair or poor self-rated health, to meet criteria for major or minor depression and to have recently experienced anxiety attacks. Those who doubled up in the past year were also more likely to report anxiety attacks. Table 1 also shows that respondents reporting multiple moves, moves for cost, doubling up or homelessness were significantly younger than the stably housed and more likely to be

African American. Respondents who moved for cost were less likely to be married or cohabiting than those with no housing instability.

Comparison of educational attainment and employment experiences reveals important differences in human capital among those with and without housing instability in Table 1. Respondents who moved for cost and those who had doubled up recently were less likely to have a bachelor's degree than the stably housed, and those who doubled up or had experienced homelessness were more likely to report recent employment problems and current unemployment. Income-to-needs profiles were substantially worse for those reporting multiple moves, moves for cost, doubling up, and those who had been homeless recently, compared to those who reported no recent housing instability. While those who had recently doubled up were more likely to report having had a mental health condition diagnosed at least three years ago, earlier health and housing instability profiles did not otherwise differ for those who experienced these types of housing instability, compared to the stably housed.

Among the respondents who reported each type of housing problem, we also examined the percentage who reported at least one other kind of housing instability. As shown at the bottom of Table 1, among those who reported multiple moves in the past three years, about half also reported some other kind of housing instability. Those who had doubled up with others to save on costs or been homeless in the past year reported even more clustering of housing problems – 76 to 85% of these respondents reported some other form of housing instability from the types we considered.

Table 2 presents a similar set of comparisons for housing instability measures specific to different risk subgroups. Focusing on the first set of columns, which report on those who were renting at the time of the survey, comparison reveals that respondents behind on their rent were

significantly more likely to have had an anxiety attack in the past month, and were also less educated than renters without any housing instability. About 48% of those behind on their rent also reported some other form of housing instability. The second set of columns, which consider the larger risk group that includes renters and those who were neither renters or owners, shows that the relatively small number of respondents who were evicted in the past year were more likely to report a recent anxiety attack than their stably housed counterparts. The evicted were also much more likely to be female and African American and had much worse income-to-needs profiles than renters and others who had not experienced recent housing instability. Nearly all of those who were evicted recently also experienced some additional form of housing instability.

– TABLE 2 ABOUT HERE –

Table 2 also shows that respondents who were behind on their mortgage or who had gone into the process of foreclosure were more likely to report fair/poor self-rated health, to meet criteria for major or minor depression, and to have had a recent anxiety attack than mortgage holders without any recent housing instability. Those behind on their mortgage or in foreclosure were also more likely to be African American and to fall below an income-to-needs ratio of two, and less likely to have a bachelor's degree or more than their counterparts with no instability. However, only about 12% who were behind on their mortgage or in foreclosure reported any other type of housing instability. Finally, among those who currently or had ever owned a home, those who had experienced a foreclosure in the past three years had worse health than ever owners with no housing instability on every measure except problematic alcohol use. Those who had experienced foreclosure were more likely to be female and African American and had worse income profiles than their counterparts without housing instability. Almost three-quarters of

respondents who had been through foreclosure had also experienced another form of housing instability recently.

We also estimated multivariate models to explore whether associations between housing instability and health were fully explained by differences in sociodemographic characteristics and human capital between the stably housed and those who experienced instability. Table 3 presents results from multivariate logistic regression models predicting the four health outcomes, and shows odds ratios and 95% confidence intervals for the focal independent variable: the specific type of housing instability under consideration. We omitted respondents with prior housing instability, so the analytic samples for the regression models are smaller than the total samples for the appropriate risk groups. No housing instability is used as the reference category for all models, and all models control for the respondent's age, sex, race, partnership status, educational attainment, income-to-needs ratio for 2008, and indicator of earlier health problems. We adjust for earlier chronic condition diagnoses in models predicting self-rated health and for earlier mental health diagnoses in models of depression, anxiety attack, and harmful/hazardous alcohol use.

– TABLE 3 ABOUT HERE –

Results in Table 3 show that individuals who moved for cost had odds of a recent anxiety attack about 2.5 times as great as those with no recent housing instability, though the greater likelihood of reporting fair/poor self-rated health and of meeting criteria for depression that we found in bivariate comparisons (shown in Table 1) were no longer statistically significant after we adjusted for their less-advantaged sociodemographic profiles. Those who experienced homelessness had higher odds of reporting fair/poor self-rated health (OR: 4.0) and of meeting criteria for depression (OR: 6.1) than their counterparts with no housing instability recently,

thought the higher likelihood of reporting an anxiety attack found in the bivariate analysis was no longer significant after adjustment for their sociodemographic characteristics. Multiple moves were still not associated with worse health profiles in the multivariate analysis, and doubling up was no longer associated with a greater likelihood of reporting a recent anxiety attack.

Table 3 also shows that those behind on their rent had odds of meeting criteria for depression about 3.6 times as great as those of renters who experienced no instability recently, though they are no longer more likely to report a recent anxiety attack after adjustment for their sociodemographic characteristics. While those with a recent eviction had been more likely to report a recent anxiety attack in the bivariate comparison, adjustment for their sociodemographic characteristics weakened this association to insignificance.

Being behind on one's mortgage or in foreclosure was associated with odds of reporting fair/poor self-rated health about 3.1 times as great as that for mortgage holders with no recent housing instability and with odds of a recent anxiety attack about 3.7 times greater. However, while those behind on their mortgages or in foreclosure showed greater likelihood of meeting criteria for depression in the bivariate comparison, this association was no longer significant in the multivariate models. Respondents who had experienced a foreclosure in the past three years had odds of meeting criteria for depression 5.8 times as great as those for their stably housed counterparts and odds of a recent anxiety attack about 3.5 times as great. However, they were no longer more likely to report fair/poor self-rated health after adjustment for their less advantaged sociodemographic characteristics.

Sensitivity Analyses

In additional analyses not shown here but available from the authors, we included an indicator for owner, renter or other in models estimated for all respondents: those for multiple

moves, moves for cost, doubling up and homelessness. Results were largely unchanged, though moves for cost were now significantly associated with depression. The pattern of results was also similar in models that: (i) only included a prior health or mental health condition if it limited the respondent's functioning, (ii) substituted an indicator of having a work limiting condition, and (iii) dropped respondents with a preexisting health condition. Finally, the joint distribution of employment status and instability, income-to-needs ratio category, and the detailed housing categories meant that we could not include both employment and income variables in the multivariate regressions. We included the 2008 income-to-needs ratio because it generally temporally preceded recent housing instability experiences, whereas the timing of potentially linked employment and housing problems was less clear. The pattern of results is similar if we substitute the employment variable for the income-to-needs ratio.

DISCUSSION

In this study, we used a unique new population-based survey sample of Southeastern Michigan residents surveyed in the wake of the Great Recession to measure a wide variety of housing instability experiences and to assess their associations with self-rated health, depression, anxiety and problematic alcohol use. Our study addresses several key limitations of prior studies: we do not rely on a sample comprised solely of individuals experiencing housing problems, and we can separately consider a variety of housing experiences and health outcomes. We examine distinct types of housing instability among those who are at risk, and for each of these risk groups we are able to construct a distinct category of individuals with no experiences of housing instability on any of our measures. These data were collected very recently and allow us to assess the importance of precipitating sociodemographic characteristics and earlier health, which could

account for the association between recent housing instability and health found in some earlier studies.

While most remained stably housed over the last several years, our results suggest that about 30% of Southeastern Michigan residents experienced at least one of the forms of housing instability we measured. This fraction was even higher among renters, at about 53%. Even when we do not consider those with a history of housing problems and account for the nonrandom distribution of housing instability on the basis of sociodemographic characteristics and pre-existing health problems, we found that several different forms of instability were linked with health. We found that respondents who experienced homelessness and those who were behind on their mortgage or in foreclosure had a higher likelihood of reporting fair/poor self-rated health. Respondents who experienced homelessness, were behind on their rent, or went through foreclosure recently were more likely to meet criteria for major or minor depression. Finally, individuals who had recently moved for cost, fallen behind on their mortgage or were in the foreclosure process, and those who completed a foreclosure recently were significantly more likely to report a recent anxiety attack.

As suggested by previous literature, our results show that preexisting social disadvantages contribute to a cycle of problems for some individuals (Pevalin 2009; Phinney, Danziger, Pollack, and Seefeldt 2007; Robertson and Cousineau 1986; Shaw 2004). Some of the associations between health and housing problems that were evident in bivariate associations were explained by the lower incomes, education, or other social disadvantaged faced by many of the respondents experiencing housing instability. Nonetheless, our results provide new evidence that some forms of housing instability common in the recent recession may have an independent

influence on health, net of other forms of social disadvantage with which they are often associated (Nettleton and Burrows 1998; Pollack and Lynch 2009).

Taken together, our findings reveal the importance of distinguishing different types of housing instability and of having a sample of respondents from across the socioeconomic spectrum. Interestingly, we found that frequent moves, doubling up and eviction were not associated with substantially poorer health outcomes after adjustment for individuals' sociodemographic profiles and earlier health. Only about half of the individuals who made multiple moves recently reported any other type of housing instability, and at least some may be engaging in voluntary moves that are not health harming. By contrast, those who doubled up or went through eviction reported a variety of housing problems in the recent past, and were very socially disadvantaged compared to their stably housed counterparts. Adjustment for their social characteristics helps to explain our findings for those groups. While our data do not allow it, future research on housing instability would greatly benefit from examining the voluntariness of various kinds of moves and acceptability of doubling up or other strategies relative to other options when evaluating potential consequences for health. Finally and importantly, we did not find higher rates of problematic alcohol use among those facing housing problems. Our measure of alcohol use captures harmful and hazardous levels of drinking, not smaller changes in use that may be occurring. Nonetheless, future studies using this and other data could observe a wider range of behavioral responses to the stress of housing instability and should be sensitive to protective changes in behavior as well as possible harmful changes.

These findings suggest the value of future research on diverse housing instability experiences. However, they should be interpreted in light of the relatively small number of respondents in most housing instability categories. We observe small numbers in some

categories because their prevalence in the general population is low. Reducing the analytic sample to those with no prior housing instability in the multivariate models reduces some of these already small numbers further. In analyses not shown here, we re-estimated the models but included those with former housing instability, and results reassured us that their omission does not change our main conclusions. A variety of associations became stronger or gained statistical significance, though those behind on rent were no longer more likely to meet criteria for depression. Sampling from the population has advantages, but future research with larger samples or targeted sampling of each of these types of housing problems is also needed to verify our findings.

Our bivariate analyses revealed that many individuals who reported one kind of housing instability also reported another within the past three years. Those reporting certain types of housing instability may be going through a process of multiple housing problems, and this may help to account for their health outcomes, rather than the experience of one specific type of instability. Obtaining larger samples of people who have experienced cascades of housing events over a short window of time would be useful for untangling the contributions of distinct events and strains; here we observe that the more objectively serious experience like homelessness do not frequently occur in the absence of other housing problems. In models not shown here, we included an indicator of whether respondents reported more than one type of housing instability. Moves for cost became a significant predictor of poor/fair health and depression, while doubling up and being behind on rent became significant predictors of poor/fair health and those behind on their mortgage or in foreclosure were now significantly less likely to meet criteria for harmful alcohol use. However, given the extent of clustering of experiences and our small base sample of cases of housing instability, confidence intervals in these models were large. Though further

exploration with larger samples is needed, these findings suggest that while it is important to take account of the process of housing instability and cascades of distinct events in future research, even isolated experiences of instability are associated with well-being. It will also be important to supplement such findings with targeted study of the most housing unstable individuals, who are unlikely to appear in a population-based survey because they have no stable residential location or are using institutional facilities.

Additionally, the cross-sectional data available for these analyses make it difficult to convincingly isolate the independent effect of housing problems from the negative health consequences of employment instability or financial strain that occurred as a related chain of events in the recent recession. Using future waves of data from this study and data from other studies, it will be important to better establish the temporal ordering of events and the ways that changes in domains such as work (such as a job loss) and home (such as relationship dissolution) influence housing instability trajectories. Future research should also consider the duration of any given housing problem or the total cascade of housing problems (e.g., getting behind on mortgage payments, entering foreclosure, and subsequently losing one's home). Longitudinal data may also reveal differences in the ways individuals utilize private or public sources of help to deal with housing instability and financial problems and whether these modify the association between housing instability and health. Finally, to further explore the threat of housing loss – measured here as being behind on rent or mortgage or in the foreclosure process – and its association with well-being, longitudinal data and analyses are needed to assess whether housing loss actually occurred or was prevented and whether outcomes differ for these divergent trajectories.

These findings should also be interpreted in the context of some other limitations. The sample was drawn from Southeast Michigan; focusing on a restricted geographic area holds constant local housing market conditions and regulations that could affect the risk for certain types of housing instability. However, this region has been particularly hard hit by the recent recession, and our findings may not be generalizable. Nonetheless, to the extent that even prior to this recession economic insecurity among many Americans was increasing (Hacker, Huber, Rehm, Schlesinger, and Valetta 2010), our findings may apply to other communities and groups who will continue to experience difficulties in the unusually slow macroeconomic recovery that has begun. Second, our use of self-reported health measures and self-reports of housing instability is not ideal, but is an approach taken by some other studies. The strategy used by some prior studies of selecting subjects on the basis of publicly-recorded foreclosures avoids errors in self-reports but selects only those who have completed one kind of housing loss and cannot provide a population-level assessment of the frequency or predictors of this experience, alone or compared to other housing instability experiences. We use a variety of self-reported health measures, providing more robust support for our contention of important links between certain forms of housing instability and health. Nonetheless, other studies with more objective health measures are needed.

When considering the consequences of housing instability for health and potential ways to intervene, our findings reveal that focusing only on those who lose their housing is insufficient. Those who were currently behind on housing payments or actively in the foreclosure process may be experiencing poor health outcomes. Two federal programs, the Home Affordable Modification Program (HAMP) and the Homelessness Prevention and Rapid Re-housing Program, are designed in part to help prevent foreclosures and evictions by assisting home

owners in modifying their mortgages (e.g., lowering monthly payments) or providing funds to localities to help people remain in their homes. Because these programs are new, evidence about their effectiveness is limited, although early reports indicated that relatively few homeowners were able to secure loan modifications (Chan 21 July 2010). However, their potential buffering effects should be considered. Many Americans' major source of financial assets is their home (Bucks, Kennickell, and Moore 2006), and foreclosure may represent a serious loss of wealth or potential wealth. Owners who lose their homes and renters who are evicted may also experience a damaged credit rating that could make it more difficult to achieve housing stability (Wu, De Armond, Carter, Rubin, Bennett, Delbaum, and Saunders 2010).

However, maintaining some individuals in housing situations that will be unaffordable in the long term – so that they are frequently behind on payments – may prolong stress. Persistent insecurity of this type could be worse than moving in some cases. Home ownership for lower-income people or those with unsustainable housing payments may even harm health (Taylor, Pevalin, and Todd 2007). This possibility merits further study using samples of housing insecure people who experience different subsequent trajectories, including financial stabilization, continued chronic payment arrears or foreclosure threat, and a move to different housing or to homelessness. More broadly, our results suggest the need for continued exploration of the nature and extent of housing instability, its connections with health, and potential ways to intervene and groups to target. Such information will be critical for both academics and policymakers in the long shadow of the Great Recession.

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Appendix A. Description of types of housing instability, groups of respondents asked about each type, and items used to generate measures.

	Who was Asked	Items and Coding Strategy
Multiple moves	All respondents	Respondents were asked: "In the past three years, how many places, including this house/ apartment, have you lived for one week or longer?" Those who lived 3 or more places coded as frequent movers.
Moved due to cost in past 3 years	All respondents	Respondents were asked: "In the past three years, how many places, including this house/ apartment, have you lived for one week or longer?" If more than one place, they were asked: "Did you move because you could no longer afford that home?" Those who answered affirmatively on the second item were coded as having moved for cost.
Doubled up in past 12 months	All respondents	Respondents were asked: "Have you moved in with anyone in the last 12 months to share household expenses?" Those responding affirmatively were coded as having doubled up.
Homeless in past 12 months	All respondents	Respondents were asked: "Have you ever been homeless at any time in the last 12 months?" Those responding affirmatively were coded as having been homeless.
Behind on rent	If renting at time of interview	Those paying rent were asked: "In the last 12 months, have you ever gotten behind on your rent?" If yes, they were asked: "Are you currently behind on your rent?" Those who responded affirmatively on the second item were denoted as behind on rent.
Evicted in past 12 months	If did not currently own/ was not buying a home	Those who did not own their home and were not paying a mortgage were asked: "Have you been evicted at any time in the last 12 months?" Those responding affirmatively were coded as having been evicted.
Behind on mortgage/currently in foreclosure	If currently paying a mortgage at time of interview	Those with a mortgage were asked: "Are you paying off this loan ahead of schedule, behind schedule, or are your payments about on schedule?" Those behind on their mortgage were also asked: "Has your lender or bank started the process of foreclosing on your home?" Those who reported being 'behind schedule' or reported that the bank had started the foreclosure process were coded as currently behind or in foreclosure.
<i>(Appendix A continued below)</i>		

Appendix A, cont. Description of types of housing instability, groups of respondents asked about each type, and items used to generate measures.

	Who was Asked	Items and Coding Strategy
Foreclosed in 2007 or later	If ever owned a home	Respondents who currently owned their home or were paying a mortgage were asked: “Have you ever had a house foreclosed upon?” and “Have you ever been removed from a home that you owned due to delinquent mortgage payments or delinquent taxes? In what year or years did this happen?” Those who were not current home owners but had formerly owned a home were asked: “Was your home ever threatened with foreclosure? In what year or years did this happen? What happened to your home? Was it foreclosed on, abandoned, did you catch up on payments or something else?” Those responding that they had been removed from a home in 2007 or later were considered completed foreclosures.
Former Housing Instability	All respondents ^a	Respondents who currently owned their home or were paying a mortgage were asked: “Have you ever had a house foreclosed upon?” and “Have you ever been removed from a home that you owned due to delinquent mortgage payments or delinquent taxes? In what year or years did this happen?” Those who were not current home owners but had formerly owned a home were asked: “Was your home ever threatened with foreclosure? In what year or years did this happen? What happened to your home? Was it foreclosed on, abandoned, did you catch up on payments or something else?” Those responding that they had been removed from a home in 2006 or earlier were coded as having former housing instability. All respondents who did not own a home and who had not been evicted in the past year were asked: “Has a landlord ever evicted you?” Those responding affirmatively were coded as having experienced former housing instability.

a. Current homeowners and those paying a mortgage were not asked about evictions, and those who had never owned a home were not asked about foreclosure experiences, but all respondents were asked about one or the other of these experiences.

Table 1. Sample Characteristics by Housing Instability Category for Sample Overall, MRRS Respondents.

	All Respondents								
	No Insecurity	Multiple moves past 3 yrs	p	Moved for cost past 3 yrs	p	Doubled up past 12 mo	p	Homeless past 12 mo	p
SRH Health Fair/Poor	13.5%	16.6%	0.514	36.9%	0.010	22.4%	0.085	41.9%	0.001
Major/Minor Depression	13.4%	17.2%	0.281	29.7%	0.006	16.4%	0.570	40.9%	0.001
Anxiety Attack	12.5%	19.7%	0.144	35.0%	0.001	29.2%	0.004	40.0%	0.003
Harmful alcohol use	22.5%	24.1%	0.782	21.2%	0.822	33.8%	0.116	33.9%	0.224
Age in years	43.9 (0.89)	33.5 (1.06)	<.001	36.6 (2.02)	0.003	34.2 (1.68)	<.001	35.5 (2.39)	0.002
% Female	49.3%	47.0%	0.713	58.2%	0.339	46.8%	0.791	53.0%	0.660
% African American	19.6%	35.9%	0.003	42.6%	<.001	46.9%	<.001	69.3%	<.001
% Married/Cohabiting	66.1%	56.6%	0.193	36.9%	0.002	49.1%	0.079	56.3%	0.339
% With Bachelor's Degree or More	28.5%	35.8%	0.082	7.6%	<.001	13.6%	0.009	8.0%	0.106
Employment Status and Instability			0.434		0.079		0.010		0.037
Employed, No Instability	34.4%	33.3%		14.8%		15.0%		5.2%	
Employed, Recent Employment Problem	21.4%	30.5%		23.6%		28.0%		26.3%	
Employed, Recent Long Unemployment	7.5%	4.4%		8.2%		17.2%		9.2%	
Currently unemployed	12.3%	11.4%		23.3%		22.7%		29.8%	
NILF	24.4%	20.3%		30.1%		17.1%		29.6%	
Income-to-needs ratio 2008			<.001		<.001		<.001		<.001
2+ (moderate poverty - not poor)	71.4%	50.4%		21.9%		38.4%		15.0%	
<2 (poor or near poor)	21.3%	44.4%		73.1%		58.6%		81.4%	
Missing income information	7.4%	5.3%		4.9%		3.1%		3.6%	
% Had Housing Instability in Past	6.2%	14.1%	0.065	10.4%	0.227	7.0%	0.791	9.7%	0.399
% Had chronic condition 3+ years ago	44.4%	39.6%	0.475	50.7%	0.527	35.3%	0.216	49.0%	0.507
% Had mental health condition 3+ years	9.7%	14.5%	0.246	13.0%	0.332	20.2%	0.048	11.0%	0.794
N	584	120		118		81		34	
% of overall sample	70.4%	11.8%		10.5%		7.0%		2.1%	
% with 2+ Reports of Housing insecurity	0.0%	50.1%		59.3%		75.7%		85.0%	

Note: Figures are weighted except for numbers of cases. P-values are presented for Pearson chi-square tests of difference across groups (instability versus no instability) that adjust for the survey design.

Table 2. Sample Characteristics by Housing Instability Category for Housing Status-Specific Groups, MRRS Respondents.

	Renters Only			Renters and Others Only			Mortgage Holders Only			Ever Owners Only		
	No Insec.	Behind on rent	p	No Insec.	Evicted past 12 mo	p	No Insec.	Behind mortg./ in foreclos.	p	No Insec.	Foreclos. since 2006	p
SRH Health Fair/Poor	22.0%	37.4%	0.074	18.8%	29.1%	0.343	8.8%	24.1%	0.020	12.3%	39.7%	0.035
Major/Minor Depression	21.0%	32.9%	0.303	16.1%	13.9%	0.794	10.2%	27.7%	0.047	12.9%	52.2%	<.001
Anxiety Attack	15.9%	41.5%	0.018	13.9%	33.8%	0.035	12.2%	34.6%	0.002	11.5%	40.2%	<.001
Harmful alcohol use	24.6%	28.0%	0.779	27.3%	8.7%	0.192	19.1%	10.3%	0.246	22.3%	27.6%	0.713
Age in years	39.1 (1.64)	35.8 (2.44)	0.188	36.0 (1.11)	30.5 (3.44)	0.117	45.6 (1.04)	42.5 (1.75)	0.120	47.2 (0.62)	43.5 (2.19)	0.097
% Female	52.5%	56.1%	0.753	48.6%	82.3%	0.007	49.6%	52.6%	0.787	48.5%	72.6%	0.043
% African American	43.1%	65.3%	0.087	36.0%	81.3%	0.003	10.8%	28.1%	0.002	13.3%	27.4%	0.032
% Married/Cohabiting	41.4%	40.2%	0.925	33.9%	34.7%	0.968	84.8%	80.8%	0.430	76.6%	64.2%	0.289
% With Bachelor's Degree or More	10.8%	2.8%	0.047	13.6%	0.0%	0.228	38.1%	18.5%	0.002	33.3%	15.4%	0.120
Employment Status and Instability			0.709			0.242						0.605
Employed, No Instability	22.0%	12.6%		21.7%	0.0%		42.8%	25.6%	0.075	39.0%	32.8%	
Employed, Recent Employment Problem	26.5%	32.5%		23.3%	23.5%		20.8%	21.1%		21.7%	17.1%	
Employed, Recent Long Unemployment	7.9%	7.8%		13.8%	5.5%		4.3%	18.6%		4.8%	7.0%	
Currently unemployed	23.3%	29.5%		19.6%	28.5%		9.7%	17.5%		9.3%	20.4%	
NILF	20.3%	17.6%		21.6%	42.5%		22.4%	17.3%		25.3%	22.7%	
Income-to-needs ratio 2008			0.057			0.001			0.003			0.002
2+ (moderate poverty - not poor)	40.4%	20.7%		46.0%	2.6%		88.2%	69.2%		80.3%	45.2%	
<2 (poor or near poor)	54.1%	78.3%		47.6%	92.4%		5.8%	27.3%		12.0%	41.4%	
Missing income information	5.5%	1.1%		6.4%	5.0%		6.0%	3.5%		7.7%	13.5%	
% Had Housing Instability in Past	14.8%	16.5%	0.818	13.4%	3.2%	0.143	3.9%	1.0%	0.192	5.1%	0.0%	0.574
% Had chronic condition 3+ years ago	37.8%	49.3%	0.295	38.3%	60.2%	0.227	43.6%	39.1%	0.735	47.2%	46.1%	0.920
% Had mental health condition 3+ years	12.6%	17.0%	0.624	11.3%	19.1%	0.416	9.6%	13.8%	0.640	9.1%	17.3%	0.257
N	185	49		228	18		250	47		405	24	
% of overall sample	47.1%	9.6%		52.7%	3.1%		79.8%	13.1%		77.2%	3.1%	
% with 2+ Reports of Housing insecurity	0.0%	47.9%		0.0%	92.3%		0.0%	11.6%		0.0%	71.7%	

Note: Figures are weighted except for numbers of cases. P-values are presented for Pearson chi-square tests of difference across groups (instability versus no instability) that adjust for the survey design.

Table 3. Odds ratios from Logistic Regression Models of Health Outcomes (95% Confidence Intervals in Parentheses), MRRS Respondents without Recent Prior Housing Instability.

	SRH Fair/Poor	Major/Minor Depression	Anxiety Attack	Harmful alcohol use
All Respondents N = 822				
Multiple moves past 3 yrs	1.32 (0.48 , 3.64)	1.35 (0.62 , 2.92)	1.25 (0.58 , 2.69)	0.86 (0.42 , 1.75)
Moved for cost past 3 yrs	2.64 (0.73 , 9.54)	1.93 (0.93 , 4.01)	2.47 * (1.25 , 4.90)	1.03 (0.42 , 2.52)
Doubled up past 12 mo	1.93 (0.83 , 4.47)	0.86 (0.39 , 1.89)	1.86 (0.74 , 4.65)	1.48 (0.59 , 3.69)
Homeless past 12 mo	3.95 * (1.17 , 13.3)	6.14 *** (2.47 , 15.3)	4.31 (0.97 , 19.2)	2.54 (0.83 , 7.79)
Renters N = 333				
Behind on rent now	2.28 (0.74 , 7.01)	3.66 * (1.15 , 11.7)	3.03 (0.97 , 9.42)	1.72 (0.28 , 10.7)
Renters and Others N = 394				
Evicted past 12 mo	1.47 (0.30 , 7.16)	0.85 (0.16 , 4.5)	1.54 (0.36 , 6.67)	0.68 (0.07 , 6.6)
Currently Paying a Mortgage N = 313				
Behind on mortgage/ in foreclosure now	3.09 * ^a (1.19 , 8.03)	3.13 (0.76 , 12.9)	3.74 * (1.08 , 13.0)	0.46 (0.10 , 2.07)
Ever Owned a Home N=517				
Foreclosed since 2006	4.23 (0.56 , 31.9)	5.76 ** (1.93 , 17.2)	3.47 * (1.06 , 11.3)	1.32 (0.19 , 9.13)

Note: *p<.05, **p<.01, ***p<.001. All models include the respondent's age, sex, race, partnership status, educational attainment, income-to-needs ratio for 2008, and indicator of earlier health problems. Earlier chronic condition diagnosis used in fair/poor self rated health model, earlier mental health diagnosis used in harmful or hazardous alcohol use, major or minor depression, and anxiety models.

a. P-value for F-test of this logistic regression model is 0.114; p-values for all other models are <.05