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THE EFFECT OF HOUSING CIRCUMSTANCES ON RECIDIVISM:

Evidence From a Sample of People on Probation in San Francisco

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Abstract

The relationships between housing circumstances and recidivism are well established among people released from prison. Despite probation being far more common than prison or parole, we know little about living situations, homelessness, and residential instability among people on probation, and we know even less regarding how these housing circumstances may affect their risk of recidivism. Using a unique dataset of 2,453 people on probation and longitudinal analyses, this study finds that housing insecurity is common and is associated with an increased risk of recidivism among people on probation, above and beyond an array of other recidivism risk factors. Furthermore, we find housing effects are particularly strong for relatively low risk people and for relatively low-severity offenses (i.e., property crimes, minor crimes, and revocations). Interventions that increase housing access for people on probation may reduce recidivism, especially for those who are relatively low risk and low-level reoffending.

Keywords

probation; recidivism; risk factors; criminogenic needs; community supervision; reentry

INTRODUCTION

In the United States, probation departments supervise 3.6 million people (Jones, 2018). Dramatically overshadowing the number of people incarcerated, probation is the largest site of correctional control. Probation has the potential to become an even larger site of correctional intervention, as states seek to reduce costs (Justice Reinvestment Initiative, 2013). Although some reformers view expanding probation as a decarceration strategy, extending corrections in this manner has yet to have such an effect (Phelps, 2013, 2017). In part, probation's ability to facilitate decarceration is hindered by recidivism. Estimates suggest that 40%–65% of people on probation are rearrested (Geerken & Hayes, 1993; Petersilia & Turner, 1991; Whitehead, 1991).

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People on probation have a variety of social and economic needs that may promote recidivism. Lack of stable housing may be among these needs. Research suggests that housing instability and homelessness is common and related to recidivism among other justice-involved groups, such as those released from prison (Clark, 2016; Harding et al., 2016; Lutze et al., 2014; Steiner et al., 2015). Prior research also suggests that the effect of housing on recidivism can vary within these groups (see, for example, Harding et al., 2016) and by reoffense type (see, for example, Clark, 2016; Steiner et al., 2015). To date, however, relatively little is known about the housing circumstances of people on probation, the relationship between their housing circumstances and recidivism, or factors that alter the strength of those relationships.

In this study, we address this gap by describing three housing circumstances—living situation, homelessness, and residential instability—among people on probation and testing the relation between these circumstances and recidivism. To understand potential sources of effect variation, we also test whether the relation between residential circumstances and recidivism differs by level of criminal risk or reoffense type (i.e., drug, person, property, and minor crimes, or revocations). First, we contextualize our study of residential circumstances and recidivism among people on probation, describing extant research on other justice-involved groups.

HOUSING CIRCUMSTANCES AMONG THE JUSTICE-INVOLVED

As noted above, securing stable housing is a common challenge for people with criminal records (Dong et al., 2018a; Evans et al., 2019; Geller & Curtis, 2011; Herbert et al., 2015; Keene et al., 2018; Petersilia, 2003; Roman & Travis, 2006). Among people released from prison, best estimates suggest that most exit to live with parents, nearly one third experience some form of housing instability, and about 10% experience homelessness in the year following release (Clark, 2016; Geller & Curtis, 2011; Roman & Travis, 2006; Steiner et al., 2015). What limited research has been conducted with people on probation has found that housing is also a priority issue among this groups. In a survey of people on probation in Rhode Island ($n = 304$), more than 20% reported being homeless (Dong et al., 2018a; see, also, Dong et al., 2018b). We know of no study to date that has captured living situation or housing instability among people on probation.

Several factors challenge housing access for the justice involved. In the private market, housing is difficult for people with a criminal record to obtain because basic prerequisites are often out of reach (i.e., reference letters from previous landlords and deposits), and because landlords can explicitly bar potential tenants due to criminal records (Clark, 2016; Travis et al., 2001). Public housing is also difficult for people with criminal records to obtain due to long waitlists, challenging bureaucracy, and criminal history exclusions (Clark, 2016; Geller & Curtis, 2011; Keene et al., 2018; Roman & Travis, 2004). Furthermore, recent growth in rental prices and wage stagnation (Desmond & Bell, 2015) join the abovementioned barriers to constrain access to affordable, stable housing among justice-involved persons.

HOUSING AND RECIDIVISM

One important implication of housing inaccessibility for people with criminal records is that it has the potential to increase their risk of recidivism. At least two theoretical perspectives (general strain theory [GST] and rational choice theory [RCT]) provide support for this view. In this article, we do not align ourselves with any particular theory and do not seek to test these theories. However, we describe these theories briefly to demonstrate that there is reason to expect an association between housing circumstances and recidivism.

GST is a theory that asserts that exposure to strain or stress leads to criminal offending (Agnew, 1992; Brezina, 2017). GST is distinct from other criminological theories because it places importance on emotions and coping (Brezina, 2017; Gottlieb & Moose, 2018). GST highlights three types of strain that often lead to offending: (a) lack of success (expected or actual) in meeting goals, (b) the loss of something viewed as important, and (c) a negative experience (Agnew, 1992; Slocum et al., 2005). In response to strains, people often experience anger, anxiety, depression, resentment, and other negative emotions (Agnew, 1992; Slocum et al., 2005). GST postulates that people resort to crime as a coping mechanism to ease these emotions (Agnew, 1992; Brezina, 2017; Gottlieb & Mahabir, 2019).

As applied to the relationship between residential circumstances and recidivism, GST suggests that housing instability and/or homelessness will create strain primarily by exposing people to negative stimuli, particularly an increase in material hardship (Agnew, 1992; Brezina, 2017; Desmond & Kimbro, 2015; Gottlieb & Moose, 2018). In cases where people lose homes, housing instability and homelessness may also lead to strain by removing something the person valued (Agnew, 1992; Gottlieb & Moose, 2018). In response to strain, people on probation are likely to experience negative emotions (e.g., depression, resentment, anxiety, and anger), which are likely to increase criminal behavior (Agnew, 2001; Brezina, 2017; Gottlieb & Moose, 2018).

A second framework for understanding how housing instability and homelessness may lead to recidivism is RCT. RCT starts with the basic assumption that people are rational actors (Becker, 1968). When determining whether to commit a crime, RCT asserts that people act rationally, weighing the costs and benefits (Becker, 1968). Becker's model highlights three influences on perceived benefits and costs: the (a) likelihood of getting caught engaging in crime, (b) severity of the consequence if caught, and (c) magnitude of benefits if not caught. When benefits outweigh costs, people seek to maximize utility by engaging in crime; when costs exceed benefits, people will maximize utility by choosing not to engage in crime (Becker, 1968; Cornish & Clarke, 1986; Loughran et al., 2016). From a RCT standpoint, housing insecurity may increase the benefits of criminal behavior without impacting typical costs, like furthering material hardship (Becker, 1968; Desmond & Kimbro, 2015; Loughran et al., 2016).

Empirical work supports the theoretical connection between housing and recidivism. Most studies find housing insecurity is associated with increased risk of recidivism (see, for example, Clark, 2016; Harding et al., 2016; Lutze et al., 2014; Steiner et al., 2015). Several studies find residential instability (i.e., number of moves) is associated with increased risk

of recidivism among people on parole, after adjusting for demographic markers, social and economic factors, and criminal history (Harding et al., 2016; Steiner et al., 2015). Controlling for a similar array of risk factors, studies also find that homelessness (at or following release from prison) is associated with increased risk of rearrest among formerly incarcerated people and those on parole (Clark, 2016; Steiner et al., 2015). The importance of stable housing is further indicated by quasi-experimental and experimental studies, which show that programs that provide housing to people leaving prison reduce recidivism (Kirk et al., 2018; Lutze et al., 2014). Qualitative research further drives this point home; people returning from prison and parole officers view stable housing as one of the key elements of recidivism prevention (Baer et al., 2006; Harding et al., 2016; Petersilia, 2003).

Yet, not all moves and living situations are the same. The circumstances surrounding a move or living situation may determine whether a move is criminogenic. For instance, Kirk (2009) finds that people on parole forced to relocate after hurricane Katrina had decreased risk of recidivism. People on parole were often forced to move far away, which may have protected against recidivism by removing criminogenic networks (Kirk, 2009). As for living situation, research suggests that who you live with and the type of housing you live in can impact recidivism for people on parole (Clark, 2016; Harding et al., 2016; Steiner et al., 2015). Living with people (e.g., spouses and family) and in programs (e.g., treatment), where social control can be exerted or greater housing stability offered, are associated with recidivism reductions (Harding et al., 2016; Steiner et al., 2015). Despite evidence of housing insecurity's criminogenic effect and some living situation's protective effects on recidivism for people released from prison or on parole, we know of no study that tests these relations among people on probation.

VARIATION IN THE HOUSING–RECIDIVISM RELATIONSHIP BY CRIMINAL RISK AND OFFENSE TYPE

Justice-involved people vary considerably in their risk of reoffending and in the risk factors they face. This variation incentivizes establishing risk factors across justice-involved groups, such as testing housing factors not only for people on parole, but also probation. It also incentivizes establishing variation in risk factors within justice-involved groups, such as people on probation who are assessed as low and high in criminal risk or for different types of reoffending.

In our view, level of criminal risk (i.e., the overall balance of risk and protective factors accumulated by a person) is one potential source of effect variation for housing circumstances. Criminal justice decision-makers increasingly use risk assessments to inform supervision and direct intervention (Monahan & Skeem, 2016; Simon, 2005). Furthermore, this practice is often directed by the widely cited “risk principle,” which recommends targeting intervention efforts toward those high in recidivism risk (see Bonta & Andrews, 2016). This approach helps promote efficient allocation of resources to those at greatest risk, though it is also possible that those classified as low risk may increase their risk upon exposure to certain conditions, like homelessness. If this is the case, neglecting interventions that decrease such exposures for low risk people will result in missed opportunities for recidivism prevention. In short, understanding what factors effect recidivism outcomes for

both high- and low-risk people is necessary. Despite the popularity of risk classification, its relevance to correctional intervention, and potential variation in effects across classification, research has yet to explore whether criminal risk interacts with housing factors to affect recidivism.

There is good reason to expect effect heterogeneity for housing circumstances by criminal risk. The disadvantage saturation perspective suggests that high risk people face many challenges, so that any additional risk factor, such as housing instability, homelessness, or a criminogenic living situation, is not likely to dramatically further increase risk of recidivism (Hannon, 2003; Turney, 2017). However, people who are low risk are likely to face fewer challenges, so the abovementioned stressors are likely to be quite impactful. From this perspective, housing instability or homelessness may increase strain or material hardship for those who are low risk to a greater extent than for those who are high risk and, therefore, is likely to be associated with larger increases in recidivism risk among relatively low risk people. The impact of informal social control enacted within criminogenic living situations is also likely to be particularly salient for low risk people, which in turn should lead to larger increases in recidivism. In short, people who are already quite high in risk at probation start are likely to reoffend, regardless of additional housing-related challenges; their low risk counterparts may not reoffend but for additional housing-related challenges.

Relatedly, not all recidivism risk factors unilaterally affect reoffending (see, for example, Loeber et al., 2008). Some risk factors promote relatively serious reoffenses (e.g., person-related crimes), while others promote relatively low level reoffenses (e.g., property crimes, minor crimes, or revocations). Prior research among people on parole suggests this may be the case for housing circumstances. For example, Steiner et al. (2015) find homelessness has a substantial effect on rearrest ($\beta = 1.50$), but is virtually unassociated with felonious rearrest ($\beta = 0.04$; see also Clark, 2016).

In this study, we expect relatively large effects for low-level reoffenses in part because of findings from research on people on parole (see above). Moreover, RCT suggests that property or drug crime could be viewed as a rational choice to alleviate economic hardships (e.g., housing instability and homelessness), while person-related crimes are less likely to be viewed as rational ways to address economic hardships (Becker, 1968; Loughran et al., 2016). Together, these sources of potential effect variation (criminal risk and reoffense type) also highlight the importance of investigating the relation between housing circumstances and recidivism among people on probation, who may be particularly susceptible to the effects of housing insecurity, since they are more likely to be lower in criminal risk and less likely to have been convicted of serious offenses than people formerly imprisoned.

CURRENT STUDY

In this study, we use a longitudinal study design and draw on a unique dataset for a cohort of people on probation to answer the following questions: (a) Do certain living situations, homelessness, and/or housing instability increase risk of recidivism among people on probation, above and beyond demographic markers and established risk factors? And (b) do the relationships between these housing circumstances and recidivism vary by level of criminal risk or reoffense type? In light of prior research among people released from prison,

we hypothesize that lacking a stable address at probation start, homelessness, and residential instability will increase risk of recidivism for those on probation. Based on the disadvantage saturation perspective and RCT, we also hypothesize that those who are relatively low in criminal risk will be more affected by housing circumstances and that housing circumstances will be most strongly associated with relatively low severity reoffending.

METHOD

SAMPLE AND STUDY SITE

The sample for this study included 2,453 people supervised by the San Francisco Adult Probation Department (SFAPD). We included all people who started a standard probation term from October 2011 to June 2013.¹ Because we wanted to isolate the role of housing-related factors above and beyond other commonly accepted recidivism risk factors and wanted to test if criminal risk moderates the housing–recidivism relationship, we excluded those without a risk assessment prior to start ($n = 967$). This yielded an inclusion rate of 72% of those who began probation on standard probation terms.² The sample was 85% male, 50% Black, and had a mean age of 36 years (see Table 1). The majority were sentenced due to a felony conviction (87%).

The sample reflects the probation population in San Francisco. As of June, 2011, the SFAPD population ($n = 6,329$) was 83% male, had a mean age of 37 years, and 81% were sentenced due to a felony (race/ethnicity data were unavailable; SFAPD, 2011). This high proportion of felony convictions was a distinctive feature of SFAPD, which supervised more people convicted of person and other serious offenses than the typical probation department (SFAPD, 2011). SFAPD is also unique in that it is responsible for overseeing people on probation across a region that is both a county and a major metropolitan city. This brings unique opportunities for programming (e.g., SFAPD has several specialty and collaborative programs, such units for those with mental illnesses and the homeless), but also challenges (e.g., San Francisco is a densely populated urban area with a high cost of living, a great shortage of affordable housing, and a high rate of homeless; for a rich description, see Gowan, 2010).

DATA SOURCES AND MEASURES

Data for this study were drawn from four sources, probation records, county court records, publicly funded behavioral health service records, and the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) risk assessment (Brennan et al., 2009). Probation case records contained data on probation start and stop dates, stop reasons, addresses, homeless spells, and demographics. We extracted demographic and rearrest data from county court records, and extracted mental and substance use disorder diagnoses from behavioral health service and billing records. We extracted data on criminal risk and living situation from the COMPAS. At the study site, the COMPAS was completed

¹Standard probation reflects a sentence to probation alone or a split jail-probation sentence. We exclude “Post-release Community Supervisees” and “1170s” (CA Penal Code 1170[h]), who would traditionally be supervised by parole.

²Those included were comparable with those excluded in terms of age and gender. Those included were more likely to be Black ($\chi^2 = 39.54, p < .001$) and recidivate ($\chi^2 = 265.94, p < .001$).

during presentence investigations, and includes data collected via self-report and criminal records (see “Covariates” below for further detail). Where data sources provided overlapping demographic or outcome data (i.e., probation stops and rearrests), we cross-checked data between records to verify accuracy.

Outcomes—The primary outcome in this study is time to recidivism. Recidivism data were culled through June of 2014, to ensure at least 1 year of follow-up. The maximum follow-up time was 2.74 years. We measured time as weeks under probation supervision, beginning with probation start date and ending with a recidivism or censor date. We define recidivism as rearrest for either a new crime or a revocation, as have other studies measuring criminal justice failure (Ostermann et al., 2015). We adopted this liberal definition of recidivism because residential instability and status could compromise the ability to avoid criminal behavior and to abide by the terms of supervision. Although rearrests may capture offenses for which people are not convicted and revocations may capture petitions that do not result in probation termination, this definition of recidivism avoids overestimation of postrelease “successes” (e.g., counting as successes those who violate community supervision; Ostermann et al., 2015). To test for variation in housing effects by offense type, we also constructed offense-specific outcomes. Specifically, following the crime classification codes developed by the Macarthur Violent Risk Assessment Study (Monahan et al., 2001), we coded failures as person-related crimes, drug crimes, property crimes, minor crimes, or revocations. In doing so, we matched 91% of charges to the penal code. We coded the 9% of unmatchable codes as censor dates in offense-specific analyses described below.

Predictors—Prior research in other populations has noted the relevance of several aspects of housing to criminal justice outcomes. As such, we measured three aspects of housing as our predictors of interest—living situation, homelessness, and residential instability. We measured living situation to capture the housing context in which a person lived at baseline. Coded from self-report in COMPAS assessments, living situation is a factor variable with five categories: family (including spouses or domestic partners of at least 1 year; reference category), friends, alone, other living situation, and no regular living situation.³ We measured homelessness (i.e., lacking a residential address) drawing data from residential address changes prospectively documented by probation officers. These data were particularly detailed, including dates and indicators of homelessness, and the geographic region in which the homeless person tended to stay. We measured homelessness as time-varying, with yes (1) or no (0) indicating homeless status each week. We also constructed a time-varying measure of residential instability, to represent the cumulative sum of moves and bouts of homelessness (range: 0–4). We assessed the validity of homelessness and residential instability, correlating them with baseline self-reported housing information in the COMPAS. We found these constructs correlated with measures in anticipated

³Some prior studies have not disentangled the “with whom” and “regularity” aspects of living situation, equating “living with” and “staying with.” Yet, these constructs may have different repercussions. Some people in our sample reported having no regular address and reported living with family, friends, alone, or in other situations. We found imbalance in the number of people reporting no regular living situation across these groups ($\chi^2 = 578.35, p < .001$). Given this imbalance and the potential of conflating different constructs and their effects, we created a fifth category of “no regular living situation” and include only those with regular living situations as living with family, friends, alone, or in other living situation categories.

directions. Homelessness and residential instability were positively associated with report of no regular living situation ($p = 0.75, 0.37$) and negatively associated with report of years at address ($p = -0.48, -0.24$).

Covariates—To measure the effects of residential circumstances net of other risk factors for recidivism, we included several risk and demographic variables known to predict recidivism. First, we included COMPAS criminal risk scores (i.e., “general recidivism risk” score). The COMPAS is a proprietary risk assessment instrument, containing age and scales on criminal associates, criminal involvement, criminal personality, criminal thinking, violence, family criminality, vocation/education, finances, noncompliance, leisure/recreation, residential instability, social environment, isolation, socialization, and substance abuse. It is impossible to comprehensively describe the criminal risk score because its owner, Equivant, will not release the items they use to calculate the score. However, we regressed criminal risk scores on other COMPAS scale scores (listed above), and found criminal involvement ($\beta = 0.77$), age ($\beta = -0.53$), vocational/educational needs ($\beta = 0.30$), and substance use problems ($\beta = 0.12$) explained the vast majority of variance in risk scores ($R^2 = 0.83$). The COMPAS has been validated internally by Northpoint, Inc. (now Equivant; Brennan et al., 2009), and externally (Farabee et al., 2010). Validation studies indicate that COMPAS scores predict recidivism (area under the receiver operating characteristic curve [AUC] = .67, $r = .31$) on par with other instruments (AUC = .57–.74, $r = .19$ –.44; Desmarais, et al., 2016). We also found the risk score predictive of recidivism in the study site (AUC = .74, $r = .41$). In turn, the COMPAS risk score is a good control variable, representing several established recidivism risk factors.

Given demographics often predict recidivism, at times above other risk factors, we included age, gender, and ethnoracial group in our statistical models (Gendreau et al., 1996). Age is measured as years since birth at probation start. Ethnoracial group is a four-category factor variable that includes White (reference), Black, Latinx, and Other ethnicity/race. We measure gender as a binary variable (male = 1).

Finally, because the effect of residential instability could partially represent poverty, lack of social support, or a behavioral health problem, we conservatively included control variables to account for these effects. Specifically, we constructed a social support score based on responses to four items (e.g., “I have friends who help me when I have troubles”) from the COMPAS social isolation scale ($\alpha = .81$). We constructed a financial insecurity scale based on responses to six items (e.g., “How often do you have barely enough money to get by?”) from the COMPAS financial needs scale (Guttman’s $\lambda = .72$). We standardized both measures as z scores. Notably, these social support and financial insecurity items were not drawn from scales that strongly predicted the criminal risk score. In combination with low Variance Inflation Factor (VIF) scores, this reduces concern regarding collinearity. Finally, we included an indicator for prior mental or substance use disorder diagnoses (disorder = 1), as gleaned from diagnoses documented by clinicians in county behavioral health billing and service records.

ANALYSES

Due to the longitudinal nature of our data, we conducted analyses through a time-to-event (i.e., survival analysis) framework. We constructed a person-time dataset, with rows representing each week for each person. We incorporated time varying covariates, when possible (i.e., for homelessness and residential instability). To analyze the effects of predictor variables on time to recidivism, we used Cox proportional hazard models with the survival package in *R* (Therneau & Lumley, 2018). Cox models estimate the probability of failure (i.e., recidivism) at a point in time, given survival (i.e., remaining recidivism free) up until that time (i.e., hazard rate; Hosmer et al., 2011). We examined assumptions related to proportionality, linearity, outliers, and collinearity, and found no violations of the Cox model. We also found no signs of problematic collinearity, with VIF scores less than two for all predictors and covariates.

Statistical modeling preceded in four steps. First, we calculated bivariate associations between housing variables and covariates, and the hazard of recidivism (i.e., unadjusted effects). Second, we tested the main effect of each housing variable in a separate model, adjusting each predictor by covariates (i.e., gender, race, age, criminal risk score, social support, financial insecurity, and mental/substance disorder). We clustered observations (i.e., weeks) within individuals to account for nonindependence of observations (i.e., adjusting standard errors to avoid falsely inflating statistical significance). When interpreting coefficients, we consider a hazard ratio of approximately 1.3 to be meaningfully (i.e., clinically) significant, and we consider effects small, moderate, or large when hazard ratios per standard deviation increase for continuous predictors are approximately 1.14, 1.47, or 1.9, respectively (see Azuero, 2016).

Next, to test whether the effect of housing variables varied by criminal risk, we interacted each housing variable by criminal risk score. Finally, we tested differential effects by recidivism type. In circumstances where covariates are time-independent, a competing risk analysis would be the standard approach for modeling effects over multiple outcomes. However, the cause-specific hazard approach is strongly advised in situations like ours, where time-dependent covariates are of interest (Poguntke et al., 2018). Thus, we repeated step two (see above), calculating cause-specific hazards for person, drug, property, and minor crimes, and revocations. In each of the five models, recidivism is coded as failure when the specific offense occurs and other offenses are treated as censor dates. For each statistically significant housing effect, we tested the equality of coefficients between offenses. We use a seemingly unrelated regression model to calculate the difference in coefficients, where $z = (b_1 - b_2) / \sqrt{Var1 + Var2 - 2 * Cov(Var1, Var2)}$. This approach is like that recommended by Paternoster et al. (1998), but also accounts for potential covariance between coefficients that may arise due to nonindependence in dependent variables.

RESULTS

Below, we present results pertaining to the effect of housing circumstances on recidivism. We then present results from analyses in which we test variation in the effect of housing circumstance across levels of criminal risk and recidivism offense type. First, we contextualize the results from our main analyses, describing the housing circumstances

of people on probation and presenting tests of association between housing variables and covariates, and recidivism.

HOUSING CIRCUMSTANCES, RECIDIVISM, AND BIVARIATE ANALYSES

Housing insecurity was common in our sample (see Table 1). One in every four persons had no stable living situation at probation start. Of those with a regular living situation, most lived with family, followed by friends and alone. They were least likely to live in some other living situation (a shelter, treatment program, or half-way house). Over 25% were homeless at some point during the observation period, with about half of homeless spells lasting at least 6 months. More than half of the sample (56%) experienced one or more residential transitions, and 11% experienced two or more residential transitions. Of 1,672 residential transitions, about 60% reflected a move to a residence and the remainder reflected a transition to homelessness. With respect to the outcome of interest, over half of the sample recidivated. Most failed due to an arrest for a new crime (80%), including person-related crimes (16%), drug crimes (22%), property crimes (22%), and minor crimes (12%). A minority failed due to a revocation (20%). Bivariate analyses indicated that, prior to adjusting for other variables, nearly all covariates and predictors were associated with recidivism (see Table 2, unadjusted effects). Of all variables, criminal risk (hazard ratio [HR] = 1.87, $p < .001$), having a behavioral health problem (HR = 1.66, $p < .001$), lacking a regular living situation (HR = 1.89, $p < .001$), and homelessness during probation (HR = 1.97, $p < .001$) had the strongest associations with recidivism.

DO HOUSING CIRCUMSTANCES PREDICT RECIDIVISM AMONG PEOPLE ON PROBATION, ABOVE OTHER RISK FACTORS?

With the understanding that living situation at probation start, homelessness, and residential instability were each associated with recidivism in bivariate analyses, we next assessed their unique associations with recidivism (i.e., main effects) in a multivariate framework. To do so, we completed three Cox regressions, one for living situation, homelessness, and overall residential instability (see Table 2). Each model contains the main effect for one of the housing predictors, adjusting for other risk factors and demographic markers. In turn, coefficients for housing variables amount to the effect of that variable, above an array of potential confounders and competing exposures.

We found each residential circumstance predicted recidivism, above and beyond demographic markers, criminal risk, behavioral health problems, social support, and financial insecurity. Coding living situation as a factor variable with family as the reference category, we found that starting probation without a regular living situation increases the hazard of recidivating by 35% (HR = 1.35, $p < .001$) compared with those who live with family. Examining confidence intervals, we found no evidence of differences in recidivism risk between those living with family members, friends, alone, or in other living situations at baseline. We found being homeless increased the hazard of recidivism by nearly 50% (HR = 1.44, $p < .001$), and that each residential transition (i.e., residential instability) increased the risk of recidivism by 12% (HR = 1.12, $p = .011$), above and beyond demographic markers and established recidivism risk factors.⁴

To assess the possibility that these effects were dependent on our construction of the outcome (i.e., rearrest for a new offense or revocation), we ran the same models again with the same sample but with recidivism defined only as rearrest for a new offense. We found the effects of no regular living situation ($HR = 1.25, p = .003$), homelessness ($HR = 1.37, p < .001$), and residential instability ($HR = 1.10, p = .047$) are the same in direction and significance when predicting rearrest only as when predicting rearrests or revocations. We discuss offense-specific results further below.

DO THE EFFECTS OF RESIDENTIAL CIRCUMSTANCE VARY BY CRIMINAL RISK?

To test whether criminal risk moderates the effect of residential circumstances on recidivism, we conducted three Cox regressions. In these models, we interacted each housing variable by criminal risk scores. For each model, we present the main effects of the residential circumstance variable and criminal risk, and their interaction (see Table 3). Although coefficients are not displayed, these effects are adjusted by all covariates described above.

We found that lack of regular housing at probation start and homelessness during probation interacted with criminal risk to predict recidivism. In the first model, criminal risk ($HR = 1.85, p < .001$) and no regular address at probation start ($HR = 1.50, p < .001$) were statistically significant predictors of recidivism, and the effect of having no regular address weakened as criminal risk increased ($HR = 0.80, p = .005$). Similarly, in the second model, criminal risk ($HR = 1.82, p < .001$) and homelessness during probation ($HR = 1.59, p < .001$) were statistically significant predictors of recidivism, and the effect of homelessness weakened as criminal risk increased ($HR = 0.82, p = .007$). Although criminal risk ($HR = 1.75, p < .001$) and residential instability ($HR = 1.12, p = .011$) had statistically significant main effects on recidivism in the third model, we found no evidence that criminal risk moderated the effect of residential instability.

One way of interpreting these interactions, is to predict the survival probabilities for people in varying housing circumstances conditional on different levels of criminal risk. Table 4 displays the predicted probability of avoiding recidivism (i.e., “survival”) at 1 year for a typical person in our sample (i.e., a Black, 36-year-old, with average social support, average financial insecurity, and no behavioral health diagnosis). For typical persons who are low risk (i.e., 1.5 standard deviations below the mean criminal risk), lacking a regular address at probation start or experiencing homelessness during probation increased the probability of recidivating at 1 year by 15% and 16%, respectively. Similar probabilities existed for moderate risk people (i.e., with a mean criminal risk score). However, if these otherwise typical people are high in criminal risk (i.e., 1.5 standard deviations above the mean), lacking a regular address at probation start or experiencing homelessness during probation increased the probability of recidivating by a relatively small margin—3% and 5%, respectively. In short, housing circumstances had larger effects on recidivism for people with fewer or less serious other criminal risk factors.

⁴.As a sensitivity test, we recoded homelessness as a cumulative sum of weeks homeless. Running the same model with the same covariates, we found weeks homeless also increased recidivism risk ($HR = 1.005, 95\% \text{ CI } [1.00, 1.01]$). For every 2-week period homeless, risk of recidivism increased 1%. However, this relationship was nonlinear, so we examined the relation among those who spent at least 1 week homeless. We found no issues with the functional form of cumulative days homeless and, among those who experience homelessness, each 2-week period homeless increased the risk of recidivism over 7% ($HR = 1.04, 95\% \text{ CI } [1.01, 1.06]$).

DO THE EFFECTS OF HOUSING CIRCUMSTANCES VARY BY REOFFENSE TYPE?

In this last set of analyses, we tested whether or not the effects of housing circumstances differed by recidivating offense type. To do so, we repeated the modeling strategy used to answer our first question, but here we defined five offense-specific outcomes—arrests for person crimes, drug crimes, property crimes, minor crime, and revocations. We present three models for each offense (see Table 5), where each produces the effect of a single residential circumstance variable on that outcome, after adjusting for covariates.

Results indicated housing variables predicted some offenses, but not others. All housing predictors—no regular living situation at probation start ($HR = 1.38, p = .023$), homelessness during probation ($HR = 1.58, p < .001$), and residential instability during probation ($HR = 1.34, p = .002$)—increased the risk of property crime rearrests. Two housing variables were associated with rearrest for minor crimes; having no regular address ($HR = 1.48, p = .038$) increased the risk of rearrest for a minor crime, as did experiencing homelessness ($HR = 1.54, p = .010$). Similarly, having no regular living situation and homelessness were associated with revocations. Having no regular address ($HR = 1.88, p < .001$) increased the risk of rearrest for a revocation, as did homelessness ($HR = 1.78, p < .001$). One housing variable predicted person-related crimes. Living with friends decreased risk of rearrest for person-related crimes ($HR = 0.52, p = .029$). No housing variable had a statistically significant relationship to drug offenses.

Focusing on the statistically significant effects described above, we assessed the equality of coefficients for effects across outcomes. In doing so, we found statistically significant differences in coefficients in most cases. Lacking a regular living situation at probation start had a larger effect on property crimes ($z = 2.30, p = .011$), minor crimes ($z = 2.29, p < .001$), and revocations ($z = 3.57, p < .001$) than person-related crimes, and a larger effect on revocations than drug crimes ($z = 2.15, p = .016$). Similarly, homelessness had a larger effect on property crimes ($z = 2.90, p = .002$), minor crime ($z = 2.51, p = .006$), or revocations ($z = 3.38, p < .001$) than person-related crimes, and a larger effect on revocations than drug crimes ($z = 1.85, p = .032$). As for residential instability, its effect on property crime was greater than that for drug ($z = 2.31, p = .011$) and person-related crimes ($z = 2.93, p = .002$), and its effect on minor crime was greater than person crimes ($z = 2.05, p = .020$). Finally, in the one case where a housing variable was associated with a person-related crime, living with friends compared with family had a larger protective effect on person crimes than drug ($z = 2.05, p = .020$) or minor ($z = 2.86, p = .002$) crimes. In sum, residential circumstances tended to increase risk of recidivating for property crimes, minor crimes, and revocations, but not for person or drug crimes, and we found no evidence that the effects of residential circumstances differed significantly between property crimes, minor crimes, and revocations.

DISCUSSION

High rates of recidivism limit the success of probation as a public safety and correctional intervention. People on probation face numerous risk factors for recidivism. One group of established risk factors among other justice-involved groups (i.e., people released from prison and people on parole) are those that relate to housing. Here, we examined housing

circumstances—living situation at probation start, homelessness during probation, and residential instability during probation—in a sample of people on probation. We find housing factors predict recidivism for this group. We also find effects are strongest for those who are relatively low risk and for low-severity offenses. Below, we unpack these findings, drawing implications for future research and policy. We first address limitations.

This study has four limitations. First, we use a longitudinal design that measures predictors prior to outcomes. As such, we interpret predictors as risk factors for recidivism, but not causal risk factors (see Monahan & Skeem, 2016). Because we did not randomly assign exposure to residential circumstances, we cannot fully reject potential spuriousness. We mitigate this limitation by adjusting for an extensive set of covariates. Second, this study takes place in a single county (San Francisco). Although the study is an important first step in establishing the relationship between housing circumstances and recidivism for people on probation, the single site design weakens external validity. Findings are best generalized to locales with similar correctional and housing contexts (i.e., urban areas with specialty supervision, high percentages of felony probation cases, and affordable housing shortages). Third, though we were able to capture several important housing characteristics and examine moves and homelessness as time varying, we were unable to measure living situation as time varying and could not fully describe residential moves (i.e., whether residential changes represent positive or negative changes). Finally, like prior studies that rely on parole records, we relied on probation records to measure moves and homelessness. Probation officers may irregularly record addresses and, in turn, residential instability predictors may be unreliable. However, to our knowledge, this is unlikely; probation officer records correlated with self-reported residential circumstances (see “Method” section). Furthermore, though we find lower rates of moving than have samples of former prisoners, we find larger rates of homelessness. Thus, low move rates do not seem indicative of poor recording.

With these limitations in mind, we turn to our findings on the relation between housing circumstances and recidivism. Our first research question asked, do housing circumstances predict recidivism for people on probation? We find that housing circumstances do predict risk of recidivism for this group. For living situation and homelessness, as hypothesized, we find that people who start their supervision term without a regular living situation or who experience homelessness during probation are at increased risk of recidivating. Specifically, we find lacking an address at probation start and homelessness during probation are associated with a 35% and 44% increase in recidivism risk, after adjusting for an extensive array of covariates. These findings for living situation and homelessness compliment prior research that finds homelessness after release from prison a recidivism risk factor (see, for example, Clark, 2016; Steiner et al., 2015).

We also tested the effect of residential instability (i.e., the accumulation of moves and homelessness) on recidivism. In partial support of our hypothesis, we found residential instability had a small, positive association with recidivism. Given this effect is smaller than that of homelessness alone, moves seem to dilute the effect of homelessness and thus appear protective.⁵ The protective effect of moving conflicts with prior research, which has found that moves among other justice-involved groups in other locales increase recidivism risk. Such conflicting findings may speak to the contextual nature of residential circumstances’

effects on recidivism. Our findings may be due to the highly competitive housing market of the study site, which limits affordable housing, promotes homelessness, and prohibits residential moves. If a person on probation is able to move into a new residence, this likely represents a stabilizing event. This sample's high rate of homelessness (25%) and relatively low rate of moving (11% moved more than once compared with 30% in prior studies) provides support for this explanation, as does prior research that finds moving can have a protective effect on recidivism (Kirk, 2009).

Our second research question asked, do the effects of residential circumstances differ depending on level of criminal risk or type of reoffending? Aligning with prior research on people released from prison (Clark, 2016; Steiner et al., 2015) and the disadvantage saturation perspective (Hannon, 2003; Turney, 2017), we hypothesized that people relatively low in criminal risk and relatively low-level reoffenses would be more affected by housing circumstances than their higher risk and severity counterparts. Findings generally support these hypotheses; the effects of having no regular residence at probation start, homelessness during probation and, to a lesser extent, residential instability, decreased as criminal risk increased. We estimate (see Table 4), for example, that of every 100 low risk people with housing, about 17 are likely to recidivate at 1 year. Whereas, for every 100 low risk people without housing, about 33 are likely to recidivate at 1 year. For reoffense type, we found the effects of residential circumstances were almost entirely borne by relatively low-severity offenses—property and minor crimes, and revocations. Notably, no regular address at probation start and homelessness during probation nearly doubled the risk of rearrest for a revocation, beyond covariates.

These findings have implications for policy and research. First, results indicate that lack of stable housing at probation start and homelessness during supervision are meaningful risk factors for recidivism among people on probation, with strongest effects on those relatively low in other risk factors and relatively low severity offenses. As such, probation departments should assess and attend to housing needs for all people on probation. However, somewhat contrary to the risk principle (Bonta & Andrews, 2016), these findings suggest that providing housing resources may be especially effective in reducing reoffending when directed toward those classified as low risk. Ultimately, policies that promote interventions that decrease homelessness for people on probation could lead to meaningful reductions in recidivism among probation caseloads. Such interventions may also decrease commission of low-level offenses, allowing probation and police officers to focus on addressing more serious, person-related crimes.

As for research, our finding that residential moves may have a protective effect provides support for theories that interpret moving as an asset. For example, prior researchers interpret the positive effect of out-of-state moves as reducing recidivism by disconnecting parolees from criminogenic networks (Kirk, 2009). Here, we find that even moving within a county, can have a positive effect in a housing market where affordable housing is extremely scarce and homelessness common. Scholars should place the effects of residential instability

⁵. We tested the effect of residential moves only (i.e., not including bouts of homelessness) and found a small, protective effect on recidivism (HR = 0.88, 95% CI [0.78, 0.99]).

within the context of local housing markets in future theory development. Furthermore, future research among people on probation should measure living situation as a time-varying measure, so that the effect of residential transitions from homelessness to housing can be parsed from the effect of residential transitions from housing to homelessness. Doing so would allow researchers to classify and test protective versus risky moves.

CONCLUSION

This study finds that people on probation may not recidivate, but for unstable housing and homelessness. This is especially the case for those relatively low in risk, and relatively low-level reoffending. We also find that not all moves are created equal. Although prior research indicates moves increase risk of recidivism, we found combining residential moves with transitions to homelessness diluted the effect of homelessness. This suggests that tests of residential instability may depend on what a person is moving from and to. It also suggests effects may be context specific; in a context low in affordable housing and high in homelessness, moving to any residence may improve one's circumstances and reduce recidivism. Together, these findings motivate policies that ensure stable housing to probationers, including those otherwise classified as "low risk," and research that understands the context-specific nature of residential circumstances.

Biography

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TABLE 1:

Sample Demographic, Social, and Housing Characteristics

Characteristics	<i>n</i>	%
Male	2,085	84.99
Age (<i>M/SD</i>)	(36.18)	(12.08)
Black	1,212	49.40
Latinx	345	14.06
Other	282	11.49
White	614	25.03
Criminal risk (<i>M/SD</i>)	(0.00)	(1)
Financial insecurity	(0.00)	(1)
Social support	(0.00)	(1)
Mental or substance disorder	767	31.27
Living situation: Family	1,161	47.33
Living situation: Friends	274	11.17
Living situation: Alone	272	11.09
Living situation: Other	98	3.99
Living situation: No regular	648	26.41
Homelessness	621	25.31
Residential instability (<i>M/SD</i>)	(0.68)	(0.70)
Recidivated	1,436	58.54

Note. *n* = count; % = percent of 2,453 people sampled, where variable is continuous; *M* = mean; *SD* = standard deviation.

TABLE 2:

Bivariate and Multivariate Cox Proportional Hazard Model Coefficients for the Effects of Covariates and Housing Circumstances on Recidivism

Predictors	Unadjusted effects		Living situation		Homelessness		Residential instability	
	HR	CI	HR	CI	HR	CI	HR	CI
Male	1.19 [*]	[1.02, 1.37]	1.13	[0.76, 1.02]	1.13	[0.98, 1.31]	1.15	[0.99, 1.33]
Age	1.00	[0.99, 1.00]	1.00	[0.99, 1.00]	1.00	[0.99, 1.00]	1.00	[0.99, 1.00]
Black	1.18 [*]	[1.04, 1.33]	0.96	[0.84, 1.10]	0.96	[0.85, 1.10]	0.93	[0.82, 1.06]
Latinx	0.86	[0.72, 1.03]	0.83	[0.68, 1.00]	0.82 [*]	[0.68, 1.00]	0.80 [*]	[0.66, 0.96]
Other	0.65 ^{***}	[0.53, 0.79]	0.79 [*]	[0.64, 0.98]	0.81	[0.66, 1.00]	0.77 [*]	[0.63, 0.96]
Criminal risk	1.87 ^{***}	[1.76, 1.99]	1.72 ^{***}	[1.61, 1.85]	1.72 ^{***}	[1.60, 1.85]	1.75 ^{***}	[1.64, 1.88]
Financial insecurity	1.33 ^{***}	[1.26, 1.40]	1.02	[0.96, 1.08]	1.01	[0.95, 1.07]	1.04	[0.98, 1.10]
Social support	0.86 ^{***}	[0.82, 0.91]	0.95	[0.90, 1.01]	0.96	[0.90, 1.01]	0.94 [*]	[0.89, 0.99]
Mental disorder	1.66 ^{***}	[1.49, 1.85]	1.31 ^{***}	[1.17, 1.47]	1.31 ^{***}	[1.17, 1.47]	1.33 ^{***}	[1.19, 1.49]
Living situation: Family	0.77 ^{***}	[0.69, 0.85]	—	—	—	—	—	—
Living situation: Friends	0.69 ^{***}	[0.57, 0.82]	0.92	[0.76, 1.11]	—	—	—	—
Living situation: Alone	0.79 ^{**}	[0.67, 0.75]	0.96	[0.79, 1.17]	—	—	—	—
Living situation: Other	0.92	[0.70, 1.21]	1.16	[0.88, 1.52]	—	—	—	—
Living situation: No regular	1.89 ^{***}	[1.69, 2.10]	1.35 ^{***}	[1.18, 1.53]	—	—	—	—
Homelessness	1.97 ^{***}	[1.77, 2.20]	—	—	1.44 ^{***}	[1.28, 1.63]	—	—
Residential instability	1.25 ^{***}	[1.15, 1.36]	—	—	—	—	1.12 [*]	[1.03, 1.22]

Note. Coefficients represent results from bivariate (unadjusted effects) and multivariate cox proportional hazard models (living situations, homelessness, and residential instability). In the unadjusted effects column, coefficients for living situation reflect binary indicators for each living situation. In the adjusted models, living situation is coded as a factor variable, with family as the reference group. Each model includes clustered standard errors to account for multiple observations (weeks) per person. HR = hazard ratio, CI = 95% confidence interval.

^{*} $p < .05$.

^{**} $p < .01$.

^{***} $p < .001$.

TABLE 3:

Interaction Effects of Housing Circumstances and Criminal Risk on Recidivism

Predictors	Living situation		Homelessness		Residential instability	
	HR	CI	HR	CI	HR	CI
Criminal risk	1.85 ***	[1.67, 2.04]	1.82 ***	[1.68, 1.97]	1.75 ***	[1.61, 1.92]
Living situation: Friends	0.98	[0.75, 1.12]	—	—	—	—
Living situation: Alone	0.92	[0.81, 1.20]	—	—	—	—
Living situation: Other	1.15	[0.86, 1.54]	—	—	—	—
Living situation: No regular	1.50 ***	[1.29, 1.73]	—	—	—	—
Friends × Criminal Risk	1.05	[0.84, 1.32]	—	—	—	—
Alone × Criminal Risk	0.90	[0.73, 1.11]	—	—	—	—
Other × Criminal Risk	1.07	[0.80, 1.44]	—	—	—	—
No regular × Criminal Risk	0.80 **	[0.69, 0.93]	—	—	—	—
Homelessness	—	—	1.59 ***	[1.39, 1.81]	—	—
Homelessness × Criminal Risk	—	—	0.82 **	[0.71, 0.95]	—	—
Residential instability	—	—	—	—	1.12 *	[1.02, 1.23]
Residential Instability × Criminal Risk	—	—	—	—	1.00	[0.90, 1.10]

Note. The interaction between each housing variables and criminal risk has been tested via a Cox proportional hazard model with robust standard errors. Each of the three models includes the main effect of the housing variable, and the interactions between criminal risk and the housing variable. Interactions are conditioned on all covariates (i.e., gender, race, age, social support, financial insecurity, and mental/substance use disorder). The table does not contain values for these controls. All continuous variables are standardized ($M = 0$, $SD = 1$). HR = hazard ratio; CI = 95% confidence interval.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

TABLE 4:

Predicted Probability of Avoiding Recidivism for People Classified as Low-, Moderate-, and High-Risk, Conditional on Living Situation and Homelessness

Criminal risk	Living with family		No regular living situation		Not homeless		Homeless	
	<i>S</i> (<i>t</i> = 52)	CI	<i>S</i> (<i>t</i> = 52)	CI	<i>S</i> (<i>t</i> = 52)	CI	<i>S</i> (<i>t</i> = 52)	CI
Low	.83	[0.80, 0.87]	.68	[0.61, 0.77]	.83	[0.80, 0.86]	.67	[0.60, 0.76]
Moderate	.63	[0.59, 0.68]	.50	[0.44, 0.57]	.63	[0.59, 0.68]	.49	[0.42, 0.56]
High	.31	[0.59, 0.68]	.29	[0.22, 0.38]	.33	[0.26, 0.40]	.27	[0.20, 0.36]

Note. Predicted survival probabilities (*S*) at 1 year (*t* = 52 weeks) are provided for the typical person in the sample, that is, a 36-year-old, Black man with average social support and financial insecurity, and no diagnosis for a mental or substance use disorder. Low = criminal risk score of 1.5 standard deviations below the mean, Moderate = mean criminal risk score, High = criminal risk score of 1.5 standard deviations above the mean. CI = 95% confidence interval.

TABLE 5:

The Effect of Housing Circumstances Across Rearrests for Person, Drug, Property, and Minor Crimes, and Revocations

Predictors	Crime against person		Drug crime		Property crime		Minor crime		Revocation	
	HR	CI	HR	CI	HR	CI	HR	CI	HR	CI
Living situation: With friends	0.52 *	[0.29, 0.94]	1.09	[0.73, 1.62]	0.82	[0.53, 1.29]	1.42	[0.85, 2.39]	1.05	[0.70, 1.58]
Living situation: Alone	0.91	[0.56, 1.47]	1.03	[0.68, 1.57]	1.00	[0.65, 1.55]	0.81	[0.42, 1.53]	1.20	[0.79, 1.82]
Living situation: Other	0.84	[0.80, 1.41]	1.00	[0.52, 1.92]	0.83	[0.41, 1.69]	1.84	[0.89, 3.80]	1.60	[0.91, 2.79]
Living situation: No regular	0.82	[0.39, 1.78]	1.20	[0.90, 1.59]	1.38 *	[1.04, 1.81]	1.48 *	[1.02, 2.15]	1.88 ***	[1.39, 2.53]
Homelessness	0.83	[0.59, 1.18]	1.25	[0.96, 1.62]	1.58 ***	[1.22, 2.04]	1.54 *	[1.11, 2.15]	1.78 ***	[1.36, 2.33]
Residential instability	0.87	[0.70, 1.09]	0.99	[0.82, 1.19]	1.34 **	[1.12, 1.61]	1.11	[0.88, 1.40]	1.17	[0.98, 1.40]

Note. Coefficients represent results from three Cox proportional hazard models per recidivism crime type. Each model includes clustered standard errors to account for multiple observations (weeks) per person. All models are adjusted for the covariates presented in Table 2, though they are omitted here. All statistically significant HR's are statistically different from at least one other offense type, per seemingly unrelated regression tests of coefficient equality. HR = hazard ratio, CI = 95% confidence interval.

* $p < .05$.

** $p < .01$.

*** $p < .001$.