Homelessness and Housing Insecurity Among Former Prisoners

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The United States has experienced dramatic increases in both incarceration rates and the population of insecurely housed or homeless persons since the 1980s. These marginalized populations have strong overlaps, with many people being poor, minority, and from an urban area. That a relationship between homelessness, housing insecurity, and incarceration exists is clear, but the extent and nature of this relationship is not yet adequately understood. We use longitudinal, administrative data on Michigan parolees released in 2003 to examine returning prisoners' experiences with housing insecurity and homelessness. Our analysis finds relatively low rates of outright homelessness among former prisoners, but very high rates of housing insecurity, much of which is linked to features of community supervision, such as intermediate sanctions, returns to prison, and absconding. We identify risk factors for housing insecurity, including mental illness, substance use, prior incarceration, and homelessness, as well as protective "buffers" against insecurity and homelessness, including earnings and social supports.

Keywords: reentry, homelessness, housing instability, intermediate sanctions

The United States has experienced dramatic increases in both incarceration rates and the homeless population since the 1980s, the latter owing in part to the severe decline in affordable housing (Blau 1992; Burt 1992; Jencks 1994; Wright, Rubin, and Devine 1998). By 2001, another 36.9 million U.S. households had experienced forms of housing insecurity, such as spending over 30 percent of household income on housing or living in poor-quality housing or

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in overcrowded conditions (National Low Income Housing Coalition 2004). Recent counts estimate that 665,000 persons are homeless on any given night, and that approximately 1.6 million Americans use shelters or transitional housing over the course of a year (U.S. Department of Housing and Urban Development 2010). Meanwhile, the United States now incarcerates nearly 1 percent of its population at any given time, while an additional 2 percent serve time on probation and parole (Wakefield and Uggen 2010).

Beyond the confluence of these two trends, there are strong reasons to expect a connection between incarceration and homelessness. First, both the formerly incarcerated and the insecurely housed or homeless are disproportionately poor minorities from urban areas (Lee, Tyler, and Wright 2010; National Low Income Housing Coalition 2004; Wakefield and Uggen 2010). There are also more direct connections between returning from prison and the risk of housing instability. Formerly incarcerated persons face a unique set of obstacles to finding and maintaining secure and stable housing, including prejudice and discrimination against those with a criminal record, legal barriers, and hurdles stemming from the direct involvement of the criminal justice system in their lives. Housing insecurity and homelessness have important consequences for returning prisoners, and some researchers have argued that secure housing is their most pressing and immediate short-term need (Lutze, Rosky, and Hamilton 2013; Metraux and Culhane 2004; Roman and Travis 2006); moreover, parole officials cite housing as the biggest need for parolees (Petersilia 2003, 8). Stable housing may be the foundation upon which other aspects of successful reentry rely (Bradley et al. 2001): it can be difficult for returning prisoners to find and maintain stable employment, maintain family connections, receive physical and mental health care, and avoid substance use without stable housing (Lutze, Rosky, and Hamilton 2013).

Despite these links between prisoner reentry and homelessness, only a few studies have specifically examined housing insecurity and homelessness among former prisoners. They show high rates of shelter use (Metraux and Culhane 2004) and residential insecurity

(Geller and Curtis 2011), as well as an elevated risk of recidivism for returning prisoners who do not receive housing and wraparound services upon their release (Lutze et al. 2013).

There are still many important gaps in the research on prisoner reentry and housing instability. First, there are no estimates of the frequency of various forms of residential instability and homelessness based on representative samples of former prisoners, and no studies have considered residential instability and homelessness together as part of a spectrum of insecure housing using long-term prospective, longitudinal data. Second, there has been no prior research on the role of the criminal justice system in housing individuals recently released from prison and in generating residential instability through forced residential moves.

In this article, we use prospective, longitudinal data on a cohort of prisoners released on parole in Michigan in 2003 to examine their experiences with housing insecurity and homelessness. The first part of our analysis asks two questions: How often do former prisoners experience homelessness and housing insecurity both immediately after release and over time? And what forms of homelessness and housing insecurity are most common among former prisoners? Our analysis reveals the prevalence and forms of housing insecurity and homelessness among the reentry population. We are able to compare the relative prevalence and timing of different forms of adverse housing situations that returning prisoners face. Our analysis details the range of unstable housing situations experienced by this population, including living on the streets or in shelters or other temporary housing; living in institutional settings; experiencing high rates of mobility; and absconding (aka being "on the run") (Goffman 2014).

The second part of our analysis looks at the characteristics and experiences of former prisoners to determine which are predictive of homelessness and housing insecurity. We examine preprison, prison, and postprison characteristics and experiences, such as demographics, preprison residence type, incarceration length, crime type, substance use, mental health, education, and work history. We use discrete time event history models

with competing risks to predict various types of residential moves, including moves to new private residences, to treatment or medical care, to homelessness, to short-term criminal justice sanctions, and to prison.

Our analysis finds relatively low rates of outright rooflessness or shelter use among former prisoners, but very high rates of housing insecurity. The predictors of homelessness and housing insecurity in the existing literature on other populations are also found here, including mental illness, drug and alcohol use, prior incarceration, and prior homelessness. Much of former prisoners' housing insecurity is linked to features of community supervision, including increased risk of arrests, substance abuse tests, intermediate sanctions, returns to prison, and absconding. Two buffers against housing insecurity and homelessness among former prisoners are higher earnings and social support from parents and romantic partners.

LINKS BETWEEN PRISONER REENTRY AND HOUSING INSECURITY

A staggering 700,000 prisoners are released from federal and state prisons each year (West, Sabol, and Greenman 2010). This transition is fraught with obstacles. Most prisoner reentry research seeks to identify the predictors of a "successful" transition and the risk factors associated with recidivating and returning to prison. This research has focused predominantly on the effects of employment, physical and mental health, substance abuse, family reintegration and social support systems, and neighborhood characteristics. Housing has received little attention within the prisoner reentry literature. For example, a recent National Academy of Sciences report on mass incarceration and its consequences contains chapters on health, employment, families, and communities, but little discussion of housing and homelessness (National Research Council 2014).

Many of the obstacles to successful prisoner reentry overlap with the obstacles facing the insecurely housed and homeless populations. Both populations are at risk for mental health problems (Beck and Maruschak 2001; Burgard, Seefeldt, and Zelner 2012; Lee et al. 2010; Shaw 2004; Travis 2003), substance abuse (Mumola 1999; Shlay and Rossi 1992; Visher and Travis

2003), and fragile family relationships. Family support is associated with lower risks of housing insecurity (Burgard, Seefeldt, and Zelner 2012), homelessness (Bassuk et al. 1997), and recidivism (Nelson, Deess, and Allen 1999; Visher and Travis 2003). Former prisoners face great difficulty finding and maintaining employment (Bushway, Stoll, and Weiman 2007; Sampson and Laub 1993; Solomon, Gouvis, and Wall 2001; Uggen, Manza, and Behrens 2003; Visher and Travis 2003; Western, Kling, and Weiman 2001), and experiencing unemployment can be a precursor to housing insecurity (Burgard, Seefeldt, and Zelner 2012) and homelessness (Shlay and Rossi 1992). These risks threaten successful reentry for former prisoners, and overcoming these risks is made more difficult without stable housing (Geller and Curtis 2011). Former prisoners who lack secure housing thus face a compounded disadvantage as they not only are compelled to negotiate the stigma and barriers of a criminal record but are also hindered by a lack of stable housing.

With regard to the effects of incarceration on homelessness, we know that returning prisoners can face structural obstacles to obtaining housing that put them at risk of housing insecurity or homelessness (see, for example, Geller and Curtis 2011). Prior research suggests that being homeless puts individuals at risk of incarceration, and also that incarceration increases an individual's risk of homelessness, although the direct evidence on these effects is thin. With regard to the effect of homelessness on incarceration, the lives of homeless persons are increasingly controlled by laws and ordinances that criminalize their daily activities. Lacking private, personal space, the homeless must use public spaces to engage in private activities such as sleeping, urinating, and drinking or using drugs, and many cities have enacted "anti-homeless" campaigns that criminalize such private activities in public spaces (Donley and Wright 2008). In Seattle and several other West Coast cities, even sitting or lying on the sidewalk is illegal (Beckett and Herbert 2010). The homeless are also more likely to engage in actions that put them at high risk of entering the criminal justice system, such as heavy drinking, stealing money, and stealing food (Gowan 2002; Greenberg and Rosenheck 2008).

Understanding homelessness and housing insecurity requires a broad conceptualization of the challenges of securing and maintaining stable housing. Homelessness research has expanded over time to analyze a range of experiences, from transitional and episodic forms to chronic homelessness, and many scholars emphasize the necessity of viewing homelessness as part of a spectrum of precarious housing situations (Geller and Curtis 2011; Honig and Filer 1993; Lutze, Rosky, and Hamilton 2013). People who are insecurely housed may experience frequent residential moves; may be cost-burdened by spending more than 30 percent of their income on housing; may live in overcrowded conditions or be doubling up (for example, two families sharing one apartment); may be at risk of losing their housing (such as facing an eviction); or may be exiting an institutional setting, having been homeless prior to entering.[1] There is a fine line between being insecurely housed and literal homelessness (Shlay and Rossi 1992), and housing insecurity is a risk factor for homelessness (Reid, Vitting-hoff, and Kushel 2008). Longitudinal research on homelessness affirms the fluid nature of housing, demonstrating that exits from and entries into homelessness are quite common after an initial period of homelessness (Metraux and Culhane 1999; Piliavin et al. 1996; Wong and Piliavin 1997). Research on housing obstacles among former prisoners needs to incorporate (1) insecurity in addition to outright homelessness, and (2) a longitudinal approach in order to capture the spectrum of housing situations that former prisoners may face and how they unfold over time. In this article, we conceptualize "housing insecurity" as a broad spectrum of precarious housing situations, from living on the street to being cost-burdened by a high mortgage payment.

BARRIERS TO HOUSING STABILITY AMONG FORMER PRISONERS

Former prisoners face many obstacles to finding housing upon release. Returning prisoners often have little to no income, they can be discriminated against by private landlords, and they can be prevented from applying for the limited supply of public housing, a restriction that may also affect the families with whom they may plan to live after prison (Geller and Curtis 2011). In this section, we discuss the key barriers to stable housing for former prisoners, including the nature of the U.S. housing market, collateral consequences of criminal justice system involvement, and the role of community supervision after release from prison.

The Market for Low-Income Housing

The constrained affordable rental market in the United States has heightened consequences for returning prisoners. Scholars cite the lack of affordable housing in the United States as a key factor in the growth of homelessness (Blau 1992; Snow and Anderson 1993; Wright, Donley, and Gotham 2008). Starting in the 1970s and 1980s, real wages have not kept up with increasing housing prices (Jencks 1994). Joel Blau (1992, 75) explains: "More than any other single phenomenon, it is the interaction between the relative decline of income and the relative increase in housing costs that explains the growth of the homeless population." By 1983, the proportion of renters paying more than 35 percent of their income on rent increased to 37 percent, up from 25 percent in 1974 (Blau 1992, 74). Some households handle this increase by spending less money on other expenses, like food or clothing. When that is not possible, some renters turn to other forms of insecure housing, like doubling up in order to save on rental costs, while others end up homeless (Blau 1992).

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1. Signed into law in 1987, the McKinney Act defined homelessness as "an individual who lacks a fixed, regular, and adequate nighttime residence," including persons living in shelters, hotels, or anywhere not designed for regular sleeping accommodations (McKinney Homeless Assistance Act 1987, 101 STAT 515 Q2). Over time, these guidelines have been expanded to include persons exiting an institution who were homeless prior to institutionalization and anyone facing an imminent threat to their housing (such as facing an eviction or not having the resources to continue to pay for their housing beyond fourteen days), as well as to cover a category of persons "at risk" of homelessness because they have income below 30 percent of the median for their geographic area, they move frequently, they are staying with others ("doubling up") or living in overcrowded conditions, they live in a hotel or motel, they are facing eviction, or they are exiting an institution (McKinney-Vento Act 1987, 3).

Low-income renters who turn to public housing face long waiting lists, at times longer than the number of available housing units.[2] The Reagan administration cut subsidies for the construction of new public housing, instead supporting housing-choice vouchers, which subsidize rents on the private rental market for low-income individuals. These vouchers are rarely enough to enable the holder to find an affordable rental, however, and thus merely reflect the lack of affordable housing for the poor (Blau 1992); moreover, private landlords may discriminate again potential renters, including former prisoners.

The decline in the availability of single-room-occupancy (SRO) hotels has further constrained housing options for those, like former prisoners, who are seeking very low-cost housing. SROs historically were utilized by returning prisoners or others leaving institutions, the elderly, and casual laborers (Blau 1992). These single-room rentals shared a bathroom and kitchen facility and were available for weekly or monthly rental (Rossi 1989). But as urban areas gentrified, SRO hotels and rooming houses were increasingly converted into high-cost rental units for urban professionals who returned to the city (Blau 1992).

The Collateral Consequences of the Involvement of the Criminal Justice System

Recent scholars have documented what could be called the "collateral consequences" of incarceration: the stigma and prejudice of prior incarceration burdens and disadvantages former prisoners long after their incarceration spells are complete. These collateral consequences have a negative impact on former prisoners' ability to find employment and housing, or even to maintain personal relationships (Petersilia 2000). Devah Pager (2003, 2007) explains that the "mark of a criminal record" negatively affects potential employers' perceptions of job applicants' trustworthiness and employability. Harry Holzer (1996) conducted surveys in four major U.S. cities and found that 60 percent of employers were unwilling to hire someone with a criminal record. Private land-

lords often require criminal history disclosure (Helfgott 1997; Holzer 1996), and landlords can refuse—and often do—to rent to those with a felony record (Geller and Curtis 2011).

There are also formal mechanisms of discrimination at play that negatively affect former prisoners long after reentry. In ten states, a single felony conviction bars the individual from voting for the rest of his or her life (Petersilia 2000, 19). Depending on the state, persons with a felony record are excluded from certain occupations, such as education, medicine, the law, and real estate (Petersilia 2000, 4). Many states temporarily or permanently ban those with felony convictions from receiving benefits such as food stamps, Temporary Assistance for Needy Families (TANF), and Supplemental Security Income (SSI) (Harding et al. 2014; Travis 2005). Those with a felony record can be banned from residing in public housing, either temporarily or permanently, and thus are often prohibited from residing with family members who may be receiving such assistance (and sometimes families risk eviction if they welcome home a family member with a felony record) (Freudenberg et al. 2005; Geller and Curtis 2011; Godsoe 1998; Pinard 2010; Rubinstein and Mukamal 2002; Travis 2005).

Community Supervision and Residential Instability

Recent research documents the way the intense surveillance of formerly incarcerated and wanted men shapes their desire to *avoid* the criminal justice system (Brayne 2014; Goffman 2014). Alice Goffman illustrates the intense presence of law enforcement in the lives of wanted men in Philadelphia, where searches and seizures are commonplace. Both qualitative and quantitative research finds that persons with criminal history involvement avoid institutions such as hospitals and schools for fear of arrest (Goffman 2014; Brayne 2014). With parole and the intense surveillance of poor communities, returning prisoners' daily lives are shaped even *after* incarceration through interventions by the criminal justice system.

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2. The number of households on the waiting list for public housing is estimated to be in the millions. A survey of 134 Public Housing Authorities found more than 1.5 million for just those PHAs, and many had closed their lists to restrict new applicants. For further discussion see Leopold 2012.

The institution of parole has shifted from treating parole agents as providers of *services* to emphasizing *surveillance;* the kind of training parole officers now receive is more akin to law enforcement than social work—stressing monitoring and arrests, for example, rather than service referrals (Petersilia 1999; 2003, 11; Travis 2005, 40). Because parolees are technically still in the legal custody of the criminal justice system, their constitutional rights are severely limited (Petersilia 1999, 506). Former prisoners on parole must, among other requirements, report to parole officers when directed and answer all reasonable questions, notify the parole agent of changes in residence, submit to mandatory drug tests, and not leave the jurisdiction without permission (Travis 2005, 47). If the conditions of parole are violated, the parolee may be required to adhere to a curfew or even change residences (Travis 2005, 47). Parolees may be returned to prison or temporarily moved to a variety of institutional settings other than prison. Drug treatment facilities, for example, may be "rehabilitative" settings but are often used as punitive measures of control (Lynch 1998, 860).

These forced moves present an additional risk factor for the reentry population that has not received prior attention in the literatures on homelessness and housing insecurity or on prisoner reentry—namely, the high frequency of so-called intermediate sanctions, which remove parolees from the community for short-term spells of custody in institutions such as jails, residential treatment centers, and programs for technical rule violators (Harding, Morenoff, and Herbert 2013). Intermediate sanctions are often given as punishments for parole violations as alternatives to returning the parolee to prison. Sometimes these behaviors are illegal, such as drug use or petty theft, and sometimes they are violations of the rules of parole, such as alcohol consumption, curfew violations, failure to report to one's parole officer, association with other parolees, or contact with crime victims. Intermediate sanctions are often intended to stop such behavior from escalating to more serious offenses. For example, a parolee who fails to report to his parole officer and is suspected of using drugs may be sent to a residential drug treatment program or a technical rule violation center for a week or two in order to "detox." Typically a parolee will not receive such a sanction for a rule violation until he or she has accumulated a number of infractions or displays behaviors consistent with prior crimes. Another common intermediate sanction is spending time in jail. This occurs when a parolee is arrested by the police for a minor crime and either serves a short jail sentence (for example, ninety days) or has the charges dropped before prosecution. Parolees may also spend a few days in jail as an intermediate sanction at the behest of parole agents. In addition, treatment programs can be used as an intermediate sanction by parole officers. Frequent, short-term, temporary moves in and out of intermediate sanctions are a potential source of residential instability for parolees.

Some parolees also may abscond in order to avoid intermediate sanctions. Goffman tells of a young man named Mike who was recently released from prison and lived at a halfway house. He "discovered that the guards there were conducting alcohol tests. He left before they could test him, assuming he would test positive and spend another year upstate for the violation. He planned to live on the run for some time" (Goffman 2014, 30). Absconding or being "on the run," a pathway unique to the population of former prisoners, may cause them to experience greater housing insecurity. Seeking to evade intermediate sanctions, parolees may temporarily stay elsewhere in order to avoid their registered residence or other locations where a parole officer might be likely to look for them.

PRIOR RESEARCH ON HOUSING INSECURITY AND HOMELESSNESS AMONG RETURNING PRISONERS

Despite the obstacles that former prisoners face in finding and maintaining secure housing and its important role in aiding a successful reentry process, few studies have examined the relationship between homelessness or housing insecurity and the formerly incarcerated population. Moreover, the studies that have examined this relationship face methodological limitations. Most research on the relationship between homelessness and incarceration has at least one of three weaknesses. First, most studies rely on small or nonrepresentative samples of formerly incarcerated individuals and therefore cannot estimate the

extent and duration of homelessness among the formerly incarcerated (Bucklen and Zajac 2009; Cooke 2005; Garland, Wodahl, and Mayfield 2011; Harding et al. 2014; van Olphen et al. 2006). Second, many studies examine past experiences of incarceration or homelessness and are therefore unable to prospectively analyze how these events unfold over time (Freudenberg et al. 2005; Snow, Baker, and Anderson 1989). Longitudinal data are needed in order to examine trajectories of homelessness and residential instability. Third, many studies rely on experiences with shelter use as an indicator of homelessness and therefore exclude experiences of outright rooflessness or other forms of housing insecurity that intertwine with shelter use, such as squatting, doubling up, staying with friends or relatives, residing in hotels or weeklies, or residing in short-term criminal justice institutions such as halfway houses and technical rule violator centers. Because returning prisoners face many institutional obstacles to securing stable housing (Geller and Curtis 2011; Metraux, Roman, and Cho 2008; Roman and Travis 2006), exclusively focusing on experiences of homelessness results in an incomplete picture of housing insecurity among the reentry population.

Here we briefly review the few relevant studies of housing insecurity and homelessness among the reentry population of which we are aware. Using longitudinal data on shelter use from the Department of Homeless Services in New York City and on incarceration from the New York Department of Correctional Services, Stephen Metraux and Dennis Culhane (2004) matched identifying data (such as name and Social Security number) for 48,424 returning prisoners to examine their shelter use and incarceration history over time. The authors found that 11.4 percent experienced a shelter stay after their release, and that over half of these shelter stays (6.2 percent) occurred within the first month after release. Although this study utilizes longitudinal data on a large sample, it defined homelessness narrowly as use of a shelter administered by the Department of Homeless Services in New York City, which operates 85 percent of the shelters in the city; therefore, it cannot provide a more detailed analysis of housing insecurity or other forms of homelessness.

Amanda Geller and Marah Curtis (2011) studied the housing security of urban fathers with incarceration histories using survey data from the Fragile Families study. They demonstrated that 31 percent of those with an incarceration history experienced housing insecurity, versus 14 percent of those without such a history. Examining only shelter use, they found that twice as many men with an incarceration history had a shelter history compared to those without an incarceration history (4 percent versus 2 percent). These findings provide empirical motivation for analyzing the spectrum of unstable housing situations that formerly incarcerated persons experience; however, the study looks only at formerly incarcerated fathers and relies on potentially unreliable survey-based measures that ask respondents to recall past experiences.

In a longitudinal study that evaluated a housing assistance program for high-risk or high-need offenders leaving prison, Faith Lutze, Jeffrey Rosky, and Zachary Hamilton (2013) found that periods of homelessness significantly increased the risk of recidivism. Periods of homelessness created more than two times the risk for new convictions and prison readmissions and three times the risk for revocations. Because this study was designed as a program evaluation, ethical and feasibility restrictions prevented the use of a random sample. Lutze and her colleagues called for increased attention to experiences of housing insecurity, not just homelessness, as the program evaluation specifically examined instances of homelessness and did not include housing insecurity.

In sum, despite the clear links between the reentry population and the population at risk of homelessness and housing insecurity, there is little research on homelessness and housing insecurity among those leaving prison. The existing literature suffers from important methodological limitations, does not consider the role of criminal justice institutions of supervision and custodial control, and tends to focus narrowly on particular forms of homelessness, such as shelter use, or on particular subpopulations. It also does not address heterogeneity within the reentry population in the risk of homelessness or housing insecurity.

The present study makes five contributions to the literature on prisoner reentry and housing:

1. We present estimates of the frequency of housing insecurity and homelessness for a representative sample of all individuals paroled in a single state in a single year.

2. We examine the more widespread problem of residential instability in conjunction with outright homelessness.

3. We assess the role of criminal justice institutions in "housing" individuals under community supervision and in generating residential instability.

4. We examine sources of heterogeneity in the risk of housing insecurity and homelessness within the reentry population.

5. We incorporate postrelease experiences into our analysis in addition to characteristics of individuals fixed at release.

DATA

Our data come from detailed administrative records—compiled in collaboration with the Michigan Department of Corrections (MDOC)—on a cohort of 11,064 Michigan prisoners who were placed on parole in Michigan during 2003.[3] Over 90 percent of Michigan's released prisoners are put on parole, one of the higher conditional release rates among American states. Our analyses in this article are based on a randomly selected one-third sample (n = 3,681) of this population for whom we collected more detailed data on postprison living arrangements by coding the narrative case notes that parole agents update regularly on each parolee.[4] All of the variables used in our analysis have been extensively cleaned, which involved checking for duplicate records, multiple people with the same ID number, and logical inconsistencies across variables, as well as detailed reading of the case notes where appropriate to resolve discrepancies across sources.

We operationalize the concept of housing insecurity in this article by examining the duration of time that parolees spend within a given set of living arrangements. (In the literature, more than one move per year is considered an indicator of residential instability [Geller and Curtis 2011]). We compiled event histories of residential moves and changes in living arrangements from the parole agent case notes, which contained the addresses of parolee residences, a description of what type of residence it was, whom the parolee lived with when the residence was private housing, and the dates of all residential moves, periods of unknown residence, and absconding.[5] Although parole agents may not always be aware of where the parolees they supervise are living, our background research revealed that the case notes do capture the vast majority of parolees' residential locations.[6] Moreover, parolees are required to report all changes of address for the duration of their parole to their parole officers, who in turn are expected to ver-

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3. Whereas jails are run by local cities and counties and hold individuals whose sentences are less than one or two years or who are awaiting trial, prisons are run by the states or the federal government and hold individuals who have longer sentences.

4. For more information on our sampling framework and the methods we used to collect residential address data, see Harding et al. (2013) and Morenoff and Harding (2011).

5. Determining exact move-in and move-out dates for residences was challenging. We estimated approximately one-quarter of the dates based on inexact information in the case notes. However, periods of absconding tend to be well documented in the case notes. An absconding warrant issued by a parole agent signals that the parolee is no longer being supervised by the agent and so the agent cannot be held responsible for the parolee's behavior.

6. We conducted a comparative analysis of a small sample of former prisoners who were interviewed for a longitudinal qualitative study and found that thirty-three of the thirty-seven addresses obtained through the qualitative study were correctly recorded by MDOC parole agents, and that fourteen of the eighteen subjects had their complete residential histories recorded in the case notes. Addresses that were missing in the case notes were either brief stays or short periods of living on the streets; parolees with missing addresses tended to be more residentially mobile, suggesting that the administrative data understates mobility slightly for some parolees.

ify the address, assess its appropriateness, and record it in the MDOC database. Failure to keep one's parole agent informed of one's address is a parole violation, and parole agents are required to verify the residence information provided by parolees, so parolees have a strong incentive to provide address information. In approximately 12 percent of the residential episodes (as defined later) in our sample (5,882 out of 48,186 episodes), the parolee's place of residence was unknown to the parole agent. In 72 percent of such cases, the parolee was officially absconding (that is, the parole agent had issued an absconding warrant). In a very small fraction of episodes ($n = 67$), the residence was unknown because the offender had been paroled out of state.

Residential Episodes

Our strategy for analyzing housing insecurity is to model the duration of parolees' "residential episodes," which we define as the continuous periods of time during which a parolee lives in the same location with the same living arrangement, excluding correctional settings. A residential episode begins when a parolee experiences a transition in living arrangements marked by a move to (1) a new private residence; (2) a state of homelessness, including living on the streets or in a temporary residence at a hotel, motel, shelter, or mission; or (3) a state of absconding. A residential episode ends with an event marking a change in a parolee's living arrangements, including moving to a new private residence, becoming homeless, absconding, being incarcerated,

and being admitted to a treatment center or hospital.[7]

It is noteworthy that moves to institutional locations (prisons, jails, residential treatment centers, residential centers for technical rule violators, and hospitals) marked the end of the current episode but did not trigger the start of a new residential episode. Residential episodes also ended when our observations of a parolee were either temporarily or permanently censored from our data and therefore the parolee was no longer at risk of experiencing a move we could observe. Censoring occurred when a person was discharged from parole, died while on parole, or reached the end of the observation period (August 18, 2009). Once a person moved to an institutional setting (prison, jail, hospital, treatment center, or correctional center), we excluded observations of them from the analysis until they returned to a residential setting. It is also important to note that the proportion of parolees who were censored increased over time as more parolees were discharged, returned to prison, or died, making the sample more selective. The direction in which such selection might bias our estimates is not clear. On the one hand, parolees who discharge earlier are likely to have more stable living arrangements, but those who move to prison or other institutional settings may have been at greater risk of housing insecurity while in the community.

We defined the start of the observation period for each person as the first residential episode after their parole in 2003 (the same parole that made the person eligible to be sampled).[8] People who were paroled to insti-

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7. The residential histories constructed from the case notes do not detect changes in living arrangements that occur when a parolee absconds or when the parole agent is otherwise unaware of the parolee's place of residence. Thus, if a given episode ends with a transition to a state of absconding or an unknown residence, a new episode cannot begin until the person moves to a known residential location. However, episodes that begin with a period of absconding or living in an unknown residence can end with a move to an institutional location, and such episodes are observed in the data.

8. No prisoner in Michigan is released without a planned place to live, so living on the streets immediately following release is extremely rare, but it may be more common later in the parole period. Few parolees have the financial resources to live alone, and few are married (12 percent of those paroled in 2003 in Michigan, according to estimates), so most parolees must live with parents, other family members, or romantic partners. Parolees are forbidden from moving out of state unless they initiate a lengthy bureaucratic procedure and pay a fee. Moving between counties is allowed but requires prior permission; as such, a move would require changing parole offices. In Michigan there is no requirement that the offender return to the same city or county where she or he was arrested or sentenced.

Table 1. Moves, Types of Moves, and Censoring Events for Michigan Prisoners Paroled in 2003: Frequencies for Event Outcomes

Variables	Person-Weeks		Person-Episodes		People[a]	
	Frequency	%	Frequency	%	Frequency	%
Moving as a binary outcome						
Moved	23,013	4.71%	23,013	87.81%	3,343	90.82%
Did not move	465,662	95.29%	3,196	12.19%	338[b]	9.18%
Type of move experienced						
To new private residence	6,727	1.38%	6,727	25.67%	2,397	65.12%
To homelessness	528	0.11%	528	2.01%	347[b]	9.43%
To treatment or care	2,511	0.51%	2,511	9.58%	1,131	30.73%
To intermediate sanction	8,275	1.69%	8,275	31.57%	2,411	65.50%
To prison	2,410	0.49%	2,410	9.20%	1,732	47.05%
To absconding	2,562	0.52%	2,562	9.78%	1,343	36.48%
Censoring events						
Death	89	0.02%	89	0.34%	89	2.42%
Discharge from parole	2,329	0.48%	2,329	8.89%	2,200	59.77%
On parole when observation period ended	778	0.16%	778	2.97%	778	21.14%
n	488,675		26,209		3,681	

Source: Authors' calculations.

[a]Person-level frequencies indicate how many people experienced a move or censoring event at least once.
[b]The number of people who never moved during the observation period.

tutions offering no exposure to the community, such as hospitals, in-patient treatment centers, and county jails, did not begin their first episode until they moved to a non-institutional address.[9] To estimate the models described here, we structured the data set such that each record corresponds to a weekly interval of time for a specific person and episode.[10] For example, a person who had three residential episodes, with the first lasting for twenty weeks, the second for fifty weeks, and the third for ten weeks, would have eighty records in our data set. As indicated in this example, we measure episode duration by resetting the "clock" to zero at the beginning of each new episode and counting the number of weeks until the end of that episode. The resulting data set contains 488,675 person-week observations.

Outcomes

We use two types of outcome variables in this analysis: a binary indicator of whether a person moved during a given week, and a categorical typology of moving events that captures the type of residence or living arrangement to which the individual moved. Table 1 shows frequencies for both of these outcomes, tabulating the frequencies of events per week (*n* = 488,675 person-weeks), episode (*n* = 26,209 person-episodes), and person (*n* = 3,681 people). Frequencies for the binary measure of moves show that approximately one out of every twenty observations (4.71 percent) in the person-week data corresponds to weeks during which moves occurred. The vast majority of episodes (87.81 percent) eventually ended with moves, while the others (12.19 percent) were censored without a move occurring.

9. Roughly 15 percent of the parolees in our sample were released from prison before their parole date because they were moved to a correctional center where they had community exposure or were placed on electronic monitoring (and technically were not yet considered to be on parole).

10. We treated weeks as the unit of time for measuring episode duration to reduce the size of the data set, but our underlying data identify the precise date on which each event occurred.

The typology of moves describes the particular type of event that ended an episode. We classified moves into six categories. The first category consists of moves to a new private residence,[11] which may include living alone, with family, or with friends.[12] The second category, homelessness, captures moves in which the parolee was either living "on the streets" or staying in a shelter, mission, hotel, or motel. Although spells of homelessness were relatively rare in this population, occurring in only 2 percent of all residential episodes, roughly 9 percent of all sample members experienced at least one homelessness spell.[13] The third category, treatment and care, includes moves in which the parolee was admitted to a residential treatment center for substance abuse problems or mental illness, a hospital, or a care facility (such as adult foster care, hospice care, or a nursing home).[14]

The next two categories represent events in which the parolee was reincarcerated. "Intermediate sanctions" refer to custodial punishments for new crimes or technical violations of parole or probation guidelines that involved incarceration, usually for shorter periods of time, in jails or custodial centers that ran programs for technical rule violators. Alternatively, a parolee could be returned to prison, which usually involved the revocation of parole and a longer period of incarceration. The final category is absconding, which was recorded in the case notes when a parole officer issued an absconding warrant for a parolee.

Covariates

The covariates used in the models described here include both time-varying and fixed (time-invariant) characteristics of parolees and episodes. Summary statistics on the covariates are shown in table 2. We constructed five types of time-varying covariates. First, we captured the passage of time with measures of time (in weeks) since the start of the episode, and of episodes since the start of the observation period.

Second, we constructed a typology of employment status and wages from linked Michigan Unemployment Insurance (UI) records, which contain information on the employment status and gross wages paid to individuals during a calendar quarter.[15] Since the UI data did not allow us to observe changes in employment and wages within a given calendar quarter, we used data from the most recently completed calendar quarter to construct this measure. The reference category is being unem-

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11. The parole agent case notes not only indicate whether the residence was private or institutional but also provide details, in the case of private residences, on the type of living arrangement. We chose to aggregate all types of private living arrangements into a single category for the purposes of creating this typology, but we constructed other measures that use the more detailed classification of living arrangements as predictors of moving events.

12. Moves to new private residences can be further classified as follows: 15.5 percent to live with parents, 27.8 percent to live with a romantic partner, 20.2 percent to live with other family, 12.4 percent to live with a friend, and 6.6 percent to live alone. In 11.2 percent of moves, the parole agent knew that the parolee was living in a private residence but did not record with whom, while in the remaining 6.4 percent of moves the parolee's location was unknown.

13. Owing to the restrictions we imposed on the analytic sample, the frequencies of homelessness reported in table 1 underestimate the actual prevalence of homelessness that we observed in our data. Recall that we excluded from our sample episodes that began when a person moved to an institutional facility (a prison, jail, residential treatment center, residential center for technical rule violators, or hospital). Had we included institutional episodes in our sample, we would have observed that 20.0 percent (*n* = 735) of the parolees in our sample experienced at least one spell of homelessness, and that 5.7 percent (*n* = 1,487) of all episodes ended in homelessness.

14. Roughly two-thirds of the moves in this category (69 percent) were to residential treatment centers, and 31 percent were to hospitals or care facilities.

15. For more information on the UI data and how we matched them to parolee records from the Michigan Department of Corrections, see Morenoff and Harding (2011).

Table 2. Event Histories for Michigan Prisoners Paroled in 2003: Summary Statistics for Covariates

Variables	Week-Specific[a]				Episode-Specific[a]				Person-Specific[a]			
	Mean	(SD)	Minimum	Maximum	Mean	(SD)	Minimum	Maximum	Mean	(SD)	Minimum	Maximum
Time since start of episode	30.05	(36.50)	0	319	6.35	(5.40)	1	45				
Episode order												
Wages in last complete quarter												
Unemployed (reference)	0.70	(0.46)	0	1								
Gross wages less than $1,000	0.08	(0.27)	0	1								
Gross wages $1,000–$2,900	0.08	(0.27)	0	1								
Gross wages $3,000–$5,900	0.08	(0.27)	0	1								
Gross wages $6,000 or more	0.06	(0.24)	0	1								
Recent events												
Number of arrests in past month	0.02	(0.16)	0	4								
Number of positive substance abuse tests in past month	0.05	(0.26)	0	7								
Treatment or care in last episode					0.13	(0.34)	0	1				
Intermediate sanction in last episode					0.30	(0.46)	0	1				
Prison in last episode					0.05	(0.22)	0	1				
Absconding warrant in last episode					0.01	(0.09)	0	1				
Living arrangements												
Living with parent (reference)					0.22	(0.41)	0	1				
Living with romantic partner					0.18	(0.38)	0	1				
Living with other family					0.17	(0.38)	0	1				
Living with friends					0.06	(0.24)	0	1				
Living alone					0.03	(0.18)	0	1				
Living at other private residence					0.06	(0.24)	0	1				
Homeless					0.06	(0.23)	0	1				
Living at unknown residence					0.22	(0.42)	0	1				
Living at preprison address					0.13	(0.34)	0	1				

(continued)

Table 2. *(continued)*

Variables	Week-Specific[a]				Episode-Specific[a]				Person-Specific[a]			
	Mean	(SD)	Minimum	Maximum	Mean	(SD)	Minimum	Maximum	Mean	(SD)	Minimum	Maximum
Cumulative event history (up to current week)												
Proportion of quarters with wages less than $1,000	6.65	(14.32)	0	100								
Proportion of quarters with wages $1,000–$2,900	6.81	(15.35)	0	100								
Proportion of quarters with wages $3,000–$5,900	6.41	(16.65)	0	100								
Proportion of quarters with wages $6,000 or more	4.51	(16.05)	0	100								
Rate of arrests	0.61	(1.33)	0	100								
Rate of positive substance abuse tests	1.25	(3.38)	0	200								
Number of prior episodes with parents					1.38	(2.23)	0	25				
Number of prior episodes with romantic partner					1.09	(2.30)	0	39				
Number of prior episodes with other family					1.11	(2.13)	0	31				
Number of prior episodes with friends					0.93	(1.73)	0	20				
Number of prior episodes in treatment or care					1.05	(2.18)	0	25				
Number of prior episodes of homelessness					0.43	(1.06)	0	12				
Number of prior episodes with intermediate sanction					3.35	(4.27)	0	41				
Number of prior episodes in prison					0.37	(0.65)	0	6				
Number of prior episodes of absconding					1.14	(1.93)	0	21				
Race												
White (reference)									0.45	(0.50)	0	1
Black									0.53	(0.50)	0	1
Other race									0.02	(0.14)	0	1
Female									0.08	(0.27)	0	1
Age									35.32	(9.65)	18	75

Marital status

	Mean (SD)	Min	Max
Never married (reference)	0.66 (0.47)	0	1
Married	0.12 (0.33)	0	1
Divorced or separated	0.20 (0.40)	0	1
Widowed	0.01 (0.11)	0	1
Number of dependents			
Zero (reference)	0.40 (0.49)	0	1
One	0.23 (0.42)	0	1
Two	0.18 (0.38)	0	1
Three or more	0.20 (0.40)	0	1
Education			
Zero to eight years (reference)	0.07 (0.26)	0	1
Nine to eleven years	0.35 (0.48)	0	1
Obtained GED	0.31 (0.46)	0	1
Twelve years	0.20 (0.40)	0	1
Thirteen to nineteen years	0.06 (0.24)	0	1
Education missing	0.01 (0.11)	0	1
Mental illness			
Known mental illness	0.21 (0.41)	0	1
Missing data on mental illness	0.01 (0.08)	0	1
Substance abuse history			
None	0.51 (0.50)	0	1
History of alcohol abuse	0.04 (0.20)	0	1
History of THC use	0.08 (0.27)	0	1
History of hard drugs	0.05 (0.22)	0	1

(continued)

Table 2. *(continued)*

Variables	Week-Specific[a]				Episode-Specific[a]				Person-Specific[a]			
	Mean	(SD)	Minimum	Maximum	Mean	(SD)	Minimum	Maximum	Mean	(SD)	Minimum	Maximum
History of alcohol and THC									0.06	(0.24)	0	1
History of hard drugs and alcohol/THC									0.26	(0.44)	0	1
Years served on sampled prison spell									2.95	(3.18)	0	21
Prison prefix												
Prefix A (reference)									0.48	(0.50)	0	1
Prefix B									0.26	(0.44)	0	1
Prefix C or D									0.21	(0.40)	0	1
Prefix E or above									0.06	(0.24)	0	1
Offense type												
Non-assaultive offense (reference)									0.46	(0.50)	0	1
Assaultive offense									0.28	(0.45)	0	1
Drug offense									0.26	(0.44)	0	1
Sex offense									0.08	(0.27)	0	1
Preprison measures												
Lived in private residence before prison									0.88	(0.33)	0	1
Homeless before prison									0.03	(0.17)	0	1
Employed in the year before prison									0.14	(0.35)	0	1
Missing on preprison employment									0.15	(0.36)	0	1

Source: Authors' calculations.
[a]There were 48,8675 weeks, 26,209 episodes, and 3,681 people.

ployed (no reported wages), and we classified employed parolees into four categories based on quarterly gross wage cut-points of $1,000, $3,000, and $6,000.

Third, we constructed time-varying indicators of adverse events related to contact with the criminal justice system, including the number of arrests and positive substance use tests that a parolee had during the four weeks prior to the current week and whether the prior residential episode ended with the parolee being moved to a treatment or care facility, an intermediate sanction, a return to prison, or the issuance of an absconding warrant.

Fourth, we constructed an episode-specific typology of parolee living arrangements consisting of the following categories: living with parents, a romantic partner, other family members, friends, or alone, being homeless, or living in a private residence that was not recorded by the parole agent.[16]

Fifth, to help us isolate the effects of recent adverse events and current living arrangements on residential instability, we control for the frequency of repeated adverse events over time, including the proportion of prior quarters spent in each category of the employment or wage typology, rates of arrests and positive tests for substance abuse (calculated as the number of events divided by the number of elapsed weeks in the observation period), and the number of prior episodes spent in each living arrangement.

We also controlled for an extensive set of fixed individual characteristics pulled from MDOC's database (listed in table 2). Most of these characteristics were measured at the time

the person was admitted to prison for the spell that ended with parole in 2003. Our list of controls includes measures of race, sex, age at parole (using linear splines with knots that define equal intervals at ages twenty-seven, thirty-four, and forty-two), marital status, number of dependents, education, mental illness, history of substance abuse, time (in years) served in prison for the spell that ended with parole in 2003 (using linear splines with knots that define equal intervals at 0.96, 1.79, and 3.55), the number of prior prison spells (aka the person's "prefix"), the type of offense (related to the sampled prison spell), and whether the parolee was a sex offender. We also controlled for the person's living arrangements (whether the person lived in a private residence or was homeless) prior to the sampled prison spell and an indicator of whether the person was employed in the year before that prison spell.

METHODS

To analyze housing insecurity, we model the duration of residential episodes using discrete-time event history models.[17] The hazard of moving during a given week is defined as the conditional probability of moving during week t (for person j in episode i), given that no event occurred during a previous week in that episode: $p_{tij} = \Pr(y_{tij}=1|y_{t-1,ij}=0)$, where y_{tij} is a binary response variable that is coded as 1 when a move occurred during that week and 0 for weeks when a person's living arrangement was unchanged from the prior week (Steele 2008).[18]

We take two different approaches to modeling types of discrete-time models in our anal-

16. The residential episodes characterized as living with "other family" can be further classified into the following arrangements: 48.4 percent were with a sibling, 17.6 percent were with an aunt or uncle, 13.7 percent were with a grandparent, 8.9 percent were with a cousin, 6.7 percent were with one of their children or stepchildren, 1.1 percent were with a relative of a current or former romantic partner, and 1.0 percent were with other family.

17. In the analysis, we use the term "homeless" to refer specifically to times when a parolee was living on the streets, in a shelter, or in a hotel or motel. We use the term "housing insecurity" to refer to the broader spectrum of events that we are modeling, namely, the frequency of moves in general and events that represent moves to specific types of private and institutional settings. We do not have more direct measures of housing insecurity in our data, such as doubling up or being cost-burdened.

18. In the multinomial logit model presented in equation (3), the response variable has seven categories. In this case, the hazard is the probability of moving to state r during weekly interval t in episode (for person j in episode i), given that no transition has occurred before the start of week t:

$$p_{tij}^{(r)} = \Pr(y_{tij}=r \mid y_{t-1,ij} = 0) \text{ for } r = 1,\cdots,R.$$

ysis. In the first, we estimate a discrete-time hazard model of moving using a logistic regression model:

$$\log\frac{p_{tij}}{1-p_{tij}} = \alpha\boldsymbol{D}_{tij} + \beta\boldsymbol{x}_{tij}, \qquad (1)$$

where $\boldsymbol{D}_{tij}$ is a vector specifying a function of the cumulative duration of weeks at week t, with coefficients , and $\boldsymbol{x}_{tij}$ is a vector of covariates that include both time-varying and invariant (fixed) characteristics, with coefficients β (Steele 2008).[19] To estimate the baseline logit-hazard function, $\alpha\boldsymbol{D}_{ti}$, we employed a piecewise specification of time consisting of five linear splines, with knots (at weeks 4, 11, 24, and 49) that partition the data into equal-size groups.[20] The β coefficients represent associations between the covariates and the log-odds of moving during a given week. Because having a higher probability of moving at any given week also means that the episode is likely to end sooner, the results of these models are often interpreted in terms of episode duration, whereby positive coefficients indicate associations with shorter duration and negative coefficients imply longer duration.

The model described in equation (2) can be criticized for presenting an overly simplistic picture that reduces the phenomenon of housing insecurity to the duration of time that any residential episode lasted, regardless of why the episode ended. Put differently, this approach to modeling episode duration equates episodes of equal length that end for reasons as diverse as moving to a new private residence, becoming homeless, incurring a sanction, or absconding. Since these events are produced by very different processes, it is reasonable to believe that the effects of the covariates, x_{tij}, may depend on the type of event that ended the episode. To differentiate between these types of moves, we coded a response variable with the following categories:

$$y_{tij} = \begin{cases} 0, & \text{no event (continuing to live in} \\ & \text{the same residence as prior week)} \\ 1, & \text{move to private residence} \\ 2, & \text{homeless} \\ 3, & \text{move to treatment or care facility} \\ 4, & \text{intermediate sanction} \\ 5, & \text{move to prison} \\ 6, & \text{absconding} \end{cases}$$

The discrete-time hazard function can then be defined as the probability of moving to state r during weekly interval t (for person j in episode i), given that no transition has occurred before the start of week t:

$$p_{tij}^{(r)} = \Pr(y_{tij} = r \mid y_{t-1, ij} = 0) \text{ for } r = 1,2,3,4,5,6.$$

We estimate this hazard function using a multinomial logit model that compares the prob-

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19. The model described in equation (1) assumes that the durations of the episodes experienced by the same person are independent of one another. This assumption breaks down if there are individual-specific factors that influence the risk of moving but are not captured by the covariates. We can account for such unobserved heterogeneity by adding a person-level random effect to the model:

$$\log\left(\frac{p_{tij}}{1-p_{tij}}\right) = \alpha\boldsymbol{D}_{tij} + \beta\boldsymbol{x}_{tij} + u_j,$$

where u_j is a time-invariant latent variable (random effect) that is normally distributed, $u_j \sim N(0,\sigma_u^2)$. In event history analysis, this is also referred to as a "shared frailty" model. We ran this model and obtained results that were very similar. We report the results from the logit model without random effects in this article because they are more comparable to the multinomial logit model described here, which also does not contain random effects.

20. To explore the robustness of the results to spline specification and choice of knots we refit the models substituting the linear splines with restricted cubic splines, using Frank Harrell's (2001) method for selecting knots. We followed this procedure not only for the episode duration splines but also for other continuous variables that we measured with splines (episode number, age, and years served on sampled prison spell). In all cases, the results were unchanged by using restricted cubic splines. We report the results from linear splines because they are much easier to interpret.

ability of experiencing an event of type r to the probability of having no event, $p_{tij}^{(0)}$:

$$\log \frac{p_{tij}^{(r)}}{p_{tij}^{(0)}} = \alpha^{(r)} \boldsymbol{D}_{tij}^{(r)} + \beta^{(r)} \boldsymbol{x}_{tij}^{(r)}, \text{for } r = 1, 2, 3, 4, 5, 6. \quad (2)$$

This is also known as a discrete-time model for recurrent events with competing risks (Steele 2008).[21] As was the case with the logit model, positive coefficients in this model indicate associations with shorter spell duration, and negative coefficients mean longer spell duration. The main difference in the coefficients from the multinomial logit model, however, is that they are event-specific, meaning that they represent associations between the covariates and the probability that one of the six different types of moving events will occur during a given week, relative to the probability that the episode will continue without an event.

RESULTS

We begin with a descriptive analysis of residential episode duration and the types of moves that were most common among the sampled parolees. There are three important points to make about the level and type of residential instability that parolees experienced. First, table 1 shows that spells of homelessness were relatively rare in this population, occurring in only 2 percent of all residential episodes. Second, a much bigger source of housing insecurity among parolees was the risk of having a residential episode disrupted by some kind of sanction-related move. Returning to table 1, we see that almost one-third (31.6 percent) of all episodes were disrupted by an intermediate sanction; when combined with moves to treatment or care or prison, these "forced" moves ended just over half (50.4 percent) of all episodes. This proportion grows still higher when absconding (9.8 percent) is added (many parolees abscond to avoid receiving sanctions). Only one-quarter (25.7 percent) of episodes ended with a move to a new private residence. Thus, despite the relative infrequency of street, shel-

ter, or hotel or motel homelessness among parolees, housing insecurity brought on by sanction-related moves was a large problem in this population.

Third, most residential episodes were very short, lasting only a few months, which signals high levels of housing insecurity. This can be seen in figure 1, which shows a stacked area graph plotting change over time in the episode-specific cumulative probability that a move of a given type has already occurred. The sum of all shaded regions in the graph represents the probability that an episode will have ended with some type of move by a given time point. This area increases dramatically as episode time increases during the early weeks. In fact, over 50 percent of the episodes ended at or before week 8, and 75 percent ended by week 27. The median spell length was seventeen weeks.

Next, we consider the flows that parolees experienced going into and out of different living arrangements. Table 3 presents a transition matrix that cross-tabulates the frequencies of (1) the living arrangements that parolees experienced in a given week (in the rows) against (2) the living arrangements they experienced in the following week (in the columns), for the 488,675 person-weeks we observed. The percentages displayed in the table reflect the probabilities of ending up in a given living arrangement during week $t + 1$, conditional on the living arrangement that the parolee experienced in week t. Note that there are fourteen columns but only ten rows in this table. There are fewer rows than columns because our analytic sample consists only of residential episodes during which parolees were living in non-institutionalized settings. Thus, the starting points of each transition (the rows) can only be a residential setting, whereas the ending points (the columns) can be either a residential or institutional setting.

One may be tempted to conclude from this table that there is a lot of stability in parolees' living arrangements because the modal pattern is to remain in the same category from

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21. We intended to include random effects in this model to account for unobserved risk factors and their potential correlation across competing risks. We have tried running a multinomial logit model with correlated random effects, but thus far we have been unable to get the maximum likelihood function to converge (after letting it run for a long time). We will pursue other options, such as using different software packages and running models on a more powerful computer.

Figure 1. Cumulative Probability of Residential Moves, by Type
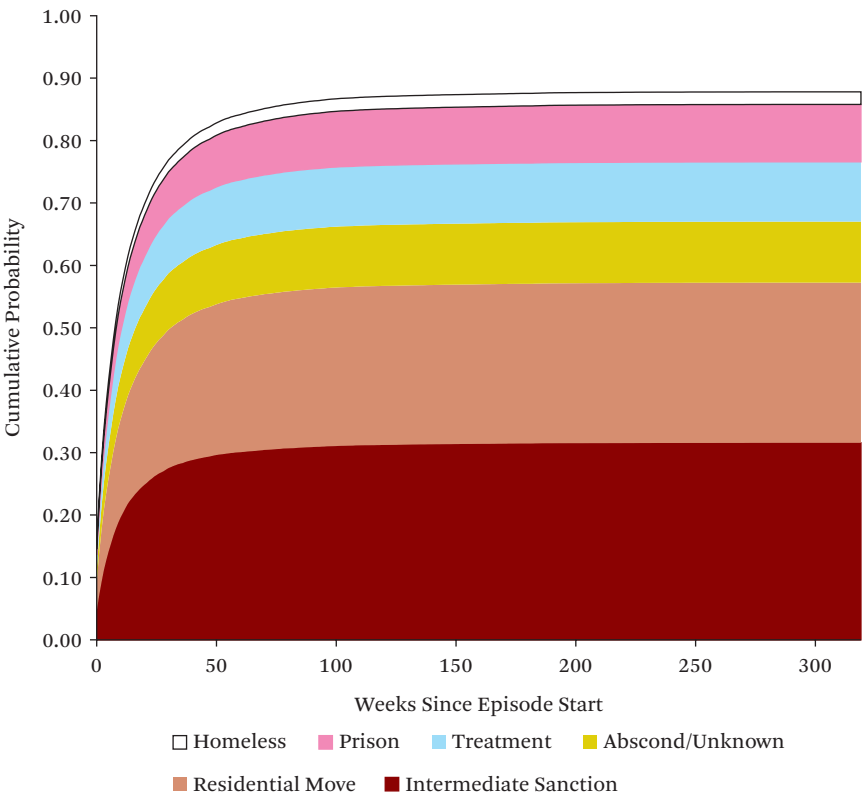
Source: Authors' calculations.

one week to the next. It is important to keep in mind, however, that even small departures from this pattern can represent high levels of residential insecurity. For example, consider the pattern of transitions for weeks in which parolees were living with their parents. On the one hand, this appears to be a very stable living arrangement, since 96 percent of the time a parolee was living with a parent during a given week the same parolee would be living with a parent the following week. On the other hand, four out of every 100 weeks in which parolees were living with a parent, they would move to a different living arrangement the following week; in other words, over the course of a year (fifty-two weeks), the average parolee living with a parent was likely to experience roughly two residential moves. The rate of residential mobility was slightly lower (3.51 percent) for parolees living with a romantic partner or alone, but substantially higher for parolees living with friends (5.99 percent), living in a hotel or motel (13.49 percent), living in a mission or shelter (13.19 percent), or living on the streets or being homeless (12.15 percent).

Discrete-Time Event History Analysis

Results from the discrete-time models of episode duration are presented in table 4. The table shows the results from both the logistic regression model of moving during a given week, as described in equation (1), and the multinomial logit model predicting whether a specific type of move occurred during a given week, as described by equation (2). For ease of exposition, we consider the results of both models together, emphasizing the most central results.

First, as we saw in figure 1, the initial weeks of residential episodes are often a very turbulent period when the risk of moving is quite

Living Arrangement at Week t	Living Arrangement at Week t + 1										Receiving Treatment or Care	Group Home	Jail or Center	Prison	Total
	Parent	Romantic Partner	Other Family	Friend	Alone	Other Private	Hotel-Motel	Mission-Shelter	Homeless	Unknown					
Parent	96.04% (112,068)	0.38% (442)	0.23% (269)	0.10% (119)	0.08% (99)	0.10% (122)	0.02% (29)	0.03% (30)	0.01% (9)	0.71% (833)	0.58% (681)	0.34% (394)	1.34% (1,569)	0.02% (28)	100.00% (116,692)
Romantic partner	0.29% (262)	96.49% (88,071)	0.23% (214)	0.12% (110)	0.04% (33)	0.09% (86)	0.02% (22)	0.03% (27)	0.01% (5)	0.58% (529)	0.56% (509)	0.25% (231)	1.26% (1,148)	0.03% (24)	100.00% (91,271)
Other family	0.29% (226)	0.41% (327)	95.45% (75,635)	0.17% (135)	0.12% (98)	0.16% (123)	0.03% (26)	0.07% (59)	0.01% (5)	0.92% (731)	0.61% (486)	0.42% (331)	1.32% (1,046)	0.02% (16)	100.00% (79,244)
Friend	0.40% (87)	0.58% (127)	0.47% (103)	94.01% (20,565)	0.22% (48)	0.32% (70)	0.06% (13)	0.15% (32)	0.04% (8)	1.14% (250)	0.70% (153)	0.35% (76)	1.56% (342)	0.01% (2)	100.00% (21,876)
Alone	0.15% (25)	0.32% (54)	0.22% (38)	0.20% (33)	96.49% (16,316)	0.09% (15)	0.03% (5)	0.02% (4)	0.00% (0)	0.54% (92)	0.66% (111)	0.13% (22)	1.14% (193)	0.01% (1)	100.00% (16,909)
Other private	0.21% (59)	0.41% (118)	0.26% (75)	0.22% (64)	0.06% (17)	96.17% (27,664)	0.05% (13)	0.04% (12)	0.01% (3)	0.62% (177)	0.50% (144)	0.24% (70)	1.19% (342)	0.02% (7)	100.00% (28,765)
Hotel/motel	0.71% (25)	1.16% (41)	2.04% (72)	1.22% (43)	0.88% (31)	0.94% (33)	86.51% (3,053)	0.68% (24)	0.11% (4)	2.07% (73)	0.82% (29)	0.77% (27)	2.07% (73)	0.03% (1)	100.00% (3,529)
Mission/ shelter	0.73% (41)	0.82% (46)	1.42% (80)	1.51% (85)	0.55% (31)	0.98% (55)	0.39% (22)	86.81% (4,877)	0.14% (8)	2.92% (164)	1.64% (92)	0.48% (27)	1.58% (89)	0.02% (1)	100.00% (5,618)
Homeless	0.64% (5)	0.26% (2)	1.28% (10)	0.90% (7)	0.00% (0)	0.26% (2)	0.13% (1)	1.41% (11)	87.85% (687)	0.77% (6)	2.43% (19)	0.51% (4)	3.58% (28)	0.00% (0)	100.00% (782)
Unknown	0.10% (124)	0.10% (130)	0.12% (151)	0.06% (78)	0.02% (20)	0.06% (75)	0.01% (8)	0.05% (62)	0.00% (3)	95.54% (118,454)	0.23% (287)	0.08% (105)	3.54% (4,387)	0.08% (105)	100.00% (123,989)
Total	23.11% (112,922)	18.29% (89,358)	15.68% (76,647)	4.35% (21,239)	3.42% (16,693)	5.78% (28,245)	0.65% (3,192)	1.05% (5,138)	0.15% (732)	24.82% (121,309)	0.51% (2,511)	0.26% (1,287)	1.89% (9,217)	0.04% (185)	100.00% (488,675)

Source: Authors' calculations.

Table 4. Discrete-Time Event History Models of Moving (Logit) and Type of Move (Multinomial Logit) for Michigan Prisoners Paroled in 2003

| | Logit | | Multinomial Logit | | | | | | | | | | |
| | Any Move | | Private Residence | | Homeless | | Treatment or Care | | Intermediate Sanction | | Prison | | Abscond | |
Variables	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Time since start of episode														
Spline: weeks 0–4	−0.20	(0.01)***	−0.24	(0.01)***	−0.37	(0.04)***	−0.30	(0.02)***	−0.13	(0.01)***	−0.07	(0.02)**	−0.22	(0.02)***
Spline: weeks 4–11	−0.01	(0.00)**	−0.01	(0.01)	−0.07	(0.03)*	0.00	(0.01)	−0.02	(0.01)*	0.00	(0.01)	−0.02	(0.01)
Spline: weeks 11–24	−0.02	(0.00)***	−0.02	(0.00)***	−0.04	(0.02)	−0.05	(0.01)***	−0.03	(0.00)***	−0.02	(0.01)*	−0.03	(0.01)***
Spline: weeks 24–49	−0.02	(0.00)***	−0.02	(0.00)***	−0.02	(0.02)	−0.02	(0.01)**	−0.03	(0.00)***	−0.01	(0.00)**	−0.02	(0.01)***
Spline: weeks 49 and later	0.00	(0.00)***	0.00	(0.00)**	−0.03	(0.02)+	−0.02	(0.00)***	0.00	(0.00)*	0.00	(0.00)	−0.02	(0.00)***
Episode order														
Spline: episodes 1–5	0.03	(0.02)*	0.13	(0.03)***	0.15	(0.06)**	0.14	(0.03)***	−0.06	(0.02)**	−0.11	(0.03)***	0.17	(0.03)***
Spline: episodes 5 and more	0.02	(0.02)	0.15	(0.03)***	0.12	(0.05)**	0.07	(0.03)*	−0.05	(0.02)*	−0.13	(0.03)***	0.03	(0.03)
Wages in last complete quarter (reference = unemployed)														
Gross wages less than $1,000	0.00	(0.03)	0.14	(0.04)**	0.21	(0.15)	−0.06	(0.07)	0.00	(0.04)	−0.20	(0.08)*	−0.12	(0.07)
Gross wages $1,000–$2,900	−0.15	(0.03)***	0.07	(0.05)	−0.16	(0.18)	−0.19	(0.09)*	−0.24	(0.05)***	−0.32	(0.09)***	−0.35	(0.09)***
Gross wages $3,000–$5,900	−0.50	(0.05)***	−0.03	(0.07)	−0.35	(0.21)+	−0.90	(0.15)***	−0.79	(0.07)***	−1.18	(0.15)***	−0.86	(0.13)***
Gross wages $6,000 and higher	−0.49	(0.07)***	0.10	(0.08)	−0.62	(0.33)+	−0.83	(0.21)***	−0.94	(0.12)***	−1.36	(0.22)***	−0.98	(0.19)***

Recent events

Number of arrests in past month	0.09	(0.04)*	0.05	(0.08)	0.36	(0.21)+	0.28	(0.10)**	0.09	(0.06)	0.19	(0.10)*	-0.07	(0.12)
Number of positive substance abuse tests in past month	0.31	(0.02)***	0.18	(0.05)***	0.03	(0.17)	0.70	(0.04)***	0.28	(0.04)***	0.03	(0.08)	0.43	(0.05)***
Treatment or care in last episode	0.27	(0.03)***	-0.20	(0.05)***	0.16	(0.17)	1.06	(0.07)***	0.24	(0.04)***	0.30	(0.08)***	0.47	(0.07)***
Intermediate sanction in last episode	0.26	(0.02)***	-0.23	(0.04)***	-0.05	(0.13)	0.45	(0.07)***	0.55	(0.03)***	0.32	(0.05)***	0.45	(0.06)***
Prison in last episode	-0.18	(0.04)***	-0.29	(0.07)***	-0.38	(0.25)	-0.04	(0.12)	-0.29	(0.07)***	-0.09	(0.11)	0.16	(0.09)
Absconding warrant in last episode	0.34	(0.09)***	0.06	(0.16)	-0.49	(0.61)	0.92	(0.19)***	0.20	(0.16)	0.52	(0.27)+	0.59	(0.18)**
First episode (no prior events)	0.01	(0.03)	0.01	(0.05)	0.10	(0.19)	0.02	(0.10)	0.00	(0.05)	-0.06	(0.09)	0.22	(0.09)*

Living arrangements (reference = living with parents)

Living with romantic partner	-0.04	(0.03)	0.03	(0.05)	-0.19	(0.21)	-0.04	(0.09)	0.02	(0.06)	-0.20	(0.10)*	-0.31	(0.08)***
Living with other family	0.15	(0.03)***	0.26	(0.05)***	0.45	(0.19)*	-0.10	(0.09)	0.07	(0.06)	-0.03	(0.09)	0.25	(0.08)**
Living with friends	0.33	(0.04)***	0.55	(0.06)***	0.71	(0.24)**	-0.11	(0.11)	0.14	(0.08)+	0.07	(0.13)	0.31	(0.11)**
Living alone	-0.10	(0.06)+	-0.02	(0.08)	-1.05	(0.45)*	-0.09	(0.14)	-0.20	(0.10)*	-0.34	(0.19)+	0.08	(0.17)
Other private	0.14	(0.04)***	0.29	(0.07)***	-0.03	(0.25)	-0.16	(0.13)	0.03	(0.08)	0.18	(0.14)	-0.04	(0.11)
Homeless	0.84	(0.05)***	1.45	(0.07)***	1.76	(0.21)***	0.07	(0.13)	0.11	(0.11)	0.19	(0.15)	0.54	(0.12)***

(continued)

Table 4. *(continued)*

| | Logit | | | | Multinomial Logit | | | | | | | | | |
| Variables | Any Move | | Private Residence | | Homeless | | Treatment or Care | | Intermediate Sanction | | Prison | | Abscond | |
	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Living at unknown residence	0.01	(0.03)	−0.90	(0.06)***	−0.34	(0.22)	−1.06	(0.11)***	0.78	(0.05)***	1.05	(0.08)***	−3.88	(0.21)***
Living at preprison address	−0.12	(0.03)***	−0.55	(0.05)***	−0.45	(0.19)*	0.19	(0.07)**	0.07	(0.05)	0.05	(0.08)	−0.07	(0.07)
Cumulative event history (up to current week)														
Proportion of quarters with wages less than $1,000	0.00	(0.00)+	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)**
Proportion of quarters with wages $1,000–$2,900	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Proportion of quarters with wages $3,000–$5,900	0.00	(0.00)	0.00	(0.00)*	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)+	0.00	(0.00)
Proportion of quarters with wages $6,000 or higher	0.00	(0.00)	0.00	(0.00)***	0.00	(0.01)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Rate of arrests	0.02	(0.00)***	0.00	(0.01)	−0.09	(0.06)	−0.02	(0.02)	0.03	(0.01)***	0.04	(0.01)***	0.01	(0.01)
Rate of positive substance abuse tests	0.01	(0.00)***	−0.01	(0.01)+	−0.02	(0.01)	0.01	(0.00)**	0.02	(0.00)***	0.01	(0.00)**	0.02	(0.00)***

Number of prior episodes with parents	0.00	(0.01)	−0.09	(0.03)**	−0.16	(0.05)**	−0.11	(0.03)***	0.07	(0.02)***	0.13	(0.03)***	−0.08	(0.03)**
Number of prior episodes with other family	−0.02	(0.01)	−0.08	(0.03)**	−0.18	(0.06)**	−0.09	(0.03)**	0.05	(0.02)*	0.11	(0.03)***	−0.15	(0.04)***
Number of prior episodes with friends	−0.01	(0.02)	−0.07	(0.03)*	−0.15	(0.06)*	−0.08	(0.04)+	0.04	(0.02)+	0.11	(0.03)**	−0.09	(0.04)*
Number of prior episodes alone	−0.01	(0.02)	−0.09	(0.04)*	−0.07	(0.09)	−0.10	(0.04)**	0.08	(0.03)**	0.18	(0.04)***	−0.26	(0.06)***
Number of prior episodes other private	−0.05	(0.02)	−0.12	(0.04)***	−0.14	(0.08)+	−0.11	(0.04)**	0.01	(0.03)	0.08	(0.04)*	−0.10	(0.04)*
Number of prior episodes in treatment or care	0.01	(0.01)+	−0.02	(0.01)	−0.04	(0.04)	0.13	(0.01)***	0.01	(0.01)	0.00	(0.02)	−0.04	(0.02)*
Number of prior episodes homeless	0.02	(0.02)	−0.12	(0.03)***	0.08	(0.06)	−0.02	(0.04)	0.09	(0.03)**	0.19	(0.04)***	−0.04	(0.04)
Number of prior episodes with intermediate sanction	0.00	(0.01)	−0.04	(0.01)**	0.02	(0.02)	−0.04	(0.01)**	0.04	(0.01)***	0.04	(0.01)**	−0.01	(0.01)
Number of prior episodes in prison	−0.02	(0.02)	0.07	(0.04)*	0.13	(0.09)	0.07	(0.05)	−0.05	(0.03)	−0.08	(0.05)	−0.06	(0.05)
Number of prior episodes absconded	−0.01	(0.01)	−0.19	(0.03)***	−0.21	(0.06)***	−0.07	(0.03)*	0.03	(0.02)+	0.11	(0.03)***	0.17	(0.03)***

(continued)

Table 4. *(continued)*

| | Logit | | Multinomial Logit | | | | | | | | | | | |
| | Any Move | | Private Residence | | Homeless | | Treatment or Care | | Intermediate Sanction | | Prison | | Abscond | |
Variables	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Race (reference = white)														
Black	-0.06	(0.02)*	-0.21	(0.04)***	-0.10	(0.11)	0.05	(0.06)	-0.04	(0.04)	-0.15	(0.05)**	0.28	(0.06)***
Other race	0.11	(0.07)	0.11	(0.11)	-0.09	(0.30)	-0.01	(0.19)	0.00	(0.10)	0.12	(0.16)	0.58	(0.17)***
Female	-0.02	(0.04)	0.14	(0.05)**	0.35	(0.17)*	0.05	(0.08)	-0.11	(0.06)*	-0.27	(0.09)**	-0.04	(0.10)
Age														
Spline: age 18–27	-0.03	(0.01)***	-0.04	(0.01)***	0.08	(0.06)	0.01	(0.03)	-0.03	(0.01)**	-0.05	(0.02)***	-0.02	(0.02)
Spline: age 27–34	0.01	(0.01)	-0.01	(0.01)	0.09	(0.04)*	0.05	(0.02)**	0.01	(0.01)	-0.04	(0.01)**	0.04	(0.02)**
Spline: age 34–42	-0.01	(0.01)**	-0.02	(0.01)**	0.03	(0.02)	0.00	(0.01)	-0.01	(0.01)	-0.02	(0.01)+	-0.02	(0.01)+
Spline: age 42 or older	-0.02	(0.00)***	-0.02	(0.01)**	0.00	(0.01)	0.01	(0.01)	-0.03	(0.01)***	-0.06	(0.01)***	-0.02	(0.01)*
Marital status														
Married	0.04	(0.04)**	0.20	(0.05)***	-0.11	(0.16)	-0.04	(0.09)	-0.07	(0.06)	0.04	(0.09)	-0.17	(0.10)+
Divorced/separated	0.07	(0.03)	0.16	(0.04)***	-0.22	(0.13)+	-0.02	(0.07)	-0.01	(0.04)	0.26	(0.07)***	0.02	(0.07)
Widowed	0.04	(0.10)	0.20	(0.12)	-0.84	(0.33)*	-0.04	(0.19)	-0.11	(0.16)	0.26	(0.23)	-0.02	(0.24)
Number of dependents (reference = zero)														
One	-0.01	(0.03)	0.07	(0.04)+	-0.06	(0.13)	0.01	(0.06)	-0.09	(0.05)	0.05	(0.06)	0.05	(0.07)
Two	0.03	(0.03)	0.08	(0.05)+	-0.20	(0.14)	0.00	(0.07)	-0.02	(0.04)	0.13	(0.07)+	0.06	(0.07)
Three or more	0.00	(0.03)	0.08	(0.05)+	-0.40	(0.15)**	-0.10	(0.07)	-0.03	(0.04)	0.10	(0.06)	0.04	(0.07)
Education (reference = zero to eight years)														
Nine to eleven years	-0.07	(0.04)+	-0.12	(0.05)*	-0.28	(0.19)	-0.10	(0.10)	0.02	(0.05)	0.00	(0.09)	-0.17	(0.09)+
Obtained GED	0.01	(0.04)	-0.13	(0.05)*	-0.01	(0.18)	-0.06	(0.10)	0.09	(0.06)+	0.19	(0.09)*	-0.05	(0.09)
Twelve years	-0.07	(0.04)+	-0.21	(0.06)***	-0.17	(0.19)	-0.12	(0.11)	0.06	(0.06)	0.04	(0.10)	-0.26	(0.11)*

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
Thirteen to nineteen years	−0.08	(0.06)	−0.08	(0.09)	−0.06	(0.23)	−0.38	(0.15)*	−0.01	(0.09)	0.17	(0.14)	−0.39	(0.16)*
Education missing	−0.04	(0.10)	−0.08	(0.14)	−0.70	(0.46)	−0.31	(0.19)+	0.13	(0.12)	0.21	(0.19)	−0.41	(0.31)
Mental illness														
Known mental illness	0.10	(0.03)***	0.06	(0.04)	0.04	(0.11)	0.31	(0.06)***	0.07	(0.04)+	0.09	(0.05)+	0.00	(0.06)
Missing on mental illness	0.04	(0.15)	0.30	(0.21)	−12.86	(0.39)***	0.22	(0.24)	−0.01	(0.13)	−1.11	(0.45)*	−0.42	(0.26)
Substance abuse history (reference = none)														
History of alcohol abuse	−0.04	(0.05)	−0.10	(0.07)	−0.01	(0.19)	−0.17	(0.15)	0.03	(0.07)	0.37	(0.10)***	−0.45	(0.14)**
History of THC use	−0.11	(0.04)**	−0.13	(0.05)*	−0.23	(0.27)	−0.60	(0.13)***	−0.04	(0.05)	0.04	(0.09)	−0.21	(0.10)*
History of hard drugs	0.13	(0.04)**	−0.11	(0.08)	−0.16	(0.21)	0.09	(0.09)	0.25	(0.06)***	0.13	(0.10)	0.40	(0.09)***
History of alcohol and THC	−0.09	(0.04)**	−0.17	(0.06)**	0.23	(0.22)	−0.35	(0.13)**	−0.03	(0.05)	0.07	(0.09)	−0.09	(0.11)
History of hard drugs and alcohol/THC	0.15	(0.02)***	−0.04	(0.04)	0.32	(0.12)**	0.17	(0.06)**	0.25	(0.04)***	0.34	(0.06)***	0.17	(0.06)**
Time served on sampled prison spell														
Spline: years 0–0.96	−0.06	(0.06)	−0.02	(0.12)	−0.23	(0.32)	−0.10	(0.18)	0.01	(0.09)	−0.41	(0.16)*	−0.02	(0.16)
Spline: years 0.96–1.79	−0.06	(0.04)	−0.01	(0.07)	−0.29	(0.22)	−0.05	(0.11)	−0.10	(0.06)	0.10	(0.10)	−0.14	(0.11)
Spline: years 1.79–3.55	0.00	(0.03)	0.03	(0.04)	0.04	(0.12)	−0.03	(0.07)	0.00	(0.04)	0.00	(0.06)	0.00	(0.06)
Spline: years 3.55 and more	−0.01	(0.01)	0.01	(0.01)	−0.12	(0.04)**	0.00	(0.02)	−0.02	(0.01)	−0.03	(0.02)	−0.02	(0.03)

(continued)

Table 4. *(continued)*

	Logit		Multinomial Logit										
	Any Move		Private Residence		Homeless		Treatment or Care		Intermediate Sanction		Prison		Abscond	
Variables	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Prison prefix (reference = prefix A)														
Prefix B	0.18	(0.02)	0.07	(0.04)+	0.01	(0.12)	0.11	(0.07)+	0.16	(0.04)***	0.77	(0.06)***	0.17	(0.06)**
Prefix C or D	0.30	(0.03)	0.16	(0.04)***	−0.09	(0.13)	0.22	(0.07)**	0.25	(0.04)***	1.07	(0.07)***	0.36	(0.07)***
Prefix E or above	0.32	(0.05)	0.07	(0.08)	−0.17	(0.21)	0.30	(0.10)**	0.26	(0.07)***	1.22	(0.11)***	0.41	(0.11)***
Offense type (reference = non-assaultive)														
Assaultive offense	−0.04	(0.03)	−0.07	(0.04)+	0.04	(0.12)	0.10	(0.07)	−0.10	(0.04)*	0.09	(0.06)	−0.08	(0.07)
Drug offense	−0.12	(0.03)	−0.12	(0.04)**	−0.51	(0.13)***	−0.04	(0.07)	−0.08	(0.04)*	−0.22	(0.06)***	−0.19	(0.06)**
Sex offense	0.08	(0.04)	0.05	(0.06)	0.34	(0.14)*	0.05	(0.10)	−0.03	(0.06)	0.53	(0.08)***	−0.20	(0.11)+
Preprison measures														
Lived in private residence before prison	−0.06	(0.03)	−0.03	(0.05)	−0.25	(0.12)*	−0.13	(0.08)	−0.10	(0.04)*	−0.01	(0.07)	−0.01	(0.08)
Homeless before prison	0.02	(0.06)	−0.13	(0.11)	0.22	(0.19)	0.06	(0.14)	0.00	(0.08)	−0.07	(0.14)	0.09	(0.13)
Employed in year before prison	−0.01	(0.04)	0.02	(0.05)	−0.01	(0.17)	−0.15	(0.10)	0.01	(0.05)	−0.06	(0.08)	−0.14	(0.10)
Missing on preprison employment	−0.05	(0.06)	−0.08	(0.07)	0.30	(0.31)	−0.28	(0.16)+	−0.05	(0.08)	0.35	(0.13)**	−0.38	(0.16)*
Constant	−1.52	(0.17)	−1.84	(0.26)***	−7.11	(1.50)***	−4.71	(0.66)***	−3.02	(0.26)***	−4.31	(0.42)***	−3.79	(0.50)***

Source: Authors' calculations.

+$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$ (robust standard errors in parentheses)

high. This is reflected by the coefficients for the splines measuring the number of weeks since the start of an episode. The first spline measuring linear change from weeks 0 to 4 has a large and significant negative coefficient in the logit model and in every category of the multinomial logit model. In the logit model, this coefficient implies that the odds of moving drop by 18 percent $(1–\exp[–0.200] = 0.18)$ with each passing week during the first four weeks of an episode. The spline coefficients for weeks 0 to 4 in the multinomial logit model indicate which types of moves tend to occur early in an episode. Homelessness is the most time-dependent of all the moving events: the odds of becoming homeless drop sharply with each passing week of an episode, declining by 31 percent $(1–\exp[–0.37] = 0.31)$ per week during the first month. In other words, episodes that end in homelessness tend to have very short durations. The coefficients for splines representing later time periods are much smaller in both the logit and multinomial logit models, indicating that the passage of time does not change the likelihood of a move occurring if the episode has already lasted five or more weeks. Returns to prison are the least time-dependent types of moves, meaning that as the duration of an episode increases, the odds of it ending with a move to prison do not drop as dramatically as with other types of moves.

Second, parolees who were working and earning higher wages were less likely to move, primarily because they were at much lower risk of experiencing a sanction-related event, such as being admitted for treatment or care, having an intermediate sanction, being returned to prison, or absconding. For example, the odds of returning to prison during a given week were 74 percent $(1-\exp[-1.36] = 0.74)$ lower for parolees who were earning at least $6,000 per quarter in gross wages—the highest wage category in our typology—compared to those who were unemployed. Parolees in the highest wage category were also significantly less likely to become homeless. The effects of wages and employment status are weakest in predicting moves to private residences, but there is one significant difference: those in the lowest wage category (earning less than $1,000 per quarter) were more likely to move than those who were

unemployed. One interpretation of the association between working for a very small wage and moving to a new private residence is that when contrasted with being unemployed, establishing a toehold in the labor market with a low-paying job could provide an impetus for parolees to move, perhaps to seek a more desirable living situation.

Third, being involved with the criminal justice system or living under institutional care had disruptive effects on subsequent episodes. Episodes were less stable (that is, they were likely to end sooner) when the parolee had recently been arrested, tested positive for substance use, been released from a treatment center or hospital, incurred an intermediate sanction, or been issued an absconding warrant. The most disruptive of these events were testing positive for substance abuse tests and having an absconding warrant in the prior episode. The odds of moving increased by 37 percent $(\exp[0.31] = 1.37)$ with each positive substance abuse test in the past month and by 40 percent if the last episode ended with an absconding warrant. These associations were even stronger in predicting moves to treatment centers or hospitals. For example, the odds of being sent to a treatment center or hospital doubled $(\exp[0.70] = 2.02)$ with each positive substance abuse test a parolee had within the past month and were two and a half times $(\exp[0.92] = 2.50)$ higher for parolees who had absconded in the prior episode. The only instance where criminal justice system contact did not disrupt subsequent episodes was when a parolee was returned to prison and subsequently released again to the community. It is important to note that many of these episodes were censored because they began late in the observation period; this censoring could account for the apparent stability that followed a return from prison.

Fourth, some living arrangements were associated with more stable episodes. Moves were less frequent when parolees lived with parents (the reference category), with a romantic partner, or by themselves, and this was especially true of moves to new private residences. The odds of moving were lowest for parolees who lived alone, and this was especially protective against becoming homeless or

moving because of an intermediate sanction or prison sentence. The odds of moving were higher when parolees were living with other family members, with friends, or at other private residences or when they were homeless. Moreover, the odds of becoming homeless were significantly higher among parolees living with friends or other family members and among those who were already homeless.

Returning "home" (to the same residence where they lived prior to the prison spell that ended in 2003) was also associated with significantly lower odds of moving in general and, more specifically, with moving to a new private residence or becoming homeless. However, living at home was associated with higher odds of being admitted for treatment or to a hospital, which is consistent with the idea that parolees who return home face more temptations to return to drug and alcohol use.

Fifth, among fixed (time-invariant) characteristics of parolees, some of the strongest predictors of episode duration were a parolee's history of mental illness, substance abuse, and imprisonment. Parolees known to have mental illnesses tended to experience shorter episodes, principally because they were at greater risk of being sent to a residential treatment center or hospital. The relationship between substance abuse history and episode duration was less straightforward. Those who had a history of using hard drugs (alone or in combination with alcohol and THC) were more likely to move because they were at highest risk of experiencing intermediate sanctions or absconding. However, having a history that involved THC use (either alone or with alcohol) was associated with longer episodes, in part because people with histories of THC use were less likely to be sent to treatment or a hospital than those with no substance abuse history. Finally, parolees who had been to prison more often (that is, who had a higher prefix) had significantly shorter episode durations, owing to their higher risk of having a sanction-related event (being sent to treatment or care or prison, having an intermediate sanction, or absconding).

DISCUSSION AND CONCLUSION

Decades of high incarceration rates and defunding of various welfare and public assistance programs have led to an increase in two at-risk populations in the United States: former prisoners who are reentering society (or are struggling to do so successfully), and precariously housed or homeless persons. Despite the significant overlap in the demographic composition of and risk factors for these two populations, and despite a burgeoning literature on prisoner reentry that focuses on outcomes that are closely intertwined with housing, such as employment, recidivism, and health, few prior studies have examined homelessness and housing insecurity among former prisoners. Former prisoners struggling to successfully reenter society—while burdened by the "mark of a criminal record" and facing many structural barriers to parity—face a compounded disadvantage when they are also encumbered by the obstacles of housing insecurity. Using administrative data on a large sample of parolees in Michigan, we have examined the frequency and predictors of various forms of housing insecurity and homelessness among former prisoners. We emphasize four key conclusions from our analysis and then discuss the limitations of our data and implications for the reentry and homelessness literatures, including considerations for future research. To help interpret our results and highlight important findings we present the marginal effects—measured as the proportional change in the probability of the outcome per unit change in the predictor—for key covariates from our models in table 5.

Key Findings

First, there was a great deal of residential mobility among the former prisoners in our sample. In previous research, we found that this same sample of parolees experienced an average of 2.6 moves per year (Harding et al. 2013, 226), a rate of mobility higher than that of any other population of which we are aware. The conventional threshold for residential instability in housing research is more than one move per year (Geller and Curtis 2011). Here we show that there was considerable variability in the risk of a residential move over time. The probability of a residential move decreased dramatically after the early weeks at a particular residence; 50 percent of the moves occurred within the first eight weeks. In other words, there was an inverse relationship between housing tenure and the probability of a

Table 5. Marginal Effects of Selected Covariates from Discrete-Time Event History Models for Michigan Prisoners Paroled in 2003 (Proportional Change in Probability of Move per Unit Change in Predictor)

Variables	Logit	Multinomial Logit					
	Any Move	Private Residence	Homeless	Treatment or Care	Intermediate Sanction	Prison	Abscond
Wages in last complete quarter (reference = unemployed)							
Gross wages less than $1,000	0.00	0.14*	0.23	−0.06	−0.18	−0.12*	0.00
Gross wages $1,000–$2,900	−0.13*	0.08	−0.14	−0.17*	−0.27*	−0.29*	0.01*
Gross wages $3,000–$5,900	−0.37*	0.00	−0.27+	−0.58*	−0.68*	−0.56*	0.03*
Gross wages $6,000 or higher	−0.37*	0.14	−0.44+	−0.55*	−0.74*	−0.61*	0.03*
Recent events							
Number of arrests in past month	0.08*	0.04	0.42+	0.31*	0.08	0.20*	−0.08*
Number of positive substance abuse tests in past month	0.32*	0.16*	−0.01	0.94*	0.27*	−0.01	0.48*
Treatment or care in last episode	0.26*	−0.21*	0.13	1.77*	0.23*	0.30*	0.55*
Intermediate sanction in last episode	0.26*	−0.22*	−0.08	0.54*	0.70*	0.35*	0.53*
Prison in last episode	−0.16*	−0.24*	−0.31	−0.03	−0.24*	−0.08	0.18
Absconding warrant in last episode	0.34*	0.02	−0.41	1.39*	0.17	0.61+	0.72*
Living arrangements (reference = living with parents)							
Living with romantic partner	−0.03	0.04	−0.17	−0.03	0.02	−0.18*	−0.26*
Living with other family	0.13*	0.26*	0.54*	−0.11	0.05	−0.05	0.26*
Living with friends	0.33*	0.66*	0.96*	−0.14	0.11+	0.03	0.31*
Living alone	−0.09+	−0.01	−0.65*	−0.08	−0.18*	−0.28+	0.09
Other private	0.14	0.33*	−0.04	−0.15	0.02	0.19	−0.05
Homeless	0.97*	2.62*	3.94*	−0.09	−0.05	0.03	0.46*
Living at unknown residence	0.05	−0.58*	−0.26	−0.64*	1.26*	1.95*	−0.98*
Living at preprison address	−0.09*	−0.41*	−0.35*	0.23*	0.09	0.06	−0.05

Source: Authors' calculations.

Notes: Marginal effects are defined for a black male, age thirty-five, never married, with no dependents, between nine and eleven years of education, unemployed, and living in private residence in year prior to sampled prison sentence, no history of substance use, not mentally ill, not a sex offender, has been to prison once for non-assaultive offense, currently in first week of third postprison residential episode, never homeless, with mean values on all cumulative event history variables.

+*p* < .1; **p* < .05

move; the longer a parolee lived in a residence, the less likely it was that he or she would move from that residence. This means that instability begets instability. When a former prisoner moves, he or she is put at heightened risk for another move.

Second, the predictors of homelessness and housing insecurity identified in the prior literature on risk factors among the general population also seem to operate among former prisoners. Mental illness, drug and alcohol use, prior incarcerations, and prior experiences with homelessness were all predictive of greater residential instability. Earnings and social supports are both protectors against homelessness and housing insecurity. As table 5 shows, former prisoners earning at least $6,000 in the past quarter had a 37 percent lower probability of moving compared to those who were unemployed, as well as a 44 percent lower probability of becoming homeless, 55 percent lower probability of being moved for residential treatment or care, 74 percent lower probability of receiving an intermediate sanction, and 61 percent lower probability of being returned to prison. These findings are consistent with the idea that there are important commonalities among the reentry population and those at risk of homelessness and housing insecurity in the wider population.

Our third conclusion is that the criminal justice system is a key player in generating residential instability: moves due to intermediate sanctions, to treatment or care, to prison, or to absconding status accounted for nearly 60 percent of all moves made by parolees in our sample. Absconding is by nature an unstable housing situation. When individuals go "on the run" from authorities in an attempt to avoid criminal justice sanctions, they put themselves in a precarious state in which it is difficult to achieve stable housing or employment and to maintain social relationships and access social supports (Goffman 2014). In table 5, we see more evidence of the way the criminal justice system influences residential moves: following a positive substance abuse test, parolees were 26 percent more likely to experience a move, 177 percent more likely to be moved to a treatment or care facility, 23 percent more likely to receive an intermediate sanction, 30 percent more

likely to return to prison, and 53 percent more likely to abscond (most likely in an attempt to avoid being assigned to treatment or to an intermediate sanction).

The positive or negative effects of this kind of residential mobility triggered by the criminal justice system are unclear. On the one hand, intermediate sanctions are an attempt by parole agents to intervene by preventing unwanted behavior. Sometimes these behaviors are illegal, such as drug use or petty theft, and sometimes they are violations of the rules of parole, such as alcohol consumption, curfew violations, failure to report to one's parole officer, association with other parolees, or contact with crime victims. Intermediate sanctions are also an alternative to returning a parolee to prison as punishment for minor crimes or rule violations, and they are often intended to stop such behavior from escalating to more serious offenses. On the other hand, temporary removal from the community for an intermediate sanction may disrupt otherwise stable living situations, separate the parolee from family and other forms of social support, and cause a parolee to lose a job or be unable to search for a job.

Fourth, we found two important postrelease "buffers" against residential instability among the parolee population: wages and living arrangements. Our analysis found that parolees were significantly more likely to avoid intermediate sanctions if they had higher quarterly earnings. This finding suggests a preventative effect of earnings on criminal or prohibited behavior, but it could also reflect unobserved differences between parolees with high earnings and others with lower earnings, or the lower likelihood of parole officials assigning a parolee to an intermediate sanction when he or she is stably employed. This finding also suggests that research attempting to uncover the relationship between employment and housing among parolees needs to consider the role of intermediate sanctions. Moreover, parolees were least likely to move, experience homelessness, or move to a correctional institution when they were living alone, a sign of being economically self-sufficient. Second, living with parents, living with a romantic partner, and returning "home" to the preprison

residence were all associated with more residential stability, consistent with prior findings that social supports play a key role in both the reentry process and avoiding homelessness (Bassuk et al. 1997; Harding et al. 2014; Nelson, Deess, and Allen 1999, 10; Visher and Travis 2003).

Limitations of the Study

Data for this research are drawn from one particular cohort of parolees in one state. Although Michigan's rate of incarceration was close to the national average during the time period, other features of Michigan make the experiences of Michigan parolees potentially less generalizable. Michigan experienced higher rates of unemployment, less immigration, and greater racial and economic segregation during the study time period than many other states. And with their high levels of residential vacancy and abandonment, homelessness often takes a different form in Michigan's central cities than it does elsewhere. For instance, squatting is common and often slips under the radar of authorities; thus, it may not be immediately evident that a parolee is squatting and therefore actually homeless. The states also vary in their criminal justice policies on, for instance, prison release, parole supervision, and the treatment of those with a felony record. Michigan has a longer time to parole than other similar states but imposes fewer restrictions than most states on access to public benefits by those with a felony record. Furthermore, since the 2003 cohort of parolees was released, Michigan implemented the Michigan Prisoner Reentry Initiative, which greatly expanded the services and resources offered to individuals released on parole.

The administrative data used in this research also present potential limitations. Records may be inaccurate since the data are based on parolees' self-reported residences. Although residences are supposed to be verified by parole agents, their large caseloads may prevent them from conducting frequent residence verifications. In particular, moves to new residences may not be recorded right away, and some parolees surely have reason to report one residence while living elsewhere (for example, reporting a mother's address while living with a girlfriend). This is likely to lead to underestimation of residential instability for some parolees.

Moves to homelessness (as defined by living on the streets, in a shelter, or in a hotel or motel) were relatively rare in our sample, and it is likely that such forms of homelessness are underestimated for a few reasons. First, because parolees are required to report a viable address to their parole agents, some reported addresses may have been used by parolees who were not actually living there. For example, some parolees may have used the address of a family member or acquaintance to report to their parole officer while actually being homeless or in some other living situation not sanctioned by the conditions of their release; such self-reports would also have led to overestimating the number of episodes spent living with parents, other family members, or friends. Second, given the high levels of residential vacancy in urban areas of Michigan, especially throughout Wayne County (where about one-third of the former prisoners were paroled), squatting in abandoned homes is a common form of residence for homeless persons. It is beyond the scope of our study to assess whether or not addresses listed as "private" are legally occupied or squatted, but high rates of squatting present a potentially interesting area for future research. (One soup kitchen estimates that 70 percent of its clientele, which includes a high rate of returning prisoners and parolees in Detroit, are squatting [Herbert 2014].) Third, unknown residences and periods of absconding are likely to include some periods of homelessness unknown to parole agents.

Finally, not all residential moves are "bad" moves. Moving in with a new spouse or romantic partner, moving to a more desirable neighborhood, returning to family, or upgrading housing may be indicators of successful reintegration rather than residential instability. Our administrative data do not allow us to reliably capture these fine-grained distinctions.

Implications for Prisoner Reentry

This research indicates that among the formerly incarcerated population (1) there is a high level of residential instability, and (2) this instability is expressed in a unique way because of the role of intermediate sanctions in generating resi-

dential instability. Moves due to intermediate sanctions account for over 30 percent of all moves. Using the same sample of Michigan parolees, we previously found that only 74.7 percent of parolees return to their presanction neighborhood, and that there is evidence that most postsanction moves are to neighborhoods with high poverty rates, where fewer opportunities for employment and more of a risk for criminal involvement can be expected (Harding et al. 2013). What this demonstrates is that intermediate sanctions may be having unintended consequences for parolees. Rather than just curtailing undesirable activities that might lead to recidivism, intermediate sanctions and forced moves to prison or treatment facilities may put a parolee at greater risk of recidivating by creating unstable housing situations. Furthermore, frequent moves in and out of the community for intermediate sanctions, to treatment facilities, or for absconding may have unforeseen impacts on former prisoners' ability to maintain employment and may stress familial relationships. Future reentry research should consider (1) the unintended consequences of moves forced by the criminal justice system and their collateral consequences for families and communities; (2) the consequences of absconding beyond the increased risk of returns to prison: and (3) the spectrum of insecure housing situations other than homelessness as conventionally defined (living on the street or in a shelter) that former prisoners may face.

Implications for Homelessness and Housing Insecurity

Research on housing insecurity needs to take into consideration the unique residential moves of former prisoners subject to community supervision. Some residential instability among former prisoners takes a particular form and may have a different temporal trajectory. Further research should consider the impact of not only the very high frequency of moves among some former prisoners but also the short duration of many of their residential episodes. Intermediate sanctions or spells in treatment or care programs often last only a few days or weeks and may have disruptive effects not considered by previous research on housing insecurity because they involve tem-

porary removal from the community and separation from social supports and the labor market. This oversight also implies a need for the broader literature on homelessness and housing insecurity to more thoroughly measure and analyze contact with the criminal justice system and how it interacts with residential trajectories. Moreover, the risk of living on the streets may be lower for individuals on community supervision because parole and probation agents, viewing living on the streets as a risk factor for recidivism, are likely to place people in custodial housing or treatment to prevent them from living on the streets.

Our results also suggest that understanding housing insecurity is aided by considering time-varying predictors. In general, we found that postrelease experiences are strong predictors of housing insecurity, even net of longer-term histories. For example, recent substance abuse test results and recent arrests are important even when controlling for prior substance abuse history and criminal history. Some of this association is accounted for by intermediate sanctions, incarceration in prison, and absconding, but recent positive substance abuse tests are also predictive of moves to private residences. This suggests that future research on homelessness and housing insecurity should incorporate time-varying predictors capturing recent experiences whenever possible.

Policy Implications

From this research, we have identified three main policy implications for prisoner reentry. First, certain living arrangements—living with parents or romantic partners—are predictive of greater residential stability. This suggests that incentivizing these protective living arrangements would encourage families to take in family members who are returning from prison. Current policy is counterproductive: low-income families in public housing are *prohibited* from having family members who have a felony record reside with them. Second, reentry policies need to consider the importance of stable residences in the first few weeks following release: 50 percent of all moves in our study occurred in the first eight weeks, and when a former prisoner moves, he or she is at greater risk for another move in

the future. In other words, more residential stability in the first few weeks following reentry may lower the risk of experiencing residential instability in the future. Finally, while intermediate sanctions are intended to curb undesirable behavior among parolees, they are very disruptive for residential stability. The possible unintended consequences of increased residential instability among parolees should be considered when imposing intermediate sanctions.

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