

ABSTRACT

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EXPLORING THE ROLE OF
CONCENTRATED REENTRY IN
THE RELATIONSHIP BETWEEN
HALFWAY HOUSES AND
RECIDIVISM

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Despite their widespread use, research on the effectiveness of halfway houses has been largely mixed, with many studies indicating that halfway houses may actually increase likelihood of recidivating rather than reducing it. This study aims to shed light on the relationship between halfway houses and recidivism by focusing on the role of parolee concentration as a mediating factor. Results based on the analysis of all first time parolees released from Pennsylvania State Prisons (n=8,515) indicate that the likelihood of recidivism for parolees transitioning through halfway houses is higher than that for those paroled directly to the street. Analyses on a smaller sample of parolees with geocodable address information (n=5,708) indicate that parolee concentration significantly affects the association between halfway houses and rearrests, but not for reincarceration. Additional evidence points towards significant direct associations between parolee concentration and all recidivism outcomes, with higher parolee concentration within neighborhoods being associated with higher likelihood of recidivism. Interestingly, halfway house capacity (examined only for individuals paroled to halfway houses, n=3,796) was not significantly associated with any recidivism outcome except rearrests within one year of release, and in this case a higher capacity was associated with a lower likelihood of rearrest.

EXPLORING THE ROLE OF CONCENTRATED REENTRY IN THE RELATIONSHIP
BETWEEN HALFWAY HOUSES AND RECIDIVISM

By

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INTRODUCTION

Over the last forty years, the rate of imprisonment in the United States has increased nearly five-fold, presently making it the highest in the world (Travis & Western, 2014). Despite a slight reduction since 2008, numbers are still soaring high with a reported 1.6 million individuals incarcerated in state and federal prisons across the nation as of yearend 2014 (Carson, 2015).

Since the onset of mass incarceration in the late 1970s, prisoner reentry has become a pertinent issue of concern. Over 90% of all prison inmates are eventually released and return to the community (Petersilia, 2003; Travis, 2005). This implies that an increase in the number of incarcerated individuals leads to an increase in the population reentering back into society after completing prison time (Lynch & Sabol, 2001). Recent estimates show that roughly 600,000 men and women reenter society from state and federal prisons every year (Carson, 2015). The fragility of prisoner reentry is evident from persistently high recidivism rates: about two-thirds of released state prisoners are arrested and half are reincarcerated within 3 years (Durose, Cooper & Snyder, 2014; Langan & Levin, 2002).

There are numerous interventions, both in prison and in the community, aiming to facilitate successful prisoner reentry and to lower the likelihood of released prisoners' recidivism (MacKenzie, 2006; Petersilia, 2003; Travis, 2005). One such intervention is the use of halfway houses. Halfway houses, also known as residential reentry centers or community corrections centers, are facilities designed to aid newly released prisoners in successful societal reentry by providing direct supervision and transitional services. Halfway houses have been part of corrections in the U.S. for over half a century, and the effectiveness of halfway houses in aiding prisoner reintegration has been a focus of various studies over the years. These studies on halfway houses have often generated mixed results (Hamilton & Campbell, 2014; Makarios et

al., 2010). Some studies have tried to explain the heterogeneity in results by focusing on individual offender characteristics such as risk and needs (Lowenkamp & Latessa, 2005) and ecological factors and their effect on the quality of programs offered at halfway houses (Wright et al., 2012). The current study focuses on the role of concentrated reentry as a factor that could shed light on the heterogeneous results in the prior literature on the effects of halfway houses on recidivism.

Within the realm of prisoner reentry, concentrated reentry, a geographic concentration of released prisoners, is a well-documented phenomenon (e.g., La Vigne, Mamalian, Travis, & Visher, 2003; Lynch & Sabol, 2001; Sampson & Loeffler, 2010), yet a relatively new factor in our understanding of post-prison recidivism (Chamberlain & Wallace, 2016; Kirk, 2015). There are possibly many mechanisms that link such concentration to higher recidivism risk, including a learning explanation at the individual level, in which living in close proximity to other released prisoners can lead to not only criminogenic learning of techniques, criminal attitudes and motivations, but also access to materials like drugs and weapons that can aid criminal activity (Kirk, 2015). There are also neighborhood-level mechanisms that can influence individual recidivism risk, including the disruption of neighborhood organization as a result of concentrated incarceration and reentry (Chamberlain & Wallace, 2016).

Although there have been several attempts at studying halfway houses and concentrated reentry separately with regard to their association with recidivism, their relationship with one another has largely been ignored in prior literature examining prisoner reentry. This relationship is an important one to study since these two aspects often coexist. Halfway houses by definition create a condition of released prisoners living in close proximity, and over the years many have voiced concern that this condition allows prisoners to “contaminate” one another (Seiter,

Petersilia, & Allen, 1974). The current study explores the relationship between halfway houses and recidivism by focusing on the role of concentrated reentry, using data from Pennsylvania. If concentrated reentry is associated with higher recidivism, and halfway houses contribute to concentration, part of the effects attributed to halfway houses in prior studies is likely due to concentration of offenders, rather than halfway houses themselves. Because halfway houses tend to be located in economically and socially disadvantaged areas – areas found to have already high concentration of returning prisoners (Clear, 2007) and high recidivism (e.g., Hipp, Petersilia & Turner, 2010; Kubrin & Stewart, 2006) – the current study takes into account the level of neighborhood concentrated disadvantage. Policies around the use of halfway houses are often under the control of state or local correctional agencies. Thus, questions like who should transition through halfway houses, how many parolees should be housed, where they should be located, etc. can be addressed to make the intervention more effective in reducing the likelihood of recidivism.

This paper will follow the following basic outline: The subsequent section will review the theoretical motivation behind the present study as well as prior empirical studies on halfway houses and concentrated reentry, along with delineating the contributions of the current study. This will be followed by a section on the data and methods utilized in the present study, with a focus on data sources, variables and analytical approach used. The paper will then present results and discuss limitations and potential theoretical and policy implications.

HALFWAY HOUSES

The primary concept behind halfway houses is that recently released prisoners need assistance in their transition back to society, as for many, the transition occurs after spending

considerable time in confinement, and without such assistance, prisoners are vulnerable to recidivism. In 1964, Robert Kennedy, then the U.S. Attorney General, strongly advocated for halfway houses, which he believes could “make the transition from institution to community less abruptly, less like slamming into a brick wall” (Kennedy, 1964:3). Halfway houses aim to reduce recidivism and facilitate successful prisoner reintegration through two primary functions – support and control (Latessa, 2012). The former is achieved by providing inmates with temporary housing, services (e.g., assistance in finding employment) and treatment programs (e.g., alcohol and drug treatment), while the latter is achieved by providing a structured community-based setting with round the clock supervision (Latessa, 2012; Latessa & Smith, 2015). Ever since the widespread acceptance of community based corrections in the 1960s, halfway houses have been an area of important focus for the federal and state governments (Latessa & Smith, 2015; Seiter, 1977). Currently, several states, including California, New Jersey, Ohio, and Pennsylvania, and the Federal Bureau of Prisons (BOP) release a substantial portion of their prisoners through halfway houses (Center for Behavioral Health Services & Criminal Justice Research, 2013).¹ A survey of 30 states and the BOP in 2002 (Camp et al., 2003) indicated that almost 20,000 parolees are housed in approximately 500 halfway houses across these states every year.

Despite their widespread use, research efforts on the effectiveness of halfway houses on recidivism and prisoner reintegration have been limited. Further, the existing literature has presented mixed results over the years. While some studies suggest that halfway houses are

¹Halfway houses encompass mainly two types of facilities – those for probationers and those for parolees (Hamilton & Campbell, 2014). Despite being tailored for two different populations, the motivation behind these facilities is similar, i.e. to provide supervision and services aimed at reducing recidivism. Since the focus of the present study is on reentry, it is the latter type (i.e. halfway-out, designed for parolees) that will be the pivot of the discussion henceforth.

successful in reducing recidivism (Dowell et al., 1985; Hamilton & Campbell, 2014; Harer, 1994; LeClaire, 1985), others disagree and find mixed or no support for this claim (Lerch et al., 2010; Makarios et al., 2010; Pennsylvania Department of Corrections, 2013; Seiter et al., 1977), while still others find different results for different subgroups of individuals (Lowenkamp & Latessa, 2002, 2005). Seiter et al. (1977) and Latessa and Allen (1982), who reviewed existing evaluations of halfway houses, found that overall evaluations tend to suggest that halfway houses are associated with recidivism reductions; however they also found that studies with weak conceptualizations of halfway house program goals and values, and those employing less rigorous evaluation methods tend to find halfway houses being associated with low recidivism, thereby indicating that halfway houses may not be as effective as prior evaluations indicated. In their study of halfway houses in New Jersey, Hamilton and Campbell (2014) found that halfway houses are effective means of reducing the number of revocations resulting due to parole violations, however they seem to have no effect on whether or not one is rearrested or reconvicted for a new offense. Further, in their study of halfway houses managed by the BOP, Lerch et al. (2010) found little evidence of halfway houses being effective in reducing the likelihood of recidivism. A recent study conducted by the Pennsylvania Department of Corrections (2013) found counterproductive effects in that halfway houses were associated with higher recidivism among paroled state prisoners. Considering the amount of federal and state resources being invested in these facilities, mixed findings such as these raise an important question – why are these facilities, which theoretically seem like a sound plan, not as successful in practice?

In order to better understand the effects of halfway houses, recent research has delved into understanding the ecological context and its association with halfway house effectiveness

(Wright et al., 2012). Based on 38 halfway houses in Ohio, Wright et al. (2012) found that individuals paroled to halfway houses showed higher post-prison recidivism (measured as reincarceration) and that the relationship was stronger in counties marked by concentrated disadvantage. Although, among all the factors that were examined, the quality of the treatment provided by halfway houses was found to be the most significant factor that was associated with lower recidivism, treatment quality seemed to be impacted by the structural characteristics of the community the halfway houses were situated in, i.e. the halfway houses in more disadvantaged communities seemed to be lacking good quality programs in terms of the type of programs used and the staff training and expertise (Wright et al, 2012).

One overlooked concept in the study of halfway houses is concentrated reentry. Previous research has indicated that a high concentration of former prisoners within neighborhoods has been found to be significantly associated with higher recidivism (Chamberlain & Wallace, 2016; Kirk, 2015). Surprisingly, the fact that halfway houses might be playing a direct role in increasing the concentration of parolees within neighborhoods since they by definition house multiple parolees together (Klein-Saffran, 1993), has largely been ignored. It is interesting to note that a common condition individuals need to follow while on parole is a prohibition on interactions with those with criminal history (Petersilia, 1999; Travis & Stacey, 2010) likely intended to avoid any criminogenic learning or antisocial influence these individuals might have on parolees. However, halfway houses clearly facilitate opportunities for parolees to associate with one another in residential settings (Seiter et al., 1974).

CONCENTRATED REENTRY

Prior research has shown that after release, most prisoners return back to a small number of neighborhoods (Clear, 2007; Harding et al., 2013; LaVigne et al., 2003; Lynch & Sabol, 2001, 2004a; Sampson & Loeffler, 2010).² For example, Lynch and Sabol (2001) found that two thirds of all state prisoners released in 1996 returned to “core counties” that contain the central cities of metropolitan areas, and within these counties, parolees were concentrated in just a few communities. A series of Urban Institute studies conducted in 4 metropolitan areas (Baltimore, Chicago, Cleveland and Houston) documented that a majority of released prisoners clustered in a small number of neighborhoods (La Vigne et al., 2003; La Vigne, Visher, and Castro 2004; Visher and Courtney, 2007; Visher, 2004; Visher, Yahner, and La Vigne, 2010). In their Chicago study, 34 percent of the prisoners released from Illinois state prisons in 2001 returned to just six (out of a total of seventy-seven) communities in Chicago (La Vigne et al., 2003).

Studies have found that high parolee concentration is associated with higher crime rates in the community (Clear et al., 2014; Clear et al., 2003; Hipp & Yates, 2009).³ Based on data of parolees in Sacramento, California, for example, Hipp and Yates (2009) found that monthly increases in parolees per capita in each census tract resulted in higher crime rates in those respective tracts, particularly rates of burglaries, robberies and aggravated assaults. They reasoned that this could be a result of three possibilities – the parolees who reentered these neighborhoods themselves reoffended, the parolees reoffended along with criminal associates in

² Concentrated reentry in the form of coercive mobility can be a result of returning to the same communities where one lived before, for example to reunite with families, or might take place due to a lack of other housing options arising out of limited financial resources upon release, forcing people to move to poorer and more disadvantaged communities.

³ However, methodological difficulties in estimating causal effects of incarceration on crime are a major issue (Lynch & Sabol, 2004b; Morenoff & Harding, 2014; National Research Council, 2014).

the neighborhoods they reside in, and/or their return to the neighborhood sparked structural changes like residential instability that resulted in an increase in crime.

Potential for the disruptive effects of mass incarceration and reentry that play out in a small number of communities is the focus of the literature on “coercive mobility”. Similar to the conceptualization of high residential mobility within the social disorganization framework as a leading criminogenic factor, coercive mobility is the form of forceful removal from and reentry into certain neighborhoods. Coercive mobility can lead to higher rates of crime, and likely recidivism, within neighborhoods because this forceful cycling of individuals in and out of communities damages local network structures and reduces the ability to practice informal social control (Clear, 2007; Clear et al., 2014; Clear et al., 2003; Rose & Clear, 1998).

Also at the neighborhood level, concentrated reentry can increase competition for resources (like jobs, housing, drug treatment, and other social services), creating a condition conducive for reentry failures and return to crime. These neighborhood conditions can also exacerbate the challenges returning prisoners are facing already, including lack of employment opportunities as a result of inadequate education and technical/vocational skills (Lynch & Sabol, 2001; Mauer, 2005; Western, Kling, & Weiman, 2001), social stigma attached to having a criminal record (Maruna, 2011; Pager, 2003), substance abuse and dependence (Visher, LaVigne, and Farrell, 2003), and health care and securing housing (Petersilia, 2003).

Additionally, social learning and peer influence perspectives can provide explanations to criminal conduct and recidivism (Andrew & Bonta, 1994; Gendreau, Little & Goggin, 1996). These perspectives may be particularly useful in explaining the detrimental effect of offender concentration (Nagin, Cullen, & Jonson, 2009). For instance, if a number of parolees and ex-offenders are placed together in close proximity, they may be more likely to be in each other’s

company and influence each other to commit crimes (by sharing information, providing access to weapons, or help develop new criminal skills), or even simply relapse into alcohol and drug abuse by sharing access to these substances (Kirk, 2009).

Two studies in particular focus on the empirical relationship between offender concentration and individual level recidivism (Chamberlain & Wallace, 2016; Kirk, 2015). Chamberlain and Wallace (2016) studied parolees returning back to three cities in Ohio and found that returning to neighborhoods with a higher concentration of parolees were associated with a higher likelihood of reincarceration. The authors also acknowledged the coexistence of high parolee concentration and high rates of social and economic disadvantage and found that these were significantly correlated with one another. Surprisingly, however, they did not find a significant relationship between concentrated disadvantage in neighborhoods and recidivism rates in models both with and without parolee concentration, contrary to findings of most studies exploring these variables. They attributed this to location specific influences and concluded the need to replicate their study in multiple cities with different structural influences to check the robustness of their findings.

Relatedly, Kirk (2015) used Hurricane Katrina as a natural experiment, which generated an exogenous variation in the concentration of paroled prisoners as hurricane damage in New Orleans dispersed parolees across space. He measured concentration by calculating the number of parolee per 1,000 residents in each zip code. Results indicated that a decrease in the concentration of parolees in a neighborhood leads to a substantial and significant decrease in the reincarceration rates of former prisoners.

CURRENT STUDY

This paper aims to shed light on the mixed picture of halfway house effect by focusing on the role of offender concentration. Studies in the past have focused exclusively either on halfway houses or concentrated reentry, each of which seems to be significantly associated with recidivism. The present study focuses on bringing these varied factors together by identifying a largely overlooked contribution of halfway houses in bringing parolees and ex-offenders in close proximity to one another and possibly undermining the efforts of halfway houses to affect recidivism.

Specifically, this paper aims to answer two main research questions. First, what is the nature of relationship between halfway houses and recidivism, i.e. are the odds of recidivating lower for parolees who transition through halfway houses, as intended? Second, is the relationship between halfway houses and recidivism mediated by concentrated reentry, i.e. can the association between halfway houses and recidivism be, at least in part, explained by the contribution of halfway houses to offender concentration? In order to answer these questions, this study looks at parolees' first post-release residential placement (halfway house or otherwise) and corresponding parolee concentration. The first address encapsulates his/her initial reentry experiences, which may be most influential in what individuals learn, whom they decide to associate with, and ultimately their odds of successful reintegration, or contrarily, recidivism. Studies on recidivism consistently find that the likelihood of recidivism is highest immediately following release (Durose et al., 2014; National Research Council, 2008), pointing to the pivotal role that the first residential and neighborhood placement may play in stirring parolees one way or another.

In our effort to tease out the relationship between halfway houses and parolee concentration, the current paper aims to differentiate the sources of parolee concentration, one of organizational and the other of neighborhood. Organizational concentration is operationalized as the number of other parolee residents in the halfway house. This is closely related to the size and capacity of halfway houses, and living in a large halfway house with many other parolees could predict recidivism, not only due to likely criminogenic learning but also diminished supervision capacity and rehabilitative programming opportunities. Thus, this organizational attribute may be associated with recidivism distinctly from the concentration of parolees in the neighborhood.

Importantly, to help better delineate the relationship between halfway houses, parolee concentration, and recidivism, the current study accounts for the level of disadvantage in the neighborhoods to which parolees return. Studies have found most consistently that concentrated disadvantage is associated with higher recidivism among released prisoners in multiple states: Oregon (Kubrin & Stewart, 2006), California (Hipp, Petersilia, & Turner, 2010), Florida (Mears et al., 2008), using different recidivism measures: rearrest (Kubrin and Stewart, 2006), reincarceration (Hipp et al., 2010), and reconviction, particular with respect to violent crimes (Mears et al., 2008).

Unique to this study is also the conceptualization of the recidivism measure. Unlike other studies in this area of research (Chamberlain & Wallace, 2016; Hipp et al., 2010; Kirk, 2015; Kubrin & Stewart, 2006), which rely on a single measure of recidivism, this study studies recidivism by operationalizing it as both rearrest and reincarceration (return to prison). Considering both arrests and incarceration as measures of recidivism helps us paint a more complete picture of the recidivism taking place (if any). Being involved in criminal activity or violating parole conditions can likely result in rearrest of the parolee, but not all parole violations

result in a police arrest. On the other hand, a serious parole violation can result in direct incarceration, without being arrested first.

DATA AND METHODS

PENNSYLVANIA CONTEXT

Currently, there are 26 state prisons in Pennsylvania housing about 51,000 inmates (Carson, 2015), and over 100,000 individuals are on parole (Kaeble, Maruschack & Bonczar, 2015). Pennsylvania has a parolee rate per 100,000 populations of about 283% higher than the national average (Kaeble, Maruschack & Bonczar, 2015; National Institute of Corrections, n.d.).⁴

Pennsylvania has an indeterminate sentencing system that imposes minimum and maximum sentence lengths for convicted offenders. Prisoners become eligible for parole after the completion of their minimum sentences, and once granted parole, they serve the remaining part of the sentence (i.e. until the maximum sentence date) in the community (PBPP, 2016).⁵ When released on parole, inmates are released either to halfway houses (or community correctional centers) or to private residences. Presently, approximately 60 halfway houses are actively functional in the state.

All parolees are required to abide by certain general supervision conditions,⁶ while certain groups of parolees (e.g., sex offenders, domestic violence offenders) may have additional conditions. Parolees can be reincarcerated due to violations of parole conditions (technical violations) or committing a new crime and being convicted through the court. Specifically, when

⁴The national average number of parolees per 100,000 is calculated based on the averages of all states with both discretionary and mandatory parole.

⁵ On average, about 80% of inmates are released on parole, while the other 20% are released unconditionally, i.e. they max-out of prison (Kramer et al., 2008). In the latter case, inmates complete their entire sentence in prison itself and are released unconditionally on their maximum sentence date.

⁶ For example, reporting to parole officers at decided intervals of time, reporting any address changes, securing a job, abstaining from alcohol and drugs, among others.

a parolee violates a condition while not committing an illegal act (e.g., failure to report a new address or employment), the parolee is said to have committed a technical violation.

SAMPLE

The sample used in this project includes 5,708 prisoners from Pennsylvania state prisons released on parole for the first time between January 1st, 2006 and December 31st, 2007.⁷ The first-time parole releasees represent those who have no prior reentry experience, including halfway houses, thereby reducing any extraneous effect of learning that may have taken place as a result of past reentry experiences.

The original data provided by PADOc consisted of all parolees (n=8,881) released from Pennsylvania State Prisons for the first time between 2006 and 2007.⁸ Missing address information resulted in a sample size of 6,844 parolees. Missing address data as a result of Pennsylvania Board of Probation and Parole (PBPP) not having recorded information can be due to various reasons, such as the parolees having absconded without ever reporting to their parole officers or having moved to another state.

For the 6,844 individuals included in the sample, the prison release dates were compared to their address effective dates.⁹ Individuals not falling within the decided range were excluded from the sample,¹⁰ which resulted in 6,149 observations. The addresses of these parolees were

⁷Those individuals identified by PADOc as having no prior incarceration in a Pennsylvania state prison.

⁸ First-time releasees comprise about 50% of the entire parolee population released between 2006 and 2007.

⁹ The address effective date is the date an individual starts to live in a particular residential address. Most parolees have multiple effective dates since each time an individual moves to a new address, he/she is required to report the new address and the date of moving to his/her parole officer.

¹⁰ Only those individuals whose first effective dates were 7 days or less before the release days or 30 days or less after the release date were included in the sample. Most often, the release date and effective date are the same (thereby making the difference 0). However, this range was selected in order to allow for variations in reporting and recording.

then geocoded in order to create neighborhood-level variables. Some addresses could not be geocoded due to incorrect or incomplete address information. Excluding individuals with such addresses resulted in a sample size of 5,732 parolees.

Finally, observations with missing individual-level information (like LSI-R scores) were excluded from the sample, resulting in a final sample size of 5,708 individuals.

DATA AND VARIABLES

This study utilizes data from the Pennsylvania Department of Corrections (PADOC), the Pennsylvania Board of Probation and Parole (PBPP) and the U.S. Census. The dataset from PADOC contains records of each individual's demographic and social characteristics, criminal history, sentencing, risk/needs assessment, recidivism (rearrest, reincarceration), etc. Data from PBPP includes information on parolees' residential address information. Community characteristic data were obtained from the 2010 Decennial U.S. Census, particularly from the American Community Survey (ACS).¹¹ This included information on socio-economic information about neighborhoods. Data were obtained at the census tract level.

Following is the description of variables used in the present analysis. The focus of the study is on community level factors (offender concentration), however a number of individual level factors, which have been found to be correlates of recidivism, have been included as statistical controls.

¹¹The 2010 American Community Survey was used for information on community characteristics rather than the 2000 survey since the focal years of this study (2006 and 2007) are temporally closer to 2010 and information collected during this survey may be more indicative of the neighborhood characteristics in 2006-2007.

Outcomes

The dependent variable in the current study is post-prison recidivism, which is captured through three separate measures – rearrest (*Rearrest*), reincarceration (*Reincarceration*), and the first occurrence of either rearrest or reincarceration (*Overall Recidivism*).

Recidivism is measured at different time points in the sample – 1 year, 3 years, and 7 years after release. The present study focuses on the first post-release addresses and the corresponding neighborhood characteristics of paroled inmates and their association with recidivism. Since recidivism risk varies over time (Durose et al, 2014; Langan & Levin, 2002; National Research Council, 2008), it is important to examine the temporal patterns of recidivism outcomes.

Independent Variables

The two main independent variables are – parolee concentration (*Parolee Concentration*) and halfway house indicator (*Halfway House*). Based on parolee address data, parolee concentration was measured by calculating the percentage of parolees (relative to the total tract population) living in each census tract between January 2006 and December 2007. The construction of this variable followed several steps. First, all the parolee addresses in the sample were geocoded using the U.S. Census geocoder. Approximately 94% of all first-time addresses and 85% of all successive addresses (if any) were successfully geocoded.¹² Next, the number of parolees in each tract was calculated by counting the number of parolees in each tract during

¹²The first post-release addresses are the first recorded address after a parolee is released from prison to parole. Successive addresses are all addresses that each parolee has lived in (as recorded by PBPP) between 2006 and 2007 after moving from their first address. Successive addresses were included in the calculation of offender concentration in order to obtain a more accurate picture of parolee concentration. It is important to note that successive addresses are less geocodable than first addresses because a large percentage of these addresses are private addresses. Incorrect or incomplete private residence addresses are more difficult to correct.

each month between 2006-year beginning and 2007-year end. These counts were then divided by the total population in the respective tract (from the 2010 U.S. Census) and multiplied by 100 to calculate the percentage. Instead of solely relying on the first post-release address, parolees' subsequent addresses until the end of parole supervision (the maximum sentence date) or the first occurrence of recidivism (rearrest or reincarceration), were taken into account to calculate the number of parolees residing in a given census tract in each month.

Certainly, this measure of concentration does not capture all the parolees living in each tract. The measure is limited to those individuals released for the first time between 2006 and 2007. Individuals released prior to January 2006 who were on parole and residing in Pennsylvania during the study period (i.e. between 2006 and 2007) and those who were released between 2006 and 2007 but have prior incarcerations in Pennsylvania are not included in the parolee concentration measure. Additionally, it is important to note that month-to-month address data were not available for parolees, due to which while creating the monthly concentration variable, it was assumed that each parolee continued to live in the same address until a new address was reported. However, these limitations may not be very problematic, since prior studies have indicated that parolee concentration across neighborhoods remains relatively stable over time (Sampson & Loeffler, 2010). A separate analysis (not shown) was conducted to test the stability of concentration measures, which indicated that the correlations between monthly counts of offender concentrations for the current sample remain fairly consistent across the study period and.¹³ . Therefore, we can assume that despite the unavailable data, the parolee concentration would remain fairly consistent, deeming this measure of concentration as valid.

¹³ Additionally, there is a high correlation between the measure of concentration based only on 2007 addresses and the measure based on 2006 and 2007 addresses, providing further evidence that parolee concentration is a relatively time-stable characteristic of neighborhoods.

The second main independent variable, the halfway houses indicator (*Halfway House*), reflects the nature of each parolees' first residence and is a binary variable of whether each parolee's first residence after release was a halfway house (Community Corrections Centers) or a private residence. Community Corrections Centers (CCCs) are state or privately run facilities designed to aid prisoners nearing release in successful societal reentry by providing direct supervision and transitional services. The decision to release parolees to one or the other is made by the parole board based on factors, including whether or not an individual has an approved place to stay after release ("home plan") as well as individual's risk that may indicate a need for additional supervision.

Additionally, for further analyses, parolee concentration has been divided into two distinct types of concentration – organizational (halfway house) concentration and neighborhood concentration. As noted earlier, differentiating these two types of concentration can help better understand how halfway houses affect recidivism through parolee concentration. Neighborhood parolee concentration (*Non HH Concentration*) is the percentage of parolees living in a particular census tract but not living in a halfway house. Organizational concentration (*HH Capacity*) was calculated by counting the number of parolees living at a particular halfway house address during a particular month.

Individual Level Controls

A number of individual level factors have been included in the analysis. Gender is measured as a dichotomous variable, *Male*, with 1 indicating the parolee is male and 0 for

female. With respect to race, the sample contains Black, White, Hispanic,¹⁴ American Indian, Asian and other (unlisted or uncommon) racial groups. Since the first two categories make up the bulk of the sample, race has been categorized into three categories – *White*, *Black* and *Other*. Each category is operationalized as a dichotomous variable. Age at release is calculated by subtracting the parolee’s birth date from his/her date of release and divided by 365 in order to get the age in years. Finally, marital status reflects the individual’s status at time of incarceration. It is categorized into three categories – *Single*, *Married* and *Other*. The last category consists of divorced, separated and widowed individuals, as well as those individuals whose marital status is unknown. They have been categorized together since they comprised of a very small percentage of the entire sample. Similar to race, each category has been dummy coded.

Data on criminal history include parolees’ prior arrest history, incarceration crime type, length of time served and number of prison misconducts. Parolees arrest history (*Prior Arrests*) is measured by the number of prior arrests in the Pennsylvania State Police rap sheets that occurred prior to the current incarceration. The incarceration crime type reflects the type of most serious crime an individual was convicted of that led to the current incarceration. All crimes have been categorized into four categories – violent crimes (*Violent*), property crimes (*Property*) and drug offenses (*Drug*) and other crimes (*Other*), based on the definitions used by PADO. The other crimes include mostly public order offenses. The length of time served is the number of years an individual included in the sample spent in prison, and is calculated by subtracting the prison admission date from the release date, and dividing by 365. Finally, PADO maintains information regarding prison misconducts each inmate is involved in. The total number of such misconducts committed by each individual in the sample has been calculated.

¹⁴ Since PADO does not measure race and ethnicity separately, ‘Hispanics’ is a separate race category instead of being included in conjunction with White or Black.

Additionally, parolees' risk score has been included in the analysis. Each parolee's risk score is based on the Level of Service Inventory – Revised (LSI-R). The instrument contains 54 items in 10 domains, including criminal history, education/employment, family/marital, accommodation, alcohol/drug problems, and attitude/orientation, which assess both static and dynamic risk factors of recidivism, and the composite score is designed to predict recidivism (Andrews & Bonta, 2000). Statistically adjusting for the LSI-R score is important as parole decisions, including whether or not one should be granted parole, and if so, what level of supervision one should be under, and whether or not one should be assigned to halfway houses are in part determined by an individual's risk-needs assessment and risk score.

Community Level Control

As discussed previously, various studies in the past have found that neighborhood factors play a key role in determining recidivism (Grattet et al., 2009; Hipp et al., 2010; Kubrin & Stewart, 2006). The present research focuses on concentrated disadvantage as a statistical control at the neighborhood level because not only does it have a very strong theoretical standing, it is also used most frequently in studies of social ecology of crime and recidivism and have most consistent empirical support (Hipp et al., 2010; Kubrin & Stewart, 2006; Mears et al., 2008; Pratt & Cullen, 2005). Following the conceptualization in prior research, concentrated disadvantage was operationalized as an index and created by combining multiple variables using the principal component analysis.¹⁵ The variables included in creating this index were percent poverty, percent

¹⁵The principal component analysis is used to transform multiple, highly correlated variables into a smaller number of uncorrelated variables called principal components. These principal components are obtained as linear combinations of the original variables (Abdi & Williams, 2010). The first principal component is used here to represent concentrated disadvantage since it accounts for the most variance (as compared to subsequent principal components). In the present study, the first principal component accounts for 78% of the variance in the index.

unemployment, percent female-headed households, percent households on public assistance, and median household income.

METHOD

The main questions this study aims to answer are whether or not halfway houses are associated with reduced recidivism, and whether the association between halfway houses and recidivism is mediated by parolee concentration. This study delves deeper into this mediated relationship by separating the role of neighborhood concentration and organizational concentration.

Since the recidivism outcome is operationalized as binary variables, the analysis makes use of logistic regressions. In order to study the direct relationship between halfway houses and recidivism, regression models were run sequentially – first without any controls, then with just individual controls, then with all controls, including neighborhood disadvantage. Following this process can help provide insight into the role different factors play in the halfway house-recidivism relationship. Similarly, in order to study the potential mediating role of parolee concentration, regression models were run sequentially – first one without parolee concentration and the other with parolee concentration. We can informally examine mediation effects and attribute part of the “halfway house effects” to the concentration of parolees if the halfway house estimates are diminished when parolee concentration is added to the model. Additionally, a formal mediation test that is suitable for the type of variables in the current models was conducted (using Stata command `medeff`; Imai, Keele & Tingley, 2010) to estimate the extent of mediator influence in the halfway house-recidivism relationship.

Recall that the outcome measure is classified into three separate categories – rearrest,

reincarceration, and overall – which means three separate models were run, one for each outcome type. Also, as this study focuses on three different follow-up periods (1 year, 3 years, and 7 years), models for each time period were run separately.

RESULTS

SAMPLE DESCRIPTIVE SUMMARY

Descriptive statistics in Table 1 suggest that the current sample of parolees mainly comprises of single males. The proportion of whites and blacks are similar, and they comprise the majority of the sample. With respect to race and gender compositions, the individuals included in the sample are very similar to the general Pennsylvania prison population characteristics (Lategan & Santore, 2014). At the time of release, the average age of the sample parolees is 33 years. With respect to criminal history, drug crimes is the most common conviction crime that led to the current incarceration for this sample of first-time parolees, followed by violent crimes.¹⁶ On average the first-time parolees have approximately 5 prior arrests, and the about 6 misconducts during the average 2.69 years in prison. The mean LSI-R score is 25 and the LSI-R categorical data suggests that most parolees in the sample are considered moderate risk followed by the high-risk category.

Table 1 also shows that more than half the first-time parolees transitioned through halfway houses as opposed to private residences. Further, the parolee concentration in PA census tracts, calculated based on the individuals included in the sample, ranged from a low of 0.01% to a high of about 11%, with an average of approximately 3%. Most high concentration tracts are located in large cities like Pittsburgh, Philadelphia, and Harrisburg, while the low concentration

¹⁶ This is different from the Pennsylvania prison population, since violent crimes is the modal category in case of the overall prison population (Lategan & Santore, 2014).

tracts are spread across cities like Pittsburgh to small rural towns. Within overall concentration, Non HH Parolees averaged at 1.34% and Not Same HH Parolees averaged at 1.46 %. Further exploration into halfway houses (n=3,794) reveals that halfway house capacities range from 0 to 40,¹⁷ averaging at about 10.¹⁸ With respect to disadvantage, the index ranges from a minimum of -4.12 to a maximum of approximately 3.87, averaging at a score of 0. Similar to parolee concentration, most high disadvantage tracts are located in large cities like Philadelphia and Pittsburgh, while most low disadvantage tracts are spread across large urban cities and small rural towns. Finally, Table 1 also presents descriptives on the outcomes and highlights that within 1 year of release, almost 20% of the sample was rearrested, about 22% of the sample was reincarcerated, and about 30% of the sample recidivated in general (i.e. either rearrested or reincarcerated); and within 7 years, 63.9% of the sample were rearrested, 55.1% of the sample were reincarcerated, and taken together, 72.7% of the sample recidivated. As expected, recidivism is more likely during the early period of reentry (National Research Council, 2008).

Bivariate correlations (not shown) between the outcome measures and the main independent variables suggest relationships in expected directions, including higher recidivism for those who transitioned through halfway houses (PADOC, 2013). Additionally, results suggest a positive correlation between halfway houses and concentrated disadvantage ($r=0.415$), indicating that halfway houses are more likely to be established in places marked by high disadvantage. This can also be seen in Figure 1, which shows the percentage of halfway houses

¹⁷ The number is small because we are looking at the monthly concentration of each facility based on the parolees included in the sample only (i.e. only 5,708 parolees - out of which many have not been paroled to halfway houses). We have excluded all non-first time parolees (who make a large chunk of parolees) and others who did not have address information, did not fit in the date bound range and whose address could not be geocoded. Since these people have not been included in the parolee counts, the totals are bound to be smaller.

¹⁸ Recall that these are monthly estimates based on parolees included in the sample only, which is why the minimum can be zero. It is possible that during some months, none of the parolees included in the sample were living in a particular halfway house.

by the tract's level of concentrated disadvantage (based on the quartiles of the distribution of the disadvantage index). This indicates that least disadvantaged neighborhoods have the least number of halfway houses, while in general; halfway houses are more concentrated in highly disadvantaged neighborhoods. This is possibly a result of the NIMB "not in my backyard" attitude of communities toward halfway houses and the fact that most prisoners are from disadvantaged communities. The latter is confirmed by a positive correlation between parolee concentration and concentrated disadvantage ($r=0.517$).

MISSING DATA

It is important to examine whether observations with missing data and thus excluded are systematically different from observations with no missing data and retained in the analysis sample, because such systematic differences can introduce bias. Most missing data (about 94.6%) in the present dataset pertain to parolee addresses – i.e. some parolees who were included in the original sample either did not have address information at all (64.69%), or did not have address information close to the release date (22.07%).¹⁹ Additionally some individuals were not included in the analysis sample due to addresses that could not be geocoded (13.24%). Other missing and excluded data pertained to missing/incorrect LSI-R scores (roughly 4.1%). Finally, a few observations were dropped because the parolee age reflected a juvenile status (about 1.4%). Because most missing data are due to two reasons – missing address records and the first post-release address records occur much later than the release date – we examine these two reasons separately.

Pairwise t-tests were used to test if there were any differences between the observations

¹⁹As mentioned earlier, a time period of 7 days prior to release date and 30 days after was selected to make sure to make sure we have the first address of each parolee after release.

included and excluded from the sample (Table 2). For the case of missing address records, results (not shown) indicate that individuals excluded from the sample were slightly older than those included in the sample (34 vs. 32), were less likely to be black (36% vs. 44%), more likely to be married (15% vs. 12%), had fewer prison misconducts (5 vs. 7), were incarcerated for a lesser time (2.3 years vs. 2.7 years), had fewer prior arrests (4 vs. 6) and scored lower on the LSI-R (24 vs. 25). They were also less likely to be paroled to halfway houses than those included in the sample (33% vs. 52%). Consistent with these differences, they were less likely to be rearrested and reincarcerated compared to individuals included in the sample (46% vs. 63% for rearrests, 40% vs. 54% for reincarceration).

Similar pairwise t-tests were used to investigate differences between those falling outside of the decided date bound range and those falling within. Results indicate that parolees belonging to the former group were slightly older than those included in the sample (34 vs. 32), were less likely to be black (39% vs. 44%), more likely to be married (16% vs. 12%), had fewer prison misconducts (6 vs. 7), had fewer prior arrests (4 vs. 6) and scored lower on the LSI-R (24 vs. 25). They were also less likely to be paroled to halfway houses than those included in the sample (33% vs. 52%). Again, reasonably expected from the lower risk profile above, they were less likely to be rearrested and reincarcerated compared to individuals included in the sample (51% vs. 63% for rearrests, 43% vs. 54% for reincarceration).

There are many possible reasons for the missing data. Some parolees may have moved out of Pennsylvania. These individuals have been treated as observations with missing data since they do not have geocodable Pennsylvania addresses. Alternatively, parolees with missing address data could also have been spending time in other correctional facilities (like county jails).

The results from the missing data analysis above suggest that the sample with complete neighborhood variables (non-missing disadvantage and parolee concentration) is missing apparently for lower risk parolees, parolees who are less likely to transition through halfway houses, and parolees who have a lower likelihood of recorded recidivism. This pattern of missing data will likely bias the estimates of halfway houses because those who were not paroled to halfway houses in the analysis sample consisting disproportionately of higher risk offenders.

Table 3 presents the recidivism differences by parolee address type (i.e. halfway house vs. non-halfway house) between the excluded and included groups. The table clearly shows that the differences in recidivism between non-halfway house and halfway house parolees in the excluded group are much higher than the differences in the included group. In the excluded groups, halfway house parolees were clearly more likely to recidivate than non-halfway house parolees were. In the included group, on the other hand, the differences between halfway house and non-halfway house parolees are not as large and the findings are mixed, with halfway house parolees being less likely to experience rearrest but being more likely to experience reincarceration. Comparing just the non-halfway house parolees, parolees excluded from the sample seem to have a lower likelihood of recidivism than parolees included in the sample. Excluding these individuals from the analyses, then, would bias estimates since analyses would indicate that non-halfway house parolees have a recidivism risk higher than they really do. Given this limitation, the following results from the multivariate models that involve neighborhood-level variables should be interpreted with caution.

REGRESSION RESULTS

As previously explained, a number of sequential logistic regression models were run to

answer the two main research questions.²⁰

The first research question focuses on the direct relationship between halfway houses and recidivism. In order to answer this question, models were run to explore the effect both with and without individual and neighborhood controls. Results from these analyses are presented in Tables 4(a)-(c). Tables 4(a) and 4(b) present estimates from logistic regression models without controls and with only individual-level controls for all first-time parolees (i.e. including individuals with missing address/geocoded information; n=8,515). The estimates for halfway house indicate that halfway houses are associated with increased odds of recidivism for all outcomes and all follow-up periods, except for rearrests within one year in Table 4(b). Halfway houses increase the odds of reincarceration and overall recidivism within one year by almost 41% and 25% respectively; the odds of rearrest, reincarceration and overall recidivism within 3 years by almost 5%, 39% and 30% respectively; and the odds of rearrest, reincarceration and overall recidivism within 7 years by almost 11%, 41% and 35% respectively.

The estimates of individual controls are consistent with prior literature, and almost all models show that the odds of rearrest, reincarceration and experiencing recidivism overall are higher for younger male parolees with a more extensive criminal history (more prior arrests, more criminal misconducts, and more time spent in prison). As expected, an increase in risk score is also associated with higher odds of recidivating.

Table 4(c) presents estimates from logistic regression models with both individual and neighborhood controls for the final sample (i.e. individuals without missing information; n=5,708). Estimates for this group show very different results, with the odds ratios being significant only for rearrests. Contrary to earlier findings, this model shows that halfway houses reduce the odds of getting rearrested within 1 year by almost 30%, within 3 years by almost

²⁰ Robust standard errors were used in all models to account for heteroscedasticity.

25%, and within 7 years by almost 23%. Reincarceration estimates are consistent with the findings of the previous models, albeit with smaller effects; however, they are no longer significant. As mentioned earlier, these extreme changes in findings are possibly the result of data excluded from the sample due to missing information. This aspect is discussed in greater detail in the following section.

Finally, concentrated disadvantage seems to be significantly associated with a higher likelihood of recidivism across all models when studied in isolation; however, once we control for individual level factors, the effects almost altogether disappears, with evidence of marginal significance present only for rearrest within three years. This is in contradiction to earlier studies that focused on concentrated disadvantage (Kubrin & Stewart, 2006; Mears et al., 2008) that found evidence of its association with recidivism even after controlling for individual level factors. However, it is important to consider that the earlier studies have used different outcome measures (only rearrests or convictions), and the individual controls included in the models are not the same.

The second research question focuses on the role of parolee concentration as a potential mediator in the association between halfway houses and recidivism. This question aims to explore whether part of the halfway house-recidivism relationship can be explained by the concentration of parolees within neighborhoods and within halfway houses. This question is answered in two ways. First, regression models are estimated sequentially by adding parolee concentration to the model and observe the changes in the halfway houses estimates to informally assess the possibility of mediation. Results from the analyses are presented in Table 4(c) and Table 5. Additionally, a formal mediation test (Imai et al., 2010) was conducted for significance testing and to estimate the extent of mediation.

First, for the rearrest models, there appears to be small decreases in the halfway houses estimates after parolee concentration is included. Odds ratios decrease from 0.706 in the 1 year follow up model to 0.649, from 0.734 in the 3 year follow up model to 0.718, and from 0.785 in the 7 year follow up model to 0.773. These odds are significant both before and after the introduction of parolee concentration. These findings point towards halfway houses appearing more effective when parolee concentration is accounted for, thus providing support for a mediating effect. A formal mediation test indicated that the mediation effects are significant for the rearrest models and parolee concentration represents 6.23% of total effect of halfway houses on rearrests. It is also clear that an increase in concentration of parolees is associated with higher odds of rearrest, however the estimate is significant only within one year of release (OR = 1.046). Reincarceration and overall recidivism models present similar findings. Although the halfway house estimates are mostly non-significant, the directionality of change in estimates after introducing parolee concentration suggests parolee concentration as a mediator in the same way as seen in rearrests models. Despite larger changes in halfway house estimates before and after the inclusion of parolee concentration, a formal test suggests that the mediation effects are not statistically significant.

Parolee concentration was also explored as two separate types – neighborhood parolee concentration and organizational parolee concentration. The effect of the former was estimated for the entire final sample, whereas the latter was estimated only for individuals paroled to halfway houses. Results are presented in Tables 6 and 7.

Similar to the general parolee concentration results in Table 5, the neighborhood parolee concentration, excluding the parolees in halfway houses (*Non HH Concentration*), is associated with higher odds of rearrest (OR=1.058), reincarceration (OR=1.063), and overall recidivism

(OR=1.059), most strongly within the first year, and less weakly within three years of release (see Table 6). Also similar to the general parolee concentration results, non-halfway house concentration is a significant mediator for the relationship between halfway house and rearrests and represents 4.18% of halfway house effects on rearrests. It is interesting that non-halfway house concentration seems to account slightly less for the halfway house-recidivism association than the general concentration that includes halfway house parolees (4% vs. 6%), although the difference may not be statistically significant.

In order to study the mediating effect of organizational concentration or the halfway house capacity, regression models were run for individuals paroled to halfway houses (n=3,794). The concentration of parolees outside of that halfway house (i.e. Non HH Parolees) was also included in the model. Analyses revealed that halfway house capacity was significantly associated with recidivism only in the case of rearrests within the first year. In addition, the directionality seems to be opposite of what might be expected. Results indicate that a one-person increase in the halfway house population was associated with an approximately 1% lower likelihood of rearrest.

CONCLUSIONS AND DISCUSSION

Mass incarceration and the consequent mass reentry have brought effective prisoner reintegration strategies to the center stage of criminal justice reforms. Among many reentry initiatives, halfway houses continue to be used across the country with the primary aim of reducing recidivism, which is persistently high and an important driver of prison growth. Despite widespread research on these facilities, evidence regarding their effectiveness is mixed at best.

The present study aimed to explore the association between halfway houses and

recidivism by focusing on not only the direct relationship between the two, but also exploring the mediating effect of parolee concentration on the effectiveness of halfway houses – an aspect not studied in context of halfway houses previously.

The findings based on the large sample that does not suffer missing data suggest that halfway houses are associated with higher recidivism with all models, especially for reincarceration outcomes. This is consistent with PADOA's (2013) study on Pennsylvania parolees, which found that the odds of recidivism were higher for individuals paroled to halfway houses as compared to those paroled directly to the street and that the findings were mostly driven by higher reincarceration for halfway house parolees.

Once we account for neighborhood-level factors but lose a large number of observations due to missing data, the results change. Individuals transitioning from halfway houses had lower odds of rearrest as compared to those paroled directly to the community. However, the odds of reincarceration and recidivism in general were still higher for parolees transitioning through halfway houses, although most estimates were not significant.

A detailed look at the inconsistent findings points to the problems of missing data. The largest proportion of these dropped observations was a result of missing address information (64%), i.e. the dataset used did not have records of addresses for these individuals, and the excluded individuals had higher recidivism odds (on all three outcomes) for individuals transitioning through halfway houses compared to those not transitioning through these facilities. The level of protective factors against recidivism is higher in the excluded individuals compared to the individuals included in the remaining sample. Additionally, they were less likely to be paroled to halfway houses. Excluding these low risk parolees who were largely paroled directly to the street rather than halfway houses mostly certainly affects results by making the non-

halfway house group in the analysis sample less representative and higher risk than it actually is, especially since the analysis consists of largely halfway house parolees (almost 2/3rd of the sample). Due to this group being systematically and consistently different from the included sample, the findings of the current study are likely biased in predictable directions. This puts more confidence in our findings from the larger sample with all of the individual-level controls (results shown in Table 4(b)), and we conclude that halfway houses are associated with higher likelihood of recidivism.

Another aspect worth looking into is the difference in the direction of halfway house estimates between rearrest and reincarceration models. Results suggest that criminogenic influences of halfway houses are stronger when reincarceration is used as recidivism outcome. One plausible reason might be differential vulnerability to direct reincarceration for parole violations for individuals living in halfway houses. As described previously, in case of parole violations, parolees can be reincarcerated directly without going through an arrest first. In case of halfway houses, the level of surveillance is presumably higher, which may result in parole violations being detected and reported more frequently compared to parolees living in private residences.

Our results on the role of parolee concentration are limited by the missing data issue. With this limitation in mind, the results still suggest that parolee concentration is associated with higher recidivism (especially rearrests) and contributes as a mediator in the halfway house-recidivism relationship. The positive association between concentration and recidivism confirms findings from prior studies (Chamberlain & Wallace, 2016; Kirk, 2015). The relationship between parolee concentration and recidivism is the strongest (and statistically significant) for the one-year follow-up, reflecting a stronger temporal correspondence between the concentration

variable based on parolees' first post-prison address and recidivism within the first year. Accounting for parolee concentration in rearrest models seemed to make halfway houses more effective by reducing odds of rearrests within one, three and seven years further. In other words, the potential benefits of halfway houses are partially masked by parolee concentration if one fails to account for it.

This study did not find strong evidence supporting a significant relationship between concentrated reentry and recidivism, contrary to findings of earlier neighborhood studies (Hipp et al., 2010; Kubrin & Stewart, 2006; Mears et al., 2008), but it is interesting to note that this null relationship between disadvantage and recidivism was also found by Chamberlain and Wallace's (2016) study on concentrated reentry. Given that offender concentration was consistent and significant predictor of recidivism in most models of the present study, even after disadvantage is accounted for, offender concentration should be taken into account in future research on the ecological context of reentry.

Finally, our analyses of the organizational concentration did not yield significant results, except for rearrests within one year. This means that the number of people living in halfway houses seem to be associated with recidivism only in the case of rearrests within one year. Again, it makes sense that this variable seems to have the strongest effect in the 1-year follow up period model, since the number of people an individual is living with would have strongest effect on their behavior while he/she is still living with them and/or had a recent experience of doing so. What is interesting, however, is that the direction of association seems to be opposite to the expected direction. This finding can be attributed to the halfway organizational concentration measure. Halfway house capacity has been estimated based on only the parolees included in the sample, i.e. first-time parolees (and therefore, lower risk offenders compared to parolees in

general and parolees living in halfway houses more specifically). Therefore, the size/capacity of halfway houses possibly is a criminogenic factor, but we are unable to accurately test that here due to the nature of the sample and measure. Obtaining official capacity statistics from PADOC could be a way to capture a more accurate variable of capacity.

It is interesting to note that in all these analyses, the measure for rearrests seems to be more sensitive to the missing data problem than reincarcerations. The answer to why this is lies in Table 3. By excluding observations with missing data, we remove a large group of individuals from the halfway house parolee sample who were more likely to be rearrested. This exclusion resulted in the final sample (i.e. $n=5,708$) having a much larger group of low-rearrest-risk individuals among the halfway house parolees, thereby influencing the results drastically and changing the direction of regression estimates once observations with missing data were excluded.

Aside from the missing data issue, several other limitations should be acknowledged. First, the measurement of parolee concentration is limited. Since the dataset used contained no information about parolees released before January 2006, there was no way to account for those individuals who were on parole and living in Pennsylvania during the duration of this study (i.e. January 2006 - December 2007). Additionally, individuals with prior imprisonment in Pennsylvania are not included in the sample. As a result, the concentration estimates used in the study are not true reflections of parolee concentration in Pennsylvania census tracts. Further, approximately 15% of non-first addresses could not be geocoded due to errors in address details (like wrong zip, missing street name, etc.). Recall that the parolee concentration is a monthly measure calculated based on the number of individuals residing in a particular census tract during a particular month. If an address could not be geocoded, it was assumed that the parolee

continued to live in the same census tract as the last known, and geocoded, address. These limitations may be influencing the estimates of parolee concentration as well as halfway house.

Second, related to the previous point, this study focuses only on first-time parolees/prisoners in Pennsylvania. Although this can be viewed as advantageous since this removes potentially confounding effects of previous reentry experiences, it limits the generalizability of the results.

Lastly, some individual level factors that can help contribute to a more accurate picture have not been included (e.g., mental health status, program participation in prison), and these can also introduce bias. For a related reason, it should be acknowledged that either the transition through halfway houses or the choice of neighborhoods parolees return to (and the resulting exposure to parolee concentration) is not exogenous, and thus, it is not possible to infer clear causal interpretations from the current regression estimates (Morenoff & Harding, 2014; Sampson, Morenoff, & Gannon-Rowley, 2002).

The current study as well as much of the prior work on halfway houses highlight a theoretical disconnect for the justification of halfway houses. The theoretical backbone of halfway houses has been that they provide supervision and transitional assistance that can aid successful transition back into society. However, such theoretical reasoning misses many other problems of halfway houses that may theoretically predict criminogenic effects. One such criminogenic mechanism the current paper explored is the concentration of parolees, which can increase undesirable interaction among newly released prisoners who are most vulnerable to recidivism and other reentry failures. This interaction may facilitate criminal activity in the form of learning and opportunities for new criminal behavior as well as return to earlier criminal activity and trigger relapses for drug-involved offenders. The current study provides stronger

support that concentration of parolees in the neighborhood, not necessarily in halfway houses, can increase recidivism. This means that areas that already have a high concentration of parolees should be avoided as locations for new halfway houses. This does not necessarily imply situating halfway houses in relatively affluent communities where the opposition of community residents may be stronger. The results show that parolee concentration and neighborhood disadvantage are correlated but parolee concentration seems to be a stronger predictor of recidivism. This suggests that a reasonable policy would allow for choosing a low parolee concentration area for a halfway house even if the area is relatively disadvantaged. Given the relative lack of evidence that living with a larger number of other parolees in a halfway house increases recidivism, the current evidence suggests that released prisoners are exposed to criminogenic influences due to halfway houses not because of the immediate environment of halfway houses but because of the nature of the surrounding environment in which halfway houses are situated.

TABLES AND FIGURES

Figure 1: Percentage of Halfway Houses by the Level of Neighborhood Disadvantage

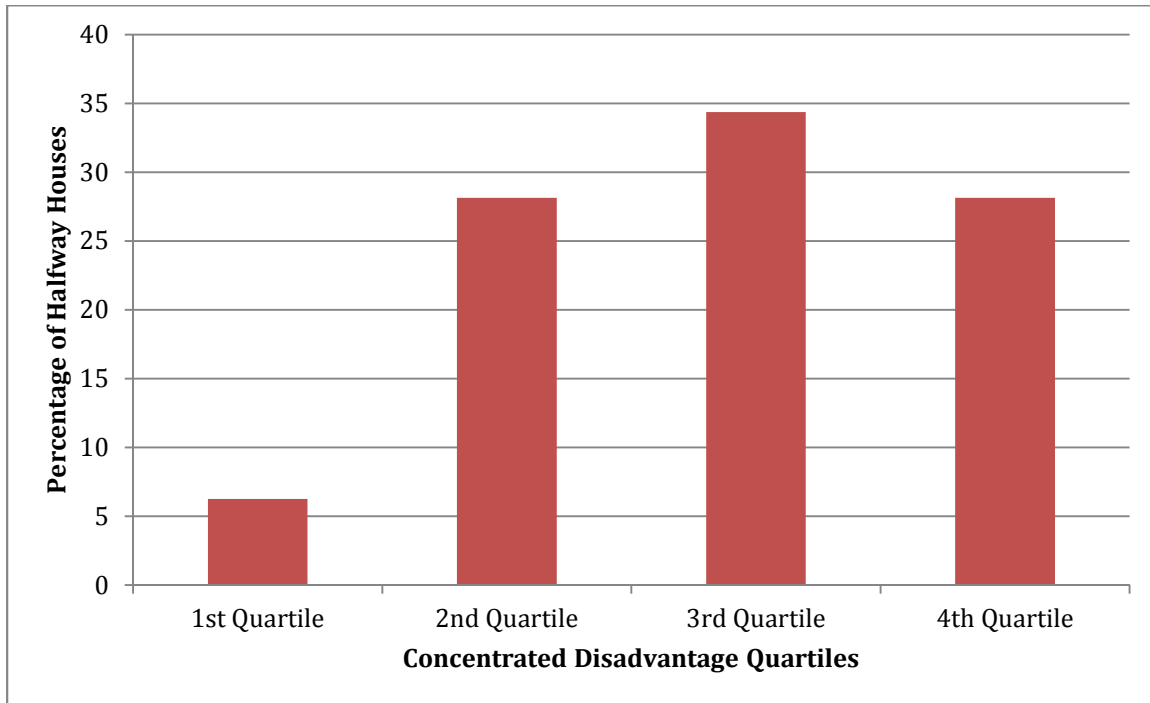


Table 1: Sample Descriptive Statistics

Variable	n	Mean	Std. Dev.	Min	Max
Outcome					
7 Year Follow-Up					
Rearrest	8,515	0.599	0.490	0	1
Reincarceration	8,515	0.514	0.500	0	1
Overall Recidivism	8,515	0.688	0.463	0	1
3 Year Follow-Up					
Rearrest	8,515	0.414	0.493	0	1
Reincarceration	8,515	0.416	0.493	0	1
Overall Recidivism	8,515	0.545	0.498	0	1
1 Year Follow-Up					
Rearrest	8,515	0.176	0.381	0	1
Reincarceration	8,515	0.191	0.393	0	1
Overall Recidivism	8,515	0.271	0.445	0	1
Individual-Level					
Gender: Male	8,515	0.898	0.302	0	1
Race					
White	8,515	0.452	0.498	0	1
Black	8,515	0.413	0.492	0	1
Other	8,515	0.135	0.342	0	1
Marital Status					
Single	8,515	0.757	0.429	0	1
Married	8,515	0.137	0.344	0	1
Other Marital Status	8,515	0.106	0.308	0	1
Age at Release	8,515	33.120	9.969	18.307	76.893
Prior arrests	8,515	4.526	4.412	0	54
Misconducts	8,515	6.407	11.037	1	43
Incarceration Crime					
Violent	8,515	0.281	0.450	0	1
Property	8,515	0.135	0.342	0	1
Drug	8,515	0.405	0.491	0	1
Other	8,515	0.179	0.383	0	1
Length Served (in years)	8,515	2.657	2.797	0.093	25.216
Halfway House	8,515	0.483	0.500	0	1
LSI-R Score	8,515	24.791	7.159	1	50

Community-Level

Concentrate Disadvantage	5,708	0	1.919	-4.121	3.874
Parolee Concentration	5,708	1.713	2.473	0.010	25.359
Non HH Parolees	5,708	1.342	2.089	0	25.359
Halfway House Capacity	3,794	7.150	8.434	0	40

Table 2: Differences between Parolees Included in and Excluded from the Sample

	Excluded Group (Due to Missing Address Records, n=2,037)	Excluded Group (Due to Observations Falling Outside of Date Margin, n=694)	Included Group (n=5,709)
Age	34	34	32
Black	36%	39%	44%
Married	16%	16%	12%
Misconducts	5	6	7
Incarceration Length	2.3 years	2.3 years	2.7 years
Prior Arrests	4	4	6
LSI-R Scores	24	24	25
Halfway House	33%	33%	52%
Rearrests	46%	51%	63%
Reincarcerations	40%	43%	54%

All differences are statistically significant at the 0.05 level

Table 3: Recidivism Differences between Parolees Included in and Excluded from the Sample, by Parolee Address Type

	Excluded Group (Due to Missing Address Records, n=2,037)		Excluded Group (Due to Observations Falling Outside of Date Margin, n=694)		Included Group (n=5,709)	
	Non-Halfway House Parolees	Halfway House Parolees	Non-Halfway House Parolees	Halfway House Parolees	Non-Halfway House Parolees	Halfway House Parolees
Rearrest	38.46%	60.49%	45.64%	61.09%	64.10%	62.81%
Reincarceration	31.21%	56.61%	35.86%	56.26%	50.41%	57.84%
Overall Recidivism	46.59%	72.49%	53.74%	72.99%	70.73%	73.62%

Table 4(a): Logistic Regression Models Without Controls (n=8,515)

	1-Year Follow-Up			3-Year Follow-Up			7-Year Follow-Up		
	Rearrest	Reincarceration	Overall Recidivism	Rearrest	Reincarceration	Overall Recidivism	Rearrest	Reincarceration	Overall Recidivism
	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)
Halfway House	1.082 (0.062)	1.522*** (0.085)	1.337*** (0.065)	1.153*** (0.051)	1.551*** (0.069)	1.427*** (0.062)	1.231*** (0.055)	1.633*** (0.071)	1.521*** (0.072)

*Robust standard errors are presented in parentheses, * p<0.10 **p<0.05 ***p<0.01*

Table 4(b): Logistic Regression Models With Individual Controls (n=8,515)

	1-Year Follow-Up			3-Year Follow-Up			7-Year Follow-Up		
	Rearrest	Reincarceration	Overall	Rearrest	Reincarceration	Overall	Rearrest	Reincarceration	Overall
	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)
Halfway House	0.984 (0.060)	1.408*** (0.083)	1.243*** (0.065)	1.0459** (0.051)	1.386*** (0.066)	1.297*** (0.063)	1.111** (0.056)	1.408*** (0.067)	1.345*** (0.072)
Male	1.802*** (0.231)	2.256*** (0.283)	2.024*** (0.213)	1.554*** (0.137)	2.136*** (0.195)	1.927*** (0.163)	1.386*** (0.116)	2.172*** (0.187)	1.756*** (0.150)
Age	0.937*** (0.004)	0.959*** (0.0040)	0.951*** (0.003)	0.938*** (0.003)	0.950*** (0.003)	0.943*** (0.003)	0.936*** (0.003)	0.945*** (0.003)	0.939*** (0.003)
White	0.908 (0.091)	1.061 (0.099)	1.048 (0.088)	0.967 (0.074)	1.052 (0.079)	1.108* (0.083)	1.014 (0.077)	1.051 (0.078)	1.105 (0.087)
Black	1.311*** (0.124)	1.043 (0.095)	1.190** (0.097)	1.498*** (0.112)	1.221*** (0.090)	1.477*** (0.109)	1.556*** (0.118)	1.279*** (0.093)	1.544*** (0.122)
Single	0.994 (0.128)	1.145 (0.136)	1.086 (0.113)	0.992 (0.094)	0.907 (0.081)	0.961 (0.085)	0.975 (0.087)	0.863** (0.075)	0.956 (0.087)
Married	0.738** (0.116)	0.862 (0.122)	0.779** (0.098)	0.828** (0.092)	0.814** (0.084)	0.836** (0.085)	0.954 (0.099)	0.825** (0.082)	0.963 (0.100)
Violent Crime	0.856* (0.087)	1.008 (0.094)	0.887* (0.075)	0.898* (0.073)	0.988 (0.077)	0.859** (0.069)	0.936 (0.077)	0.959 (0.075)	0.936 (0.082)
Property Crime	1.037 (0.111)	1.017 (0.102)	1.029 (0.094)	1.075 (0.095)	1.214** (0.104)	1.202** (0.108)	1.028 (0.095)	1.217** (0.106)	1.224** (0.122)
Drug Crime	0.878* (0.074)	0.705*** (0.058)	0.708*** (0.052)	0.866** (0.060)	0.755*** (0.051)	0.728*** (0.050)	0.873** (0.063)	0.779*** (0.053)	0.789*** (0.059)
Years in Prison	0.948*** (0.018)	0.999*** (0.000)	0.100*** (0.000)	0.932*** (0.012)	1.000 (0.000)	0.100*** (0.000)	0.999*** (0.000)	1.000*** (0.000)	0.100*** (0.000)

Prior Arrests	1.103*** (0.009)	1.067*** (0.008)	1.085*** (0.008)	1.138*** (0.009)	1.073*** (0.007)	1.115*** (0.009)	1.171*** (0.010)	1.076*** (0.007)	1.149*** (0.011)
Criminal Misconducts	1.009*** (0.003)	1.010*** (0.003)	1.008*** (0.003)	1.010*** (0.003)	1.007*** (0.002)	1.010*** (0.003)	1.006*** (0.003)	1.006*** (0.003)	1.007*** (0.003)
LSI-R Score	1.025*** (0.005)	1.042*** (0.005)	1.036*** (0.004)	1.026*** (0.004)	1.045*** (0.004)	1.044*** (0.004)	1.032*** (0.004)	1.047*** (0.004)	1.047*** (0.004)

*Robust standard errors are presented in parentheses, * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$*

Table 4(c): Logistic Regression Models With Individual and Neighborhood Controls (n=5,708)

	1-Year Follow-Up			3-Year Follow-Up			7-Year Follow-Up		
	Rearrest	Reincarceration	Overall	Rearrest	Reincarceration	Overall	Rearrest	Reincarceration	Overall
	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)
Halfway House	0.706*** (0.058)	1.089 (0.085)	0.943 (0.067)	0.739*** (0.051)	1.102 (0.073)	0.966 (0.066)	0.785*** (0.056)	1.110 (0.074)	0.977 (0.074)
Male	2.071*** (0.326)	2.462*** (0.362)	2.277*** (0.288)	1.703*** (0.184)	2.398*** (0.266)	2.172*** (0.225)	1.643*** (0.169)	2.424*** (0.256)	2.092*** (0.220)
Age	0.940*** (0.005)	0.963*** (0.005)	0.953*** (0.004)	0.937*** (0.004)	0.952*** (0.004)	0.944*** (0.004)	0.935*** (0.004)	0.946*** (0.004)	0.938*** (0.004)
White	0.856 (0.109)	0.864 (0.099)	0.890 (0.095)	0.848 (0.085)	0.779** (0.077)	0.863 (0.087)	0.797** (0.084)	0.764 (0.077)	0.773** (0.088)
Black	1.199 (0.139)	0.881 (0.096)	1.053 (0.106)	1.328 (0.127)	0.998 (0.094)	1.253** (0.122)	1.287** (0.134)	1.006 (0.098)	1.168 (0.132)
Single	1.150 (0.185)	1.240 (0.177)	1.229 (0.157)	1.046 (0.124)	0.997 (0.109)	1.053 (0.116)	1.019 (0.113)	0.958 (0.102)	1.057 (0.120)
Married	0.973 (0.187)	0.957 (0.162)	0.948 (0.146)	0.978 (0.137)	0.966 (0.123)	1.020 (0.132)	1.092 (0.145)	0.956 (0.117)	1.174 (0.157)
Violent Crime	0.899 (0.109)	1.087 (0.120)	0.918 (0.093)	0.950 (0.094)	1.009 (0.096)	0.863 (0.086)	0.884 (0.092)	0.943 (0.092)	0.860 (0.097)
Property Crime	1.219 (0.156)	1.139 (0.135)	1.191 (0.131)	1.104 (0.121)	1.277** (0.136)	1.221* (0.138)	1.053 (0.125)	1.198* (0.131)	1.198 (0.155)
Drug Crime	0.939 (0.095)	0.722*** (0.070)	0.724*** (0.063)	0.913 (0.077)	0.733*** (0.061)	0.723*** (0.062)	0.854* (0.078)	0.740*** (0.062)	0.750*** (0.073)
Years in Prison	0.958* (0.021)	0.924*** (0.019)	0.929*** (0.018)	0.933*** (0.016)	0.985 (0.014)	0.947*** (0.015)	0.945*** (0.015)	1.033** (0.015)	0.975 (0.015)
Prior Arrests	1.101***	1.065***	1.082***	1.129**	1.064***	1.103***	1.161***	1.065***	1.132***

	(0.011)	(0.009)	(0.009)	(0.010)	(0.008)	(0.010)	(0.013)	(0.009)	(0.013)
Criminal Misconducts	1.035*** (0.010)	1.042*** (0.011)	1.047*** (0.010)	1.036*** (0.010)	1.028*** (0.010)	1.048*** (0.013)	1.033*** (0.013)	1.032*** (0.012)	1.048*** (0.017)
LSI-R Score	1.031*** (0.006)	1.039*** (0.0050)	1.037*** (0.005)	1.029*** (0.005)	1.046*** (0.005)	1.047*** (0.005)	1.031*** (0.005)	1.047*** (0.005)	1.049*** (0.005)
Concentrated Disadvantage	1.027 (0.022)	0.971 (0.019)	0.975 (0.017)	1.044** (0.0180)	0.986 (0.017)	1.003 (0.018)	1.012 (0.019)	1.000 (0.017)	0.995 (0.020)

*Robust standard errors are presented in parentheses, * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$*

Table 5: Logistic Regression Models With Parolee Concentration (n=5,708)

	1-Year Follow-Up			3-Year Follow-Up			7-Year Follow-Up		
	Rearrest	Reincarceration	Overall Recidivism	Rearrest	Reincarceration	Overall Recidivism	Rearrest	Reincarceration	Overall Recidivism
	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)
Halfway House	0.650*** (0.057)	0.992 (0.083)	0.868* (0.066)	0.718*** (0.052)	1.039 (0.073)	0.941 (0.068)	0.773*** (0.059)	1.064 (0.076)	0.983 (0.079)
Parolee Concentration	1.046*** (0.018)	1.056*** (0.018)	1.050*** (0.016)	1.017 (0.015)	1.036** (0.015)	1.017 (0.015)	1.01 (0.016)	1.026* (0.015)	0.996 (0.017)

*All models include all the statistical controls. Robust standard errors are presented in parentheses, * p<0.10 **p<0.05 ***p<0.01*

Table 6: Logistic Regression Models Using Non-Halfway House Parolee Concentration (n=5,708)

	1-Year Follow-Up			3-Year Follow-Up			7-Year Follow-Up		
	Rearrest Odds Ratio (SE)	Reincarceration Odds Ratio (SE)	Overall Recidivism Odds Ratio (SE)	Rearrest Odds Ratio (SE)	Reincarceration Odds Ratio (SE)	Overall Recidivism Odds Ratio (SE)	Rearrest Odds Ratio (SE)	Reincarceration Odds Ratio (SE)	Overall Recidivism Odds Ratio (SE)
Halfway House	0.651*** (0.056)	1.004 (0.083)	0.873* (0.065)	0.721*** (0.052)	1.045 (0.073)	0.942 (0.067)	0.776*** (0.058)	1.069 (0.075)	0.981 (0.078)
Non HH Parolees	1.058*** (0.020)	1.063*** (0.020)	1.059*** (0.018)	1.019*** (0.017)	1.042** (0.017)	1.021 (0.017)	1.009 (0.018)	1.030** (0.017)	0.997 (0.019)

*All models include all the statistical controls. Robust standard errors are presented in parentheses, * p<0.10 **p<0.05 ***p<0.01*

Table 7: Logistic Regression Models with Halfway House Capacity (n=3,794)

	1-Year Follow-Up			3-Year Follow-Up			7-Year Follow-Up		
	Rearrest	Reincarceration	Overall Recidivism	Rearrest	Reincarceration	Overall Recidivism	Rearrest	Reincarceration	Overall Recidivism
	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)
HH Capacity	0.985*** (0.006)	1.000 (0.005)	0.994 (0.005)	0.994 (0.005)	0.998 (0.005)	0.995 (0.005)	1.005 (0.005)	1.000 (0.005)	0.997 (0.005)
Non HH Parolees	1.084*** (0.022)	1.064*** (0.020)	1.083*** (0.019)	1.025* (0.017)	1.044*** (0.018)	1.027* (0.018)	1.004 (0.019)	1.031** (0.018)	1.000 (0.020)

*All models include all the statistical controls. Robust standard errors are presented in parentheses, * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$*

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