Moving Home: Examining the Independent Effects of Individual- And Neighborhood-Level Residential Mobility on Recidivism in High-Risk Parolees

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Abstract

A number of studies have shown that the residential mobility of an offender post-release can significantly influence recidivism. Research has also shown how the mobility of neighborhoods into which offenders are released is an important contextual factor that predicts recidivism. Within the social disorganization framework, this study combines these lines of research by examining the effect of both individual- and neighborhood level residential mobility on recidivism for a cohort of high-risk prisoners released on parole in New Zealand. Using multilevel analysis techniques we found that neither immediate individual-level residential mobility nor neighborhood-level mobility were associated with recidivism after controlling for various multilevel predictors. A number of individual- and neighborhood level variables were predictive of recidivism, including the number of parole conditions placed on the released offender, and the percent foreign born in their neighborhood. These results are discussed within the context of an increasingly eclectic and diverse country.

Keywords

Introduction

Parolees face many challenges in re-establishing themselves in the community. Finding stable housing ranks high among these challenges. Even if suitable housing is forthcoming, it may be found in neighborhoods that have high levels of residential mobility. Variations in levels of neighborhood residential mobility have long been used to explain the spatial variation of crime and delinquency. This neighborhood factor has traditionally been associated with a lack of social cohesion and collective efficacy (Sampson & Groves, 1989) with the idea being that in highly mobile communities, residents are unlikely to know each other and will be less eager to notice or intervene in suspect situations. The term has its historical antecedents in the social disorganization theory developed by Shaw and McKay (1942), who outlined a number of factors thought to increase the risk of young men resorting to delinquent activities in Chicago in the 1920s. In their now seminal work, Shaw and McKay painstakingly hand mapped the residential locations of thousands of juvenile delinquents in Chicago, Philadelphia and other cities in the US, and noted how areas with high levels of residential turnover within cities yielded the highest delinquency rates regardless of the types of people residing there. They suggested that there was a withdrawal in community social control activities in areas with mobile populations and this increased the risk of criminality of young people.

Unsurprisingly, a large number of studies have been conducted over the past few decades examining the relationship between neighborhood-level crime and residential mobility. This body of literature has largely demonstrated that communities with higher levels of residential mobility tend to experience higher overall levels of most types of crime (see Andresen, 2006; Breetzke, 2010; Bernasco & Luykx, 2003; Ceccato & Dolmen, 2011). Other studies have begun investigating the impact of

residential mobility on other aspects of criminality including reoffending in known offenders. From a social disorganization perspective, the notion here is that released offenders who are highly mobile may be unable to conform with, or grow any attachment to communities (Sampson, 1991; Wooldredge & Thistlethwaite, 2002) which may weaken the ability of the community (i.e., family, friends) to exhibit direct social control, thereby increasing an offender's odds of recidivism. At the neighborhood level, highly mobile communities can also inhibit the ability of newly-released offenders to develop prosocial networks and may thus decrease involvement in other conventional activities (Sampson, 1988; Sampson, 1991), which could raise the risk of recidivism.

But residential mobility can also be studied as a characteristic of individual offenders. Results from studies of offender recidivism have found that changes in an offender's residential situation predict reconviction (see Meredith, Speir, & Johnson, 2007; Visher & Courtney, 2007). For example, in the United States Meredith, Speir, Johnson and Hull (2003) found that the likelihood of arrest increased 25 percent each time parolees in Georgia changed addresses, while Steiner, Makarios, and Travis (2015) found in Ohio that changing residences several times during parole supervision was associated with a higher likelihood of recidivism.

Although attention has been paid to exploring the linkage between neighborhood residential mobility and recidivism, how individual-level residential mobility in the first few months' post-release impacts recidivism remains less clear. Moreover, the impact of neighborhood level residential mobility on parolee recidivism risk is largely unexplored. Large-scale studies of recidivism have shown that most offenders who recidivate do so within their first year post-release (see Langan & Levin, 2002), underscoring the importance of identifying both individual- and neighborhood level

recidivism risk factors in the immediate period of an offenders' re-entry into the community. This study contributes to this limited body of research by **using multilevel models** to examine the impact of the residential mobility both of individual parolees, and within their initial release neighborhood, on recidivism among a cohort of high-risk male violent prisoners paroled across New Zealand.

Individual and Neighborhood-level Predictors of Recidivism

An extensive body of research on risk prediction in offenders has identified a large number of factors that are correlates of recidivism. Although community-level variables have rarely been investigated in this research, criminological studies have identified a number of neighborhood level factors that are also related to individual recidivism. We briefly review predictors before outlining our research questions.

Individual Level

Past studies have identified a number of individual-level socio-demographic characteristics such as age, gender, and ethnicity (see for example Broadhurst & Loh, 1995; Cottle, Lee, & Heilbrun, 2001; Ulmer, 2001) as robust predictors of recidivism. Being young, male, and belonging to an ethnic minority group have all been identified as significant risk factors for recidivism after controlling for a number of other factors (Gendreau, Little, & Goggin, 1996; Lipsey & Derzon, 1998; Listwan, Sundt, Holsinger, & Latessa, 2003; Payne, 2007; Schwaner, 1998; Spohn & Holleran, 2002). Individual-level economic and lifestyle factors have also been found to increase the risk of re-offending. These include unemployment, lower educational attainment, housing conditions, poor family and social supports, and alcohol and drug use (Lynch, Buckman, & Krenske, 2003; Makkai, Ratcliffe, Veraar, & Collins, 2004; Mbuba &

Grenier, 2008; Payne, 2007; Pritchard & Payne, 2005; Putnins, 2003; Salmelainen, 1995).

This literature has been reviewed extensively, as part of the development of predictive tools for use by the criminal justice system in assessing the level of risk posed by any individual on release. Demographic and criminal history factors have been the most investigated, though more changeable variables (e.g., personality characteristics, attitudes and beliefs, choice of associates) with potentially stronger theoretical associations with recidivism have received more attention in recent years for their potential in rehabilitation (Bonta & Andrews, 2012; Gendreau, 1996)

Compared to myriad meta-analyses on psychological predictors of recidivism, far fewer studies have examined the impact of other types of individual factors, such as individual-level residential mobility, on recidivism. Most literature in this area has examined how previous incarceration (Warner, 2015), homelessness (Rossman, Sridharan, Gouvis, Buck, & Morley, 1999), and housing challenges (Roman & Travis, 2006) lead to post-prison residential mobility of ex-offenders. Theoretically, highly mobile individuals may have trouble integrating themselves socially into neighborhoods and may struggle to develop prosocial and supportive networks that could guard against recidivism, and promote conventional aspirations and plans (Intravia, Pelletier, Wolff, & Baglivio, 2017). Indeed, residential movement has been found to impair social relationships, family capital, as well as treatment stability (see Haynie & South, 2005). The few studies that have investigated the mobility-recidivism linkage have generally demonstrated that high levels of residential mobility following release from prison increase the risk of recidivism. For example, Makarios, Steiner and Travis (2010) found that residential mobility was a significant predictor for rearrests and felony arrests in their state-wide study in Ohio, while

Meredith et al. (2007) found that the odds of a new arrest increased 25% for every move experienced by parolees in Georgia. Also in the US, Steiner and colleagues (2015) found that offenders who moved more frequently were more likely to recidivate, but that living situations also mattered. Offenders who lived with their spouse, parent, other relative, or in a residential program, in the year post-release were less likely to recidivate, while offenders who lived with a boyfriend/girlfriend, or were homeless or at large, typically were more likely. Most recently, Wolff, Baglivio, Intravia, Greenwald and Epps (2017) examined whether the direction of residential mobility with regard to socioeconomic context increased recidivism among a large sample of adjudicated youth in Florida. The researchers found that relocation increased the risk of recidivism irrespective of the direction of the move (i.e., moving upward to a more affluent neighborhood, moving downward to an area of greater disadvantage, or moving laterally to a similar neighborhood). In the majority of these studies, individual-level mobility was measured by the number of residence changes that occurred during the follow-up period, or monthly residential changes for up to a year post-release were counted.

Neighborhood Level

Less research has been undertaken to identify neighborhood level predictors: how the social and structural composition of neighborhoods could increase or decrease the risk of recidivism. A large number of neighborhood constructs have been tested in previous research, mostly within the framework of social disorganization theory, which suggests that crime and delinquency within a neighborhood depends on the neighborhood's level of socioeconomic deprivation, residential mobility, and ethnic heterogeneity. Research in this area has found that various central tenets of the social disorganization theory increase the risk of recidivism. For example, Mears,

Wang, Hay, and Bales (2008) found a positive association between resource deprivation and reconviction among male offenders released in Florida, while Wolff, Baglivio, Piquero, Vaughn, and DeLisi (2016) similarly found with youth that highly disadvantaged communities increased recidivism net of individual risk factors.

Kubrin and Stewart (2006) found that offenders who returned to disadvantaged neighborhoods after their release from prison were more likely to recidivate than those who returned to more affluent communities, controlling for individual-level factors. Wolff, Baglivio, Intravia and Piquero (2015) also found that neighborhood levels of disadvantage increased the risk of recidivism among juveniles, but unexpectedly also found that immigrant concentration in neighborhoods served as a protective factor for reoffending. Those living in neighborhoods marked by a high concentration of immigrants were roughly six percent less likely to reoffend. Other studies have found how other neighborhood-level factors such as concentrated affluence (Baglivio, Wolff, Jackowski, & Greenwald, 2017), the geographic accessibility of social service agencies (Hipp, Petersilia, & Turner, 2010), surrounding crime levels (Hipp & Yates, 2009), as well as the presence of bars and liquor stores in neighborhoods are associated with recidivism (Hipp et al., 2010).

In terms of neighborhood-level residential mobility, Tillyer and Vose (2011) found neighborhood-level residential instability to be positively related to recidivism among a sample of adult Iowa offenders, but found no support for concentrated disadvantage or immigration concentration in predicting reoffending. In contrast, Stahler, Mennis, Belenko, Welsh, Hillder and Zajac (2013) found that residential mobility was not associated with recidivism, due to variance in community resources, neighborhood cohesion, and various other factors across the neighborhoods in question. Residential stability in neighborhoods immediately adjacent to those in

which offenders reside has also been found to predict reduced recidivism (Hipp et al., 2010).

The Current Study

This research examines individual-level mobility over about the first 100 days after release. This period has been identified as a particularly precarious time, especially for the men at the center of this study—high-risk parolees—as many as one-quarter may not only have recidivated, but have committed an offense serious enough to return them to prison for the new offending within this period (Nadesu, 2007). The geographical focus area for this research is New Zealand, located in the southern tip of Australasia. The country has a population of approximately 4.2 million people and has a heterogeneous social and economic structure, with unusually high levels of residential mobility (Jatrana & Crampton, 2012; Superu, 2015), social inequality (Crothers, 2014) and imprisonment[a], set alongside a crime rate that is comparable to other Western nations. Although there is some consensus that neighborhood residential mobility is predictive of recidivism, there remains considerable uncertainty as to how individuals' immediate mobility with these first three months impacts on short-term recidivism (e.g., one year). Moreover, the relative importance of individual-level mobility versus neighborhood-level mobility has seldom been examined within the same study. Highly mobile individuals are thought to be generally less able to conform with or grow any attachment to communities, while highly mobile neighborhoods to which ex-offenders may return may exhibit lower community cohesion, which could hinder effective reintegration into society. In this study we use multilevel models to gauge the independent effect that both neighborhood- and individual-level mobility have on short-term recidivism among a sample of high-risk parolees in New Zealand. Based on prior research we would

expect that each of these variables— the level of mobility within the neighborhoods to which each released offender returns (neighborhood-level), and the number of residences recorded for that offender within three months of release (individual-level)—would be predictive of recidivism, after controlling for other individual- and neighborhood level predictors.

Method

Sources of Data

Individual-level data used here were taken from the Parole Project, a longitudinal archived dataset collected from 308 high-risk violent male prisoners who were paroled between 2010 and 2013 by the New Zealand Parole Board. Participants were selected and consented to take part in the study as they were nearing parole eligibility, or sentence expiration; 280 had complete data and were included in these analyses. Criteria for selection into the original study included at least a 65% risk of returning to prison within 5 years for a new offense (measured using the RoC*RoI, see below), a sentence of imprisonment of at least 2 years, and aged over 20 years at the time of recruitment (for more detail see Polaschek, Yesberg, Bell, Casey, & Dickson, 2016; and Polaschek, Yesberg, & Chauhan, 2017). Table 1 shows pertinent sample characteristics, and they are described more fully below.

At 31 March 2017, New Zealand had a total sentenced prisoner population of 7143, with an additional 2892 in prison on remand (New Zealand Department of Corrections, 2017). Between 1 July 2010 and 30 June 2013, the New Zealand Parole Board heard 17287 applications for parole, of which only 4535 were successful (26%; New Zealand Parole Board, 2011; 2012; 2013). The 280 offenders used in this study

emanate from this group of 4535 parolees and thus represent 6% of all offenders

released during 1 July 2010 to 30 June 2013.

Table 1
Descriptive Statistics for Independent Variables

Variable	Min	Mean	Max	SD
Individual-level				
Age (years)	19	31.89	60	8.58
RoC*RoI	.16	.74	.97	.12
Ethnicity	0	.65	1	.48
Age at first conviction	11	16.05	27	1.91
Days served	277	1531.79	13133	1638.94
No. of parole conditions	2	6.9	12	1.97
RPFA-R	0	12.63	21	4.05
RelPlQ	0	12.02	19	3.02
Neighborhood-level				
Percent unemployed	1.61	6.4	19.25	12.26
Alcohol outlets per 1000 pop.	0	19.23	420.94	78.1
Neighborhood fragmentation	-1.33	.78	3.09	1.01
Percent male	44.84	48.75	59.09	1.95
Percent aged between 15-29	10.06	22.61	63.33	9.15
Diversity Index	7.51	36.31	66.37	14.4
Percent foreign born	2.5	22.18	76.03	12.26
Median Income (NZD)	10900	26419.57	55000	6411.87
Variables of interest				
Parolee had multiple addresses 3 months post-release	0	.16	1	.37
Percent of neighborhood moved homes in < 5 years	33.33	54.81	90.91	10.85

Notes. $n = 280$; RPFA-R=Release Proposal Feasibility Assessment-Revised;
RelPlQ=Relationship Plan Quality

In New Zealand prisoners serving a sentence of two years or longer are eligible

for release on parole after serving at least one-third of the sentence. All offenders

released on parole are evaluated by the New Zealand Parole Board prior to release,

and are subject to **standard release conditions as** set out in the Parole Act of 2002.

These conditions are imposed until the offender's statutory release date plus six

months or for six months if the offender has served their entire sentence in prison

(i.e., to the statutory release date). Standard conditions include restrictions related to

the parolee's place of residence, place of work and associates. For those released prior to their statutory release date, the New Zealand Parole Board can also impose **special conditions** in addition to the standard release conditions. The latter conditions are generally imposed on higher risk offenders and may pertain to the offender's finances and earnings, restrictions on movement, and compliance with electronic monitoring, along with various rehabilitative requirements (e.g., program attendance for alcohol and drug problems).

Address data for released offenders were extracted from the Department of Corrections national offender management database (IOMS) for the first three months after release on parole. A three-month interval was chosen to capture the period of greatest precariousness for those managing offenders, during which about a quarter return to prison (Nadesu, 2007). A relatively short period was chosen to capture rapid and early changes, while minimizing the proportion of offenders for whom changes of accommodation might a consequence of new convictions for which they were not imprisoned. Recidivism data (reimprisonment for new offences) were extracted for the first 12 months after parole began. We used reimprisonment within a relatively short period after release because in high risk samples such as this one, reoffending and reconvictions may still occur regardless of progress made on risk factors. Reimprisonment for a new offence represents a more serious form of desistance failure and therefore its prediction is of more interest to those managing these offenders.

On release, parolees are required to report to the Community Probation Service within 72 hours. Probation staff verify the initial residential address for the parolee and use the address for home visits as part of parole contact requirements. All parolees are also required as part of their parole license to inform their Probation

Office of any change of address. Residential addresses recorded by supervision probation officers were geocoded and matched with a census areal unit (CAU). A CAU is the second smallest unit of dissemination of census data in New Zealand and usefully approximates a neighborhood, with each CAU representing approximately two and half thousand people. Each parolee was subsequently matched to a CAU and a database containing all the relevant multi-level data was compiled. The 280 offenders were released into 220 distinct CAUs throughout New Zealand. All CAU-level data used to construct variables for the multilevel modelling analysis were obtained from Statistics New Zealand's national-wide population census of 2013.

Recidivism Outcome Variable

From among several available recidivism variables, we chose offences resulting in imprisonment within 12 months of beginning parole for our analyses. This variable was coded dichotomously (1=reimprisoned, 0=not). Just under 41% ($n = 113$) of parolees returned to prison within a year of release which is largely congruent with previous international research (see Hipp et al., 2010; Steiner et al., 2015) and with previous research on high-risk samples in New Zealand (Nadesu, 2007).

Independent Variables

The independent variables used in the study included both individual- and neighborhood-level controls. Individual-level variables were intended to capture and control individual demographics that have previously been shown to explain recidivism, whilst the neighborhood level variables intend to capture relevant neighborhood structure and dynamics that complement individual-level processes.

Individual-level variables. A total of eight individual-level variables were used in this research. *Age* was a continuous variable: the age of the offender at parole. Previous studies has generally found support for a negative relationship between age

and recidivism (Griffin & Armstrong, 2003; MacKenzie, Browning, Skroban, & Smith, 1999) although a curvilinear relationship between age and recidivism has also been highlighted (see Kubrin & Stewart, 2006). Age is strongly tied to residential mobility because young adults typically experience more life-course transitions such as residential independence, college attendance and completion, and marriage (South & Deane, 1993). *Ethnicity* was coded dichotomously (Māori = 1; non- Māori = 0). Māori are over-represented in all three stages of the criminal justice process in New Zealand: apprehension, prosecution, and conviction. Though Māori form just under 15% of New Zealand's population, currently more than half the prison population identify themselves as Māori. *Age at first conviction* measured the age of the parolee at the time of their first offence leading to an officially recorded conviction while

Days served measured the number of days the parolee served of the current sentence before they began parole. *No. of parole conditions* referred to the number of conditions imposed in the parole license by the New Zealand Parole Board at the time of granting parole.

In addition to these routine criminal history-related variables, three additional independent variables collated for the Parole Project were included. The first is known as the *Roc*RoI,* which is an actuarially-determined probability of a parolee returning to prison within the next five years calculated using a computer algorithm drawing largely on the parolee's criminal history (e.g., age of first offence, time free in community since thirteenth birthday, seriousness of previous offences, length of time between offences). Scores range from zero to one with higher scores indicating greater risk. It was originally developed and cross validated using two samples, each of 24,000 offenders. During development, the RoC*RoI demonstrated high predictive validity – an AUC of 0.76 (Bakker, O'Malley, & Riley, 1998) – and more recent

analyses confirm its predictive validity over three years post-release (Nadesu, 2007).

For more information about the method used to create the RoC*RoI measure see

Bakker, Riley, and O'Malley (1999).

Second, the *Release Plan Feasibility Assessment (RPFA-R)* score was used. The

RPFA-R is an 11 item scale that can be completed either by a staff member or a

member of the parole board, and evaluates the viability of his release with respect to

avoiding reconviction on release, based on the status of various relevant issues at the

point of assessment. Items include: lack of personal support, ability to deal with

stress, previous non-compliance with release conditions, whether financial difficulties

are anticipated and so on. Higher scores therefore indicate a less feasible release

picture. The current version of the RPFA-R was developed from an original 15-item

version, comprising an 11-item reintegration scale and a 4-item feasibility scale.

These 15 items yielded acceptable internal consistency ($\alpha= 0.86$) and interrater

reliability: with an Intraclass Correlation Co-efficient (ICC) for 30 cases of .73 when

completed under practice conditions. In subsequent analyses, the feasibility items

made no independent contribution to recidivism prediction, so they were eliminated to

make the instrument more efficient to use (Wilson, 2011). Subsequent research using

the RPFA-R confirmed that more feasible plans were associated with a lower

likelihood of reconviction (Kilgour & Polaschek, 2012; Polaschek, Kilgour & Wilson,

2017).

Lastly, a related variable —an index of Release Plan Quality *(RelPIQ)* developed

for an earlier study with this dataset (Richards, Wilson, Robson, & Polaschek,

2017)—was included to examine more directly the relationship of strong vs. weak

release plans to recidivism. Previous research, both internationally and in New

Zealand, has found that better quality release plans were associated with lower rates

of reconviction after release from prison (see Vigilante et al., 1999; Willis & Grace, 2009; Dickson, Polaschek, & Casey, 2013), although this relationship appears to be mediated by experiences external to the offender after their release (Dickson & Polaschek, 2015). Positive work experiences, for example, may help bolster parolees' motivation to desist, but this motivation level does not on its own impact on recidivism.

Overall RelPlQ scores are the sum of individual item scores for quality of plans for accommodation, employment, prosocial support, managing antisocial peer contact, and other idiosyncratic risk management factors. Higher scores mean a higher quality (i.e., better) plan was in place immediately prior to release. Scores on each of the 5 items range from 1 to 4. During development, the RelPlQ met acceptable standards of inter-rater reliability ($\kappa = 0.79$) and internal consistency ($\alpha = 0.63$). It also demonstrated predictive validity as theorized. Those with better RelPlQ scores (i.e., better plans prior to release) were less likely to be reconvicted in the first 100 days after release. Their lives during those 100 days also stabilized more, and they experienced fewer crises of the type associated with an increase in the personal risk of reconviction (e.g., serious interpersonal conflict, evicted from housing; Richards et al., 2017).

Neighborhood-level variables. Neighborhood level variables included *the percentage unemployed*; and *median income* per neighborhood (i.e., CAU). Research by Kubrin and Stewart (2006) has showed how disadvantaged neighborhoods increase the likelihood of recidivism even when taking into account the individual characteristics of parolees while Hipp et al. (2010) found that neighborhoods with higher concentrated disadvantage both within a reentering parolees' neighborhood and in nearby neighborhoods increased their risk of recidivism. These two variables

provide some measure of economic deprivation in neighborhoods in the study. The *percent male* and the *percent population aged 15-29* were included to reflect the age and gender that are most often associated with criminal offending (see Allen & Dempsey, 2016; Federal Bureau of Prisons, 2016). We speculate here that parolees may be more inclined to recidivate on reentering neighborhoods with a higher percentage of either of these two factors. Two measures of racial/ethnic heterogeneity were included in the analysis. Ethnic heterogeneity is thought to inhibit community connections and reduce the ability of communities to realize shared values (Sampson & Groves, 1989; Shaw & McKay, 1942). Two measures of ethnic heterogeneity were used: first, the *percent foreign born* and second, a *diversity index (DI*; see Meyer & McIntosh, 1992). The DI measures the probability that any two people chosen at random from a given CAU are of different races or ethnicities; and is measured on a scale of 0 to 100, with 0 indicating that a CAU is totally homogeneous and 100 stating a CAU is completely heterogeneous. The DI has been frequently employed in population studies (see Johnson & Lichter, 2010; Tam & Bassett Jr, 2004) and is calculated as follows:

$$\text{Diversity Index} = 1 - (E^2 + M^2 + A^2 + P^2 + MELAA^2)$$

where E is the proportion European, M is the proportion Māori, A is the proportion Asian, P is the proportion Pacifica, and MELAA is the proportion *Middle Eastern/Latin American/African populations.* The result is then multiplied by 100 in order to deal in whole numbers, rather than decimals.

Finally, two variables were included to reflect the ability of residents within a neighborhood to function effectively as a collective (commonly referred to as collective efficacy; Sampson, Raudenbush, & Earls, 1997) and in doing so, exert a measure of informal social control over returning parolees. First, a *neighborhood*

fragmentation index which was calculated as a summary score, using three census variables: percentage of single-parent families, percentage of residents moving out of the census tract within the past five years, and percentage of renters within the neighborhood (see Stjärne, Ponce de Leon, & Hallqvist, 2004; Fagg, Curtis, Stansfeld, Cattell, Tupuola, & Arephin., 2008). Principal components analysis revealed that these indicators loaded on the same factor: providing an empirical basis for combining them (Cronbach's α = .71). A higher neighborhood fragmentation score reflects greater social fragmentation in the neighborhood to which the reentering parolee returned, post-release. The second variable is the *alcohol outlet rate per 1000 residents* in the neighborhood. Previous scholarship, both internationally and in New Zealand, has found a correlation between the density of alcohol outlets and various crime outcomes, suggesting that the presence of alcohol outlets in neighborhoods may encourage social disorder and crime (Nielsen & Martinez Jr, 2003; Grubesic & Pridemore, 2011; Day, Breetzke, Kingham, & Campbell, 2012). For parolees, the bar and liquor store capacity of a neighborhood has already found to increase the likelihood of recidivism in the United States (see Hipp et al., 2010). It could be that an increased provision and availability of alcohol may also affect recidivism rates in New Zealand.

Importantly, the neighborhood variables selected above are loosely informed by social disorganization theory, although we emphasize that this study is not a comprehensive test of this framework. Rather the emphasis here is on selecting theoretically specified variables which have been found universally to be associated with increased risk of recidivism in neighborhoods.

Variables of interest. Of the two residential mobility variables that were the focus of the study, one was an individual-level and the other a neighborhood-level factor.

We measured first, *whether parolees had more than one address in the three months post-release* (1 = yes; 0 = no) and second, we calculated the *percentage of residents that had been living in a neighborhood for less than five years.* As previously indicated, at the individual-level, the focus of this study is on examining whether immediate residential mobility increases the risk of recidivism. We used a cut-off of five years at the neighborhood level because previous research has identified this as a critical point at which cohesion and social benefits are felt by residents (see Turney & Harknett, 2010). The descriptive statistics for both the individual and neighborhood-level independent variables used in the analysis are presented in Table 1.

Data analysis plan

First, we plan to determine whether any individual and neighborhood level factors have significant bivariate relationships with the recidivism outcome variable. Then we use cumulative multilevel logistic regressions to determine whether (1) having multiple residences three months post-release predicts recidivism; and (2) whether neighborhood level residential mobility affects recidivism after controlling for the other individual and neighborhood level variables available for analysis. The use of a multilevel approach to this study was most suited due to the nested nature of the data. Moreover, a multilevel approach explicitly incorporates the hierarchical nature of the data into the analyses and allows for the incorporation of variables measured at different levels. Most prior research that has examined the predictors of recidivism has done so at either the individual or, less frequently, the neighborhood-level, which does not allow for inferences to be made at more than one level.

Table 2

Pearson Correlations Between Recidivism Outcome and Individual- and Neighborhood-Level Independent Variables

Variables	1	2	3	4	5	6	7	8	9
1 Reimprisonment within a year	1.00								
2 Age	-.13*	1.00							
3 RoC*RoI	.15*	-.23	1.00						
4 Ethnicity (Māori vs. not)	.08	-.06	.11	1.00					
5 Age at first conviction	.03	-.07	-.31*	-.16*	1.00				
6 Days served	-.11	.44	-.13*	.01	0.07	1.00			
7 No of parole conditions	-.16*	.03	-.15*	-.01	.13*	.23*	1.00		
8 RPFA-R	.12	-.09	-.13*	.12*	-.11	-.17*	-.15*	1.00	
9 RelPlQ	-.03	.02	-.15*	-.01	.08	.09	.13*	-.35*	1.00
10 Percent unemployed	.14*	-.11	-.05	.15*	.04	-.17*	-.02	.00	-.06
11 Alcohol outlets per 1000 pop.	-.08	.07	-.04	.07	-.10	.12*	.06	.05	-.05
12 Neighborhood fragmentation	.08	-.05	-.03	.11	-.03	-.06	-.03	.07	-.13*
13 Percent male	-.09	-.04	-.05	-.02	-.04	.08	-.00	.01	-.03
14 Percent aged between 15-29	.03	.06	.05	.08	-.08	.02	-.02	.06	-.16*
15 Diversity Index	.09	-.04	-.11	.07	.11	-.10	.05	.00	-.09
16 Percent foreign born	-.09	.01	.00	-.09	.09	.02	.10	-.03	-.05
17 Median Income	-.11	.09	-.02	-.15	-.07	-.19*	.05	.00	.09
18 Parolee had multiple addresses 3 months post-release	.07	.03	.09	-.08	-.05	-.13	-.06	-.06	-.07
19 Percent neighborhood moved homes in < 5 years	-.01	.06	-.00	.02	-.08	.05	-.01	.09	-.16*

N = 280

*p<.05 (two-tailed test)

Table 2 (ctd)

Pearson Correlations Between Recidivism Outcome and Individual- and Neighborhood-Level Independent Variables

Variables	10	11	12	13	14	15	16	17	18	19
1 Reimprisonment within a year										
2 Age										
3 RoC*RoI										
4 Ethnicity (Māori vs. not)										
5 Age at first conviction										
6 Days served										
7 No of parole conditions										
8 RPFA-R										
9 RelPlQ										
10 Percent unemployed	1.00									
11 Alcohol outlets per 1000 pop.	.11	1.00								
12 Neighborhood fragmentation	.72*	.30*	1.00							
13 Percent male	-.03	.28*	.06	1.00						
14 Percent aged between 15-29	.36*	.36*	.73*	.27*	1.00					
15 Diversity Index	.50*	.28*	.67*	.13*	.54*	1.00				
16 Percent foreign born	.01	.29*	.37*	.26*	.62*	.58*	1.00			
17 Median Income	-.68*	.02	-.62*	.15*	-.36*	-.42*	-.05	1.00		
18 Parolee had multiple addresses 3 months post-release	-.08	-.02	-.11	-.05	-.09	-.06	-.02	.04	1.00	
19 Percent neighborhood moved homes in < 5 years	.17*	.52*	-.02	.18*	.83*	.46*	.58*	-.22*	-.03	1.00

N = 280

*p<.05 (two-tailed test)

Results

Correlational Analyses

Table 2 shows the correlation matrix constructed to examine bivariate relationships between the variables. There were no surprising results: there were numerous significant relationships, with the highest correlations generally being between the percentage of residents living in a neighborhood for less than five years and other neighborhood variables. There was also a plethora of significant relationships between individual-level variables. Interestingly only four variables were significantly correlated with recidivism: three individual-level variables, including age (negatively), RoC*RoI (positively) and the number of parole conditions (negatively; i.e., having fewer parole conditions was associated with imprisonment) and one neighborhood level variable, the percent unemployed (positive; more unemployment in the neighborhood correlated with parolee reimprisonment). These preliminary results suggested that individual-level variables may play more of a role in recidivism than neighborhood context. Interestingly, no significant association was found between recidivism and the two variables of interest. A number of correlations were high, raising concern about multicollinearity in the regression analyses, but only one was greater than 0.80—a common threshold for concern **(see Andresen, 2006)** — and all variance inflation factors were below 4 **(see Allison, 2012).**

Multivariate prediction of imprisonment

The first logistic regression model examined the relationship between recidivism and the individual-level independent variables (see Table 3, Model 1). The neighborhood-level variables were then added to form a logistic multilevel model (Model 2) before each of the two variables of interest were added to the multilevel model separately, to distinguish their contribution from the individual- and

Table 3

Binary Logistic Regression Coefficients, Standard Errors, and Odds Ratios for Reimprisonment within 12 Months

Variables	Model 1			Model 2		
	Coefficient	*SE*	Exp(*B*)	Coefficient	*SE*	Exp(*B*)
Constant	-4.02	2.2	.02	-1.75	4.59	.17
Individual level						
Age	-.02	.02	.98	-.02	.02	.98
RoC*RoI	3.13*	1.43	22.81	3.91*	1.53	47.19
Ethnicity (Māori or not)	.32	.27	1.37	.09	.29	1.10
Age at first conviction	.11	.07	1.12	.11	.08	1.11
Days served	.00	.00	1.00	.00	.00	1.00
No of parole conditions	-.14*	.07	.87	-.15*	.07	.87
RPFA-R	.05	.04	1.05	.06	.04	1.10
RelPIQ	.02	.05	1.02	.05	.05	1.05
Neighborhood level						
Percent unemployed	-	-	-	.10	.08	1.11
Alcohol outlet rate	-	-	-	-.00	.00	.99
Neighborhood fragmentation	-	-	-	-.47	.32	.63
Percent male	-	-	-	-.12	.08	.89
Percent aged between 15-29	-	-	-	.06	.03	1.06
Diversity index	-	-	-	.04**	.02	1.05
Percent foreign born	-	-	-	-.05*	.02	.95
Median income	-	-	-	.00	.00	1
Variables of interest						
Parolee had multiple addresses 3 months post-release	-	-	-	-	-	-
Percent neighborhood moved homes in < 5 years	-	-	-	-	-	-
-2 Log likelihood		356.82			337.94	
Nagelkerke R^2		.101			.182	
N		280			280	

*p<.05; **p<.01

Table 3 (ctd.)
Binary Logistic Regression Coefficients, Standard Errors, and Odds Ratios for Reimprisonment within 12 Months

Variables	Model 3			Model 4		
	Coefficient	*SE*	Exp(*B*)	Coefficient	*SE*	Exp(*B*)
Constant	-2.03	4.59	.13	2.61	4.01	13.55
Individual level						
Age	-.03	.02	.97	-.02	.02	.98
RoC*RoI	3.70*	1.54	40.44	3.74*	1.51	41.92
Ethnicity (Māori or not)	.11	.29	1.12	.11	.29	1.11
Age at first conviction	.12	.08	1.13	.12	.08	1.13
Days served	.00	.00	1.00	.00	.00	1.00
No of parole conditions	-.15*	.07	.86	-.14*	.07	.87
RPFA-R	.07	.04	1.10	.06	.04	1.10
RelPIQ	.05	.05	1.10	.03	.05	1.03
Neighborhood level						
Percent unemployed	.11	.08	1.11	.03	.07	1.03
Alcohol outlet rate	-.00	.00	.99	-.00	.00	.99
Neighborhood fragmentation	-.46	.32	.64	.13	.13	1.14
Percent male	-.12	.08	.89	-.09	.08	.91
Percent aged between 15-29	.06	.03	1.10	.04	.03	1.04
Diversity index	.04**	.02	1.05	.04**	.02	1.04
Percent foreign born	-.05*	.02	.01	-.05*	.02	.96
Median income	.00	.00	1.00	.00	.00	1.00
Variables of interest						
Parolee had multiple addresses 3 months post-release	.52	.36	1.67	-	-	-
Percent neighborhood moved homes in < 5 years	-	-	-	-.01	.03	.99
-2 Log likelihood		335.91			338.44	
Nagelkerke R^2		.191			.177	
N		280			280	

*p<.05; **p<.01

neighborhood level predictors (Models 3 and 4). Two variables were found to be significant at the individual-level (Model 1): the RoC*RoI measure (positive) and the number of parole conditions (negative). That is, parolees who had higher RoC*RoI scores were found to be at an increased risk of recidivism while parolees with more parole conditions were less likely to be reimprisoned. Two neighborhood-level variables were also found to be significant when added to Model 1: the diversity index (positive) and the percent foreign born (negative). That is, parolees residing in neighborhoods with greater diversity were more likely to recidivate while parolees returning to neighborhoods with more overseas-born residents were less likely to be linked with recidivism. Consistent with the correlational analyses, when the contribution of individual and neighborhood level variables was controlled, Model 3 showed that the individual-level measure of residential mobility had no significant effect on recidivism (β=0.52; p >.05). Likewise, no significant effect was found for the neighborhood level measure of residential mobility after controlling for both sets of variables (β=-0.01; p >.05). This finding provides the first empirical evidence that recidivism in New Zealand may not be related to either immediate individual- or neighborhood level residential mobility. The inclusion of additional variables at each point in the modelling process improved the model fit slightly: the Nagelkerke R^2 adjusted for degrees of freedom ranged from a weak 0.10 for the first model to a more respectable 0.19 for model 3. It is important to note, however, that while these overall values are low, they are not uncommonly so for research of this nature (see Makarios et al., 2010; McGrath & Thompson, 2012).

Discussion

Individual-level

Despite the range of variables included in our analyses, an actuarial risk assessment measure based largely on criminal history remained the most robust predictor of reimprisonment. Parolees with higher RoC*RoI scores were more likely to be reimprisoned within 12 months of release. The RoC*RoI score is widely used in the New Zealand correctional system for various purposes including sentencing, parole and rehabilitative program provision, because of its strong predictive relationship to a number of recidivism indices. This finding is consistent with prior research on the RoC*RoI with New Zealand parolees (e.g., Polaschek et al., 2017), and with an enormous body of international research attesting to the value of criminal history variables in predicting future recidivism (see Bonta, LaPrairie, & Wallace-Capretta, 1997; Mulder, Brand, Bullens, & van Marle, 2012).

The other significant relationship found at the individual-level was with the number of parole conditions; those with more parole conditions were less likely to be reimprisoned. It is difficult to contrast this result with other research given the lack of any research specifically examining the impact of the number of parole conditions on recidivism, and given the lack of information here on the basis of decision-making that led to the resulting conditions. But it is noteworthy that this result persists despite controlling for level of static risk, the quality of release plan and the judged feasibility of release: all factors weakly though significantly correlated with the number of parole conditions.

When evaluating suitability for parole and how to set conditions, a parole board needs to consider both what could be helpful, what is available, and what is feasible administratively. For example, a board may choose not to impose a condition of

counselling if the prisoner has already done considerable rehabilitative counselling while in prison. But equally, they may make the same decision because the prisoner has stated that he will not attend further counselling, or because none is available. The imposition of a greater number of parole conditions has been found to have a detrimental effect on parole officers (Finn & Kuck, 2003), suggesting that parole officer workload may be another factor relevant to a board's decision-making.

The difficulty in interpreting this finding regarding the number of conditions imposed is paralleled by the research on the effectiveness of parole itself. Research on the relationship between parole supervision and recidivism shows that the type of regime is important. To the degree that parole oversight is surveillance-oriented, it appears to increase recidivism, while the inclusion of rehabilitative and reintegrative components within the overall program of supervision, and a supportive human-service orientation among parole staff are associated with decreases in parolee recidivism (see Polaschek et al., 2017; for a review). We recently demonstrated that parole itself is associated with a reduction in reconviction for this sample (Polaschek et al., 2017), but similarly were unable to isolate the mechanism due to a lack of information about the actual management of parolees once on parole. These findings suggest that in order to understand the positive relationship found here—between the number of conditions and remaining in the community for the first 12 months—future research should examine the relative contribution of surveillance and monitoring conditions vs. rehabilitative conditions, to this result.

Neighborhood-level

At the neighborhood-level we found that parolees residing in neighborhoods with greater diversity were more likely to recidivate. However, residents in neighborhoods with more overseas-born residents were less likely to recidivate. Within the social

disorganization framework, greater diversity within a neighborhood typically increases the risk of crime and delinquency, although this central tenet of the theory has not, to our knowledge, been empirically tested on recidivism. It could be that offenders released into more diverse neighborhoods have trouble integrating themselves socially into these communities and may struggle to develop prosocial and supportive networks that could protect against recidivism. Alternatively, there could be more ethnic tension and conflict in such neighborhoods (e.g., gang conflict). However, in this context, the negative relationship between the percent foreign born and recidivism is unexpected, since being foreign-born would be presumed to increase ethnic and racial diversity. This apparent contradiction may simply be a reflection of the country's current immigration policy in which skilled foreign migrants are living in relatively ethnically homogeneous communities that are relatively cohesive and socially organized.

In support of this view, and contrary to popular public and political opinion, previous individual-level studies outside of New Zealand have shown that foreign born individuals are less crime prone than locally-born individuals (Bersani, 2014; Bersani, Loughran, & Piquero, 2014; Butcher & Piehl, 1998) while internationally no significant associations have between found between immigrant concentration, and criminal behavior at the neighborhood level (see Desmond & Kubrin, 2009; Sampson, Morenoff, & Raudenbush, 2005). More recently, and consistent with our findings, Wolff, et al. (2015) examined the effect of immigration concentration on recidivism and found that immigrant concentration had, in fact, a general *protective* effect of on reoffending. The authors suggest that immigration alters aggregate family and household structures in ways that strengthen the immediate environment in a process encapsulated in the immigrant revitalization perspective (see Martinez & Lee, 1999).

In a New Zealand context, it could be that the ways in which immigrant communities are able to build and enforce social control (both formal and informal) could provide a framework for discouraging re-offending; a finding worth future investigation.

Regarding the substantive aim of this study, neither immediate individual-level residential mobility nor neighborhood-level mobility were found to be associated with a return to prison for offenders one year post-release, after controlling for various individual- and neighborhood level predictors. This finding stands in contrast to a number of previous studies (see Meredith et al., 2007; Makarios et al., 2010; Steiner et al., 2015), although the measures of residential mobility employed in their work differ from ours. For example, Makarios et al. (2010) used the total residential changes in a year-long follow up period as a measure of residential stability, while Steiner et al. (2015) was more focused on examining the effect of the continuing changes of individual residences on recidivism and on the living conditions of offenders. But other research has found similar results, including La Vigne and Parthasarathy (2005) and Hipp et al. (2010) who found no association at the neighborhood level between residential mobility and recidivism among a cohort of offenders in California and Chicago respectively.

Explanations for our findings are speculative but could be found in the nature of offender mobility post-release. At the individual-level, the residential mobility of offenders post-release can be interpreted in one of two ways: upward or backward. Upward mobility would not imply a move into a 'better' neighborhood per se but could also include a move *away* from negative influences (people). Kirk (2012) outlines a number of ways in which residential change can be a turning point that fosters the desistance from crime. First, residential change can allow parolees to 'knife off' the past from the present; second, residential change may produce new

opportunities for supervision, monitoring, and social support; third, residential change may restructure routine activities; and finally, residential change may provide an opportunity for identity transformation. Although not all of these effects may necessarily occur following a residential change among our cohort, especially not in the first three months after release, prior scholarship has shown already shown how a change in neighborhood context following incarceration can protect against recidivism (see Kirk, 2009; Kirk, 2012), while Steiner et al. (2015) has shown how the residential situations of offenders after a residential change such as moving in with a spouse or parent can significant reduce the likelihood of recidivism.

Parole conditions, which were found to be negatively associated with reimprisonment in this study, could also play a facilitating role here, as these conditions most often restrict parolees from associating with individuals with a known criminal record. These conditions are likely intended to limit backward mobility, as offenders may not be able to move to neighborhoods where they have known criminal associates. And anecdotally, residential mobility in this sample is sometimes relatively benign, such as when it results from moving from formally supported accommodation (e.g., Salvation Army housing) into independent accommodation. In some cases, supported accommodation actually forced people into unsupervised contact with other criminals (e.g., in hostels) so moving away from these arrangements can be protective.

At the neighborhood level, our results indicate that a highly mobile neighborhood does not impact on recidivism. But social disorganization theory posits that individuals returning to neighborhoods with high levels of residential mobility may be more likely to recidivate. The notion here is that highly mobile communities may be unable to exhibit direct or indirect social control on released offenders, thereby

increasing their odds of recidivism. Astonishingly, almost 55% of residents in neighborhoods in this study had resided there for less than five years, which indicates a highly mobile population. In fact, the population of New Zealand is highly mobile. The country's rate of annual residential mobility is among the highest in the world (Superu, 2015). Taken in this context our null results for mobility could mean that residing in a mobile neighborhood in New Zealand is not necessarily distinctive nor unique, which would make it less likely to be related to reimprisonment. But it could also be that the wider neighborhood context needs to be taken into account. Research by Hipp et al. (2010), for example, found that the level of residential stability of a parolee's own neighborhood had no effect on their risk of recidivism, but greater levels of stability in nearby neighborhoods reduced the chances of recidivating. The suggestion here is that residential stability at the broader geographic level has a more important role to play.

Conclusion

The main aim of this research was to determine the impact of residential mobility on recidivism, at both the individual- and neighborhood level: the number of residential addresses of parolees three months post-release, and the residential mobility of the neighborhoods into which they were released were used as **multi-level** indicators of this central tenet of the social disorganization theory. We believe that this study achieved our main aim, and in doing so has made a number of important contributions to the existing literature. First, this study demonstrated no direct link between immediate individual-level mobility and recidivism in New Zealand, when a number of other relevant factors were taken into account. Offenders who had multiple addresses three months post-release were not more likely to return to prison within a

year. Of course, we did not determine whether residential mobility after the three month period was associated with recidivism but that was not our main aim.

Second, the study suggests that neighborhood-level residential mobility is not important in relation to recidivism, at least not in a New Zealand context. Although this may not be considered a particularly novel finding to scholars undertaking similar research, this study appears to be the first of its kind in Australasia, and therefore is of practical utility with local correctional services, who often have to be guided by research from jurisdictions that vary on numerous other parameters. Individual- and neighborhood level residential mobility can offer new and better opportunities for supervision, monitoring, and social support for released offenders, and from these findings, is in and of itself, neutral with respect to recidivism outcome.

Third, the study has provided some measure of the applicability of a central tenet of the social disorganization theory to New Zealand. Although certainly not the main aim of this research, our work does provide some initial insight into the ability of this well-established spatial theory of crime to explain parolee recidivism in the country.

Fourth, the research confirms that other individual- and neighborhood level factors impact on an offenders' risk of recidivism, and offers suggestions for future parole research, especially with respect to parole conditions. Examining the interplay between individual- and neighborhood level factors in explaining recidivism was not the main focus of this research, but future work could examine this interaction in more detail, and potentially could include parolees' own perspectives of the strengths and risks within their neighborhoods. Recent research with youth confirms the value of going beyond the models used in this study, to examine interactions between individual and neighborhood level factors (Baglivio, Wolff, Jackowski, and

Greenwald, 2017), and expose potential mechanisms that may explain when and how

neighborhood factors are important, more generally (Intravia et al., 2016).

Finally, it should be noted that this research is based on a sample of high-risk

parolees in New Zealand. Therefore, the generalizability of the specific results found

in this study to other countries is open to debate. Moreover, the sample of 280

parolees, whilst representing a sizable percentage of offenders released on parole

during the study period in New Zealand, is relatively small when compared to other,

mainly US-based studies of this nature. However, these limitations do not offset the

strengths of our study which found no significant associations between individual-

and neighborhood-level mobility and short-term recidivism. We believe the results

presented here are valuable as they increase our understanding of both the individual-

and neighborhood-level predictors of recidivism in contexts outside Europe and the

United States.

Acknowledgements

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Endnotes

[a]At around 210 per 100000 of population, the rate is above Australia and all of western Europe (see www.prisonstudies.org)