PHYSICAL PLACES, SOCIAL SPACES, AND GUARDIANSHIP FACES: EXPLORING THE CONFIGURAL INFLUECE OF SOCIOPHYSICAL CONTEXTS ON CRIME

Lacey Schaefer[1]

ABSTRACT

This paper questions whether guardianship presence, expectations, and action are a condition of the physical features of a place and the population flows that occur there, and how these different configurations inform community crime profiles. This study explores these speculations with a conjunctive analysis of case configurations through combined census, geographic, population movement, and neighborhood survey data. Across 146 Brisbane, Australia suburbs, results indicate that static features of places combine with population flows in ways that influence the different dimensions of guardianship, in turn impacting crime. Most notably, crime rates are highest in neighborhoods characterized by high ambient populations but low levels of guardianship expectations. Conversely, lower crime rates are observed in communities with smaller ambient populations, less land use, and greater beliefs that residents would take crime control action if necessary. Guardianship presence and actual guardianship action appear to be less influential.

[1] Correspondence addressing this article should be directed to: Lacey Schaefer, School of Criminology and Criminal Justice, Griffith University, Social Sciences Building (M.10), 176 Messines Ridge Road, Mt Gravatt QLD 4122 Australia; phone: +61 07 3735 3482; email: l.schaefer@griffith.edu.au.

Keywords: guardianship, crime and place, space use, population flows, conjunctive analysis

Introduction

Environmental criminology explores the temporal and spatial distribution of offending, calling attention to the place-based features of settings that attract, generate, and facilitate crime and victimization. Studies of how built environments enable or discourage crime have uncovered several correlates to crime hotspots, and situational crime prevention and crime prevention through environmental design have increasingly specified the precise environmental features seen in crime problems. These frameworks largely emphasize the role of static environmental elements, often neglecting the dynamic processes that are associated with place-crime linkages. The present study reasons that because an environment itself is unlikely criminogenic or crime preventative, additional ingredients are needed in the recipe of crime. In particular, the contextual conditions that surround these physical environments are important, as they signal to the actors of a crime event the kinds of behaviors that are expected, acceptable, or permissible. I hypothesize that the physical features of a place impact how the space is used (which subsequently goes on to affect urban design across time), thereby influencing the different dimensions of guardianship that encourage or disrupt crime control. In this paper, I aim to determine two factors. First, I investigate how the place-based elements of a suburb produce population flows that have implications for guardians (including their availability, their expectations, and the actions they take to address crime). Second, I outline the impact these patterns have on the crime rates observed there.

Literature review

Environmental backcloth

Environmental criminology has largely focused on crime events and the place-based features that are present in these hotspots. Neglected from this research has been the role of context in producing these crime concentrations (Schaefer & Mazerolle, 2017). Brantingham and Brantingham introduced the environmental backcloth as "the uncountable elements that surround and are part of an individual and that may be influenced by or influence his or her criminal behavior" (1993: 6). They describe how this backcloth includes the typical elements of the physical infrastructure of a place, but that it should also include the people that are located within that infrastructure, as well

as the cultural and social dimensions of the environment. This backcloth is patterned but dynamic (Andresen, 2014; Brantingham & Brantingham, 2008), and provides the pulse of the environment, emitting cues to prospective offenders, victims, and crime controllers that then influence decision-making and behavior activation. Unfortunately, much scholarship on crime and place is *incident*-based and has failed to operationalize this backcloth, thereby ignoring the contextual environment of these crime events (Moreto, 2010). As a consequence, the underlying *processes* that birth the conditions necessary for crime are in some ways still poorly understood.

Cognitive landscapes and behavior settings

The environmental backcloth that provides the stage for crime events is ever-changing, although the people that interact with it develop a social template for expectations that are meant to occur in that environment (Lab, 2010). Thus, potential actors in a crime event develop cognitive maps that tell the individual what kinds of behaviors exist, are possible, and are acceptable in that area (Smith & Patterson, 1980). Sampson and Wilson describe these cognitive landscapes as "ecologically structured norms regarding appropriate standards and expectations of conduct" (1995: 50). Spatial behavior is directly impacted by these mental maps, thus requiring that criminologists evaluate the ecological labels that actors apply to areas (Gilmartin, 2000).

Indeed, when these *cognitive* landscapes inform individuals about behavioral expectations, *behavioral* landscapes of observable actions may develop, in turn reinforcing the cognitive landscapes that individuals develop. Collectively, these mental maps may contribute to behavior settings, which include patterns of behavior enclosed by a physical milieu that persist regardless of who inhabits the space (Barker, 1968; Price, 1976; Schoggen, 1989). Within criminology, these behavior settings are comparable to activity nodes in crime pattern theory (Brantingham & Brantingham, 1993; 2008), representing specific human-by-environment interactions that are sociophysically bound in time and space (Hart & Miethe, 2015). A goal for scholars of place and crime is to determine why some behavior settings are more criminogenic than others, and to evaluate the role of the wider community context in developing the necessary conditions for criminogenic behavior settings (Wikström & Sampson, 2003).

The multidimensionality of guardianship

One of the central elements of crime prevention is the role of everyday people in deterring crime by their presence (Hollis-Peel et al., 2011). Routine activity theory conceptualizes these individuals as target guardians and crime controllers (Cohen & Felson, 1979; Sampson et al., 2010), while other ecological theories of crime envision these actors as agents of informal social control who are willing to take action against crime problems in their neighborhood (Morenoff et al., 2001; Sampson & Groves, 1989; Sampson et al., 1997; Warner & Rountree, 1997). More contemporary communities and crime research has acknowledged the role of social characteristics (Reynald, 2010) and mechanisms (Schaefer & Mazerolle, 2017) in individual-level crime control, which has helped to delineate between guardians as agents and guardianship as a process (Hollis et al., 2013).

Historically, guardians against crime have been conceived as being actors whose mere presence can discourage an offence (Cohen & Felson, 1979; Hollis-Peel et al., 2011). While many studies operationalize guardianship as the presence or absence of people (see, for example, Garofalo & Clark, 1992; Lynch & Cantor, 1992; Miethe & Meier, 1990; Zhang et al., 2007), Reynald (2010) argues that the presence of a potential guardian does not mean that the person is willing or able to actually guard against crime. Accordingly, she develops the concept of "guardianship intensity," which includes the step-wise elements of presence, willingness, and intervention. That is, a potential guardian against crime must be available to act, willing and able to act, and actually act.

Following from this, Wickes and colleagues (2017) have further fleshed out the multidimensionality of guardianship, measuring this element of crime prevention with three aspects: availability, expectations, and action. These scholars have sought to combine the advances made by Reynald's (2010) tripartite conceptualization of guardians with the communities and crime literature that sees crime control as a mechanism of collective efficacy; Wickes and colleagues (2017) suggest that between availability and action comes the intermediary component of *expectations*, highlighting the research that demonstrates that people engage in crime controller behaviors themselves based in part on how they expect others to behave in similar circumstances. Their findings indicate that each of these dimensions of guardianship had moderating

effects on crime at the suburb level, signifying the importance of neighborhood conditions that lay the backdrop against which actors facilitate or impede crime events.

This is similar to the results of Schaefer, Mazerolle, and Kapnoulla (2017), who found that neighborhood residents' actions against local crime problems were associated with the community processes that occurred there. The authors describe that the perceptions of community members about the crime control actions taken by others influence individual action. In this way, ideas about *collective* efficacy help to shape *self*-efficacy. Combined, these studies contribute toward recent ideas about guardianship that consider how individual behavior is a consequence of larger social processes (Groff, 2015; Weisburd, 2012) that result from the structural conditions of communities *and* the impact of places on the expectations and exchanges that occur there (Sampson, 2006; Wickes, Hipp, Sargeant, & Mazerolle, 2017).

The present study

The current project aims to take the link between place and crime beyond static environmental features. I hypothesize that the physical features of a *place* (a geographical unit) influences the way that the *space* (a social unit) is used, resulting in particular patterns of population flows, some of which can be criminogenic (Felson & Boivin, 2015). These patterns create an environmental backcloth – the pulse of a place – that emits cues to offenders, victims, and crime controllers. These cues combine to create behavior settings about the expectations for the actors situated there (Schaefer & Mazerolle, 2018; Schaefer, Mazerolle, & Kapnoulla, 2017). Not only do offenders update their decision-making template based on the information obtained from the environment, but targets and guardians are likewise dynamic in their choices. The social psychology of a space encourages or hinders crime control among these individuals, and the evaluations, motivations, and estimations that offenders, targets, and guardians make are influenced by the environment and its use (Brantingham & Brantingham, 2008; Schaefer & Mazerolle, 2017; Smith & Patterson, 1980; Wikström & Sampson, 2003), in turn influencing rates of crime.

Methodology

The current study examines the role of the physical features of a place, the way that space is used socially, and the variable faces of guardianship on suburb-level crime rates. These relationships are explored using data from the third wave of the Australian Community Capacity Study (ACCS), a large-scale multilevel survey of residents' experiences with community processes relevant to crime and its control (see Mazerolle et al., 2012). The ACCS survey was administered in 2010 to nearly 4400 residents within 148 Brisbane suburbs. These data are supplemented with land use data from the State Valuer-General (Queensland Valuation and Sales database), ambient population data (LandScan), and crime data (Queensland Police Service). After managing missing data, the total sample size for the following analyses consists of 4,348 residents across 146 suburbs in southeast Queensland (with group sizes ranging from 12 to 67, $M = 30$, $SD = 9.03$, and suburb sizes ranging from 241 to 21,000 residents, $M = 5,359$, $SD = 4,769$). The analyses and measures used to explore the influence of physical places, social spaces, and guardianship faces on crime are described below. An overview of the descriptive statistics for these measures is included in Table 1.

Conjunctive analysis of case configurations

The analytic strategy for this project focuses on community *profiles* and their association with crime, explored through the use of conjunctive analyses (Miethe et al., 2008). This method is comparable to a contingency table or qualitative comparative analysis (Ragin, 1987) which examines the main and interaction effects among multiple categorical variables. Rather than using a line of best fit to predict the change in outcome given a change in one particular independent variable, conjunctive analyses rely on case configurations in which combinations of attributes are examined simultaneously. This technique is particularly useful in identifying the underlying structure of the data and examining trends between predictors (referred to as "situational clustering"; LaFree & Birkbeck, 1991). In this way, different configurations can be compared to examine the relative influence of a given variable; the data can be rearranged to turn a particular predictor "on" or "off" to explore its causal importance on the dependent variable. The conjunctive analysis of case configurations thus provides a method for exploring the narrative inherent to the data, looking at a particular unit of analysis and the combined effects of that setting on the outcome (Hart, 2014).

TABLE 1: DESCRIPTIVE STATISTICS FOR ALL CASES AND CATEGORIES
N = 146 Brisbane Suburbs

	ALL CASES					CATEGORY 1		CATEGORY 2	
	Min	*Max*	*M*	*SD*	λ_j	*M*	*SD*	*M*	*SD*
PHYSICAL PLACES						*Low (N = 89)*		*High (N = 57)*	
ATMs	0.00	20	2.56	4.20	0.82	0.51	1.08	5.77	5.15
Gambling licenses	0.00	407	50.40	87.14	0.57	13.03	22.65	108.74	114.78
Liquor licenses	0.00	41	3.84	5.77	0.79	1.09	1.49	8.12	7.20
Bus stops	0.00	128	30.90	30.26	0.77	14.03	15.32	57.23	29.05
Neighborhood shopping centers	0.00	4	0.40	0.73	0.68	0.07	0.25	0.93	0.90
Public toilets	0.00	16	1.85	2.21	0.82	0.88	1.03	3.37	2.67
SOCIAL SPACES									
						Low (N = 95)		*High (N = 51)*	
Population inflow / suburb population	0.25	4.17	1.00	0.85		0.70	0.18	1.55	0.74
						Low (N = 55)		*High (N = 91)*	
Population outflow / suburb population	0.53	0.98	0.76	0.08		0.68	0.06	0.82	0.03
						Low (N = 96)		*High (N = 50)*	
Population inflow / suburb population	0.33	6.26	1.33	0.88		0.92	0.24	2.09	1.13
Population outflow / suburb population									
GUARDIANSHIP FACES									
						Low (N = 91)		*High (N = 55)*	
Guardianship presence	0.02	0.47	0.24	0.08		0.18	0.03	0.32	0.06
						Low (N = 71)		*High (N = 75)*	
Guardianship expectations	2.91	4.27	3.65	0.25		3.44	0.16	3.85	0.14
						Low (N = 85)		*High (N = 61)*	
Guardianship action	0.00	0.43	0.11	0.09		0.05	0.04	0.20	0.07
CRIME RATE									
2011 rate of total crime	1957	244632	26024.62	29169.30					

Using this method, the independent variables are collapsed into categories (described below) which are then used to create a truth table and populate a data matrix (see Hart, 2014). The resulting table of data includes a row for each configuration of the predictor variables, the number of cases that are defined by that particular configuration, the mean total crime rate for that configuration, and the proportion of cases within that configuration that have crime rates above the grand mean for the sample used in this study.

Physical places

To examine the role of physical place characteristics on crime, I consulted land use data for the region. After performing an exploratory factor analysis using principal components extraction, six variables consistently held together (factor loadings in parentheses): At the suburb level, the number of ATMs ($\lambda = .816$), gambling licenses ($\lambda = .565$), liquor licenses ($\lambda = .794$), bus stops ($\lambda = .770$), neighborhood shopping centers ($\lambda = .677$), and public toilets ($\lambda = .815$) all loaded on one component. To facilitate a conjunctive analysis, these six variables were used to determine group membership with a two-step cluster analysis. Two clusters emerged (silhouette coefficient $= .60$), with low average numbers of these six physical features in one group ($N = 89$) and high average numbers ($N = 57$) in the other. The mean and standard deviation for each of the six physical place characteristics across these two clusters are reported in Table 1.

Social spaces

Measures of population flow that capture how people move in and out of a space are also included given that ways that such movements are associated with offending patterns (Felson & Boivin, 2015). These measures are computed with census data (available through the Australian Bureau of Statistics) and with ambient population data from the LandScan global population distribution dataset (available through Oak Ridge National Laboratory). The ambient population captures the number of people that occupy a specified area over a 24-hour period, relying on spatial data and imagery from LandScan (such as road slopes, housing information, and light pollution). I use three measures of social space use. First, the population inflow is calculated as the ambient population relative to the population of the suburb. Second, the population outflow is

calculated as the number of people leaving the suburb for work or school (during daytime hours, as reported in the census) relative to the number of people that live in the suburb. Third, the ratio of these two variables is computed, providing a reflection of the number of people entering a suburb relative to the number of people exiting that suburb. These variables are configured into low and high clusters, divided into groups by whether the population flow measure is below or above the grand mean.

Guardianship faces

Following from recent progressions in the environmental criminology literature, I examine three different faces of guardianship: presence, expectations, and action (Wickes et al., 2017). Guardianship presence is calculated as the proportion of the suburb population that is available at home during the daytime, as identified by participants of the census. Guardianship expectations is a variable from the ACCS survey (see Mazerolle et al., 2012). This item measures the respondent's expectations that their neighbors would intervene in twelve hypothetical community disorder and crime scenarios. Survey participants were asked how likely it is that people in their community would do something about a particular crime problem (from 1 = very unlikely to 5 = very likely). These twelve variables load on one factor ($\alpha = .845$) and were collapsed into a mean score. Guardianship action reflects the proportion of residents in a suburb that indicated that they had done something in response to a local crime problem. Respondents were first asked to identify whether certain issues (drugs, public drinking, loitering, vandalism, young people getting into trouble, and speeding/hooning) were problematic in their area; if an issue was deemed as problematic, they were asked whether or not they took *any* action in response to that problem. The small portion of participants who did not identify any crime problems in their suburb (8.7%) were coded as having not taken action. Each of these dimensions of guardianship was dichotomized, with group membership based on whether the case fell below or above the grand mean for each variable.

Crime

The dependent variable used in the conjunctive analyses is the overall crime rate. This is measured as the rate (per 100,000 people) of *total* crime for the suburb in

2011, as reported by the Queensland Police Service. This category of total crime includes all offences recorded by the police, including violent, property, drug, and public nuisance crimes. The total crime rate ranged from 1,957 to 244,632 offenses per 100,000 residents (M = 26,024.62, SD = 29,169.30). Because case configurations are used, the data are not transformed. The conjunctive analyses are used to examine the mean crime rate for different case configurations, also showing the proportion of cases within a given configuration that fall above the grand mean crime rate.

Results and Discussion

        In this paper, I explored whether guardianship presence, expectations, and action are a condition of the physical features of a place and the population flows that occur there, and how these different configurations inform community crime profiles. I approached these speculations with a conjunctive analysis of case configurations through combined census, geographic, population movement, and neighborhood survey data. The results of these analyses are reported below, organized into research questions and embedded within the empirical evidence-base that helps to contextualize the findings.

Are crime rates different according to land use, population flows, or guardianship presence, expectations, and action?

        First, I explored the differences in the rate of crime among the categories of each of the independent variables. Without considering the influence of other variables, crime rates were higher when land use is high (t = -3.104, p < .01), when population inflow is high (t = -3.940, p < .01), when population outflow is low (t = 3.348, p < .01), when guardianship presence is high (t = -3.348, p < .01), when guardianship expectations are low (t = 5.024, p < .01), and when guardianship action is high (t = -4.919, p < .01). Given these relationships of each predictor with crime, I explored the impact of different case configurations of these variables on the total crime rate. When performing a conjunctive analysis, there are a number of ways a researcher can examine, organize, and present the data. Readers should note that for the analyses performed in Tables 2 and 4, I have sorted the data matrices so that the mean total crime rate is presented from highest to lowest. Reported next to this group mean (for each

case configuration) is the proportion of those cases that fall above the grand mean (for the entire sample of cases).

What is the impact of categories of land use and population flows on crime?

The first conjunctive analysis shows the configural influence of land use and population flow on the crime rate (see Table 2). Specifically, groupings of low and high levels of land use, population inflow, and population outflow were configured to explore the impact of that combined setting on the mean total crime rate. All possible configurations (3 independent variables, all binary, $2^3 = 8$) are represented in the data. These configurations have differences in their group mean crime rate that are statistically significant ($F = 8.161$, $p < .001$). A conjunctive analysis of the data matrix in Table 2 provides many interesting findings. The top three configurations all have low levels of population outflow; that is, the highest crime rates are observed in suburbs where *fewer* people leave the suburb, which may indicate greater capacities for reporting. Land use and population inflow for these same configurations tell a less clear story, with their levels having mixed impacts on the crime rate. For instance, in the top configuration (the highest mean crime rate among all combinations of variables), land use is low and population outflow is low, while the level of population inflow is high. This may indicate that people churning in and out of a place is criminogenic. Configuration #2, however, tells the opposite story: The crime rate is high when there is greater land use but lower levels of population inflow, again in spite of lower proportions of neighborhood residents leaving their community during the day. Tellingly, the bottom three configurations all have low levels of population inflow; fewer people entering the suburb appears to be associated with fewer (reported) offenses.

Are patterns of crime and space use geographically clustered?

In order to determine whether these case configurations are clustered in space, I created a map (Figure 1) that shows the suburbs used in the analyses, color-coded according to which configuration they fall in (from Table 2). Overall, there are few clear patterns that emerge; this is partly due to the unique geographic distribution of the Brisbane region (which resembles several towns placed closely together rather than one

**TABLE 2: CONJUNCTIVE ANALYSIS OF CASE CONFIGURATIONS
FOR LAND USE AND POPULATION FLOW ON THE CRIME RATE**
N **= 146 Brisbane Suburbs**

Configuration	Land Use	Inflow	Outflow	Cases (*N*)	Mean total crime rate	*P* (*N*) above mean crime
1	0	1	0	9	75516.45	0.78
2	1	0	0	12	40245.82	0.75
3	1	1	0	11	39687.76	0.82
4	1	1	1	15	28677.27	0.53
5	0	1	1	16	25754.53	0.19
6	1	0	1	19	21141.71	0.16
7	0	0	0	23	20672.89	0.13
8	0	0	1	41	11732.45	0.02
					$F = 8.161, p < .001$	

Note: 0 = Low, 1 = High

FIGURE 1: MAP OF BRISBANE SUBURBS BY CONFIGURATION
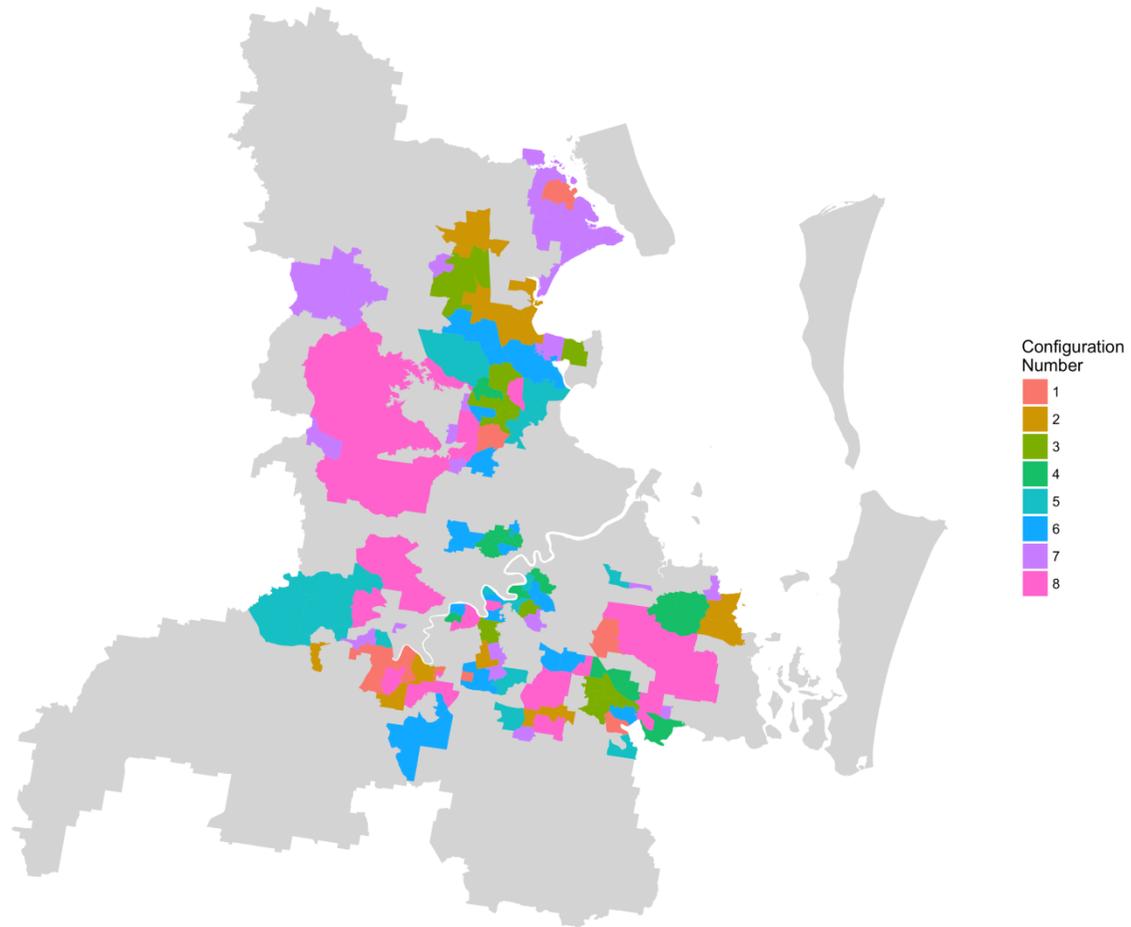
large city). One notable theme from the map is that the suburbs falling in configurations 7 and 8 (with lower rates of crime) appear in the more "rural" parts of the city proper. This tends to correspond with the contingency table showcasing the low levels of land use and population inflows in these suburbs.

One takeaway message from these analyses is that the trends in land use and population flows are not absolute. While higher crime rates are associated with concentrations of high levels of land use, high levels of population inflow, and low levels of population outflow, there are notable exceptions to this theme. Accordingly, I suggest that the physical features of a place and the subsequent flow of people in, through, and around these nodes are not sufficient explanations of crime; rather, physical places and the social use of these spaces have impacts on the different dimensions of guardianship.

Are levels of guardianship presence, expectations, and action associated with crime rates?

To explore this notion, I perform another conjunctive analysis, examining the configural influence of levels of land use and population flows on levels of guardianship presence, expectations, and action (see Table 3). The configurations are ordered in the same sequence as in Table 2; thus, the top configurations have the higher levels of crime, and the bottom configurations have lower levels of crime. In regard to mean levels of guardianship presence (the proportion of the suburb's population that reported in the census that they remain home during the daytime), the general trend is that higher levels of guardianship presence are seen in the upper configurations, and thus correspond to generally higher levels of land use and population inflow, lower degrees of population outflow, and more crime. This may indicate that foreigners entering the suburb do not act to guard against crime (but may serve as offenders or targets), and the native guardians that are present may not be as effective at *preventing* crime as they are at *responding* to crime (such as ringing the police to make a report).

For guardianship expectations, the top three configurations (again, those suburbs with higher groupings of land use, population inflow, and crime) have the lowest levels of residents' reported levels of willingness to intervene; conversely, high levels of guardianship expectations are concentrated in the low-crime suburbs where the grouped

**TABLE 3: CONJUNCTIVE ANALYSIS OF CASE CONFIGURATIONS
FOR LAND USE, POPULATION FLOW, AND GUARDIANSHIP DIMENSIONS ON THE CRIME RATE**
N = 146 Brisbane Suburbs

Configuration	Land Use	Inflow	Outflow	Cases (N)	Mean guardianship presence	Mean guardianship expectations	Mean guardianship actions
1	0	0	0	23	0.33	3.72	0.11
2	0	0	1	41	0.18	3.81	0.08
3	0	1	0	9	0.34	3.49	0.14
4	0	1	1	16	0.19	3.69	0.10
5	1	0	0	12	0.31	3.38	0.19
6	1	0	1	19	0.19	3.64	0.10
7	1	1	0	11	0.29	3.37	0.19
8	1	1	1	15	0.17	3.65	0.10

Note: 0 = Low, 1 = High

category of land use and population inflow are generally low. The proportion of suburb residents indicating that they had taken guardianship action against a local crime is highest in the top configurations, indicating that more action occurs alongside less population outflow but more inflow and more crime. Comparable to the finding that guardianship presence is *positively* associated with crime rates, the result that increased guardianship action corresponds with more crime may demonstrate the larger theme that native guardians do not stop crime from happening so much as they notice and report it after it has already occurred.

What are the combined effects of land use, population flows, and guardianship dimensions on crime?

To help explore this full sequencing of variables, I performed a third conjunctive analysis (see Table 4) with cases configured according to land use, population flow (computed as a ratio of inflow:outflow), and the three dimensions of guardianship. Out of all possible combinations of independent variables ($2^5 = 32$), 29 configurations of the 146 cases were present in the data. One immediately observable trend is that low guardianship expectations are associated with higher crime rates. For the top ten configurations, low levels of residents' estimations that their neighbors would intervene in crime problems was present in nine of the combinations; conversely, eight of the ten configurations with the lowest group crime rate have high levels of guardianship expectations. In examining configurations with a mean crime rate for the group that is higher than the grand mean for the sample ($M = 26{,}024$), 51 of the 146 suburbs fall in one of these combinations (configurations 1-13). Of these cases, high levels of land use is present 65% of the time, a high rate of population inflow to outflow is present 67% of the time, guardianship presence is high 67% of the time, guardianship expectations are low 16% of the time, and guardianship action is high 65% of the time. However, it is important to note that the proportion of cases falling above grand mean crime rate is low for some configurations.

When the data are organized another way (not presented in tabular form here), so that the proportions of cases in each configuration with a crime rate above the grand mean are sorted from high to low, the top nine configurations have more than two-thirds of cases with crime rates higher than the grand mean ($N = 38$). Of these cases, high levels of land use is present 82% of the time, a high ratio of population inflow to outflow is present 84% of the time, guardianship presence is high 74% of the time, guardianship expectations are low 100%

of the time, and guardianship action is high 58% of the time. In addition to the strong degree of importance for the expectations residents have for guardianship, this certainly suggests that

**TABLE 4: CONJUNCTIVE ANALYSIS OF CASE CONFIGURATIONS
FOR LAND USE, POPULATION FLOW, AND GUARDIANSHIP DIMENSIONS ON THE CRIME RATE**
N = 146 Brisbane Suburbs

Configuration	Land Use	Population inflow / Population outflow	Guardianship Presence	Guardianship Expectations	Guardianship Action	Cases (N)	Mean total crime rate	$P(N)$ above mean crime rate
1	0	1	1	0	0	4	120370.66	100.00
2	1	1	0	0	1	3	53383.13	100.00
3	0	1	1	1	0	2	47175.02	50.00
4	0	1	0	0	1	5	46264.95	40.00
5	1	1	1	0	1	11	43200.99	81.82
6	1	0	1	0	1	5	42818.18	80.00
7	1	1	1	0	0	4	40387.76	100.00
8	1	0	1	0	0	1	35443.50	100.00
9	0	1	1	0	1	3	34605.12	66.67
10	1	0	0	0	0	6	34467.84	66.67
11	1	1	0	1	1	2	30904.72	50.00
12	0	0	1	1	1	4	30342.45	25.00
13	1	1	0	0	0	1	26329.34	100.00
14	1	0	1	1	1	1	23652.83	0.00
15	0	0	1	0	1	6	23169.34	33.33
16	0	1	0	0	0	3	22536.97	0.00
17	0	0	0	0	1	7	21162.20	14.29
18	0	0	1	0	0	4	20476.79	0.00
19	1	1	0	1	0	4	19477.79	25.00
20	1	0	0	0	1	5	18073.79	0.00
21	1	0	0	1	0	10	16690.39	10.00
22	0	1	0	1	1	1	16589.78	0.00
23	0	0	1	1	0	9	14798.16	0.00
24	0	0	0	0	0	3	14571.85	0.00
25	1	0	0	1	1	3	13857.45	0.00
26	0	1	0	1	0	7	13792.44	14.29
27	0	0	0	1	1	5	9838.91	0.00
28	1	0	1	1	0	1	9566.03	0.00
29	0	1	0	1	0	26	9230.18	0.00

Note: 0 = Low, 1 = High

higher crime rates are found in suburbs with more land use and greater population flows, irrespective of the proportion of native guardians that are present in the neighborhood or the actual actions against crime that they take.

To ensure that these impressions aren't skewed by the small number of cases in particular configurations (which may present unique factors rather than a theme), it is instructive to look at the configurations with the highest number of cases with both low and high rates of crime. The lowest group crime rate also has the most number of cases (case configuration #29, $N = 26$, $y = 9,230$). Within this configuration, land use is low, the rate of population inflow to outflow is high, guardianship presence is low, guardianship expectations are high, and guardianship action is low. This indicates that for these communities, even when people are milling into the suburb, native guardians are fleeing the suburb during the day, and low proportions of residents take action to combat local crime problems, the crime rate is still very low; this may be due to the few numbers of crime attractors in the area or the strong expectations that residents have that their neighbors *would do* something if faced with a crime problem. Comparatively, the most number of cases for a configuration with a high group crime rate (case configuration #5, $N = 11$, $y = 43,201$) reveals a reverse trend for most variables. In these communities, the level of land use is high, the rate of population inflow to outflow is high, guardianship presence is high, guardianship expectations are low, and guardianship action is high. Thus, even with larger proportions of native guardians present and greater proportions of residents indicating that they have taken crime preventive/combative action, the crime rate is still high (for 9 of the 11 cases the suburb-level mean is above the grand mean, $P = 81.82$); this may be the consequence of high levels of land use and population flows, or due to the low guardianship expectations among residents of the community.

Conclusions

Environmental criminology typically examines the place-based features associated with crime concentrations, distilling geographic elements down to static or binary factors believed to be criminogenic. Fewer studies have explored the dynamic social processes that may bridge the association between the physical features of a place and resulting crime hotspots (Moreto, 2010; Schaefer & Mazerolle, 2017). This study hypothesized that the physical place-based elements impact how that space is used, thereby influencing the dimensions of guardianship and their impact on crime control. Specifically, I performed a

conjunctive analysis of cases configured along several elements across 146 Brisbane, Australia suburbs: low versus high land use (the number of ATMs, gambling licenses, liquor licenses, bus stops, shopping centers, and public toilets), low versus high population inflow, outflow, and inflow:outflow, and low versus high levels of guardianship presence, expectations, and action.

The first analysis (Table 2) revealed that, with a few exceptions, higher rates of crime were observed in suburbs with high levels of land use, high levels of population inflow, and population outflow. Crime tended to be high in suburbs with fewer residents vacating during the day, while crime rates were lower in suburbs with fewer outsiders entering the neighborhood. Given these findings, I speculated that the configural influence of place and space use may be indirectly impacting crime through its direct impact on guardianship factors. To explore this speculation, the second analysis (Table 3) examined the configural influence of land use, population inflow, and population outflow on guardianship presence, expectations, and action. Generally, the configurations demonstrated that guardianship presence and actions are high when land use is high, inflow is high, and outflow is low, while guardianship expectations are lowest in these same settings. In order to examine the impact of these configurations on crime, the third analysis (Table 4) explores the configural impact of land use, population inflow:outflow, and guardianship presence, expectations, and action on suburb-level crime rates. One clear finding was that low levels of guardianship expectations were consistently associated with high crime rates; conversely, suburbs exhibited lower crime rates where expectations for guardianship were high. Additionally, higher crime rates tended to appear in community profiles with greater degrees of land use and more population turnover, regardless of the presence of native guardians or the actions that residents had taken.

Limitations and directions for future research

Notwithstanding these interesting contributions, the current project is not without limitations. First, while the analytical technique used here provides important insights, the analyses were not able to provide a direct causal test of the model specified here. That is, future studies, perhaps with longitudinal data, are needed to help specify the sequencing of events; it is possible that the relationships explored here are actually non-recursive and that the variables of place use, space use, guardianship, and crime are symbiotic in some ways.

Next, subsequent tests of the ideas explored here are needed with different forms of data, examining the impact of these relationships on variable types of crime and with different operationalizations of some of the key constructs used here. For instance, the current analyses cannot directly disentangle how actions against crime are related to the crime rate; it is possible that more crime actions are noted in areas where crime is high (and that these actions may be reactive rather than preventative), whereas action has no utility in low-crime suburbs. Further research is needed to specify these underlying relationships.

Third, richer datasets will be required to more fully understand the associations suggested by some of the findings here. The use of a total crime rate rather than categories of crimes may be convoluting some of the results. Moreover, the land use and space use datasets that were used here would have ideally had a finer resolution, and such information should be sourced by researchers in the future (such as emerging studies that utilize transport data, heatmapping, or mobile phone tracking). It will be useful for future scholars to help identify *why* people flow into and out of areas to better understand the context of crime events. While conjunctive analysis gets around some of the limitations of the datasets used here due to the focus on profiles, better refined data would help to unpack the ways that crime is a product of the place-space relationship.

Finally, the unit of analysis used here was the suburb, and the sizes of these neighborhoods varied quite considerably. Moreover, the Brisbane region is somewhat unique in its distribution of suburbs. Most research on behavior settings and crime places use much smaller units of measurement (such as street segments) in more traditional city settings. Some of the mixed results may be due to the larger areas under study here, in addition to the variation in suburb size among the neighborhoods used in this project. Future studies should examine how these relationships operate in multilevel models of neighborhoods, and also within more micro places.

Implications

Collectively, these findings from this project lend moderate support to the idea that the association between place and crime is due to dynamic social processes; the predictors of crime in a suburb were not straightforward, but partially depended on how people flowed into and out of a suburb and how these population movements influenced the variable dimensions of guardianship (see Felson & Boivin, 2015). Places that typically experience high crime rates due to the features located there (such as bars or bus stops) are crime generators in that

the high rate of population inflow is likely to contain would-be offenders; importantly, however, this milieu of people also contains prospective guardians (see Kurland et al., 2014). In this way, the influx of foreigners drawn to a given neighborhood may enhance natural surveillance and increase capable guardianship.

Although not an absolute relationship, the trend of the community profiles analyzed here demonstrated that when population inflow was high relative to population outflow, guardianship expectation were low and crime was high. This pattern of findings may provide support for the ideas of environmental backcloths and behavior settings; crime seems to be a function of what people expect of others, which are related to place and space use. Rather than thinking about guardianship as a unidimensional or present/absent condition, it is helpful to think of guardianship as being dynamic and processual (Schaefer & Mazerolle, 2017); moreover, guardianship may not be an individual behavior so much as it is also an aggregate property of place (Wickes et al., 2017). Thus, the manifestations of guardianship (such as residents expectations about their neighbors' crime combative behaviors) should be studied as functions of the physical contexts and social interactions that occur within these places.

The current project helps to highlight the multidimensionality of guardianship (see Wickes et al., 2017). The literature often portrays the capable guardian as a solitary ingredient in the crime prevention calculus, when realistically, there are many aspects of guardianship (Reynald, 2010), and there are likely a number of dynamic processes that influence guardianship presence, capability, expectations, and intervention (Schaefer & Mazerolle, 2017). While the final analysis performed here demonstrates that *expectations* for guardianship was most consistently predictive of crime, it cannot be concluded that guardianship presence and action are not influential (despite the findings that their influence was mixed). The underlying relationships may be that, while we know guardians must be available and must intervene when necessary for crime prevention to be effective, in many communities guardianship presence and action may not be noted or necessary.

Indeed, in neighborhoods where guardianship action is lacking, this may not be causally related to high crime rates, because action that guards against crime is not needed when crime is rare to begin with; conversely, crime control action may be most salient in neighborhoods with crime rates that are already high. One possible explanation for some of the findings here is that foreigners entering suburbs may not be guardians after all (and may be more likely to be offenders or targets), while native residents that remain in the suburbs act as guardians not in preventing crime but in responding to it after-the-fact. Thus, research

must continue to unpack how these variables interact with one another, moving beyond traditional conceptualizations of a unidimensional form of guardianship.

In order to better understand how certain places seem to breed crime events, we must consider how the *combinations* of variables influence the opportunity structures seen there (Hart & Miethe, 2015). There are "no separate elements or sets of discrete relationships into which the system is divisible. Instead, the whole is composed of inseparable aspects that simultaneously and conjointly define the whole" (Altman & Rogoff, 1987: 24, as cited in Brantingham & Brantingham, 1993). Thus, according to Brantingham and Brantingham (1993), we must develop models that help us to see the specifics of a situation in place and time while also capturing the dynamic social backdrop that may motivate a prospective offender. The roles of socialization practices and the processes of choice should be used to aid our understanding of the social mechanisms that bridge the link between communities and crime (Schaefer & Mazerolle, 2017; Wikström & Sampson, 2003). Future research should continue to examine the sociophysical contexts of criminogenic settings, exploring the impact of population flows on guardianship expectations and crime.

References

Andresen, J.A. (2014) *Environmental criminology: Evolution, theory, and practice.* New York, NY: Routledge.

Barker, R.G. (1968) *Ecological psychology: Concepts and methods for studying the environment of human behavior*. Stanford, CA: Stanford University Press.

Brantingham, P.L. and Brantingham, P.J. (1993) Nodes, paths, and edges: Considerations on the complexity of crime and the physical environment. *Journal of Environmental Psychology*, 13(1): 3-28.

Brantingham, P. and Brantingham, P. (2008) Crime pattern theory. In: R. Wortley and L. Mazerolle (eds.) *Environmental criminology and crime analysis*. Cullumpton, UK: Willan, pp. 78-93.

Cohen, L.E. and Felson, M. (1979) Social change and crime rate trends: A routine activity approach. *American Sociological Review* 44(4): 588-608.

Felson, M. and Boivin, R. (2015) Daily crime flows within a city. *Crime Science* 4: 1-31.

Garofalo, J. and Clark, D. (1992) Guardianship and residential burglary. *Justice Quarterly* 9(3): 443-463.

Gilmartin, P. (2000) Cognitive maps and fear of crime. In: L.S. Turnbull, E H. Hendrix, and B.D. Dent (eds.) *Atlas of crime: Mapping the criminal landscape*. Westport: Greenwood, pp. 192-198.

Groff, E.R. (2015) Informal social control and crime events. *Journal of Contemporary Criminal Justice* 31(1): 90–106.

Hart, T.C. (2014) Conjunctive analysis of case configurations. JDiBrief Series. London: UCL Jill Dando Institute of Security and Crime Science.

Hart, T.C. and Miethe, T.D. (2015) Configural behavior settings of crime event locations: Toward an alternative conceptualization of criminogenic microenvironments. *Journal of Research in Crime and Delinquency* 52(3): 373-402.

Hollis-Peel, M.E., Reynald, D.M., van Bavel, M., Elffers, H. and Welsh, B.C. (2011) Guardianship for crime prevention: a critical review of the literature. *Crime, law and social change* 56(1): 53-70.

Hollis, M.E., Felson, M. and Welsh, B.C. (2013) The capable guardian in routine activities theory: A theoretical and conceptual reappraisal. *Crime Prevention and Community Safety* 15(1): 65-79.

Kurland, J., Johnson, S.D. and Tilley, N. (2014) Offenses around stadiums: A natural experiment on crime attraction and generation. *Journal of Research in Crime and Delinquency* 51(1): 5-28.

Lab, S.P. (2010) Crime prevention (7th ed.). New Providence, NJ: LexisNexis.

LaFree, G.D. and Birkbeck, C. (1991) The neglected situation: A cross-national study of the situational characteristics of crime. *Criminology* 29(1): 73-98.

Lynch, J.P. and Cantor, D. (1992) Ecological and behavioral influences on property victimization at home: Implications for opportunity theory. *Journal of Research in Crime and Delinquency* 29(3): 335-362.

Mazerolle, L., Wickes, R., Cherney, A., Murphy, K., Sargeant, E. and Zahnow, R. (2012) *Community variations in crime: A spatial and ecometric analysis*. Brisbane, Australia: Australian Research Council. Wave 3: Technical report no. 1, study methods and basic statistics.

Miethe, T.D., Hart, T.C. and Regoeczi, W.C. (2008) The conjunctive analysis of case configurations: An exploratory method for discrete multivariate analyses of crime data. *Journal of Quantitative Criminology* 24(2): 227-241.

Miethe, T.D. and Meier, R.F. (1990) Opportunity, choice, and criminal victimization: A test of a theoretical model. *Journal of Research in Crime and Delinquency* 27(3): 243-266.

Morenoff, J.D., Sampson, R.J. and Raudenbush, S.W. (2001) Neighborhood inequality, collective efficacy, and the spatial dynamics of urban violence. *Criminology* 39(3): 517- 560.

Moreto, W.D. (2010) *Applying risk terrain modeling to urban residential burglary in Newark, NJ*. Newark, NJ: Rutgers Center on Public Security.

Price, R.H. (1976) Behavior setting theory and research. In: R. Moos (ed.) *The human context: Environmental determinants of behavior*. New York: Wiley, pp. 213-247.

Ragin, C.C. (1987) *The comparative method*. Berkeley, CA: University of California Press.

Reynald, D.M. (2010) Guardians on guardianship: Factors affecting the willingness to supervise, the ability to detect potential offenders, and the willingness to intervene. *Journal of Research in Crime and Delinquency* 47(3): 358-390.

Sampson, R., Eck, J.E. and Dunham, J. (2010) Super controllers and crime prevention: A routine activity explaination of crime prevention success and failure. *Security Journal* 23(1): 37-51.

Sampson, R.J. (2006) How does community contextmatter? Social mechanisms and the explanation of crime rates. In: P.-O. H. Wikstrom & R. J. Sampson (eds.) *The explanation of crime: Context, mechanisms and development*. Cambridge, UK: Cambridge University Press, pp. 31-60.

Sampson, R.J. and Groves, W.B. (1989) Community structure and crime: Testing social-disorganization theory. *American Journal of Sociology* 94(4): 774-802.

Sampson, R.J., Morenoff, J.D. and Gannon-Rowley, T. (2002) Assessing "neighborhood effects": Social processes and new directions in research. *Annual Review of Sociology* 28(1): 443-478.

Sampson, R.J., Raudenbush, S.W. and Earls, F. (1997) Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science* 277(5328): 918-924.

Sampson, R.J. and Wilson, W.J. (1995) Toward a theory of race, crime, and urban inequality. In: J. Hagan and R.D. Peterson (eds.) *Crime and inequality*. Stanford, CA: Stanford University Press, pp. 37-54.

Schaefer, L. and Mazerolle, L. (2017) Putting process into routine activity theory: Variations in the control of crime opportunities. *Security Journal* 30(1): 266-289.

Schaefer, L., and Mazerolle, L. (2018) Predicting perceptions of crime: Community residents' recognition and classification of local crime problems. *Australian and New Zealand Journal of Criminology* 51(2): 183-203.

Schaefer, L., Mazerolle, L., and Kapnoulla, M. (2017) Different actions for different crimes: Explaining individual action in local crime problems. *Journal of Community Psychology* 45(7): 922-939.

Schoggen, P. (1989) *Behavior settings*. Stanford, CA: Stanford University Press.

Smith, C.J. and Patterson, G.E. (1980) Cognitive mapping and the subjective geography of crime. In: D.E. Georges-Abeyie and K.D. Harries (eds.) *Crime – A spatial perspective*. New York: Columbia University Press, pp. 205-218.

Warner, B.D. and Rountree, P.W. (1997) Local social ties in a community and crime model: Questioning the systemic nature of informal social control. *Social Problems* 44(4): 520-536.

Weisburd, D. (2012) Bringing social context back into the equation: The importance of social characteristics of places in the prevention of crime. *Criminology & Public Policy* 11: 317–326.

Wickes, R., Hipp, J., Sargeant, E. and Mazerolle, L. (2017) Neighborhood social ties and shared expectations for informal social control: Do they influence informal social control actions? *Journal of Quantitative Criminology* 33: 101–129.

Wickes, R., Zahnow, R., Schaefer, L. and Sparkes-Carroll, M. (2017) Neighbourhood guardianship and property crime. *Crime & Delinquency* 63(5): 519-544.

Wikström, P.O.H. and Sampson, R.J. (2003) Social mechanisms of community influences on crime and pathways in criminality. In: B.B. Lahey, T.E. Moffitt and A. Caspi (eds.) *Causes of conduct disorder and juvenile delinquency*. New York: Guilford Press, pp. 118-148.

Zhang, L., Messner, S.F. and Liu, J. (2007) A multilevel analysis of the risk of household burglary in the city of Tianjin, China. *British Journal of Criminology* 47(6): 918-937.