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Suburban neighbourhood design: Associations with fear of crime versus perceived crime risk

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ABSTRACT

Strategies that reduce fear of crime may contribute to improved health outcomes; however interventions require a better understanding of the neighbourhood correlates of both emotional responses to crime (i.e., fear of crime) and cognitive assessments of crime (i.e., perceived crime risk). This study explored the association between objective measures of suburban design and two safety outcomes: perceived crime risk and fear of crime, for participants who lived in new suburban housing developments in Perth, Western Australia. The characteristics of a walkable neighbourhood, particularly retail land, were associated with less fear of crime, but greater perceived crime risk. One interpretation is that 'strangers', attracted to the neighbourhood by diverse land-uses, might influence the emotional and cognitive aspects of 'fear of crime' differently. Researchers interested in the impact of the built environment on 'fear of crime', and any subsequent influence of these perceptions on health, should be mindful that the environment appears to impact these constructs differently.

1. Introduction

There is growing interest in the impact of the built environment on health (Casagrande, Whitt-Glover, Lancaster, Odoms-Young, & Gary, 2009; Ding & Gebel, 2012; Frank, Engelke, & Schmid, 2003; Halpern, 1995), and the negative consequences that crime and fear of crime have on health behaviours and outcomes (Foster, Giles-Corti, & Knuiman, 2013; Lorenc et al., 2012; Loukaitou-Sideris & Eck, 2007; Stafford, 2007). However, while the environmental characteristics that contribute to lower crime rates are well documented (Cozens, Saville, & Hillier, 2005), less is known about how neighbourhood design impacts residents' fear of crime or perceptions of crime. Improved understanding of these relationships is necessary because 'crime' may mediate the association between the built environment and health behaviours, such as walking (Foster & Giles-Corti, 2008; Lorenc et al., 2012). Moreover, measures capturing perceived crime risk and fear of crime are often used interchangeably by researchers (Ferraro, 1995; Foster & Giles-Corti, 2008; Hale, 1996) but it's plausible these constructs are enhanced or inhibited by different attributes of the built environment.

Different disciplines approach the relationship between neighbourhood design and crime with different assumptions. Planners typically argue that mixed-use neighbourhoods generate more pedestrian traffic, making streets safer through natural surveillance or 'eyes on the street' (Cozens, 2008; Duany, Plater-Zyberk, & Speck, 2000; Jacobs, 1961). By contrast, the criminological literature suggests that the safest neighbourhoods are characterised by residential housing, with few destinations to attract people to the area, and curvilinear street layouts (Brantingham & Brantingham, 1993; Cozens, 2008; Doyle, Kelly-Schwartz, Schlossberg, & Stockard, 2006; Greenberg, Rohe, & Williams, 1982; Poyner, 1983). This is further emphasised by studies connecting non-residential land-uses with the incidence of crime (Beavon, Brantingham, & Brantingham, 1994; Bowes, 2007; Brantingham & Brantingham, 1993; Brown, 1982; Gorman, Speer, Gruenewald, & Labouvie, 2001). However, it is important that 'crime' not be regarded homogeneously – crime exists on a continuum from minor nuisances to serious offences (Ross, Mirowsky, & Pribesh, 2002) and different crimes can be either facilitated or inhibited by the presence or

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absence of people (e.g., crowds conceal low-level crimes but can protect against serious offences) (Angel, 1968; Loukaitou-Sideris, 1999).

While evidence about the impact of the built environment on actual crime has been usefully translated into guidelines such as Crime Prevention through Environmental Design (CPTED) (Cozens et al., 2005), less is known about how the physical environment impacts perceptions of crime. The evidence primarily focuses on links between the condition of the environment (e.g. litter, graffiti and vandalism) and perceived crime or fear of crime (Hale, 1996; Pitner, Yu, & Brown, 2012), whereas the impact of broader planning influences are not well understood. For example, studies examining the association between residents' access to commercial land-uses and perceived crime and safety have produced mixed results (McCord, Ratcliffe, Garcia, & Taylor, 2007; McCrea, Shyy, Western, & Stimson, 2005; Schweitzer, Kim, & Macklin, 1999; Wood et al., 2008), although on balance, they indicate that mixed land-uses detract from feelings of safety. Moreover, Wood et al. (2008) found that, consistent with the criminology literature, residents in a conventional suburb (i.e., low density housing, curvilinear street layout) felt safer than those in other suburb designs (e.g., a traditional neighbourhood with a gridded street layout).

However, there is some evidence to the contrary suggesting that diverse land-uses might enhance perceived safety. A recent study examined the association between suburban design and resident's fear of crime using an objective scale that combined the planning and land-use characteristics that would: (1) encourage more people into the public realm (i.e., retail land, public open space); (2) facilitate their movement (i.e., street connectivity); and (3) ensure the presence of territorial guardians (i.e., residential density, residential land; less vacant land) (Foster, Giles-Corti, & Knuiman, 2010). This 'neighbourhood form' index was negatively associated with fear of crime, where for every additional attribute, the odds of being fearful reduced (Foster et al., 2010). The authors interpreted these findings as providing support for the notion that 'eyes on the street' can help minimise fear of crime in suburban neighbourhoods.

The inconsistencies in the literature examining the built environment and 'crime' may stem from different outcome measures. Perceived crime and fear of crime are related, but distinct concepts (Ferraro, 1995; Hale, 1996). Perceived crime is a cognitive assessment, weighing up potential threats and judgements about whether they will occur. In contrast, fear of crime captures an emotional response to crime (Ferraro, 1995), and can be influenced by a myriad of factors including media reporting of victimisation, previous experiences, perceived vulnerability to crime, and physical neighbourhood cues (e.g., physical incivilities, poor upkeep) (Hale, 1996). Indeed, Lorenc et al. (2012) conceptualise 'fear of crime' as one overarching concept that comprises a cognitive (i.e., perceived crime risk) and an affective dimension (i.e., fear of crime). Notably, in the literature examining commercial land-uses and perceived safety, studies with outcomes best conceptualised as cognitive assessments (or judgements) about crime appear to indicate that mixed land-uses lessen perceived safety (McCord, et al., 2007; McCrea et al., 2005; Schweitzer et al., 1999; Wood et al., 2008). Conversely, those using an 'emotional' fear of crime outcome indicate that mixed land-uses may actually enhance perceived safety (Foster et al., 2010).

In this study, we examine the association between the objective 'neighbourhood form index', developed previously (Foster et al., 2010), and residents' perceived crime risk. Furthermore, we explore whether the built environment attributes that minimise fear of crime are consistent with those that minimise perceived crime risk.

2. Methods

2.1. Study context

The RESIDential Environments (RESIDE) Project was a five-year longitudinal study evaluating the impact of urban design on health in Perth, Western Australia. All people building new homes in the study areas were invited to participate (response rate 33.4%). Participants completed a self-report questionnaire before they moved into their new home, and on three subsequent occasions after they relocated (at 12, 36 and 48 months). Geographic Information Systems (GIS) was used to generate individual-level objective measures for each participant's neighbourhood (i.e., 1600 m road network distance from each participant's house). This paper presents cross-sectional results based on participants ($n = 1195$) who had lived in their new homes for about 36 months. The study setting is predominantly suburban, with most participants living in single family detaching housing, typically located in new greenfield developments on the urban fringe. RESIDE was approved by The University of Western Australia's Human Research Ethics Committee and is fully described elsewhere (Giles-Corti et al., 2008).

2.2. Outcomes

Perceived crime risk was measured using a modified version of the Neighbourhood Environment Walkability Scale (NEWS) (Sallis, 2002). Items included: (1) there is a lot of petty crime in my local area; (2) there is a lot of major crime in my local area; (3) the level of crime in my local area makes it unsafe to go on walks during the day; (4) the level of crime in my local area makes it unsafe to go on walks at night; and (5) I would feel safe walking home from a bus or train stop at night (reversed). Factor analyses indicated that these items all loaded highly on one factor (Cronbach's alpha 0.79). Participants rated each item on a Likert scale (1 = strongly disagree, 5 = strongly agree). Items were added to create a composite scale which was dichotomised for consistency with a previously published fear of crime outcome (Foster et al., 2010). Participants with an average score greater than three were classified as perceiving crime risk.

Fear of crime was derived from the question: In your everyday life, how fearful, or not, are you about the following situations? Items were: (1) being approached on the street by a beggar or homeless person; (2) being cheated or conned out of your money; (3) having someone break into your house while you're *not* at home; (4) having someone break into your house while you're at home; (5) being attacked by someone with a weapon; (6) having your car stolen; (7) being robbed or mugged on the street; (8) having your property damaged by vandals; (9) having someone loiter near your home at night; and (10) having a group of juveniles disturb the peace near your home (Cronbach's $\alpha = 0.93$) (Ferraro, 1995; Warr & Stafford, 1983). Participants rated each item on a Likert scale (1 = not at all fearful, 5 = extremely fearful), and consistent with previous research (Foster et al., 2010), those with an average score of three or higher (i.e., at least *somewhat fearful*) were categorised as fearful.

2.3. Independent variables

The neighbourhood form index (Foster et al., 2010) captured the planning characteristics and land-uses present in each participants individual 1600 m neighbourhood. The proportion of land allocated to retail land, residential land, public open space, developed land (i.e., the absence of vacant land) were calculated from Landgate (the Western Australian State Government's land information agency) Planning Land Use Categories. Street connectivity (i.e., the ratio of