**Guardianship in action among Brisbane suburban residents: Environmental facilitators
of guardianship intensity and the influence of living in a Queenslander**

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Abstract

Using data collected from observations made of 279 properties located in two homogeneous Brisbane neighbourhoods, the current study examines guardianship intensity among Australian suburban residents. Comparisons between findings from similar studies conducted in The Hague (the Netherlands) and two U.S. cities suggest that some guardianship behaviours observed in Brisbane are unique to the suburban context. Furthermore, results from the current investigation reveal that certain physical and situational characteristics of Brisbane suburban neighbourhoods (i.e., surveillance opportunities, territoriality, and accessibility) are significantly associated with residents' guardianship intensity. Finally, current findings reveal that differences in guardianship intensity among neighbourhood residents do not vary by the type of housing commonly found in the Brisbane-suburban context (i.e., the Queenslander). A discussion of the theoretical and policy implications of the current investigation is offered.

Keywords: guardianship, supervision, routine activity theory, guardianship in action, observations, resident crime control

Capable guardians are believed to play an integral role in crime prevention and control, according to the routine activities approach (Cohen & Felson, 1979). Studies investigating the effect of guardianship on crime are generally supportive of this association, showing that guardianship is inversely related to crime (see Hollis-Peel, Reynald, van Bavel, Elffers, & Welsh, 2011 for a review). Contemporary research has begun to develop a deeper understanding of the role that guardianship plays in preventing crime, with one of the more noteworthy efforts focusing on factors that facilitate effective guardianship behaviour (Hollis, Fenimore, Caballero, & Hankhouse, 2018; Hollis-Peel, Reynald & Welsh, 2012; Hollis-Peel & Welsh, 2014; Moir, Hart, Reynald, & Stewart, 2018; Moir, Stewart, Reynald, & Hart, 2017; Reynald, 2009, 2011). Many of these efforts are informed by Reynald's (2009) "Guardianship in Action" (GIA) model.

The GIA model is included in an observational protocol intended to measure three distinct guardianship behaviours: whether a potential guardian is *available*, *supervising* their surroundings, and *intervenes* when they witness something unusual or suspicious (Reynald, 2009). To identify context-specific correlates to guardianship in action, the GIA protocol has been used in studies in The Hague in the Netherlands (Reynald, 2009; 2011), Boston, Massachusetts (Hollis-Peel et al., 2012; Hollis-Peel & Welsh, 2014), and Waco, Texas (Hollis et al., 2018). Similar research has also been undertaken recently in low-crime suburban neighbourhoods of Brisbane, Australia (Moir et al., 2018; Moir et al., 2017).

Suburban communities generally experience less crime than urban and inner-city neighbourhoods (Morgan & Kena, 2018), but it is unclear whether potential guardians' availability, capacity, and willingness to respond to crime in these areas also varies. For this reason, the current investigation was undertaken with three aims. First, this paper examines results from GIA studies conducted in The Netherlands, the U.S., and Australia to identify and describe how guardianship behaviours vary between suburban, rural, and urban

neighbourhoods. Second, the current study also identifies specific physical and situational characteristics of Brisbane suburban neighbourhoods correlated with residents' guardianship intensity. Finally, we test the hypothesis that guardianship intensity differs based on a type of housing unique to Brisbane suburban neighbourhoods – the Queenslander.

Guardianship

Ordinary citizens have long been recognised as a powerful tool in the fight against crime (Cohen & Felson, 1979; Reynald, 2009; Rosenbaum, 1988; Sampson et al., 1997). Residents can help to prevent crime by supervising their surroundings, monitoring other adults and children on the street, confronting people when unacceptable behaviour occurs, and act against community problems (Reynald, 2009, 2011; Rosenbaum, 1988; Sampson et al., 1997; Warner 2007). When community members act as guardians, opportunities for crime can be reduced (Sampson et al., 1997). A substantive body of research supports this claim, suggesting that low informal social control is associated with high crime rates (e.g., Morenoff et al., 2001; Sampson et al., 1997; Weisburd et al., 2014). Warner (2007) further explains that differences in crime can be primarily attributed to residents' ability and willingness to act as crime fighters in their area.

Looking specifically at the routine activity approach, guardianship was originally defined as the supervision over a specific space or person that could prevent crime from occurring (Cohen & Felson, 1979). Recently this definition has been reappraised to “the presence of a human elements which acts – whether intentionally or not – to deter the would-be offender from committing a crime against an available target” (Hollis-Peel, Felson, & Welsh, 2013, p. 76). While informal social control implies intent in controlling criminal activities in an area, guardianship is a behaviour that can occur both deliberately or passively (Moir et al., 2018). Overall, the key idea behind guardianship is that when guardians are

available and capable, offender's perceptions of risks are increased, discouraging them from crime (Hollis-Peel et al., 2013).

To test the relationship between guardianship and crime, studies have traditionally used secondary measures that approximate levels of household availability from large crime or victimisation surveys (Hollis-Peel et al., 2013; Hollis-Peel et al., 2011; Reynald & Elffers, 2015). While earlier research has made important contributions in understanding the link between guardianship and victimization, traditional measures equate guardianship to availability at home and do not measure two critical active components of capable guardianship: supervision and intervention (Reynald, 2009). For instance, Reynald and Elffers (2015) found that measures commonly used in guardianship research (e.g., the number of household members) do not accurately represent the extent to which Dutch residents supervise their surroundings. Consequently, Reynald's (2009) GIA extends prior research by accomplishing two things: (a) observing levels guardianship intensity of residents in real time, and (b) exploring contextual factors that are associated with guardianship intensity. While guardianship holds a critical role in crime prevention, only a handful of studies have explored factors that facilitate this behaviour by residents (Hollis-Peel et al., 2012; Moir et al., 2018; Reynald, 2009, 2010, 2011).

Guardianship In Action (GIA)

Reynald's (2009) GIA model is comprised of the three observable actions of guardianship intensity: (a) availability, (b) supervision, and (c) intervention. The GIA model begins with the *invisible guardian stage*, where there is no observable visible guardian present on the property. Guardians that are not visible are inadequate in effectively discouraging offenders. This is based on the premise that when there is an observable lack of occupancy, offenders may perceive risks to be lower as no one is presently around to see or stop them (Nee & Taylor, 2000). The *availability stage* follows, where a guardian is present and visible but may not be

capable or motivated to supervise their surroundings. While visibly being at home can deter some offenders (Nee & Meenaghan, 2006), prior research has shown that being at home does not mean a resident is watchful over their surroundings (Moir et al, 2018; Reynald & Elffers, 2015). Further, residents may be home but not capable of guardianship as they may be pre-occupied with other activities (including sleeping), have impeded views to the street, or believe supervision is unnecessary (Moir, Reynald, Hart & Stewart, 2019; Nee & Meenaghan, 2006).

The following step is the *capable guardian stage*, where residents are visible and supervise their surroundings. Supervision can be a deliberate action residents consciously engage in, something that occurs passively because of where a resident is situated on their property, or in response to something unusual occurring in their surroundings (Moir et al., 2018). Further, certain individual and neighbourhood characteristics can increase the willingness of residents to protect their area (Reynald 2011; Reynald & Moir, 2018). The final step of the model (*intervening stage*) is where guardians intervene either directly by approaching the person/s involved or indirectly through calling the police, neighbours, or others for help. Intervention can happen before a crime occurs by questioning a person who may look suspicious, or during a crime in the hopes of disrupting it. Several factors, including the guardian's own perceptions of safety and strength, can influence when and how they intervene (Reynald, 2011). In this way, opportunities for crime are dependent on what offender's observe and their perceptions of a situation and on the capability and perceptions of guardians.

Reynald (2009) first directly observed guardianship from 814 properties in The Hague. The GIA observational protocol measured a number of physical, spatial, and social factors of properties and street segments to examine aspects associated with guardianship intensity at the property level. Property factors included guardianship intensity and defensible space features (i.e., territorial definition, surveillance opportunities, and image/maintenance), while at the street level, social interaction between residents and activity levels were measured¹. Results

showed that 15% of residents were visible, 14% supervised their surroundings, and 9% intervened with the observer. Further, guardianship intensity was significantly and positively correlated with surveillance opportunities, image/maintenance, and social interaction at the property level. Conversely, territorial definition was found to be negatively correlated with guardianship intensity.

Replication studies using the same protocol explored these characteristics and their relationship to guardianship intensity from observing 888 properties in Boston (Hollis-Peel et al., 2012; Hollis-Peel & Welsh, 2014). Like The Hague, results from Boston demonstrated that surveillance opportunities and image/maintenance were positively correlated with guardianship intensity at the property level, whereas territorial definition was negatively correlated. Levels of availability were higher in Boston than in The Hague (75% vs 15%, respectively), however, supervision and intervention by Boston residents was much lower, demonstrating the importance of context in understanding guardianship patterns.

Reynald (2011) also conducted a larger study of 2,847 properties across 21 neighbourhoods in The Hague to examine the physical, situational, and socio-demographic correlates of guardianship intensity. This study used extended measurements of territoriality and image/maintenance and examined the correlates at the street level (instead of property level)². Results showed that territoriality, surveillance opportunities, image/maintenance, and social interaction were positively correlated with guardianship intensity at the street level, while activity levels were negatively correlated. So far, this is the only GIA study that included socio-demographic characteristics in analyses and found that home-ownership and single-family dwellings were associated with higher levels of guardianship on street segments, while ethnic heterogeneity and residential mobility were associated with lower guardianship levels.

The most recent work in this area have examined levels of guardianship intensity in suburban and rural areas of Brisbane (Moir et al., 2017) and Waco (Hollis et al., 2018). In

Brisbane, approximately 7% of residents monitored and approximately half (48%) of those who were actively monitoring intervened with the observer on their streets. Conversely, in Waco, while the proportion of residents monitoring was higher (15%), it seems residents were reticent to intervene, with approximately only 6% of monitors going on to intervene with the study's observers.

Guardianship and context

Crime prevention efforts undertaken by citizens vary across places due to differences in local contexts, social features and norms, and opportunities provided by the environment (Reynald 2014; Weisburd, Groff & Yang, 2012). Physical and social features including housing design, land use, accessibility, and social ties have all been associated with crime control action by residents (Hollis-Peel et al., 2012; Reynald, 2009, 2011; Sampson et al., 1997; Taylor, Koons, Kurtz, Greene & Perkins, 1995; Warner, 2007). Collectively, results from the GIA studies provide important insights about context and guardianship.

In The Hague and Boston, crime was lowest at places where residents were available, monitored, and intervened (Hollis-Peel & Welsh, 2014; Reynald, 2009; 2011). However, in less urban contexts such as Brisbane and Waco, guardianship was found to be higher in high crime areas (Hollis et al., 2018; Moir et al., 2017). It is speculated that guarding against crime may operate differently in these contexts due to lower population density, social relationships, and perceptions of safety.

Further, differences in how contextual factors related to each other were observed across study sites (Reynald, 2009; Hollis-Peel et al., 2012). The primary difference between results related to the association between guardianship intensity and social interaction between residents. In The Hague, for example, social interaction emerged as a significant, positive correlate of guardianship intensity; however, in Boston, no social interactions were observed

across the 888 observations. Differences in the spatial and social structures of cities and residents' routine activities could be responsible for divergent results (Hollis-Peel et al., 2012).

Brisbane has some critical differences from sites of prior GIA studies that could have implications for guardianship. First, Brisbane is a relatively low-crime city. While direct comparisons between crime rates across countries are crude due to reporting differences, data indicate that Boston and Waco have violent crime rates roughly 2-8 times higher than Brisbane, and property crime in the Netherlands is approximately 1.7 times higher than Brisbane (Federal Bureau of Investigation, 2016; Queensland Police Service, 2015; United Nations Office on Drugs and Crime, 2014).

Second, Queensland (where Brisbane is the capital city) has a vernacular housing style called "Queenslanders", developed for the subtropical climate (see Figure 1). Queenslanders are characterised by high-settings on stilts, with wide verandahs surrounding the outside of the property (Fisher & Crozier, 1994). Due to their height and front verandahs, Queenslander could potentially provide better opportunities for guardianship through unobstructed views to the street that make it easier for other neighbours to identify when something suspicious occurs. Further, unlike the terraced housing and apartments common in The Hague and Boston (ACCESS, 2016; National Multifamily Housing Council, 2014), 80% of houses in Brisbane are singular detached homes (Australian Bureau of Statistics, 2011a). Row housing (compared to detached housing) may enhance monitoring by residents through clear visibility to the street (Reynald, 2011). However, high-density housing may hinder guardianship through limited social relationships and higher anonymity (Roncek, 1981).

INSERT FIGURE 1 HERE

Third, the layout and structure of suburban areas differ from urban cities on a number of key characteristics: transport systems, street networks, land-use, population density, and population transience (Brantingham & Brantingham, 1995; Gill, Wooditch, & Weisburd,

2017). These features affect the routine activities of individuals and can increase the difficulty for residents to act as effective guardians (Reynald, 2011).

Exploring how guardianship operates in a different environment has important implications for theory and practice and adds to the developing field of guardianship research. First, it allows us to test whether the routine activity theory and explanation of guardianship holds across contexts, and second, if the factors that support or inhibit this behaviour are different within a unique Australian suburban environment (Hollis-Peel & Welsh, 2014). As such, this study poses these research questions:

1. In what ways does guardianship intensity within Brisbane suburbs differ from guardianship intensity in The Hague, Boston, and Waco; and in what ways is it similar?
2. Are *property-level* characteristics of suburban Brisbane neighbourhoods associated with guardianship intensity?
 - a. Is guardianship intensity associated with living in a Queensland?
3. Are *street-level* characteristics of suburban Brisbane neighbourhoods associated with guardianship intensity?

Data and Methodology

Brisbane, Australia is divided into 137 Statistical Area Level 2s (SA2)³, which were used as the initial sampling frame. As Reynald (2011) found associations between socio-demographic characteristics and guardianship intensity, properties included in the current study were chosen from two SA2s with similar socio-demographic profiles. Conjunctive Analysis of Case Configurations (CACC; Miethe, Hart, & Regoeczi, 2008) was used to develop demographic profiles of neighbourhoods for the sample selection process.

Neighbourhoods were matched on the following demographic characteristics in the CACC: (a) population growth, (b) disadvantage, (c) ethnic presence, (d) household composition, (e) residential mobility, and (f) potential offenders. Population growth was

measured by the percentage change over a 10-year period using Annual Population Estimates from 2003-2012 (Australian Bureau of Statistics, 2013a). Next, levels of disadvantage were measured using the Index of Relative Socio-Economic Advantage and Disadvantage from 2011 (Australian Bureau of Statistics, 2011c). Brisbane has generally low levels of disadvantage. Out of the 137 SA2s in the initial sampling frame, 11 recorded SEIFA scores below the national average. Data from the 2011 Australian Census was used for the remaining four factors (Australian Bureau of Statistics, 2011b). Ethnic presence was calculated using the proportion of residents that speak another language other than English at home. As the Australian Census does not include racial or ethnic identifiers (apart from Indigenous status) this was believed to be the closest variable to reflect ethnicity. Household composition was measured by the proportion of family households (a household where two or more people who are domestically related usually reside). The percentage of people who lived at a different address five years ago was used to measure residential mobility. Lastly, in order to partially control for the crime rate in each area, a measure that included the proportion of potential offenders was included, operationalised as the percentage of 10-20 year-old males living in each SA2.

CACC was used to match neighbourhoods for the sample-selection process, which considered all possible combinations of demographic variables' attributes simultaneously⁴. Because CACC requires categorical variables, demographic measures were split into quartiles and used to differentiate SA2s that were "lower-than-average" (i.e., lowest 25%), "higher-than-average" (i.e., highest 25%), and "average" (i.e., the middle 50%) relative to all SA2s in Brisbane. A total of 2,187 unique socio-demographic profiles were possible ($3^7 = 2,187$), however, based on the CACC results, only 99 unique profiles were observed in Brisbane. Two SA2s from the most common configuration were selected. These SA2s recorded low levels of potential offenders and average levels of the remaining five demographic characteristics. From these two SA2s, stratified random sampling was used to select 24 street segments – 12 from

each suburb. These sample procedures resulted in a final sample of 279 properties. In the final sample of 279 properties, 85% had not experienced any type of property crime in the 3-year period. Roughly 10% were victimised once, with one property experiencing a maximum of seven property offences across the 3-year period.

Observational Instrument and Variables

Observations were completed at 279 properties in Brisbane in July and August, 2014 during daylight hours, on weekdays and weekends. Four observers were trained in a similar manner to the observers from The Hague study (Reynald, 2009). All observers were Caucasian, in their early-to-mid-twenties, three were female, and all wore casual clothing while conducting observations. Observations were recorded electronically using the iSurvey application on iPads. Observers arrived at the street segment and walked from one end to the other to potentially alert residents to their presence, following prior GIA study procedure (Reynald, 2009).

Spatial and social street level characteristics were rated first, followed by the physical and guardianship ratings of each property on the street. Observers stood directly outside a house on either the footpath or the street, and carried identification and information sheets for residents if they intervened and questioned them. For safety reasons, two observers were required on each street segment for observations and the local police station was notified prior to data collection. Overall, inter-rater reliability showed good consistency in observer ratings across property and street level observations ($\alpha = .77$).

As routine activities differ depending on the time of day and day of week (Felson & Poulsen, 2003) each property and street was observed four times: weekday morning, weekday afternoon, weekend morning, weekend afternoon (see Moir et al., 2017). As guardianship intensity and activity levels are dynamic behaviours, they were recorded at each observation (i.e., 1113 times). The four scores were then averaged so each property had one score on these

measures and the sample for analyses remained 279. As physical characteristics of properties and spatial characteristics of streets are static (e.g., the height of a fence is unlikely to change across the observation period), they were only recorded on the first observation (i.e., 279 times).

Guardianship in action

Guardianship intensity was measured using the stages of guardianship intensity developed by Reynald (2009). Additionally, a separate indicator for non-visual occupancy was used for the first time in the current study. Each property was rated from 0 to 4, as such:

- (0) Invisible: no evidence the property is occupied
- (1) Non-visual occupancy: non-visual cues the property is occupied (i.e., observer could hear sound coming from the property or a door was open)
- (2) Visual occupancy: visible evidence the property is occupied
- (3) Monitoring: resident(s) monitored observers or carried out general surveillance of their surroundings
- (4) Direct intervention: resident(s) approached observers during observations and questioned their presence

When a person was observed to be at home, monitoring, and intervened with the observer, this property received the highest possible score for guardianship intensity (4). For current analyses, the average guardianship intensity score across four observations was used. On average, properties observed in the current study scored a 0.7 ($SD = 0.6$) on guardianship intensity (Table 1).

INSERT TABLE 1 HERE

Property-level characteristics

In addition to guardianship intensity, physical features of each property were measured. Due to the heterogeneity of housing design in suburban Brisbane, physical features of properties were measured and computed differently in the current study. Territoriality was measured by the number of signs of ownership associated with a property. Four indicators were used: (a) decorations, (b) property signs, (c) whether the resident had gardened or landscaped the front of their property, and (d) outdoor seating. Each was coded either “Present” (1) or “Absent” (0) and combined into an additive scale. Properties’ territoriality scores ranged from 0 to 4, with an average score of 1.7 ($SD = 0.8$). Only seven properties did not have any of the observed territoriality variables present.

Unlike urban areas of European and North American, property fencing is common in Australian suburbs (Poyner & Webb, 1991). In the current sample, 86% of properties had some form of physical barrier. As a result, barriers in the current study were measured separately from territoriality, unlike previous GIA studies (Hollis-Peel et al., 2012; Reynald 2009; 2011). The barriers variable used in the current study is an 9-category, ordinal-level measure. The categories range from 0 = “No barrier” to 8 = “High, non-transparent, full-barrier”. On average, properties observed in the current study scored a 3.3 ($SD = 2.4$) on the barriers measure.

Due to differences in housing design, surveillance opportunities were also measured differently in the present study. In Brisbane, generally houses are unique builds, have sight obstructions through landscaping and fencing, and have several windows (i.e., 45% of the sampled properties had more than 10 windows). As a result, measuring the level of surveillance from each window on a 4-point scale (as was the protocol used in previous GIA studies) proved unreliable during piloting. Therefore, in the current study, surveillance opportunities were measured by the number of visible windows on each property from the street. Surveillance opportunity scores ranged from 0 to 36 ($M = 10.2$, $SD = 4.9$).

Four characteristics were observed at each property to measure image maintenance. Litter and trash were observed as present (0) or absent (1). Property and garden condition were rated either well maintained (1) or poorly maintained (0). Properties needed to have a minimum of two maintenance issues to be rated as poorly maintained (e.g., peeling paint, rusting steps, rusting roof, broken tiles, broken fencing etc.). Scores were added so that a higher score reflected a better maintained property (from 0-4). On average, properties were well looked after ($M = 3.5$, $SD = 0.9$).

Target hardening was measured by the number of security features present on each property. Five security measures were counted as present (1) or absent (0) if they were observed: alarm, security windows, security doors, lock on front gate, and dog/s. The presence of louvre windows was also measured and unique to this study. This variable was reverse coded (i.e., 0 = “Yes”, 1 = “No”), as previous Brisbane-based research indicated that burglars target houses with these windows as they are easier to break into (Macintyre, 2001). A high score reflected a more secure property. On average, target hardening scores ranged from 0 to 5 ($M = 2.2$, $SD = 1.2$).

Reynald’s (2009) GIA observational protocol was adapted after piloting due to structural differences in housing design. These changes resulted in the addition of variables designed to measure the vernacular “Queenslander” housing style. In the current study, properties were observed to be either a “Queenslander” or not (0 = “No” and 1 = “Yes”). Overall, approximately one-third of the houses observed in the current study were Queenslanders.

Street-level characteristics

Four variables measured the spatial and social context of each street segment: accessibility, street functionality, number of pedestrians, and number of vehicles. Accessibility was measured by two indicators: the number of turns onto the street ($M = 4.2$, $SD = 0.8$) and

the number of traffic lanes ($M = 2.1$, $SD = 0.4$). In the current study, on average, street segments received a score of 6.3 ($SD = 1.2$) on accessibility.

Street functionality was a unique measure to this study and was computed by counting the number of three characteristics on each street segment: (a) the number of public transport stops, (b) the number of street lights, and (c) the number of sidewalks. It is argued that the inclusion of these variables into a street segment eases public access and influences in the routine activities of the street, which can affect guardianship and crime (Armitage, 2013; Bernasco, 2006). On average, street segments observed in the current study received a score of 4.4 ($SD = 3.6$) on functionality.

Finally, two types of activity were measured and included independently in the analyses: pedestrian traffic and vehicular traffic. Types of activity were also not added together as was done in previous GIA studies, as they did not make a reliable scale – likely due to the low levels of pedestrians observed over the study period ($n = 67$). Both were measured based on a three-minute timed observation interval similar to Reynald's (2009) approach. For each street segment, the amount of pedestrian ($M = 0.7$, $SD = 0.7$) and vehicular traffic ($M = 11.0$, $SD = 17.7$) for each observation was averaged. The number of cyclists ($n = 7$) and social interactions ($n = 9$) were rare and therefore not included in analyses.

Results

This study aimed to compare levels of guardianship intensity across contexts, and to uncover what spatial and physical factors correlated with guardianship intensity in the suburbs of Brisbane, and if this differs from prior GIA studies.

Cross-National Comparisons

Our initial research question focuses on similarities and differences between guardianship intensity observed across studies conducted in The Hague, Boston, Waco, and Brisbane and results are shown in Table 2. Several noteworthy findings emerge from these

comparisons. First, levels of available residents between studies are substantively different, but are highest in both the U.S. studies (75% in Boston and 41% in Waco). Second, however, is even when availability was high, active guardianship was not. For example, The Hague recorded the lowest availability rate by residents, but 90% of those who were home monitored the street (13.7% out of 15%), compared with approximately 11% of available Boston residents. Waco and Brisbane had fairly similar rates of monitoring by available residents of between 37% and 28%, respectively. Third, Dutch residents appear to be more likely to intervene with the study observers than in the three other locations. Almost two-thirds of residents who monitored intervened in The Hague (9.0% out of 13.7%). This figure was approximately 30% in Boston and about half in Brisbane residents. Waco residents very rarely intervened (approximately 6% of monitoring residents intervened). Overall, while U.S. residents were often home, this did not make them very astute guardians.

INSERT TABLE 2 HERE

Property-Level Correlates to Guardianship Intensity

To address our second research question, correlational analysis was conducted to identify what property-level characteristics were statistically associated with guardianship intensity. Due to violations of normality on several variables, Spearman's rho (r_s) was used. Results are presented in Table 3.

INSERT TABLE 3 HERE

Findings show that less than half of the property-level characteristics observed in the current study are correlated with guardianship intensity. Among those that are associated, we observed a significant positive relationship between guardianship intensity and territoriality ($r_s = .17$, $N = 276$, $p = .006$). Surveillance opportunities and guardianship intensity was also significantly correlated ($r_s = .15$, $N = 276$, $p = .011$). These results indicate that as territoriality and surveillance opportunities increase, so does guardianship intensity. As theoretically

suggested, residents that define their property as private and show ownership are more likely to act as guardians over their space. Further, territoriality included the presence of outdoor seating, which provides a resident space to monitor from the front of their house to the street. Surveillance opportunities are critical in allowing residents to monitor outside, to see who is on their street, and what is happening in their surroundings (Armitage, 2013). This is evident in our results that show an inverse significant association between surveillance opportunities and barriers that surrounded a property ($r_s = -.19, N = 275, p = .002$).

Effect of Living in a Queenslander

We also set forth to determine whether housing type (i.e., Queenslander vs non-Queenslander) was related to guardianship intensity using a chi-square test for independence. Guardianship intensity was transformed into a categorical variable with two categories: no guardianship (63%) and some level of guardianship observed (37%) and compared with whether or not the property was a Queenslander. Results are presented in Table 4 and show no significant differences in guardianship intensity across housing type ($\chi^2(1, N = 276) = .057, p = .812$).

INSERT TABLE 4 HERE

Street-Level Correlates to Guardianship Intensity

Our third and final research question focused on whether street-level characteristics of Brisbane suburbs were correlated with guardianship intensity. As presented in Table 5, our results indicate that accessibility is the only characteristic of suburban streets that was significantly associated guardianship intensity ($r_s = -.19, N = 277, p < .001$). Streets that were more accessible had a significantly higher number of pedestrian ($r_s = .19, N = 277, p < .001$) and vehicular traffic ($r_s = .26, N = 277, p < .001$), thereby potentially making the ability to detect unfamiliar people and suspicious events harder (Reynald, 2011). Further analyses identified that properties on streets with more accessibility tended to have higher, less

transparent, and full perimeter barriers ($r_s = .16$, $N = 277$, $p = .010$), impeding the ability to monitor the street effectively.

INSERT TABLE 5 HERE

Discussion

This study was the first to examine guardianship intensity in Australian suburbs. Observations of properties and street segments were used to examine guardianship intensity by residents and uncover the physical and spatial factors that correlate with this behaviour in a suburban context. Differences in guardianship intensity were found between Australian residents, compared to Dutch and American studies (Hollis et al., 2018; Hollis-Peel et al., 2012; Reynald, 2009), highlighting the important of context in understanding crime control behaviour.

The Brisbane suburbs served as a unique context that had important implications for how physical and spatial factors were operationalized and measured. Due to differences in activity, housing, and street design, a few factors were measured differently – particularly surveillance opportunities and territoriality. However, three important conclusions can be reached by comparing results of the current study with prior GIA work. First, regardless of the different context and operationalizations, key results hold across place. While significant differences in housing design were apparent in Brisbane, surveillance opportunities emerged as a universal factor that facilitated guardianship intensity in each GIA study. This result has important implications for housing design to ensure that houses and street segments are designed in a way to maximise surveillance opportunities for residents to engage in supervision and control crime in their surroundings (see Armitage, 2013).

Second, given the results of the current study, it appears that the context of place is critical in understanding how guardianship functions and how mechanisms in space support it. It is suggested that routine activities and physical structures differed and therefore impacted

guardianship intensity differently across studies. For instance, levels of pedestrians and cyclists were much lower in an Australian suburban site. Further, different patterns of guardianship intensity emerged in each context. Comparatively, The Hague had much higher rates of monitoring and intervention by available residents, and although Boston had a much higher level of occupancy (75%), it recorded the lowest levels of monitoring and intervention by residents. In a relatively low crime environment such as Brisbane suburbs, residents may not have felt the need to be vigilant about monitoring their surroundings. Moir et al. (2018) found that some suburban residents did not feel the need to actively guard their surroundings as they felt their area was safe. However, data from the current study suggest that when Brisbane residents did see someone unusual outside their property, they were much more likely to directly intervene with the observer comparative to the two U.S. studies. Further, differences in housing design could have made Dutch residents' ability of identifying and observing unfamiliar people outside of their homes easier and therefore facilitated higher levels of guardianship.

Third, unlike prior work, guardianship intensity was not related to property crime in this study. The absence of a relationship between guardianship and crime in Brisbane could be a function of two elements: (a) the context – comparatively, Brisbane is a low crime city, and even the “high” crime suburb had a relatively low crime rate, and (b) the sampling strategy used in this study differed from prior GIA studies. Suburb selection in this study controlled for factors known to affect guardianship and crime. Regardless, an important insight from the current study was that crime is not the only factor that explains guardianship behaviour, and this has important implications for future research. Future studies would benefit from focusing on the mechanisms between the environment, residents, and their guardianship behaviour. Interviews with active guardians could provide insights into this avenue to understand why, and under what conditions residents engage in supervision over their surroundings.

Other avenues for future research include investigating guardianship in vertical spaces such as high-density apartment blocks. Growth in Australia's capital cities has seen a 78% increase in the number of occupied apartments in the last 25 years (Australian Bureau of Statistics, 2016). The physical and social context could affect how residents guard and feel responsible for controlling crime in a high-rise building (Newman, 1972). Further, the role guardianship plays in preventing interpersonal crimes can be extended further beyond sexual abuse and cybercrime (Reynald, Moir, Cook & Vakhitova, 2018). The role of guardianship against different crime types could provide important insights into what types of situations guardianship is most effective.

It is important to acknowledge differences in operationalisations between this study prior GIA work. Attempts to create reliable scale measures for a number of variables using Reynald's (2009) original protocol failed due to differences in the suburban context and issues with housing design, the number of windows present on each house, and fencing. The surveillance measure in this study only measured the quantity of windows (not the quality of visibility). Further, in this study territoriality did not include the presence of fencing/barriers as they did not operate well together in one scale. This could be due to differences in how properties territories are defined across the three studies. While fencing is not common on terrace housing in Europe or North America (Poyner & Webb, 1991), approximately 86% of observed properties in Brisbane had some type of fencing. The conceptualization of territoriality remains problematic in research more generally (Ekblom, 2011). As a result of different housing styles in suburban Brisbane, what constitutes territoriality may differ. While this study used cruder measurements for surveillance and territoriality, it does highlight the importance of understanding differences in housing design when measuring physical and spatial factors in a different context (Peeters, 2013).

The main limitation of this study relates to the sample size (i.e., 279 properties across 24 street segments). The sample is considerably smaller than prior GIA studies and may not be representative of other high-density and disadvantaged cities. Further, all observers were young, white, wore casual clothing, and stood on the sidewalk or the street. Observers were not allowed to attempt to gain access to properties and did not engage in behaviours that may be perceived as potentially criminal (e.g., look into cars for valuables, rummage through letterboxes). As a result, it is possible that residents did not perceive the observers to be a threat and felt no need to question and intervene with the observers. Resident responses could differ if they saw an actual crime occurring.

To conclude, despite its limitations, this study was the first to examine guardianship intensity and physio-spatial correlates in an Australian suburban environment. Differences in guardianship intensity patterns and environmental correlates of guardianship by residents across GIA studies highlight the influence of different spatial environments and how this can affect guardianship. Importantly, surveillance was the one factor found to affect guardianship in the same way regardless of context, providing a key policy implication around housing design and opportunities for surveillance. Implications for theory are also apparent. Foremost is the confirmation that while guardianship may function in similar ways across contexts, there are also key underlying mechanisms that may also be distinct in different places. Future research could delve into the motivations and causal factors of suburban guardianship to understand what factors are important in their supervision habits and how this behaviour can be enhanced in residential areas. In understanding the universal and unique contributors of guardianship in different contexts, and investigating the factors that motivate residents to act as guardians, best-practice initiatives to foster residential guardianship can be designed and implemented as methods to prevent crime and make suburban communities safer.

Endnotes

¹ In Reynald (2009), territorial definition was measured using four key indicators: (a) the height, extent, and transparency of physical barriers, (b) presence of outdoor seating, (c) size of front garden, and (d) private landscaping including the use of decorations and property signs. A 4-point scale was used to measure the extent to which the view from property windows was obstructed to form the measurement of surveillance opportunities. Image/maintenance was measured using three indicators: (a) presence of graffiti, (b) state of disrepair including presence of litter, paint/repairs were needed, and garden condition, and (c) presence of broken lights or windows. Street level characteristics observed whether social interaction between residents was observed, and the flow of pedestrians, cyclists, and traffic per 3-minute interval.

² Reynald (2011) used different measurements of key variables compared to Reynald (2009) and examined the correlates at the street level (instead of property level). Territoriality was measured using seven indicators: (a) presence of outdoor seating, (b) height of barrier, (c) extent of barrier, (d) private landscaping, (e) presence of decorations, (f) presence of property signs/nameplates, and (g) size of front yard. The measurement of image/maintenance was extended to four indicators including: (a) presence of graffiti, (b) state of disrepair, (c) presence of broken lights/windows, and (d) presence of litter. Target hardening was also included in this study and measured whether gates, doors, and windows were open and whether security bars and alarm systems were present. Surveillance opportunities, activity levels, and social interaction were measured consistent with prior work (Reynald, 2009).

³ The Australian Statistical Geographical Standard (ASGS) is the Australian Bureau of Statistics' geographical framework (Australian Bureau of Statistics, 2013b), but does not define suburbs. Instead, they use a hierarchical system of Statistical Area Level 4's to Statistical Area Level 1's. SA2s are the closest approximation of suburbs and are "general purpose medium sized areas" that interact socially and economically, and generally have populations of 3,000-25,000 residents (average 10,000). The initial sampling frame included five SA4s: Brisbane North, Brisbane East, Brisbane South, Brisbane West, and Brisbane Inner City, which collectively consist of 137 SA2s.

⁴ For a detailed description of the CACC technique, please see Hart (2014), Miethe et al. (2008), and Hart, Rennison, and Miethe (2017).

Figure 1. Example of a Queenslander house.

Table 1. Descriptive statistics for all guardianship intensity, property-level and street-level characteristics of suburban neighbourhoods ($N = 279$)

Variables	<i>n</i>	Pct.	Min	Max	Mean	<i>SD</i>
Guardianship intensity			0	3.5	0.7	0.6
Invisible	700	62.9				
Non-visual occupancy	184	16.5				
Visual occupancy	107	9.6				
Monitored	82	7.4				
Intervened	40	3.6				
Property-level characteristics						
Territoriality			0	4	1.7	0.8
None	7	2.5				
Decorations	73	26.2				
Property signs	26	9.3				
Landscaping	264	94.6				
Outdoor seating	104	37.3				
Barriers			0	8	3.3	2.4
No barrier	38	13.6				
Low transparent partial	73	26.2				
Low non-transparent partial	0	0.0				
Low transparent full	4	1.4				
Low non-transparent full	78	28.0				
High transparent partial	25	9.0				
High non-transparent partial	34	12.2				
High transparent full	11	3.9				
High non-transparent full	14	5.0				
Surveillance opportunities			0	36	10.2	4.9
Image maintenance			0	4	3.5	0.9
No litter	230	82.4				
No trash	246	88.2				
Well maintained garden	228	81.7				
Well maintained property	258	92.5				
Target hardening			0	5	2.2	1.2
None	15	5.4				
Alarm	40	14.3				
Security windows	120	43.0				
Security doors	164	58.8				
Front gate lock	19	6.9				
Dog(s)	30	10.8				
No louvre windows	230	83.0				
Queenslander			0	1	0.32	0.5
No	187	67.8				
Yes	89	32.2				
Street-level characteristics						
Accessibility			5	10	6.3	1.2
Turns			3	6	4.2	0.8
Lanes			2	4	2.1	0.4
Street functionality			0	7	3.4	2.0
Transport stops			0	1	0.2	0.4

Street lights	0	4	2.4	1.0
Sidewalks	0	2	0.8	0.9
Average number of pedestrians	0	2.25	0.7	0.7
Average number of vehicles	0	57.5	11.0	17.7

Note: Guardianship intensity derived from a sample of 1113 observations, whereas characteristics of the neighbourhoods were derived from a sample of 279.

Table 2. International comparison of guardianship intensity in three cities.

Guardianship intensity	Percent of GIA in –			
	The Hague (<i>N</i> = 814)	Boston (<i>N</i> = 888)	Waco (<i>N</i> = 1702)	Brisbane (<i>N</i> = 1113)
Availability				
No	62.3	14.5	42.8	62.8
Yes	15.0	74.5	41.1	26.1
<i>Non-visible</i> <i>occupancy</i>	-	-		16.5
<i>Visible</i> <i>occupancy</i>	-	-		9.6
Monitoring	13.7	8.4	15.2	7.4
Intervention	9.0	2.5	0.9	3.6

Table 3. Property-level characteristics correlated with guardianship intensity.

Characteristics	GI	PC	TT	BR	SV	IM	TH
Guardianship intensity (GI)	1.0						
Property crime (PC)	.07	1.0					
Territoriality (TT)	.17**	.04	1.0				
Barriers (BR)	.05	-.07	-.03	1.0			
Surveillance (SV)	.15*	.02	.04	-.19**	1.0		
Image (IM)	0.9	-.01	.19**	-.07	.03	1.0	
Target hardening (TH)	0.4	-.02	.01	-.09	.11	.12*	1.0

* $p < .05$, ** $p < .001$.

Table 4. Cross-tabulation of house type and guardianship intensity.

Guardianship intensity	Queenslander		Total
	No	Yes	
Absent	117 (62.6%)	57 (64.0%)	174 (63.0%)
Present	70 (37.4%)	32 (36.0%)	102 (37.0%)
Total	187 (100%)	89 (100%)	276 (100%)

Note: $\chi^2(1, N = 276) = .057, p = .812$

Table 5. Street-level characteristics correlated with guardianship intensity.

Characteristics	GIA	AC	SF	PED	VEH
GIA	1.0				
Accessibility (AC)	-.19*	1.0			
Street features (SF)	-.00	.32**	1.0		
Pedestrians (PED)	-.03	.19**	.51**	1.0	
Vehicles (VEH)	-.09	.26**	.65**	.27**	1.0

* $p < .05$, ** $p < .001$.

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