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Title: Suspicious minds: Can features of the local neighbourhood ease parents' fears about stranger danger?

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Abstract: Declines in children's independent mobility are frequently attributed to parents' fears about stranger danger, yet there is limited understanding of the factors that might aggravate (or ease) these concerns. We examined the social and built environment correlates of parents': (1) fears about strangers harming their child; and (2) perceptions of the likelihood this would actually happen. We also tested whether associations differed by area socio-economic status (SES) as parents in low income neighbourhoods, typically with more crime, may hold greater fears for their children's safety. Results suggest that regardless of SES, neighbourhood features that encouraged pedestrians, whilst minimising vehicle traffic, were most conducive to parents perceiving a safer neighbourhood. The natural surveillance generated by a more walkable neighbourhood may help alleviate parents' fears about strangers.

Acknowledgements

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Professor Robert Gifford
Managing Editor
Journal of Environmental Psychology

Dear Professor Gifford,

Re: Suspicious minds: Can features of the local neighbourhood ease parents' fears about stranger danger?

We are pleased to resubmit our manuscript to Journal of Environmental Psychology.

We appreciate the opportunity to revise and resubmit the manuscript based on the feedback provided. While overall many of the reviewer's comments were very complimentary, several concepts required a clearer justification, and we have addressed these in the revision.

We are trust that the changes will meet with the reviewers' approval and are optimistic that our manuscript will now be acceptable for publication with Journal of Environmental Psychology.

As the corresponding author, please direct queries to me by email (sarah.foster@uwa.edu.au) or telephone (+618 6488 8730).

We look forward to hearing from you.

Yours sincerely,

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Response to reviewer comments: JEP-14-377

Suspicious minds: Can features of the local neighbourhood ease parents' fears about stranger danger?

Thank you for the opportunity to revise and resubmit the manuscript based on the feedback provided. We appreciate the time and effort of the reviewers, and thank them for their comments and constructive feedback. This document indicates how specific comments from each reviewer have been addressed. We trust that the changes will meet with the reviewers' approval and are optimistic that our manuscript will now be acceptable for publication with Journal of Environmental Psychology.

Reviewer #2

Overall this paper is well written, methodologically rigorous, and potentially important. I only have a few concerns.

The authors stratify their regression analyses by area SES. The authors must introduce and justify this strategy in the front of the paper. Why does this make theoretical or conceptual sense? Why do this? What is the contribution?

In response to the reviewers comment, we have expanded the background rationale to provide a clear justification for our hypothesis that parental fear might differ by SES, as follows:

Furthermore, the factors that impact parents' fears about strangers could differ according to area socio-economic status (SES). First, parents living in low income neighbourhoods are typically exposed to more crime (either directly or indirectly), less able to financially buffer themselves from the negative effects of crime (Hale, 1996), and may receive inadequate police protection (Hill & Angel, 2005). As a result, they may hold greater fears for their children's safety, or genuinely perceive them to be at greater risk. For instance, Kimbro and Schachter (2011) found higher levels of maternal fear among those living in more deprived neighbourhoods (Kimbrow & Schachter, 2011). Second, deprived neighbourhoods are often characterised by more physical disorder (e.g., litter, graffiti, vandalism) (Caughy, O'Campo, & Patterson, 2001; Foster, Giles-Corti, & Knuiman, 2011; Hill & Angel, 2005; Hill, Ross, & Angel, 2005; King, 2008; Lee, Booth, Reese-Smith, Regan, & Howard, 2005). While crime per se is often not visible, physical disorder provides a visual cue that signals the breakdown of social control (Skogan, 1990), which can inflame residents' fears and impede the formation of social ties (Ross & Jang, 2000; Sampson, Raudenbush, & Earls, 1997) and

social support (Hill, Burdette, Jokinen-Gordon, & Brailsford, 2013). Further, disorder tends to cluster near non-residential land-uses (e.g., shops, parks) (Perkins, Meeks, & Taylor, 1992), making these ‘third places’ less appealing destinations for local residents, and plausibly limiting their use for informal, opportunistic social interactions (Oldenburg & Brissett, 1982; Thompson & Kent, 2014) and social participation (Baum & Palmer, 2002; Wood, Giles-Corti, Zubrick, & Bulsara, 2013). Third, the type of local destinations and quality of public infrastructure in low and high income neighbourhoods may differ (Crawford et al., 2008; Hill & Angel, 2005; Macintyre, Macdonald, & Ellaway, 2008; Pearce, Witten, Hiscock, & Blakely, 2007). For instance, studies indicate there are more alcohol outlets in disadvantaged areas (Gorman, Speer, Gruenewald, & Labouvie, 2001; Pereira, Wood, Foster, & Haggard, 2013), in turn impacting the amenity of the local neighbourhood (Popova, Giesbrecht, Bekmuradov, & Patra, 2009). Thus, in low income areas, the confluence of crime and disorder, paired with the type and quality of local destinations, could aggravate safety concerns (page 3, paragraph 3).

In addition, we have expanded our aims to clarify the stratification, as follows:

Furthermore, we examined whether these associations differed by area socio-economic status, as exposure to crime and disorder, and the social and physical characteristics of the local environment may differ in low, medium and high SES neighbourhoods. Indeed, ultimately any strategies designed to alleviate parental fear may need to be tailored to these different settings (page 5, paragraph 1).

Finally, SES has been included in the model outlining the key study variables and hypothesised relationships.

The natural surveillance concept needs to be more thoroughly developed. As it stands, I don't find this concept convincing.

We have changed the background section to provide a clearer rationale for natural surveillance, including reference to the broader literature on the presence of other people and fear of crime, as follows:

Neighbourhood design also plays a role in promoting community safety and may similarly impact parental fear. Jacobs writes that a ‘well-used city street is apt to be a safe street’ and that to achieve this function, it requires a ‘substantial quantity of stores and public spaces sprinkled along the sidewalks’ (Jacobs, 1961)(p.36). This mix of local destinations can attract more people to the neighbourhood, which increases natural surveillance, and the additional ‘eyes on the street’ are

thought to help minimise crime and fear of crime (Jacobs, 1961). Indeed, the characteristics of the local neighbourhood that promote walking, such as retail land, have previously been associated with less fear of crime in adults (Foster et al., 2010; Foster, Wood, Knuiman, & Giles-Corti, 2013). In this scenario, the ‘strangers’ that are drawn to the area are interpreted as a source of safety or comfort rather than danger (Foster et al., 2010; Hillier, 2004). Numerous studies suggest that the presence of other people can limit fear of crime (Day, 1999; Jorgensen, Ellis, & Ruddell, 2012; Maruthaveeran & van den Bosch, 2014; Nasar & Jones, 1997; Vrij & Winkel, 1991) although any benefit may depend on whether these ‘others’ are viewed as legitimate users of the space (Day, 1999). However, it is unknown whether this connection between ‘eyes on the street’ and fear of crime also extends to parents’ fear of strangers. Can increases in natural surveillance reduce parents’ fear of strangers if each additional pair of ‘eyes’ is interpreted as yet another potential threat? (page 3, paragraph 2)

Figure 1 should represent area SES in some way. I don’t see the need to represent independent mobility. This concept is not measured in the present study.

As suggested, the figure has been amended to remove independent mobility and encompass SES. It now better represents the study and hypothesised relationships:

The data are so rich. I see so many options for interesting analyses. I would like to see if the objective neighborhood measures interact with the subjective neighborhood measures. For example, do media reports of violence amplify the effect of actual crime? Do perceptions of informal social control buffer against the effects of actual crime. The authors do not necessarily need to perform these analyses in this paper. I just find these analyses more interesting than the SES subgroups variations.

We appreciate the reviewer's suggestions for the other possible analyses using our data. While we have not changed the focus for the current manuscript, we will certainly consider these suggestions in future work.

These authors might consider reviewing and referencing the following papers:

Hill, Terrence, Catherine Ross, and Ronald Angel. 2005. "Neighborhood Disorder, Psychophysiological Distress, and Health." *Journal of Health and Social Behavior* 46:170-186.

Hill, Terrence and Ronald Angel. 2005. "Neighborhood Disorder, Psychological Distress, and Heavy Drinking." *Social Science & Medicine* 61:965-975.

Wen, Ming, Kathleen A. Cagney, and Christopher R. Browning. 2007. "A Multilevel Study of Neighborhood Environment and its Relationship to Physical Activity in Adulthood." *Urban Studies* 44: 1-18.

Burdette, Amy and Terrence Hill. 2008. "An Examination of Processes Linking Perceived Neighborhood Disorder and Obesity." *Social Science & Medicine* 67:38-46.

Nicholson, Lisa M. and Christopher R. Browning. 2012. "Racial and Ethnic Disparities in Obesity During the Transition to Adulthood: The Contingent and Nonlinear Impact of Neighborhood Disadvantage." *Journal of Youth and Adolescence* 41: 53-66.

Hill, Terrence, Amy Burdette, Hanna Jokinen-Gordon, and Jennifer Brailsford. 2013. "Neighborhood Disorder, Social Support, and Self-Esteem: Evidence from a Sample of Low-income Women Living in Three Cities." *City & Community* 12:380-395.

Thank you for these suggestions. We have reviewed the attached papers and now refer to the following papers in the manuscript:

- Hill, Terrence, Catherine Ross, and Ronald Angel. 2005. "Neighborhood Disorder, Psychophysiological Distress, and Health." *Journal of Health and Social Behavior* 46:170-186.
- Hill, Terrence and Ronald Angel. 2005. "Neighborhood Disorder, Psychological Distress, and Heavy Drinking." *Social Science & Medicine* 61:965-975.

- Hill, Terrence, Amy Burdette, Hanna Jokinen-Gordon, and Jennifer Brailsford. 2013. "Neighborhood Disorder, Social Support, and Self-Esteem: Evidence from a Sample of Low-income Women Living in Three Cities." *City & Community* 12:380-395.

Reviewer #3

This study is an important contributor to the body of knowledge related to children's independence. The study was carefully designed and organized, and I have no reservations about the methods or their implementation.

The author(s) may also wish to link their work to a related body of knowledge having to do with environments and fear more broadly. For instance, Kris Day conducted groundbreaking research 20 years ago about the physical features of urban college campuses that contributed to women's fear of sexual assault. The fear itself, she found, was as important as the carefully collected crime reports (which of course showed sexual assault rarely being perpetrated by strangers, and predominantly occurring in residence halls); the fear created by dense shrubbery and dark doorways kept women from using the amenities of the campus as freely as their male counterparts.

In sum, the research seems both sound and fruitful of future elaboration and extension.

Thank you for this suggestion. We have added a new paragraph to the discussion that links to the broader fear of crime literature and, in particular, the study by Kristen Day. This literature is has also been added to the background section (see response to Reviewer #2).

The themes that emerged from our study are largely consistent with previous research into environments and fear of crime (Day, 1999; Hale, 1996; Jorgensen et al., 2012; Nasar and Jones, 1997; Warr, 1990). For instance, Day's (1999) examination of the locations where female college students felt most and least fearful of sexual assault underscored the influence of 'strange people and places'. For the most part, familiar places and the presence of people were associated with lower fear, but this was largely contingent on whether the 'others' present were culturally and economically similar to the participant, or legitimate users of the space (Day, 1999). In our study the presence of people (and neighbourhood features theorised to attract people) also correlated with reduced parental fear. However, it is worth noting that we focused on the proximate (400m) neighbourhood, where participants are typically familiar with both the environment and the people, and therefore could be anticipated to feel relatively safe. Future research might explore the

nuances of the type of people and micro-characteristics of places that impact parental fear (page 12, paragraph 2).

Reviewer #4

This is an excellent paper and I only have a few comments. The topic of the paper is a timely one and is of concern to many parents, neighborhood planners, city officials and researchers. The paper is written very clearly and the quality of the language is unusual, particularly relative to many other papers I have read over the years. There is a very clear and thorough presentation of the literature relevant to the topic being studied, which of course will be very useful to other researchers.

The empirical study reported on is a large scale one and is an important one, because it includes in the one study objective and subjective variables, physical and social neighborhood variables and individual variables reflecting characteristics of the study participants. I am very happy to not have to comment that the actual characteristics of the neighborhoods are absent.

However, the large number of variables creates a problem in terms of how all of the results can be presented. At present, there are tables with much data in them, which are indeed necessary and important, but which make it hard to follow all of them. I would suggest putting the full tables at the end of the paper, as an appendix, and putting in the main body of the results section smaller tables that include only the information related to significant results that the author(s) should discuss.

We agree that the tables (in particular, Tables 3 and 4) contain a considerable amount of information. However, Table 3 is scattered with numerous significant findings, making it difficult to condense this table. In contrast, Table 4 contains fewer significant results, but changing this table would make it inconsistent with Table 3, and we believe this would add to (rather than lessen) any problems the reader has in following the tables. While we appreciate the reviewer's suggestion, we are conscious that the proposed changes may introduce new problems and have elected to leave the tables as they stand.

As an aside I wish to comment that under the topic of informal social control they have an item dealing with disrespect to an adult, which is an unusual item and would be interesting to have discussed somewhat.

The informal social control scale is thought to capture ‘adult solidarity’, whereby the community takes collective responsibility for ‘guiding’ local children (Furedi, 2008). The items comprising the informal social control scale were modified from Sampson et al. (Sampson, Raudenbush, & Earls, 1997) and this modified scale has been previously explored in relation to children’s independent mobility (Foster, Villanueva, Wood, Christian, & Giles-Corti, 2014).

The original (Sampson et al. 1997) items ask about the likelihood that neighbours could be counted on to intervene in the following ways: (1) children were skipping school and hanging out on the street corner; (2) children were spraying graffiti on a local building; (3) children were showing disrespect to an adult; (4) a fight broke out in front of their house and (5) the fire station closest to their home was threatened with budget cuts. This scale has been used extensively in previous research.

Our items were amended to better capture informal social control relating to both guiding and helping children when needed. However, the item highlighted by the reviewer (i.e., disrespect to an adult) was consistent to both the original scale (Sampson et al., 1997) and the one applied in our study.

On p. 12 at the beginning of the discussion there is a statement that parents assessments of risk were lower - [lower than what?]

We have amended this sentence to be clearer, as follows:

Consistent with other research (Tulloch, 2004) parents assessments of risk were generally lower than their fears, which could be substantial, demonstrating an awareness that the actual dangers posed by strangers for their children were small (Shutt et al., 2004) (page 10, paragraph 1).

The paragraph on page 14 on crime and the media is too long, relative to other issues discussed, and there are errors - it is nonetheless [concerning??]... on line 45 and the whole sentence is not clear at all, and then on line 57 there is the word advice that should be advise.

Thank you for highlighting these errors. We have shortened the paragraph as suggested:

In contrast, exposure to media coverage relating to stranger danger was consistently associated with both parental fear and perceived risk, regardless of SES. News reports of actual or attempted child abductions are often implicated in commentaries on the pervasiveness of parental fear and anxious parenting (Brussoni and Olsen, 2013; Furedi, 2008; Valentine and McKendrick, 1997),

however only a handful of studies have explicitly investigated this relationship, with most focusing on media over-reporting of child abductions and kidnappings (Martins and Wilson, 2011; Moscovitz and Duvall, 2011; Stokes, 2009; Taylor et al., 2013). Indeed, to our knowledge, this is the first study to empirically investigate the relationship between parental exposure to 'stranger danger' media and the fear of such an event happening to their child. Whilst not surprising, it is concerning that parents' consciousness of media relating to stranger danger appear to be mirrored in their perceptions that these incidents could occur. In turn, this could fuel the wider acceptance of an over protective parenting style that can stifle important facets of child development (Zubrick et al., 2010), and even transfer unfounded fears to children (Martins and Wilson, 2011). Although it is undoubtedly sensible to advise children about keeping safe when moving about their neighbourhood, an inflated emphasis on kidnappings and abductions can bring with it unintended consequences for children's social, emotional, and physical development (Martin and Wood, 2014) (page 13, paragraph 2).

The discussion of the limitations of the study is very important and very good. I recommend accepting the paper except for the few revisions that I noted in my review.

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Highlights

Parents' fear of strangers is implicated in children's declining independent mobility

There is limited awareness of the factors that shape parents' fears about strangers

We examined the correlates of parents' fear of strangers and perceptions of risk

Built environments that encouraged 'eyes on the street' correlated with lower fear

More walkable neighbourhoods may help alleviate parents' fears about strangers

Suspicious minds: Can features of the local neighbourhood ease parents' fears about stranger danger?

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Suspicious minds: Can features of the local neighbourhood ease parents’ fears about stranger danger?

Abstract

Declines in children’s independent mobility are frequently attributed to parents’ fears about stranger danger, yet there is limited understanding of the factors that might aggravate (or ease) these concerns. We examined the social and built environment correlates of parents’: (1) fears about strangers harming their child; and (2) perceptions of the likelihood this would actually happen. We also tested whether associations differed by area socio-economic status (SES) as parents in low income neighbourhoods, typically with more crime, may hold greater fears for their children’s safety. Results suggest that regardless of SES, neighbourhood features that encouraged pedestrians, whilst minimising vehicle traffic, were most conducive to parents perceiving a safer neighbourhood. The natural surveillance generated by a more walkable neighbourhood may help alleviate parents’ fears about strangers.

1. Introduction

Children's active transport (e.g., walking and cycling) and independent mobility (i.e., the freedom to actively travel without adult supervision) can increase their physical activity levels and enhance social and spatial development (Rissotto & Tonucci, 2002) – yet both behaviours have declined markedly in recent decades (Carver, Timperio, & Crawford, 2008; Harten & Olds, 2004; Hillman, Adams, & Whitelegg, 1990; McMillan, 2007; Pooley, Turnbull, & Adams, 2005; Salmon, Timperio, Cleland, & Venn, 2005). Reduced independent mobility is frequently attributed to heightened parental concerns about neighbourhood safety, particularly the dangers associated with traffic and strangers (Carver et al., 2008; Foster, Villanueva, Wood, Christian, & Giles-Corti, 2014; Prezza, Alparone, Cristallo, & Luigi, 2005). However, while evidence substantiates parental concerns about traffic (UNICEF, 2001), the threats posed by strangers appear to be overstated, and largely grounded in fear. For example, parents in a US study rated child abduction the 'greatest danger faced by primary school children' (Valentine, 1997, p.70), and Australian research found that 88% of parents of 5-6 year olds and 81% of parents of 10-12 year olds were concerned about strangers (Timperio, Crawford, Telford, & Salmon, 2004). These prevailing concerns are at odds with crime statistics, which indicate that abductions by the stereotypical stranger are 'extraordinarily rare' (Finkelhor & Ormrod, 2000; Shutt, Miller, Schreck, & Brown, 2004, p.32).

To date, research examining the factors that shape parental fear is relatively scant (Carver et al., 2008; McMillan, 2007). Prezza et al. (2005) developed a social danger perception scale, which was higher among mothers living in larger urban centres, and those with lower sense of community and higher fear of crime. This alignment between mothers' fear for their children and fear for themselves is perhaps unsurprising, with the authors noting that both 'can be seen as expressions of feelings of non-safety linked to one's own territory' (Prezza et al., 2005, p.448). Fear of crime is affected by a myriad of factors (e.g., victimisation, perceived vulnerability, social connections, neighbourhood disorder and upkeep) (Foster, Giles-Corti, & Knuiman, 2010; Hale, 1996), and there is some evidence that improvements to local aesthetics, maintenance and social cohesion could help reduce fear (Foster, Wood, Christian, Knuiman, & Giles-Corti, 2013). However, altruistic fears (i.e., fears for others) may be more entrenched, inflamed by parents' own

insecurities (Furedi, 2008; Warr, 1992) and amplified by the media (Prezza et al., 2005; Tulloch, 2004)

where the dominant message is that child abduction can happen anywhere and anytime (Glassner, 2009).

Neighbourhood design also plays a role in promoting community safety and may similarly impact parental

fear. Jacobs writes that a 'well-used city street is apt to be a safe street' and that to achieve this function, it

requires a 'substantial quantity of stores and public spaces sprinkled along the sidewalks' (Jacobs,

1961)(p.36). This mix of local destinations can attract more people to the neighbourhood, which increases

natural surveillance, and the additional 'eyes on the street' are thought to help minimise crime and fear of

crime (Jacobs, 1961). Indeed, the characteristics of the local neighbourhood that promote walking, such as

retail land, have previously been associated with less fear of crime in adults (Foster et al., 2010; Foster,

Wood, Knuiman, & Giles-Corti, 2013). In this scenario, the 'strangers' that are drawn to the area are

interpreted as a source of safety or comfort rather than danger (Foster et al., 2010; Hillier, 2004). Numerous

studies suggest that the presence of other people can limit fear of crime (Day, 1999; Jorgensen, Ellis, &

Ruddell, 2012; Maruthaveeran & van den Bosch, 2014; Nasar & Jones, 1997; Vrij & Winkel, 1991)

although any benefit may depend on whether these 'others' are viewed as legitimate users of the space (Day,

1999). However, it is unknown whether this connection between 'eyes on the street' and fear of crime also

extends to parents' fear of strangers. Can increases in natural surveillance reduce parents' fear of strangers

if each additional pair of 'eyes' is interpreted as yet another potential threat?

Furthermore, the factors that impact parents' fears about strangers could differ according to area socio-

economic status (SES). First, parents living in low income neighbourhoods are typically exposed to more

crime (either directly or indirectly), less able to financially buffer themselves from the negative effects of

crime (Hale, 1996), and may receive inadequate police protection (Hill & Angel, 2005). As a result, they

may hold greater fears for their children's safety, or genuinely perceive them to be at greater risk. For

instance, Kimbro and Schachter (2011) found higher levels of maternal fear among those living in more

deprived neighbourhoods (Kimbro & Schachter, 2011). Second, deprived neighbourhoods are often

characterised by more physical disorder (e.g., litter, graffiti, vandalism) (Caughy, O'Campo, & Patterson,

2001; Foster, Giles-Corti, & Knuiman, 2011; Hill, Ross, & Angel, 2005; King, 2008; Lee, Booth, Reese-

Smith, Regan, & Howard, 2005). While crime *per se* is often not visible, physical disorder provides a visual cue that signals the breakdown of social control (Skogan, 1990), which can inflame residents' fears and impede the formation of social ties (Ross & Jang, 2000; Sampson, Raudenbush, & Earls, 1997) and social support (Hill, Burdette, Jokinen-Gordon, & Brailsford, 2013). Further, disorder tends to cluster near non-residential land-uses (e.g., shops, parks) (Perkins, Meeks, & Taylor, 1992), making these 'third places' less appealing destinations for local residents, and plausibly limiting their use for informal, opportunistic social interactions (Oldenburg & Brissett, 1982; Thompson & Kent, 2014) and social participation (Baum & Palmer, 2002; Wood, Giles-Corti, Zubrick, & Bulsara, 2013). Third, the type of local destinations and quality of public infrastructure in low and high income neighbourhoods may differ (Crawford et al., 2008; Hill & Angel, 2005; Macintyre, Macdonald, & Ellaway, 2008; Pearce, Witten, Hiscock, & Blakely, 2007). For instance, studies indicate there are more alcohol outlets in disadvantaged areas (Gorman, Speer, Gruenewald, & Labouvie, 2001; Pereira, Wood, Foster, & Haggard, 2013), in turn impacting the amenity of the local neighbourhood (Popova, Giesbrecht, Bekmuradov, & Patra, 2009). Thus, in low income areas, the confluence of crime and disorder, paired with the type and quality of local destinations, could aggravate safety concerns.

In an era that has coined the terms 'bubble wrap' and 'cotton wool' children, a better understanding of the factors that shape parents' fear of strangers is needed. Parents are widely recognised as the 'gatekeepers' of children's outdoor activity, and therefore strategies that address their fears could, in turn, help increase children's independent mobility and active transport (Carver et al., 2008; McMillan, 2007). Thus, the overall aim of this study was to identify neighbourhood attributes that aggravate or alleviate parents' concerns for their children's safety, focusing on their fear of stranger danger and perceived risk from strangers (Figure 1 depicts the key study variables and hypothesised relationships). These outcomes were conceptualised as components of one overarching 'fear' construct, with fear of strangers capturing the 'emotional' dimension (i.e., *fear* that their child will be approached/taken/hurt by a stranger), and perceived risk capturing the 'cognitive' dimension (i.e., how *likely* is it that their child will be approached/taken/hurt by a stranger) (Lorenc et al., 2012). However, they were examined as separate outcomes as parents may

acknowledge that the risk posed by strangers is low, but may nevertheless be fearful. Furthermore, we examined whether these associations differed by area socio-economic status, as exposure to crime and disorder, and the social and physical characteristics of the local environment may differ in low, medium and high SES neighbourhoods. Indeed, ultimately any strategies designed to alleviate parental fear may need to be tailored to these different settings.

2. Methods

2.1 Study context

This study was part of the TRavel Environment and Kids (TREK) project, a cross-sectional study exploring the impact of the built environment on 10-12 year-old children's active transport to school. TREK is described fully elsewhere (Giles-Corti et al., 2011). Briefly, in 2007, students and parents were randomly sampled from government primary schools in low and high walkable school areas across metropolitan Perth, Western Australia (Giles-Corti et al., 2011). Schools were ranked by their walkability, with the most and the least walkable schools from within three area-level socio-economic strata (i.e., low, medium, high) invited to participate (n=36). For each participating school (n=25; 69.4% response rate), one class from each 5, 6 and 7 year group in each school was randomly selected to participate until at least 30 children were recruited from each year (n=2617). Overall, 1480 children (56.5% response rate) and 1245 parents (89.6% response rate) consented and completed questionnaires. This study focuses on the parent respondents. Ethics approval was obtained from The University of Western Australia's Human Research Ethics Committee (RA/4/1/1394).

2.2 Variables

Outcomes: Parental fear of strangers was created from the items: how fearful are you that if your child walked or cycled in your neighbourhood without an adult he or she may be: (1) approached on the street by a stranger; (2) taken by a stranger; and (3) hurt by a stranger (Cronbach's $\alpha=0.93$). Response options were provided on a five-point likert scale (not at all fearful to extremely fearful), and were averaged to create the

continuous subscale. Parents' perceived risk from strangers was created from another set of three items that asked 'how likely' it was that these same situations might occur (i.e., be approached by a stranger, be taken by a stranger, be hurt by a stranger) (Cronbach's $\alpha=0.90$). Response options were provided on a five-point likert scale (very unlikely to very likely), and were averaged to create the subscale.

Individual factors: Parent age (years), sex, relationship status (partner, no partner), education (less than secondary; secondary/trade/diploma; bachelor degree or higher); and length of residence (years) were sourced from the TREK parent questionnaire, and child age (10, 11, 12 years) and sex were sourced from the TREK *child* questionnaire. Area-level SES was derived from the SES ranking of their school catchment (high, medium and low).

Neighbourhood perceptions: Parents were also asked four items that together would contribute to a more inviting pedestrian environment: (1) I often see adults walking in the neighbourhood; (2) I often see children walking in the neighbourhood; (3) our neighbourhood is a nice place to walk around; (4) our neighbourhood is friendly (Cronbach's $\alpha=0.75$). Response options ranged from strongly disagree to strongly agree. Items were averaged to create the subscale.

Informal social control (i.e., the belief that other residents would take action for the good of the local community) was created from four items assessing the likelihood that people in their neighbourhood would: (1) intervene if they noticed a child being bullied; (2) intervene if children were showing disrespect to an adult; (3) assist if they noticed a child in danger when crossing the road; and (4) intervene if they noticed a stranger approaching a child in the street (Cronbach's $\alpha=0.82$). Response options were provided on a five-point likert scale (very unlikely to very likely) and averaged to create the continuous subscale.

Single items assessed parents' perception of local traffic volumes (i.e., 'there is a lot of traffic in our neighbourhood') and their exposure to media relating to strangers (i.e., 'I often see or hear news items about the danger of strangers to children walking or riding a bike without an adult present'). Response options ranged from strongly disagree to strongly agree. Finally, parents reported their dwelling type (i.e., separate

house versus a smaller dwelling such as a duplex or flat) and whether their home was located on a busy road (no, yes).

Objective variables: Geographic Information Systems (GIS) software (ESRI ArcGIS v10.2) was used to generate objective measures of the neighbourhood surrounding each participant's home. All measures assessed the 400m road network service area, as characteristics of the more proximate neighbourhood might have a stronger impact on perceptions of danger and judgement of risk (Barton, Grant, & Guise, 2003). Crime data for the year matching survey completion were supplied by the Western Australian Police. Crime measures included: (1) count of crimes committed against the person in public space (e.g., threats, disorderly behaviour, assault; robbery); and (2) count of actual and attempted burglaries. Built environment measures focused on neighbourhood attributes that might attract more (or fewer) strangers/guardians to an area, or promote their circulation throughout the neighbourhood. These included: total destinations (i.e., count of shops, services or businesses in the area); public transport stops (count), proportion of land allocated to parks and reserves; gross residential density (the ratio of the area in residential use to the total land area); proportion of land allocated to residential use; street connectivity (count of three-or-more-way intersections) and proportion of low traffic roads. These measures were derived from secondary datasets, including several provided by Landgate (The Western Australian State Government's land information agency), and a commercial destination database (i.e., SENSIS Pty Ltd).

2.3 Statistical analyses

Mixed models were conducted in SPSS v22 to account for the clustering of participants within school catchments. First, associations were examined between individual factors (i.e., parent age, sex, relationship status, education and length of residence; child age and sex; and SES of the school catchment) and: (1) parents fear of stranger danger; and (2) parents perceived risk from strangers (Table 1). Next, the mean values for the social and built environment variables (overall, and by SES strata) were calculated and presented (Table 2). Finally, individual associations between these social and built environment variables and the study outcomes were investigated using the full sample, and a stratified sample based on area-level

SES (Tables 3 and 4). Interaction effects between social and built environment variables and SES were also tested (i.e., general interactions and interaction trends). All models adjust for individual factors (i.e., listed in Table 1) and clustering within school catchments.

3. Results

Parents participating in this study were predominantly female, with a mean age of 40.7 years and length of residence of approximately eight years. Parents who were older, more educated, lived in their neighbourhood for longer, and had a male child who attended a school in a higher SES area were less fearful of strangers (Table 1). In contrast, relatively few demographic variables were associated with parents' perceived risk from strangers, with male parents and those living in higher SES areas perceiving less risk.

Table 2 presents the mean values for the study variables, overall and by area SES. On a five-point likert scale, parents mean fear of strangers score was 3.35 (standard deviation=0.96) (i.e., between 'somewhat' and 'very' fearful of strangers). However, about 21 per cent of parents indicated they were very or extremely fearful of strangers. There were also differences according to area SES, with parents in low SES areas reporting higher fear of stranger danger and those in high SES areas reporting the lowest. Despite their fears, parents appeared to acknowledge that the actual risks posed by strangers were relatively low, with the majority of parents reporting they were either unsure, or thought it was unlikely that their child would be approached, taken or hurt by a stranger (mean=2.60, standard deviation=0.84) (Table 1). Again, there were differences based on area SES, with parents in high SES areas reporting the lowest levels of perceived risk and those in low SES areas reporting the highest levels (Table 2).

Several perceptions were consistently associated with increased parental fear across all SES strata (Table 3). Specifically, the perception of an inviting pedestrian environment (i.e., more pedestrians in a pleasing, friendly setting) was consistently negatively associated with fear, whereas perceptions of more vehicle traffic and greater awareness of media reports relating to strangers consistently positively associated. In contrast, findings for objective measures of the proximate environment were mixed. There were several significant interaction terms, confirming that built environment factors had differing associations with

parental fear according to area-level SES. For instance, overall the presence of proximate destinations was negatively associated with fear (overall $p=0.024$), but this was due to a strong negative association in the high SES group ($p=0.001$) and weak non-significant positive associations in the middle and low SES groups (general interaction $p=0.047$, interaction trend $p=0.021$). The proportion of land allocated to parks and nature reserves, on the other hand, was not associated with fear overall, or in high and middle SES environments, but was strongly negatively associated with fear in low SES environments ($p=0.003$ for low SES, $p=0.009$ for interaction). Similarly, street connectivity was not associated with fear overall or in high and low SES environments but was negatively associated in middle SES environments ($p=0.028$ for middle SES, $p=0.049$ for interaction). Furthermore, there was evidence of a counterintuitive negative association between the incidence of crime against the person (committed in public space) and parental fear in high SES areas ($p=0.034$).

‘Fear’ and ‘risk’ were positively correlated ($r=0.57$), and there were some similarities in the perceptions that were associated with these outcomes (Table 4). The perception of an inviting pedestrian environment, perceiving more traffic and frequency of seeing media reports about the dangers of strangers to children were consistently associated with perceived risk across all SES strata, and in directions consistent with those reported for fear. Perceptions of informal social control were consistently negatively associated with perceived risk across SES environments, but the association did not quite reach statistical significance in low SES areas ($p=0.000$ for high, $p=0.007$ for middle and $p=0.099$ for low; interaction $p=0.728$). While a number of objective neighbourhood measures were associated with parental fear, only one showed any evidence of an association with risk – the proportion of land allocated to parks and reserves was negatively associated with perceived risk in low SES areas ($p=0.050$). While the interaction term for destinations and SES was significant (general interaction $p=0.022$; trend interaction $p=0.008$), due to a weak negative association for high SES trending to a weak positive association for low SES, the overall and SES stratified results were not statistically significant.

4. Discussion

This study examined associations between a range of neighbourhood characteristics and parents' concerns about strangers approaching, taking or hurting their children, and whether area SES could impact these associations. We focused on two (correlated) outcomes: fear – conceptualised as an emotional or affective response to strangers; and risk – a cognitive assessment of the threats posed by strangers, which were modelled on fear of crime items (Ferraro, 1995). Consistent with other research (Tulloch, 2004) parents' assessments of risk were generally lower than their fears, which could be substantial, demonstrating an awareness that the actual dangers posed by strangers for their children were small (Shutt et al., 2004). Despite this apparent mismatch, the neighbourhood features associated with both outcomes were generally consistent, although this was most notable for parents' perceptions as fewer objective neighbourhood measures were associated with either outcome.

In part, we were interested in the contribution of neighbourhood design to parents' concerns about strangers, as more walkable neighbourhoods (i.e., well-connected low traffic streets with access to local destinations and transport) would encourage the presence and circulation of pedestrians (including 'strangers') in the local area. We hypothesized that the natural surveillance generated might outweigh any reservations about the presence of more people. Together, our findings suggest that neighbourhoods that encourage pedestrians, whilst minimising vehicle traffic, are most conducive to parents perceiving a safer neighbourhood for their children, at least in terms of 'stranger danger'. We found that higher perceptions of an inviting pedestrian environment (where children and adults were seen out walking) and less neighbourhood traffic were related to lower parental fear and perceived risk about strangers.

This is consistent with findings highlighting the importance of natural surveillance to children's independent mobility and active travel (McMillan, 2007; Villanueva, 2011). However, while both the presence of pedestrians and vehicle traffic could generate natural surveillance, they had conflicting associations with parents concerns about safety. With more traffic present, parents could have heightened concerns about strangers driving up and bundling children into the frequently reported 'white van' (O'Connor & Brown, 2013; Pain, 2006). Our finding is consistent with anecdotal evidence from Zubrick et al. (2010), who note a popular family holiday destination off the coast of Perth where parents often allow their children more

freedom (Zubrick et al., 2010). In this holiday setting, the absence of private cars may minimise abduction fears, whilst also ensuring all visitors use active modes (walking, cycling, bus), and this combination may contribute to the seemingly lower anxiety levels about strangers.

The notion that the natural surveillance generated in more walkable areas might ease parents' concerns was also supported by the findings for the objective built environment variables. Local retail and service destinations, better street connectivity, and more low traffic roads and parks/nature reserves were all negatively associated with parents' fear of strangers; however there were inconsistencies across different SES areas. This could be indicative of the quality of the built environment features that characterise different SES neighbourhoods. For example, proximate retail and service destinations were negatively associated with parental fear in high SES areas where it's plausible that the quality and amenity of these destinations could be superior (Macintyre et al., 2008; Pearce et al., 2007). Local shops can be an asset to communities - providing destinations for children and adults alike to walk to (and therefore generating natural surveillance), and a setting that facilitates social interaction between neighbours (Thompson & Kent, 2014), thus potentially enhancing feelings of safety (Foster et al., 2010; Foster, Wood, Knuiman, et al., 2013; Wood et al., 2008). Indeed, our results suggest this may be the case in high income neighbourhoods, but not in middle or low income areas. One possible explanation is that physical incivilities are more prevalent in low income areas (Caughy et al., 2001; Foster et al., 2011; King, 2008; Lee et al., 2005) and typically cluster around non-residential land-uses (Perkins et al., 1992), potentially impacting the quality and appeal of these places (and perceptions of safety associated with visiting them) in less affluent neighbourhoods. Alternatively, the financial costs associated with visiting local retail destinations (Pearce et al., 2007), particularly those that act as 'third places' such as cafes, may deter use and negate their potential to facilitate social interaction between residents in low income neighbourhoods.

In contrast, proximate parks and nature reserves were negatively associated with parental fear and risk – but only in low SES settings. As with the shops and services in high SES strata, the presence of parks in low SES environments may afford equivalent opportunities for local residents to interact in a community setting. Public open space provides free infrastructure and places for people to gather (Cutts, Darby, Boone, &

Brewis, 2009), thus helping to generate natural surveillance (Kuo, Sullivan, Coley, & Brunson, 1998).

Furthermore, the presence of green space close to home has been linked with greater feelings of ‘social safety’ (Maas et al., 2009), particularly in residential settings (Maruthaveeran & van den Bosch, 2014), and less crime (Kuo & Sullivan, 2001). In Australia, the provision of public open space appears equivalent across different SES strata (Crawford et al., 2008; Giles-Corti & Donovan, 2002), however there is some evidence that the facilities provided differ. One study found that parks in low SES areas had less amenity (e.g., picnic tables, trees, water features, walking paths etc.), despite the equitable provision of freely available playgrounds and recreational facilities (Crawford et al., 2008). Notably, a New Zealand study found that parks in more disadvantaged areas tended to be of poorer quality, but had more activities and safety features (e.g., lighting, surveillance from surrounding houses and roads) than those in less deprived neighbourhoods (Badland, Kearns, Witten, & Kearns, 2010). These safety attributes may be implemented intentionally in low income areas to deter local crime and disorder, and could have subsequent positive impacts on parental perceptions of (and use of) these spaces.

The themes that emerged from our study are largely consistent with previous research into environments and fear of crime (Day, 1999; Hale, 1996; Jorgensen et al., 2012; Nasar & Jones, 1997; Warr, 1990). For instance, Day’s (1999) examination of the locations where female college students felt most and least fearful of sexual assault underscored the influence of ‘strange people and places’. For the most part, familiar places and the presence of people were associated with lower fear, but this was largely contingent on whether the ‘others’ present were culturally and economically similar to the participant, or legitimate users of the space (Day, 1999). In our study the presence of people (and neighbourhood features theorised to attract people) also correlated with reduced parental fear. However, it is worth noting that we focused on the proximate (400m) neighbourhood, where participants are typically familiar with both the environment and the people, and therefore could be anticipated to feel relatively safe. Future research might explore the nuances of the type of people and micro-characteristics of places that impact parental fear.

This study also identified some counterintuitive associations between actual crime and parents’ fear of strangers in high SES areas, whereby more crime equated with lower levels of fear. There is a considerable

body of evidence associating specific destinations with crime – for instance, shopping centres, recreational facilities and transport nodes have been associated with higher levels of property crime (Beavon,

Brantingham, & Brantingham, 1994; Bowes, 2007; Brantingham & Brantingham, 1993; McCord, Ratcliffe, Garcia, & Taylor, 2007), and the presence of drinking venues and alcohol sales linked with more violent crime (Gorman et al., 2001; Gruenewald, Freisthler, Remer, LaScala, & Treno, 2006; Popova et al., 2009). Thus, our negative association between crime and parental fear may relate to the co-location of these destinations and crime (Foster, Knuiman, et al., 2014). That is, the presence of crime may simply be a function of living in a neighbourhood with proximate access to local destinations. This negative association between crime and parental fear dissipated when both destinations and crime were included in a multivariable model (results not shown). Nonetheless, this finding serves to highlight that the incidence of crime is largely unrelated to parents concerns about strangers.

In contrast, exposure to media coverage relating to stranger danger was consistently associated with both parental fear and perceived risk, regardless of SES. News reports of actual or attempted child abductions are often implicated in commentaries on the pervasiveness of parental fear and anxious parenting (Brussoni & Olsen, 2013; Furedi, 2008; Valentine & McKendrick, 1997), however only a handful of studies have explicitly investigated this relationship, with most focusing on media over-reporting of child abductions and kidnappings (Martins & Wilson, 2011; Moscovitz & Duvall, 2011; Stokes, 2009; Taylor, Boisvert, Sims, & Garver, 2013). Indeed, to our knowledge, this is the first study to empirically investigate the relationship between parental exposure to ‘stranger danger’ media and the fear of such an event happening to their child. Whilst not surprising, it is concerning that parents’ consciousness of media relating to stranger danger appear to be mirrored in their perceptions that these incidents could occur. In turn, this could fuel the wider acceptance of an over protective parenting style that can stifle important facets of child development (Zubrick et al., 2010), and even transfer unfounded fears to children (Martins & Wilson, 2011). Although it is undoubtedly sensible to advise children about keeping safe when moving about their neighbourhood, an inflated emphasis on kidnappings and abductions can bring with it unintended consequences for children’s social, emotional, and physical development (Martin & Wood, 2014).

This study appears unique in its quantitative exploration of the correlates of parents' concerns about strangers, both in terms of their fear and risk perceptions, and whether associations differed by area SES.

Nonetheless, the study has a number of limitations. First, this study was cross-sectional so causality cannot be determined. While our findings suggest a more walkable neighbourhood might help minimise parents' fear of strangers, it is equally possible that fearful parents might choose to live in neighbourhoods that are less walkable, and attract few people (or strangers) to the area. Similarly, media reports about stranger danger may not increase parents' fears – instead fearful parents may be more cognisant of these reports. Second, the SES strata were based on the SES of the school catchment, and some participants may have lived outside the catchment and attend the school regardless. However, the sample comprised parents of students at state government primary schools where the standard convention is for students to attend the local school, hence most home addresses will be within the school catchment. Third, we used quantitative analysis to examine the correlates of parents' fear of strangers and perceived risk from strangers. One limitation of this approach is that these outcome measures may struggle to capture the nuances of complex concepts. Indeed, parental fear of strangers may be symptomatic of a broader social unease (Lorenc et al., 2012; Prezza et al., 2005), where parents are apprehensive about the world in which their children will grow up (Furedi, 2008; Zubrick et al., 2010). Future studies exploring these themes might benefit from qualitative data to better understand how neighbourhood settings impact parents fear and/or risk, and why relationships might differ by area SES. Furthermore, objective measures recording the aesthetic presentation and quality of the public realm (e.g., quality of local retail destinations, attributes of public open space and streets, neighbourhood upkeep, and presence of physical incivilities) (Foster et al., 2011; Pikora et al., 2002) would have been a valuable addition to this study, but were not available.

5. Conclusion

Paradoxically, parents desire to keep their children safe from harm can have unintended negative consequences for children's physical and psychological health (Carver et al., 2008; Foster, Villanueva, et al., 2014; Glassner, 2009; Terrell, Terrell, & Von Drashek, 2000). Hence, interventions designed to minimise parents' fears could be beneficial to children's health and wellbeing – however there is little understanding

of the factors that shape parents fear, nor the type of environments parents perceive as posing most (and least) risk (Carver et al., 2008; McMillan, 2007). This study addressed this evidence gap by examining a range of perceived and objective local neighbourhood attributes that might intensify or ease parents' concerns about strangers. We found that regardless of area SES, there were commonalities between neighbourhoods designed to promote walking, and therefore generate natural surveillance from pedestrians, and neighbourhoods that ease parents' fear of stranger danger. Ultimately, a combination of strategies may be necessary to reset parents' concerns about stranger danger – including the creation of supportive environments and more balanced media coverage of crimes involving children.

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Table 1: Socio-demographic variables and parents: (1) fear of strangers and (2) perceived risk from strangers

Independent variables	%	Fear of strangers (n=1,211)		Perceived risk from strangers (n=1,208)	
		Estimate (SE)	p value	Estimate (SE)	p value
Child sex (male)	47.6	-0.19 (0.05)	0.000	-0.09 (0.05)	0.059
Mean child age (SD)	11.0 (0.8)	0.01 (0.03)	0.755	-0.01 (0.03)	0.693
Parent sex (male)	12.0	-0.09 (0.08)	0.256	-0.16 (0.07)	0.022
Mean parent age (SD)	40.7 (5.9)	-0.01 (0.01)	0.022	-0.00 (0.00)	0.444
Partner (no partner)	21.1	-0.07 (0.30)	0.300	-0.05 (0.06)	0.410
Parent education			0.020		0.292
Less than secondary	27.1	0.24 (0.09)	0.006	0.11 (0.08)	0.160
Secondary/trade/diploma	55.3	0.17 (0.08)	0.027	0.10 (0.06)	0.140
Bachelor degree or higher	17.6	Ref		Ref	
Mean length of residence (SD)	8.12 (6.9)	-0.01 (0.00)	0.019	-0.01 (0.00)	0.056
Area socio-economic status			0.014		0.001
High	39.6	-0.36 (0.11)	0.004	-0.46 (0.11)	0.000
Medium	35.0	-0.18 (0.11)	0.120	-0.21 (0.10)	0.054
Low	25.4	Ref		Ref	

All variables included in models. Bold denotes p<0.05. SE: Standard error

Table 2 Mean values for study variables for overall sample and stratified by school catchment SES

Variable	Overall Mean (SD)	High SES Mean (SD)	Middle SES Mean (SD)	Low SES Mean (SD)	P*
Outcomes					
Fear of stranger danger	3.35 (0.96)	3.17 (0.94)	3.38 (9.56)	3.59 (0.95)	0.000
Perceived risk from strangers	2.60 (0.84)	2.40 (0.81)	2.64 (0.80)	2.87 (0.85)	0.000
Subjective measures					
Neighbourhood factors					
Inviting pedestrian environment	3.93 (0.62)	4.07 (0.54)	3.92 (0.68)	3.73 (0.59)	0.000
A lot of neighbourhood traffic	3.16 (1.08)	3.00 (1.03)	3.20 (1.12)	3.33 (1.06)	0.000
Informal social control	2.87 (1.18)	3.07 (1.15)	2.81 (1.20)	2.62 (1.12)	0.000
House factors					
Located on a busy road	0.11 (0.32)	0.10 (0.30)	0.12 (0.33)	0.14 (0.35)	0.239
Dwelling type (smaller form)	0.07 (0.25)	0.07 (0.26)	0.06 (0.23)	0.07 (0.26)	0.562
Media factors					
Media reports of strangers	3.66 (0.89)	3.61 (0.86)	3.63 (0.91)	3.75 (0.88)	0.067
Objective measures					
Crime					
Crime against the person	0.55 (1.33)	0.59 (1.28)	0.39 (1.31)	0.68 (1.40)	0.007
Actual/attempted burglary	4.83 (5.45)	4.70 (5.11)	4.26 (4.92)	5.89 (6.54)	0.000
Destinations					
Retail and Service Destinations	2.03 (5.06)	3.21 (6.84)	1.18 (2.86)	1.34 (3.47)	0.000
Public transport stops	1.94 (2.27)	2.69 (2.60)	1.51 (1.90)	1.36 (1.84)	0.000
Parks and nature reserves	0.08 (0.08)	0.08 (0.08)	0.06 (0.08)	0.09 (0.09)	0.002
Street layout and traffic					
Street connectivity	66.14 (25.48)	66.94 (21.54)	65.33 (30.53)	65.62 (23.3)	0.623
Low traffic roads	0.92 (0.15)	0.90 (0.16)	0.94 (0.15)	0.95 (0.12)	0.000
Residential density					
Gross residential density	8.20 (2.99)	8.78 (3.10)	7.30 (2.71)	8.51 (2.87)	0.000
Residential land	0.56 (0.11)	0.56 (0.11)	0.56 (0.12)	0.56 (0.12)	0.843

*P values comparing differences by area SES. Bold denotes p<0.05. SD: Standard deviation.

Table 3: Associations between self-report and objective environmental variables and parents *fear of strangers*, overall and stratified by SES*

	Overall		High SES		Middle SES		Low SES		SES comparison 1	SES comparison 2
Variable	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>	<i>p</i>	<i>p</i>
Subjective measures										
<i>Neighbourhood factors</i>										
Inviting pedestrian environment	-0.23 (0.04)	0.000	-0.18 (0.08)	0.017	-0.24 (0.07)	0.000	-0.26 (0.09)	0.005	0.857	0.585
A lot of neighbourhood traffic	0.13 (0.02)	0.000	0.15 (0.04)	0.000	0.09 (0.04)	0.029	0.16 (0.05)	0.002	0.532	0.995
Informal social control	-0.06 (0.02)	0.007	-0.06 (0.04)	0.081	-0.05 (0.04)	0.167	-0.07 (0.05)	0.155	0.997	0.958
<i>House factors</i>										
Located on a busy road	0.20 (0.08)	0.014	0.26 (0.14)	0.067	0.22 (0.14)	0.114	0.14 (0.16)	0.386	0.916	0.678
Dwelling type (smaller form)	0.28 (0.11)	0.011	0.40 (0.17)	0.017	0.30 (0.20)	0.139	0.09 (0.22)	0.697	0.537	0.268
<i>Media factors</i>										
Media reports of strangers	0.32 (0.03)	0.000	0.38 (0.05)	0.000	0.23 (0.05)	0.000	0.35 (0.06)	0.000	0.059	0.295
Objective measures										
<i>Crime</i>										
Crime against the person	-0.04 (0.00)	0.059	-0.07 (0.03)	0.034	0.03 (0.04)	0.387	-0.06 (0.04)	0.092	0.044	0.811
Actual/attempted burglary	0.00 (0.00)	0.469	-0.02 (0.01)	0.113	0.01 (0.01)	0.387	0.01 (0.01)	0.084	0.051	0.021
<i>Destinations</i>										
Retail and Service Destinations	-0.01 (0.00)	0.024	-0.02 (0.01)	0.001	0.01 (0.02)	0.419	0.01 (0.02)	0.577	0.047	0.025
Public transport stops	-0.00 (0.01)	0.742	-0.00 (0.02)	0.897	-0.03 (0.02)	0.286	0.01 (0.03)	0.652	0.520	0.642
Parks and nature reserves	-0.23 (0.00)	0.510	0.90 (0.60)	0.137	0.06 (0.62)	0.926	-1.81 (0.60)	0.003	0.009	0.003
<i>Street layout and traffic</i>										
Connectivity	-0.00 (0.00)	0.284	0.00 (0.00)	0.254	-0.00 (0.00)	0.028	-0.00 (0.00)	0.940	0.049	0.153
Low traffic roads	-0.49 (0.20)	0.013	-0.79 (0.01)	0.026	-0.31 (0.34)	0.362	0.11 (0.49)	0.823	0.174	0.066
<i>Residential density</i>										
Gross residential density	0.00 (0.01)	0.899	-0.01 (0.02)	0.433	-0.00 (0.02)	0.948	0.03 (0.02)	0.146	0.276	0.110
Residential land	-0.27 (0.25)	0.289	-0.61 (0.41)	0.141	-0.51 (0.44)	0.246	0.72 (0.48)	0.137	0.085	0.037

*Individual models (each model adjusts for Table 1 socio-demographic variables). All objective measures for the 400m service area.

¹p values for general interaction between SES and variable (df=2). ²p values for interaction trend between SES and variable (df=1). Bold denotes $p < 0.05$.

Table 4: Associations between self-report and objective environmental variables and parents *perceived risk from strangers*, overall and stratified by SES*

	Overall		High SES		Middle SES		Low SES		SES comparison 1	SES comparison 2
Variable	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>	<i>p</i>	<i>p</i>
Subjective measures										
<i>Neighbourhood factors</i>										
Inviting pedestrian environment	-0.24 (0.04)	0.000	-0.20 (0.07)	0.004	-0.22 (0.06)	0.000	-0.29 (0.08)	0.001	0.626	0.384
A lot of neighbourhood traffic	0.16 (0.02)	0.000	0.11 (0.04)	0.003	0.15 (0.03)	0.000	0.25 (0.04)	0.000	0.055	0.020
Informal social control	-0.10 (0.02)	0.000	-0.11 (0.03)	0.000	-0.09 (0.03)	0.007	-0.07 (0.04)	0.099	0.728	0.442
<i>House factors</i>										
Located on a busy road (yes)	0.22 (0.07)	0.003	0.19 (0.12)	0.118	0.25 (0.12)	0.036	0.19 (0.14)	0.190	0.970	0.816
Dwelling type (smaller form)	0.18 (0.10)	0.064	0.24 (0.14)	0.103	-0.04 (0.17)	0.832	0.22 (0.12)	0.260	0.210	0.971
<i>Media factors</i>										
Media reports of strangers	0.20 (0.03)	0.000	0.26 (0.04)	0.000	0.16 (0.04)	0.000	0.19 (0.06)	0.001	0.280	0.222
Objective measures										
<i>Crime</i>										
Crime against the person	-0.00 (0.02)	0.956	-0.04 (0.03)	0.136	0.04 (0.03)	0.196	0.02 (0.04)	0.665	0.108	0.192
Actual/attempted burglary	0.01 (0.00)	0.149	-0.00 (0.01)	0.546	0.01 (0.01)	0.357	0.01 (0.01)	0.094	0.220	0.089
<i>Destinations</i>										
Retail and Service Destinations	-0.00 (0.00)	0.876	-0.01 (0.00)	0.104	0.02 (0.01)	0.164	0.02 (0.01)	0.123	0.022	0.008
Public transport stops	-0.00 (0.01)	0.656	-0.02 (0.07)	0.210	0.02 (0.02)	0.406	-0.01 (0.03)	0.751	0.385	0.457
Parks and nature reserves	-0.17 (0.31)	0.574	-0.07 (0.53)	0.891	0.54 (0.51)	0.293	-1.10 (0.56)	0.050	0.130	0.222
<i>Street layout and traffic</i>										
Connectivity	0.00 (0.00)	0.951	0.00 (0.00)	0.379	-0.00 (0.00)	0.315	0.00 (0.00)	0.772	0.365	0.542
Low traffic roads	-0.28 (0.17)	0.108	-0.41 (0.25)	0.101	-0.04 (0.28)	0.876	-0.44 (0.45)	0.327	0.565	0.574
<i>Residential density</i>										
Gross residential density	0.01 (0.01)	0.274	0.01 (0.01)	0.412	0.01 (0.02)	0.664	0.01 (0.02)	0.694	0.991	0.942
Residential land	0.16 (0.22)	0.469	0.46 (0.36)	0.196	-0.11 (0.36)	0.763	0.10 (0.45)	0.829	0.618	0.588

*Individual models (each model adjusts for Table 1 socio-demographic variables). All objective measures for the 400m service area.

¹*p* values for general interaction between SES and variable (df=2). ²*p* values for interaction trend between SES and variable (df=1). Bold denotes *p*<0.05.

Figure

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