Paper presented at Walk21-VII, "The Next Steps", The 7th International Conference on Walking and Liveable Communities, October 23-25 2006, Melbourne, Australia
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Perceptions of crime-related safety in suburban neighbourhoods: exploring new and existing measures to examine the influence of perceived safety on walking

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Abstract

Context: In the sphere of public health, there is growing recognition of the need to build supportive environments that encourage people to be physically active. One necessary component of a supportive environment is the safety of the local neighbourhood. Neighbourhood safety is affected by several factors, including vehicle traffic, road design and infrastructure condition, however this research focuses primarily on crime-related safety. Fear of crime can have significant consequences: affecting quality of life, reducing social activities and increasing distrust. As such, individuals who are anxious about crime may change their behaviour to reduce their perceived vulnerability. One typical response pattern is constrained behaviour, where people minimise their perceived exposure to potentially dangerous situations by, for example, avoiding certain places.

Few studies adequately address the relationship between real or perceived neighbourhood safety and walking. One limitation of existing research is a reliance on inadequate measures of neighbourhood safety, particularly in relation to perceptions of crime and fear of crime. The criminological literature documents a number of failings of quantitative assessments of fear of crime, and the mislabeling of alternative safety measures as 'fear of crime'. The purpose of this paper is to describe the development and reliability testing of a survey instrument of new and established measures of neighbourhood safety and fear of crime.

This study is part of the larger RESIDential Environments project (RESIDE), a longitudinal study of people (n=1813) building homes in 74 new housing estates, designed to examine the impact of urban design on walking, cycling, and sense of community. RESIDE will evaluate the impact of the Liveable Neighbourhoods sub-division design codes that aim to increase walking. The Safety and Walking Study is funded by an ARC grant with The Department for Planning and Infrastructure (DPI) as industry partner.

Methods: A comprehensive literature review was undertaken to inform the development of the survey. The instrument includes quantitative measures for different facets of perceived safety, encompassing constructs such as fear of crime, perceived risk, and protective and constrained behaviour. New items were developed to measure altruistic fear, suburban

incivilities and street surveillance. Collective efficacy measures were updated. A test-retest study (n=189) was undertaken to assess the reliability of the survey items.

Results: The reliability testing was completed in April 2006. The majority of the safety items proved to be reliable, with most recording test-retest scores >0.70, indicating a high stability. Several items with lower reliability were altered or removed before the final instrument was administered.

Conclusion: The neighbourhood safety instrument reliably collects data on the multi-faceted elements of safety, neighbourhood presentation and surveillance from housing. The instrument will be used to test a theoretical model that investigates whether neighbourhoods designed to promote safety through activity and surveillance (i.e. Liveable Neighbourhoods) improve residents' perceived safety, and consequently affect walking behaviour. The survey is currently being administered to a sample of residents from new housing estates in the Perth Metropolitan Area, and data collection will be complete in April 2007. The study results will provide important insights into what aspects of safety are most correlated with decisions to walk, and highlight the influence of suburban design and presentation on residents' perceptions of safety.

Biographies

Sarah Foster
Sarah Foster is currently working on her PhD within the School of Population Health (University of Western Australia). Sarah's PhD focuses on the relationship between urban design, perceptions of safety and walking behaviour. The research is funded by an Australian Research Council (ARC) scholarship, with the Department for Planning and Infrastructure (DPI) as industry partner.

Billie Giles-Corti, PhD.
As a leader in health promotion research and practice in Western Australia, Professor Billie Giles-Corti has made a significant contribution to health promotion nationally and is currently a Chief Investigator of several Health Promotion Research and Evaluation Group (HPREG) research projects, including The RESIDE project; The Social Capital project; The Active Commuting project; and SEID II (Social, Environmental and Individual Determinants of Health).

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Introduction

To achieve health benefits, Australians are encouraged to participate in moderate-intensity physical activity for thirty minutes, most days of the week (Commonwealth Department of Health and Aged Care, 1999). However evidence suggests that, while Australians have become more aware of the benefits of physical activity, activity levels are actually decreasing (Armstrong et al., 2000). Physical inactivity is responsible for about 8% of the total burden of disease in Australia, and ranks second only to tobacco. Consequently, interventions that increase physical activity levels could produce considerable public health improvements (Mathers et al., 1999), and environmental interventions are of particular interest as they have the potential to affect greater numbers of people (Sallis et al., 1998).

Recently, there has been growing interest in the relationship between neighbourhood design and walking. For example, research suggests residents living in neighbourhoods with more mixed-use development are also more likely to walk and less likely to be obese (Frank et al., 2004). One necessary component of a supportive physical environment is the safety of the local neighbourhood. While it seems commonsense that concerns about safety might limit physical activity, research exploring this association has produced mixed results. The measurement of crime-related safety has predominantly relied on judgments about crime, whereas it is plausible that emotional responses (e.g. fear of crime) may have a greater affect on walking behaviour. This hypothesis may go partway towards explaining conflicting findings.

This paper describes the theoretical background and development of a survey instrument designed to assess resident perceptions of neighbourhood safety. The resulting data will be used to examine the relationship between suburban design, resident perceptions of safety and walking behaviour. The Safety and Walking Study is part of the larger RESIDential Environments Project (RESIDE), a longitudinal study of people building homes in new housing estates. The RESIDE project is designed to examine the impact of neighbourhood design on walking, cycling and sense of community.

Research model

Based on a review of the literature, a theoretical model was developed to outline the hypothesised relationships between neighbourhood design, perceived safety and walking (Figure 1). The research aims to test the affect of the physical and social environment, and individual factors on the dependant variables: 1) perceived safety and 2) local walking. The research model adopts a socio-ecological approach, which integrates the numerous, inherently multidisciplinary, elements that contribute to health related behaviours or outcomes (Stokols, 1992).

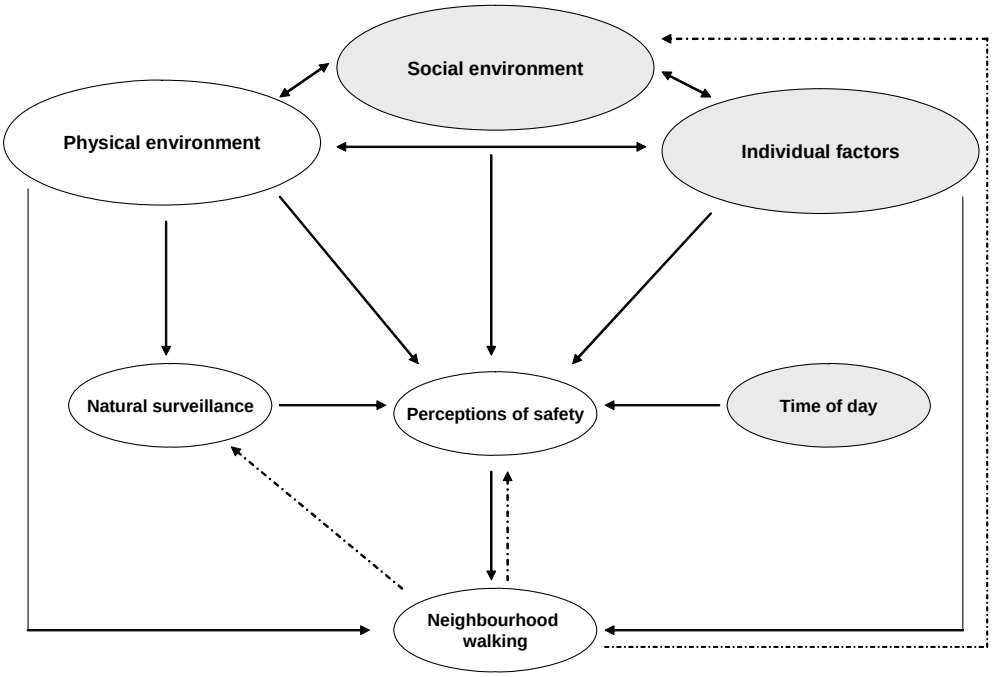

Figure 1 The research model

Methods

Questionnaire development

A review of the public health literature highlighted some limitations in the safety measures adopted by researchers to date. Given these limitations, and in accordance with the theoretical model, a pool of questions was compiled from criminological and public health literature. Questions focused on the following themes: 1) fear of crime and crime-related safety; 2) neighbourhood problems and presentation; 3) social environment; 4) victimisation and 5) house design and surveillance.

Both new and established questions were subject to reliability testing. For pre-existing, published questions, reliability testing was necessary for a number of reasons. Some questions were originally used in interviews rather than self-administered surveys, so it was important to test their reliability in this form. In some cases, the original items were altered to capture concepts arising from the literature review that were deemed relevant. Finally, while most questions remained as close as possible to their original wording, some changes were necessary for consistency with the larger RESIDE questionnaire. The final pool of questions was circulated to a panel of experts from related disciplines (i.e. environmental criminology, urban design and public health) to check for face validity. The questionnaire was also disseminated to a sample of colleagues for feedback on the appropriateness and clarity of items. Minor changes were made before proceeding with the test-retest procedure.

Sample and procedure

Ethics approval was sought and granted by The University of Western Australia (UWA) Human Ethics Research Committee (No: RA/4/1/0479) prior to the recruitment process. An email notice was drafted describing the study and calling for volunteers. This included a screening question (do you live in a house?) as the questionnaire would ultimately be administered to residents living in houses, and many questions were specific to house

design and surveillance features. The notice was sent to approximately 3200 subscribers to the UWA Staff notices email list. In addition, the notice was posted to an online student bulletin board. Due to the capacity of electronic mail to rapidly disseminate information, the notice was circulated beyond the confines of the university to friends and family of UWA staff and students, and to external workplaces.

Over a period of about three weeks, 222 people were recruited. Volunteers were posted an information sheet, consent form, the first questionnaire and reply paid envelope. In total, 203 (91%) participants returned the first survey. About ten days later, the second questionnaire was posted to these respondents, and 189 (93%) subsequently completed and returned this. Participants were sent one follow-up email reminder after each questionnaire if they did not return the completed survey within ten days. In summary, the final sample available for test-retest analysis was 189. Participants were aged 18 – 68 years (mean age 39.5 years; SD=13), and the majority were female (78%) and well educated (72% held a bachelor degree or higher).

Statistical analysis

The test-retest reliability analysis was performed using SPSS version 12. The kappa statistic (k) was applied to items with categorical responses, and intra-class correlations (ICC) for items with quantitative responses. Estimates of reliability are deemed to have moderate agreement if the value is 0.40 – 0.60; good agreement if the value is between 0.60 – 0.80; and excellent agreement if values exceed 0.80 (Fleiss, 1981).

Results

Fear of crime and crime-related safety

When the reliability of various safety concepts was assessed, fear of crime, perceived risk, global safety and neighbourhood safety were all shown to have good to excellent reliability. We included a new 'altruistic fear' item in the fear of crime and perceived risk questions, which were otherwise quite faithful to the original versions (Ferraro, 1995, Warr and Stafford, 1983). This new item was based on Warr and Ellison's examination of altruistic fear, and had excellent reliability (fear of crime: ICC = 0.806; perceived risk: ICC = 0.804) (Warr and Ellison, 2000).

However, the constrained and protective behaviour questions were less robust. While most items had good to excellent reliability, a couple of items only had moderate reliability. Two of the less stable items related to behavioural changes in response to crime, rather than physical household security measures. As such, there is a greater likelihood of recall bias. Nevertheless, we included these items in the final questionnaire since they had been included in Warr and Ellison's original version (Warr and Ellison, 2000). Another item with moderate reliability questioned respondents about the presence of steel insect screens on doors or windows. Other items addressed the presence of security screens on doors or windows, and this may have created some confusion. To redress this, the item order and wording were changed before the final questionnaire was administered.

Neighbourhood problems and presentation

Respondents were presented with an extensive list of potential problems, related to neighbourhood maintenance, incivilities and local crime. They were asked to record how much of a problem each issue was in their local neighbourhood. All items about neighbourhood presentation had good to excellent reliability. Most were retained for the final survey instrument, although one item (the presence of derelict houses or buildings)

was eliminated because it was deemed irrelevant to the present survey of residents moving to new housing estates. Items measuring house presentation and pride based on research by Brown and colleagues had excellent reliability; however due to space restrictions, these items were eventually combined into a single item for the final questionnaire (Brown et al., 2003). We modified the Baba and Austin's physical and social environment satisfaction scale by changing the focus from *satisfaction with* certain neighbourhood elements to *assessments of* these elements (Baba and Austin, 1989, Austin et al., 2002). For example, instead of asking how satisfied the respondent is with the amount of peace and quiet in the neighbourhood, we ask the respondent how strongly they agree or disagree with the statement, 'my neighbourhood is quiet and peaceful'. Again, these questions had good to excellent reliability when tested, although one item which retained a reference to 'satisfaction' had slightly lower consistency than the others. Finally, we included an item about neighbourhood deterioration, which had good reliability (ICC = 0.670). This was acceptable, given it was specifically designed for residents in new estates and was less pertinent to the testing sample.

Social environment

Some existing questions were updated to fit current social mores and language. We adapted Sampson and colleagues collective efficacy scale to better reflect local customs, and also added one new item which referred to the presence of a stranger at your home (Sampson et al., 1997). All items were reliable (ICC = 0.738 to 0.834). The social cohesion and trust scale remained faithful to the original, but was tested regardless and had good to excellent reliability.

Victimisation

The victimisation question tested was designed to record direct and indirect victimisation, and whether this had occurred in the respondent's home neighbourhood or in another neighbourhood. Ultimately the question was too ambitious, and the wording and format proved confusing for respondents. This was reflected in test-retest reliability values ranging from 0.486 to 0.835 (ICC). As a result the items were changed considerably to remove any ambiguity. The final version uses a clearer format, asks about victimisation in the previous two years (instead of five years), is only concerned with the respondent's current neighbourhood, and does not distinguish between direct and indirect victimisation.

House design and surveillance

Results of the test-retest for a series of new items showed respondents could reliably recall details about the physical design of their house. The items were intended to record housing features that might promote or deter surveillance, or make housing more vulnerable to crime (e.g. secondary space adjacent to the property). Most house design items had excellent test-retest reliability, the only exceptions being 'balcony at the front of the house' and 'front fence or wall (less than 1.2 metres)' which had good reliability. Surveillance behaviour (e.g. respondents use of their front yard versus their backyard), and estimates of pedestrian traffic volume were also consistently recalled by participants.

Discussion / conclusion

A number of changes were made to the questionnaire before the final version was administered to the target population. Items were altered if their test-retest reliability was lower than preferred, but the items were still deemed important to the overall research design. Due to space limitations in the final RESIDE instrument, some individual questions (i.e. those not belonging to established scales) were judged to be superfluous

and removed from the final version. The majority of the safety items proved to be reliable, with most recording test-retest scores >0.70, indicating a high stability.

The neighbourhood safety questions will be included in the third RESIDE questionnaire. From October 2006, the questionnaire will be posted to participants who have been in their new houses for at least two years. In addition, the neighbourhood safety questions have already been sent to a sample of participants (n=220) as a supplement to their second RESIDE questionnaire. Data are being collected using these two phases to ensure an adequate sample size is achieved. Data collection will be complete early in 2007, and the full survey instrument and preliminary study results will be published later in the year.

The final neighbourhood safety questionnaire is a comprehensive instrument for collecting information on perceptions of safety. Perceived safety is a complex issue, where several related, but distinct concepts, such as fear of crime, perceived risk, and crime assessments are influenced by numerous individual, social and environmental factors. Previous public health research examining crime-related safety and physical activity has perhaps suffered from the application of insufficiently developed measures. The neighbourhood safety instrument collects data on multi-faceted elements of safety, neighbourhood presentation and surveillance from housing. The study results will provide important insights into what aspects of safety are most correlated with decisions to walk, and highlight the influence of suburban design and presentation on residents' perceptions of safety.

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