



## Individual, social and environmental correlates of physical activity among women living in socioeconomically disadvantaged neighbourhoods

Verity Cleland<sup>a,\*</sup>, Kylie Ball<sup>a</sup>, Clare Hume<sup>a</sup>, Anna Timperio<sup>a</sup>, Abby C. King<sup>b</sup>, David Crawford<sup>a</sup>

<sup>a</sup>Deakin University, School of Exercise and Nutrition Sciences, 221 Burwood Hwy, Burwood, Victoria 3125, Australia

<sup>b</sup>School of Medicine, Stanford University, 259 Campus Drive, HRP Redwood Building, T221 Stanford, CA 94305-5405, USA

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### ABSTRACT

Women living in socioeconomically disadvantaged neighbourhoods are at heightened risk for physical inactivity, but little is known about the correlates of physical activity among this group. Using a social-ecological framework, this study aimed to determine the individual, social and neighbourhood environmental correlates of physical activity amongst women living in such neighbourhoods. During 2007–2008 women ( $n = 4108$ ) aged 18–45 years randomly selected from urban and rural neighbourhoods of low socioeconomic status in Victoria, Australia completed the International Physical Activity Questionnaire (long). They reported on individual (self-efficacy, enjoyment, intentions, outcome expectancies, skills), social (childcare, social support from family and friends/colleagues, dog ownership) and neighbourhood environmental (neighbourhood cohesion, aesthetics, personal safety, 'walking environment') factors. Multinomial logistic regression was used to examine the odds of increasing categories of leisure time physical activity (LTPA) and transport-related physical activity (TRPA) for each individual, social and environmental factor. In partially adjusted analyses, all individual, social and environmental variables were positively associated with LTPA, while all individual factors, family and friend support and the walking environment were positively associated with TRPA. In fully adjusted multivariable models, all individual and social factors remained significantly associated with LTPA, while self-efficacy, enjoyment, intentions, social support, and neighbourhood 'walking environment' variables remained significantly associated with TRPA. In conclusion, individual and social factors were most important for LTPA, while individual, social and neighbourhood environmental factors were all associated with TRPA. Acknowledging the cross-sectional design, the findings highlight the importance of different levels of potential influence on physical activity in different domains, which should be considered when developing strategies to promote physical activity amongst women living in socioeconomically disadvantaged neighbourhoods.

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### Introduction

Despite the well-documented health benefits of regular participation in moderate- to vigorous-intensity physical activity (US Department of Health and Human Services, 1996) a significant proportion of the population in developed countries fail to meet physical activity recommendations (Barr et al., 2006; Bauman, Ford, & Armstrong, 2001; Centers for Disease Control and Prevention, 2007). For instance, only 46.1% of Australian adults were active at moderate to vigorous levels for at least 30 min per day on a minimum of five days; this figure was marginally lower for women (45.5%) and substantially lower for those who had not completed secondary

school (38.9%) (Bauman et al., 2001). This is cause for serious concern because physical activity is a modifiable risk factor for many chronic conditions, such as coronary heart disease, type 2 diabetes and some cancers, and makes a major contribution to the burden of disease in developed countries (Begg et al., 2007; World Health Organization, 2007). Of particular concern, certain population groups are at greater risk for inactivity during their leisure time, including women (Crespo, Ainsworth, Keteyian, Heath, & Smit, 1999; Trost, Owen, Bauman, Sallis, & Brown, 2002; World Health Organization, 2007) and those who are socioeconomically disadvantaged (that is, those with lower education or income levels, working in low status occupations, or those who are unemployed) (Gidlow, Johnston, Crone, Ellis, & James, 2006). In addition, increasing evidence suggests that living in a socioeconomically disadvantaged neighbourhood confers an increased risk of inactivity, independent of one's individual socioeconomic circumstances (Gidlow et al., 2006;

\* Corresponding author. Tel.: +61 3 9251 7244.

E-mail address: [verity.cleland@deakin.edu.au](mailto:verity.cleland@deakin.edu.au) (V. Cleland).

Giles-Corti & Donovan, 2002; King, Kavanagh, Jolley, Turrell, & Crawford, 2006; Salmon, Owen, Bauman, Schmitz, & Booth, 2000). These discrepancies in physical activity participation are consistently observed irrespective of the measures used to characterise socioeconomic disadvantage or leisure time physical activity. Women living in socioeconomically disadvantaged neighbourhoods are therefore an important group to target in order to promote physical activity and improve population health.

While the socioeconomic differentials observed in physical activity parallel those observed for other health behaviours and outcomes (Kaplan, Baltrus, & Raghunathan, 2007; Loucks et al., 2009; Marmot, Shipley, Hemingway, Head, & Brunner, 2008), the underlying mechanisms through which socioeconomic disadvantage influences physical activity are not well understood. Behavioural theories such as social-ecological models (Sallis & Owen, 2002; Stokols, 1996) are useful in attempting to understand the influences on physical activity behaviours. These models posit that multiple levels of impact, including individual (e.g., motivation, self-efficacy, intentions, skills), social (e.g., social support from family and friends/colleagues), and physical environmental (e.g., neighbourhood aesthetics, personal safety, physical activity opportunities) factors all influence health behaviour. These individual, social and neighbourhood environmental variables have demonstrated associations with physical activity in general population samples (Sallis & Owen, 1999; Trost et al., 2002). However, little is known about whether these factors show similar relationships with physical activity amongst women living in socioeconomically disadvantaged neighbourhoods. Examining the factors associated with physical activity amongst such high-risk groups is important to provide insights to inform the development of public health interventions to promote physical activity. Using a social-ecological framework, the aim of this study was to describe the individual, social and neighbourhood environmental correlates of physical activity among women living in socioeconomically disadvantaged neighbourhoods. This study builds upon our earlier work where we qualitatively explored factors that influence women's physical activity (Ball, Salmon, Giles-Corti, & Crawford, 2006) and quantitatively explored the correlates of individual, social and environmental factors on walking amongst urban women from across the socioeconomic spectrum (Ball et al., 2007).

## Methods

Data were collected during 2007–8 as part of the Resilience for Eating and Activity Despite Inequality (READI) study (MacFarlane, Abbott, Crawford, & Ball, 2009). This study was approved by the Deakin University Human Research Ethics Committee and written consent was obtained from all participants.

### Participants

All Victorian 'suburbs' (neighbourhoods) were classified using the 2001 Socio-Economic Index for Areas (SEIFA), an indicator of area-level disadvantage based on the population census that considers factors such as employment, education and income (McLennan, 1998). Disadvantaged neighbourhoods were defined as those within the bottom SEIFA third in Victoria. From this sampling frame, 40 urban and 40 rural neighbourhoods were randomly selected. From each of the 80 neighbourhoods, 150 women aged 18–45 years were randomly identified from the Australian electoral roll ( $n = 11,940$ ; some neighbourhoods had <150 eligible women). Registration on the Australian Electoral Roll is compulsory for all persons age 18 years and over holding Australian citizenship, and there is no choice to 'opt out'. After

excluding 861 surveys which were marked 'return to sender', 4938 (45%) women responded to a postal invitation to complete a questionnaire. Those who moved from the sampled suburb prior to completing the survey ( $n = 571$ ), who completed the survey but were not the intended participant ( $n = 3$ ), withdrew their data after completing the survey ( $n = 2$ ), or were <17- or >46-years old ( $n = 13$ ), were excluded, leaving 4349 eligible participants. Those with missing leisure or transport physical activity data ( $n = 70$ ), more than one missing independent variable ( $n = 93$ ) or with more than one covariate missing ( $n = 78$ ) were excluded, leaving 4108 participants for the final analyses.

## Measures

### Dependent variables

Physical activity was self-reported using the long version of the International Physical Activity Questionnaire (IPAQ-L) (Craig et al., 2003). This reliable and valid instrument collects information on the duration, frequency and intensity of past week physical activity within leisure, transportation, occupational and domestic domains of physical activity. The behaviours of interest in this paper were physical activities that may be amenable to intervention, that is, activity that women may be able to increase volitionally, rather than utilitarian activities that are required as part of occupational or domestic duties. This paper therefore focuses on leisure time physical activity (LTPA) and transport-related physical activity (TRPA). LTPA was classified based on physical activity recommendations as none (0 min/week), insufficient (1–149 min/week), or sufficient ( $\geq 150$  min/week) (Australian Department of Health and Aged Care, 1999; Haskell et al., 2007). Because there are currently no recommendations for TRPA, this variable was categorised according to thirds of activity as low (0–29 min/week), medium (30–149 min/week), or high ( $\geq 150$  min/week). While it may be important to consider the intensity of physical activity when examining dose-response associations with health outcomes, we felt that weekly duration was a more useful indicator for trying to understand influences on specific domains of physical activity behaviour. For instance, because so few adults are sufficiently active for health, we argue that it is of greater public health importance to understand the influences on participating in any moderate to vigorous-intensity physical activity, irrespective of the intensity. Furthermore, physical activity was classified according to current physical activity recommendations (where available) which are based on time rather than intensity.

### Independent variables

Details of the individual, social and neighbourhood environment questions included in the survey are provided in Table 1, along with internal consistency coefficients (Cronbach's alpha). Each of the independent variables were included based on previous evidence of the existence of an association with physical activity in general adult population samples.

*Individual factors.* Self-efficacy for physical activity in difficult circumstances was assessed by summing responses to five statements on a five-point Likert scale (Marcus, Selby, Niaura, & Rossi, 1992). Physical activity enjoyment was assessed by summing responses to six items on a seven-point Likert scale (Kendzierski & DeCarlo, 1991), and outcome expectancies were assessed by summing responses to six reasons for doing physical activity on a four-point scale (Lechner, Bolman, & Van Dijke, 2006). One question assessed intentions for physical activity with a seven-point Likert scale (Giles-Corti & Donovan, 2003) and behavioural skills were assessed by summing responses to two questions about

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