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Sense of community and its relationship with walking and neighborhood design☆

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ABSTRACT

The aim of this study is to examine the association between sense of community, walking, and neighborhood design characteristics. The current study is based on a sub-sample of participants ($n = 609$) from the US Atlanta SMARTRAQ study who completed a telephone survey capturing physical activity patterns, neighborhood perceptions, and social interactions. Objective measures of neighborhood form were also computed. Univariate and multivariate models (General Linear Models (GLM)) were used to examine the association between sense of community (SofC) and aspects of the built environment, physical activity, and neighborhood perceptions. In multivariate models the impact on SofC was examined with progressive adjustment for demographics characteristics followed by walking behavior, neighborhood design features, neighborhood perceptions and time spent traveling in a car.

After adjustment, SofC was positively associated with leisurely walking (days/week), home ownership, seeing neighbors when walking and the presence of interesting sites. SofC was also associated with higher commercial floor space to land area ratios (FAR) – a proxy for walkable site design that captures the degree to which retail destinations are set back from the street, the amount of surface parking, and urban design of an area. Conversely the presence of more mixed use and perceptions of steep hills were inversely associated with SofC.

SofC is enhanced by living in areas that encourage leisurely walking, hence it is associated with living in neighbourhoods with lower levels of land use mix, but higher levels of commercial FAR. Our results suggest that in terms of SofC, the presence of commercial destinations may inhibit social interaction among local residents unless urban design is used to create convivial pedestrian-friendly commercial areas, e.g., providing street frontage, rather than flat surface parking. This finding has policy implications and warrants further investigation.

Main text

Introduction

Urban planning paradigms such as New Urbanism place a strong emphasis on creating pedestrian friendly neighbourhoods that promote walking and a sense of community (Joongsub & Kaplan, 2004; Lund, 2003). Yet, the premise that walkability and walking contributes to sense of community has seldom been empirically investigated.

Accumulating evidence over the last decade does however support New Urbanists' claims that walking is associated with the physical attributes of neighbourhoods. Built form characteristics reflected in key new urbanism design principles include street connectivity (typically in the form of grid-style street networks), accessible destinations and mixed land use, along with moderate to higher levels of residential density, public gathering places and quality parks and open space (Deitrick & Ellis, 2004). Objective measures of street network design, density, and distance to destinations including shops, services, employment, and places to recreate have been shown to be associated with more walking even when adjusting for neighbourhood preferences (Frank & Engelke, 2005; Owen et al., 2007). Connectivity and the degree to which destinations can be reached in a direct, rather than an indirect pathway have also been shown to be predictive of walking (Frank, Engelke, & Schmid, 2003).

Collecting objective data on the built environment can however be time consuming and expensive, and it is also arguable that perceptions of neighbourhood features play as much of a role in shaping behaviour as actual characteristics (Saelens, Sallis, Black, & Chen, 2003). For example, walking has been found to be positively associated with perceptions of attractiveness, aesthetics or greenery (Ball, Bauman, Leslie, & Owen, 2001; Ellaway, Macintyre, & Bonnefoy, 2005) the perceived convenience of local facilities

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(Ball et al., 2001; Humpel, Marshall, Leslie, Bauman, & Owen, 2004), and perceptions about whether shops within walking distance (Foster & Hillsdon, 2004) and negatively associated with fear of crime (Keane, 1998) and neighborhood incivilities (Ellaway et al., 2005).

While studies of the impact of urban design on walking abound, (Owen, Humpel, Leslie, Bauman, & Sallis, 2004; Saelens et al., 2003) fewer studies have examined the impact of community design on mental health (Sugiyama, Leslie, Giles-Corti, & Owen, 2008; Takano, Nakamura, & Watanabe, 2002), or tested the New Urbanism assumption that pedestrian friendly environments help create a sense of community, 'a feeling that members have of belonging and being important to each other and a shared faith that members' needs will be met by the commitment to be together' (McMillan & Chavis, 1986). It is however arguable that walkable environments also facilitate opportunities for residents to meet, interact and engage in their neighbourhood, which can foster sense of community (Leyden, 2003; Lund, 2002, 2003) and could improve mental health outcomes. Conversely, it is also plausible that sense of community has a favourable influence on resident's propensity to walk within their neighbourhood. The conceptual model in Fig. 1 conveys these hypothesised relationships.

There is some existing research that supports aspects of the relationship between walking, walkability and sense of community. For example, Lund (Lund, 2002) found that the frequency of walking within neighbourhoods was associated with more unplanned interactions with neighbours, which can in turn contribute to relationship formation and development. Environmental perceptions conducive to walking can further enhance the likelihood of such unplanned encounters (Lund, 2003). For example, people who perceived their neighbourhood environment to be safe and interesting have been shown to rate their sense of community more highly (Lund, 2002). Conversely, the presence and level of vehicular traffic and car parking have been shown to negatively affect perceptions of area friendliness, safety and helpfulness (Mullen, 2003). Therefore, pedestrian-friendly environments that encourage regular local walking may be important from not only a physical but also a mental health perspective.

Feeling ties with a place and fellow residents has also been linked to a range of community level outcomes that influence well-being including fear of crime and improved community problem coping skills (McMillan & Chavis, 1986). These outcomes directly and indirectly influence health, by providing social support shown to be associated with physical activity (Ball et al., 2007) increasing social networks (Berkman & Glass, 2000) and helping to build ties the community thereby improving mental health (DHAC, 2000).

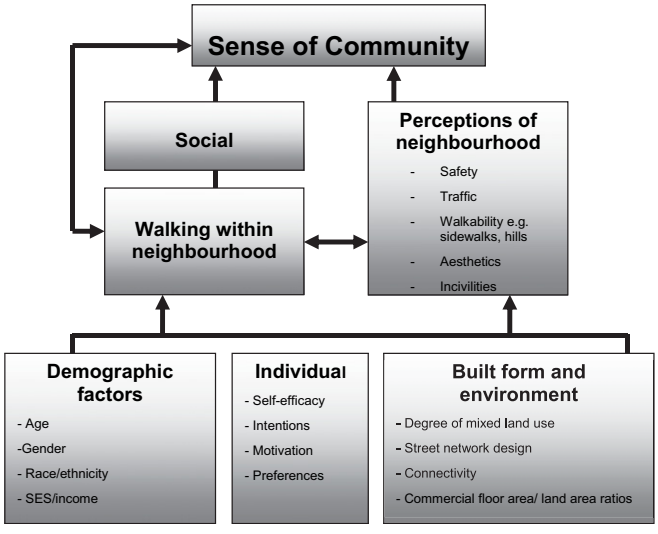

Fig. 1. Conceptual model of the association between neighborhood environment, walking and sense of community.

Calls for empirical evidence documenting the beneficial links between sense of community, urban design and well-being began a decade ago (Talen, 1999). However, as noted, very few empirical studies to date have included measures of all three as depicted in Fig. 1. Moreover, studies that have attempted to evaluate this connection have relied mainly on subjective rather than objective assessment of the built form. Leyden's measure of walkability for example, was based on the perceptions and ratings of both the researcher and residents of the degree to which neighbourhoods were pedestrian oriented and mixed use. Lund (Lund, 2003) used some objective measures of neighbourhood walkability but these were limited to indicating the presence or absence of retail destinations and parks. Strengthening the evidence-base entails moving beyond perceptions of the built environment to include a more complete set of objective measures of the environment (Frank & Engelke, 2005).

Understanding the relationships between community design, walking, and wellness will provide insights into the appropriate types of neighbourhood design interventions that promote and support both physical and mental health, and will test New Urbanism assumptions of the broader benefits of pedestrian-friendly environments. Thus, in this study we aimed to explore the association between sense of community (as our outcome variable) and walking behavior and neighbourhood characteristics hypothesized to influence walking. This study is unique because it includes a range of environmental perceptions to gauge factors that might both facilitate (e.g., presence of interesting sites) or hinder (e.g., perceptions of traffic, crime) walkability and its impact on sense of community, together with objective measures of the environment.

Methods

Sample and data collection

The current study is part of the broader SMARTRAQ (Strategies for Metropolitan Atlanta's Region Transportation and Air Quality) study undertaken in the 13 county metropolitan Atlanta Region (www.act-trans.ubc.ca/smartraq). A total of 18,326 people from 8069 households were recruited from the SMARTRAQ study area. To capture variability in neighbourhood urban form, participants were recruited across five ranges of residential density (0–2, 2–4, 4–6, 6–8, 8+ dwellings per residential acre).

The current study is based on a sub-sample of participants recruited to fill out an additional survey ($n = 896$) to capture physical activity, neighbourhood perception, and social interaction. This sub-sample of participants was selected to maximize variation across density, age, and income (recruited from above 6 and below 4 dwellings per residential acre, between the age of 20–70, and with an income $<$ \$45,000 or $>$\$54,999 per year). To reduce the potential for clustering, one member was selected from each household, and respondents were selected across the entire Atlanta region and not geographically concentrated. The sub-sample for this study had a similar demographic profile to the larger SMARTRAQ sample in terms of gender, age distribution and proportion of respondents identifying as Black/African Americans.

Data collection occurred between 2001 and 2003. Ethics approval was obtained from the Institutional Review Board of the Georgia Institute of Technology for the collection of the data upon which this manuscript is based. Survey recruitment and data collection involved random-digit-dial using a computer aided telephone interview system (CATI). The overall response rate was