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Relationships between the perceived neighborhood social environment and walking for transportation among older adults

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ABSTRACT

Ecological models state that physical activity (PA) behaviors can be explained by the interplay between individuals and their surrounding physical and social environment. However, the majority of research on PA-environment relationships has focused upon the physical environment. The purpose of the current study was to investigate the relationship between the perceived social environment and older adults' walking for transportation, while adjusting for individual and perceived physical environmental factors. Questionnaires were used to collect data on walking for transportation, individual, perceived physical and social environmental factors in 50,986 Flemish older adults (≥65 years) in the period of 2004–2010. Multilevel logistic regression analyses were applied to examine the relationships between perceived social environmental factors and the odds of daily walking for transportation. The final models showed significant positive relationships for frequency of contacts with neighbors, neighbors' social support, too many immigrants residing in the neighborhood, neighborhood involvement, participation, and volunteering. These results emphasize the need for including social environmental factors in future studies examining correlates of older adults' physical activity. Current findings suggest that projects stimulating interpersonal relationships, place attachment, and formal community engagement might promote walking for transportation among older adults. Future research should try to further disentangle the complex (inter)relationships and causal mechanisms between older individuals, their environments, and their walking for transportation behavior.

Introduction

The physical, social and mental health benefits of regular physical activity (PA) for older adults (≥65 years) are well-established (Chodzko-Zajko et al., 2009). Given that the population of older adults is growing, with many suffering from chronic diseases and few (30–40%) accumulating enough PA to maintain health benefits, the promotion of PA in this age category is needed (Centers for Disease Control and Prevention, 2012; Eurobarometer, 2010). Walking represents an ideal activity to promote among older adults, as it is healthy, safe, accessible and well-liked (De Fré, De Martelaer, Philippaerts, Scheerder, & Lefevre, 2009; Manson et al., 2002; Murtagh, Murphy, & Boone-Heinonen, 2010). In particular, walking for transportation seems promising as it can be easily integrated into

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older adults' daily routines (e.g. walking to a shop). In order to promote walking for transportation among older adults, knowledge of its correlates is required (Baranowski, Anderson, & Carmack, 1998).

According to social ecological models of health promotion, human well-being, behavior and environmental conditions are strongly interrelated. These models emphasize that the level of congruence between people and their surrounding environment is an important predictor of their health behaviors (e.g. PA) and well-being (Stokols, 1996). Social ecological models conceptualize the environment as a multi-dimensional concept, including physical and social aspects (Stokols, 1996). The physical environment can be defined as the characteristics of the physical context in which people spend their time (e.g. home, neighborhood), including aspects of urban design (e.g. presence of sidewalks), traffic density and speed, distance to and design of venues for PA (e.g. parks), crime and safety (Davison & Lawson, 2006).

In conceptualizing the social environment, definitions vary from author to author, depending on the different perspectives of their research paradigms. As a consequence of these different approaches, there are certain inconsistencies in the concepts, which lead to theoretical and methodological ambiguity (Carpiano, 2006). Social epidemiological studies, for instance, often refer to social capital (Putnam, 2000), whereas others use related concepts such as social cohesion (Echeverria, Diez-Roux, Shea, Borrell, & Jackson, 2008), perceived neighborhood climate (Brown et al., 2011), or social neighborhood environment (Kamphuis et al., 2009). According to Buffel et al. (2012) the social environment can encompass several dimensions, including: interpersonal relationships (i.e. social networks and social support) (Brown et al., 2011; Forrest & Kearns, 2001; McNeill, Kreuter, & Subramanian, 2006), place attachment (i.e. social composition of the neighborhood and neighborhood involvement) (Brown et al., 2011), and formal community engagement (i.e. participation in organizations and volunteering) (Forrest & Kearns, 2001; Putnam, 1993, 2000).

Social ecological models do not only describe the environment as multi-dimensional, they also underscore the behavior-specificity of environmental correlates (Alfonzo, 2005; Sallis et al., 2006). For example, the presence of a variety of shops in the neighborhood can be expected to stimulate walking for transportation, but might be less relevant for walking for recreation.

Since 2000, PA-environment relationships have received considerable research attention (Rhodes & Nasuti, 2011). While much of the research on the relationship between environmental factors and health-related behaviors has focused on aspects of the physical environment, less is known about social environmental conditions and PA (Mahmood et al., 2012; McNeill et al., 2006). Furthermore, the vast majority of previous studies were conducted among younger populations, whereas studies on older adults are rather scarce (Rhodes & Nasuti, 2011; Van Cauwenberg et al., 2011). Nevertheless, several authors point to an increasing importance of the neighborhood environment as people age (Buffel et al., 2012), for a number of reasons. First, the long period of time spent in the same place, resulting in cumulative memories (Phillipson, 2007); second, the greater time spent at home and in the neighborhood following retirement (Peace, Wahl, Mollenkopf, & Oswald, 2007); third, increased reliance upon neighborhood relationships for support in old age (Krause, 2004); and fourth, the significance of the neighborhood in preserving a sense of identity for older adults (Rowles, 1983; Rubinstein & Parmelee, 1992). Furthermore, in order to understand issues of physical health in older adults, neighborhood environments appear to be key elements (Mahmood et al., 2012). Therefore, the current study focuses upon the relationships between three social environmental dimensions (interpersonal relationships, place attachment, and formal community engagement) and older adults' walking for transportation.

The physical and social environment are no separate entities, they are closely interlinked and exert independent as well as joint effects on human behavior (Alfonzo, 2005; Stokols, 1996). Concerning the relationship between the physical environment and older adults' walking for transportation, several studies have observed higher levels of walking for transportation in areas with easy access to destinations (e.g. shops, services, etc.) (Frank, Kerr, Rosenberg, & King, 2010; King et al., 2011; Salvador, Reis, & Florindo, 2010; Van Cauwenberg, Clarys, et al., 2012). For example, Frank et al. (2010) reported residents of high-walkable neighborhoods (many destinations within walking distance) to be twice as likely to walk for transportation compared to residents of low-walkable neighborhoods (few destinations within walking distance). For other physical environmental factors, such as presence and quality of walking facilities, traffic- and crime-related safety, and aesthetics, a systematic review concluded that current evidence is inconclusive (Van Cauwenberg et al., 2011).

Although the positive effects of the social environment on older adults' well-being (Shiovitz-Ezra & Litwin, 2012), physical health (Ahnquist, Wamala, & Lindstrom, 2012), and levels of mortality and morbidity (Berkman, Glass, Brissette, & Seeman, 2000) have long been recognized, research is only just beginning to unravel its relationship with older adults' walking behaviors. A study in American older adults reported individual-level (but not neighborhood-level) social cohesion to be positively related to total walking (Mendes de Leon et al., 2009). However, another US study found that neighborhood-level social cohesion did explain differences in total walking between neighborhoods (Fisher, Li, Michael, & Cleveland, 2004). Studying correlates of recreational walking in Dutch older adults, Kamphuis et al. (2009) observed a negative relationship for social cohesion, but a positive relationship for size of social network. No relationships were found for feeling at home in the neighborhood and social disorganization. In a longitudinal study in older Hispanics living in the US, Brown et al. (2011) found that a positive perceived neighborhood climate was related to more total walking one year later. In another longitudinal study, Brown et al. (2008) reported that the presence of physical environmental factors that are believed to promote visual and social contacts among residents (such as stoops, front porches, windows…) positively predicted physical functioning three years later. The inconsistent findings in the above described studies point to the need for further research into the relationships between social environmental factors and older adults' walking behaviors. Furthermore, although one of the core principles of social ecological models is the domain-specificity of correlates (Alfonzo, 2005; Sallis et al., 2006), none of the above studies focused specifically upon older adults' walking for transportation.

Physical and social environments are not only hypothesized to influence health behaviors, they are also interrelated and influence each other (Eicher & Kawachi, 2011; Frumkin, Frank, & Jackson, 2004; Stokols, 1996). Leyden (2003) found that adults living in high-walkable Irish neighborhoods reported higher levels of knowing their neighbors, political participation, trust in other people, and social participation compared to participants living in low-walkable neighborhoods. These findings held when walkability was defined by a subjective rating of the researcher as well as by participants' perceptions. However, Wood et al. (2008) found the objectively measured number of destinations to be negatively related, but the perceived adequacy of local facilities positively related to social capital. Furthermore, they found the objectively measured presence of nearby bus stops to be related to lower levels, whereas nearby shops were related to higher levels of social capital. In Japanese older adults, no significant relationships were found between an objective walkability-index and any of six social capital indices (i.e. general trust, norms of reciprocity, place attachment,