



Physical environmental factors that invite older adults to walk for transportation



Jelle Van Cauwenberg^{a,b,c,*}, Veerle Van Holle^{b,c}, Ilse De Bourdeaudhuij^b, Peter Clarys^a, Jack Nasar^d, Jo Salmon^e, Lea Maes^f, Liesbet Goubert^g, Nico Van de Weghe^h, Benedicte Deforche^{a,b}

^a Department of Human Biometry and Biomechanics, Faculty of Physical Education and Physical Therapy, Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussels, Belgium

^b Department of Movement and Sport Sciences, Faculty of Medicine and Health Sciences, Ghent University, Watersportlaan 2, B-9000 Ghent, Belgium

^c Fund for Scientific Research Flanders (FWO), Egmontstraat 5, B-1000 Brussels, Belgium

^d City and Regional Planning, The Ohio State University, 230 Knowlton Hall, Columbus, OH 43210, USA

^e School of Exercise & Nutrition Sciences, Deakin University, Burwood Highway 221, Burwood, Victoria 3125, Australia

^f Department of Public Health, Faculty of Medicine and Health Sciences, Ghent University, De Pintelaan 185, B-9000 Ghent, Belgium

^g Department of Experimental, Clinical and Health Psychology, Faculty of Psychology and Educational Sciences, Ghent University, Henry Dunantlaan 2, B-9000 Ghent, Belgium

^h Department of Geography, Faculty of Sciences, Ghent University, Krijgslaan 281, B-9000 Ghent, Belgium

ARTICLE INFO

Article history:

Available online 10 January 2014

Keywords:

Physical environment
Physical activity
Walking
Older adults
Photographs

ABSTRACT

Knowledge on the physical environmental factors that invite older adults to walk for transportation is limited. The current study aimed to investigate the relationships between environmental factors and invitingness to walk for transportation and the potential moderating effects of gender, functional limitations and current walking for transportation behavior. Sixty older participants evaluated 40 panoramic photographs on their invitingness in two ways: a forced choice (first impressions) and a rating task (more deliberate evaluation). Presence of vegetation, benches, and surveillance significantly positively related to both invitingness-measures. Upkeep and presence of historic elements significantly positively related to the assigned invitingness-ratings. For the forced choice task, significant positive relationships emerged for land use and separation between sidewalk and cycling path, but only in functionally limited participants. Environments offering comfort, safety from crime, and pleasantness may attract older adults to walk for transportation. Experimental and on-site studies are needed to elaborate on current findings.

© 2014 Elsevier Ltd. All rights reserved.

1. Background

Worldwide the population of older adults (≥ 65 years) is growing and many of them suffer from one or more chronic diseases (Christensen, Doblhammer, Rau, & Vaupel, 2009; Spirduso, Francis, & MacRae, 2005; U.S. Census Bureau, 2013). These chronic diseases, such as cardiovascular diseases, cancers, and diabetes type 2, are the main causes of older adults' disability and

premature death (Murray, Vos, Lozano, AlMazroa, & Memish, 2012). Engagement in 30 min of moderate-to-vigorous physical activity (e.g. brisk walking) on at least five days/week reduces the risk for developing chronic diseases (Chodzko-Zajko et al., 2009). Furthermore, physical activity has been linked to better mental well-being (Windle, Hughes, Linck, Russell, & Woods, 2010), cognitive functioning (Eggermont, Milberg, Lipsitz, Scherder, & Leveille, 2009), and overall quality of life (Balboa-Castillo, Leon-Munoz, Graciani, Rodriguez-Artalejo, & Guallar-Castillon, 2011). Despite this multitude of benefits, older adults are the least physically active age group with 60–70% not reaching the recommended levels of physical activity (Centers for Disease Control and Prevention, 2013; Eurobarometer, 2010; Tafforeau, 2008). Therefore, integrating physical activity into older adults' daily routines is an important goal for maximizing older adults' health and managing health care costs (Leung et al., 2008; Vogel et al., 2009). Walking is an ideal activity to promote in older adults as it is well-liked, has proven

* Corresponding author. Department of Human Biometry and Biomechanics, Faculty of Physical Education and Physical Therapy, Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussels, Belgium. Tel.: +32 26292734.

E-mail addresses: jvcawwen@vub.ac.be, Jelle.Van.Cauwenberg@vub.ac.be (J. Van Cauwenberg), Veerle.Vanholle@ugent.be (V. Van Holle), Ilse.Debourdeaudhuij@UGent.be (I. De Bourdeaudhuij), Peter.Clarys@vub.ac.be (P. Clarys), nasar.1@osu.edu (J. Nasar), jo.salmon@deakin.edu.au (J. Salmon), Lea.Maes@UGent.be (L. Maes), Liesbet.Goubert@ugent.be (L. Goubert), Nico.VandeWeghe@UGent.be (N. Van de Weghe), Benedicte.Deforche@vub.ac.be (B. Deforche).

health benefits, and does not require specific skills or equipment (De Fré, De Martelaer, Philippaerts, Scheerder, & Lefevre, 2009; Manson et al., 2002; Murtagh, Murphy, & Boone-Heinonen, 2010). In particular, stimulating walking for transportation (e.g. walking to a shop or to a friend's home) is promising as this is easy to integrate into an older adult's daily routine.

To stimulate walking for transportation among older adults, we need knowledge of its determinants (Baranowski, Anderson, & Carmack, 1998). Since 2000, research on the determinants of physical activity is guided by a social-ecological framework (Rhodes & Nasuti, 2011). These social-ecological models posit that health behaviors are shaped by a complex interplay between individuals and their surrounding environments (Alfonzo, 2005; Sallis et al., 2006; Stokols, 1996). Studies typically conceptualized the physical environment as the objective and perceived characteristics of the physical context in which people spend their time (e.g. neighborhoods and streets), including aspects of urban design (e.g. residential density), traffic density and speed, distance to and design of venues for physical activity (e.g. parks and public open spaces), crime, and safety (Davison & Lawson, 2006). Physical environmental factors can be organized into four major categories that possibly affect walking choice: accessibility (e.g. distance to destinations, presence of a sidewalk), comfort (e.g. sidewalk evenness, separation from traffic, benches), safety from crime (e.g. surveillance, hiding places), and pleasantness (e.g. vegetation, historic elements, mixed land use) (Alfonzo, 2005).

A social-ecological approach that is especially relevant to older adults' walking for transportation is described in press-competence models. These models emphasize the importance of the match between environmental pressure (or environmental barriers) and the person's competence to overcome this pressure. Hence, it explicitly assumes that when people become more functionally limited and competence decreases, the sensitivity to environmental pressure and barriers increases (Wahl & Lang, 2003). This assumption has received empirical support by some studies reporting stronger environment–physical activity relationships in more, compared to less, functionally limited older adults (Forsyth, Oakes, Lee, & Schmitz, 2009; Rantakokko et al., 2009; Rantakokko et al., 2010). However, this moderating effect was not replicated by others (King et al., 2011). The physical environment cannot only hinder walking for transportation, it can also attract older adults to go outdoors and walk for transportation. This idea forms the core of the theory of "affordances". Affordances are perceptible properties of the environment that have functional significance for an individual (Heft, 2010). For example, Sugiyama, Thompson, and Alves (2009) found that the presence of high quality paths to neighborhood open spaces supported (or afforded) overall walking among British older adults. The importance of possible individual moderating factors is emphasized in this theory by stating that an environmental characteristic will only afford a certain activity if it is of functional significance for the individual (Heft, 2010). This is highlighted in Warren's definition of affordances (Warren, 1984): "The critical and optimal values of an environmental property, relevant to performing an action are an invariant proportion of some aspect of each actor's body scale". Hence, whether or not a certain environmental factor will afford walking for transportation depends on the characteristics of the perceiver. For example, the presence of a bench might afford walking for transportation for functionally limited older adults who need the possibility to rest during a walk to their local store. However, this bench might not be a relevant affordance to a fit older adult who does not need to rest during this walk. Relationships between physical environmental factors and walking for transportation might not only be moderated by the presence of functional limitations but also by gender and actual walking for transportation level (Kremers et al., 2006).

Despite the relevance of the topic, knowledge on which physical environmental factors that afford or do not afford walking for transportation among (subgroups of) older adults is limited (Thompson, 2013; Van Cauwenberg et al., 2011). Recent studies have observed positive relationships between older adults' walking for transportation and a walkability-index, a macro-scale environmental characteristic including residential density, street connectivity, land-use mix, and retail floor area (Frank, Kerr, Rosenberg, & King, 2010; King et al., 2011). For example, Frank et al. (2010) reported residents of high-walkable neighborhoods to be twice as likely to walk for transportation compared to residents of low-walkable neighborhoods. Other measures of access to possible walking destinations (e.g. perceived distance to amenities) have also been consistently linked to walking for transportation levels among older adults (Salvador, Reis, & Florindo, 2010; Van Cauwenberg, Clarys, et al., 2012). These findings support the idea proposed by Alfonzo (2005) that accessibility is a basic need that has to be fulfilled in order for older adults to walk for transportation. However, while several qualitative studies highlight the importance of micro-scale environmental characteristics related to the other major environmental categories (i.e. comfort, safety from crime, and pleasantness) (Gallagher et al., 2010; Lees et al., 2007; Lockett, Willis, & Edwards, 2005; Strath, Isaacs, & Greenwald, 2007), results from quantitative studies are inconclusive (Van Cauwenberg et al., 2011). These micro-scale environmental characteristics are more amenable to change compared to access to destinations and are, therefore, particularly relevant for urban planners aiming to promote walking for transportation. Consequently, more research is needed to inform policy makers and urban planners on which specific micro-scale environmental characteristics they should focus, in order to produce environments that invite older adults to walk for transportation.

The inconsistent findings for micro-scale environmental characteristics observed in previous research might relate to several methodological issues. First, previous studies typically examine relationships between physical activity and objective or perceived neighborhood environments. Measuring the objective or perceived neighborhood environment strongly rely upon the operationalization of "the neighborhood". However, until now there is no consensus on how to define an older adult's neighborhood (Brownson, Hoehner, Day, Forsyth, & Sallis, 2009; Spittaels et al., 2009). For example in English adults, the perceived walkable neighborhood area was estimated to be around 400 m (Smith, Gidlow, Davey, & Foster, 2010). One might expect it to be smaller in older adults. However, most of the previous studies used larger radii to define older adults' neighborhoods (Van Cauwenberg et al., 2011). Hence, there might have been a mismatch between the environment and the behavior (i.e. walking for transportation). Second, relationships in previous studies might have been obscured by limited environmental variation (De Vries, 2010). Furthermore, there is the issue of environmental co-variation, the tendency of environmental factors to co-occur, which makes it difficult to tease out the influence of one separate environmental factor (Wells, Ashdown, Davies, Cowett, & Yang, 2007). Third, the assessment of environmental perceptions by questionnaires requires a level of cognitive awareness of perceptions during exposure which respondents may not recall (Carpiano, 2009). These assessments typically involved rating tasks (e.g. rating the quality of a sidewalk on a 5-point scale), which assume that individuals make very rational decisions about where (not) to walk for transportation. However, in real-life situations decisions concerning where (not) to walk for transportation probably involve less rational choices that are guided by first impressions.

While responses to photographs might not completely capture the active process of environmental perception (Heft, 2010), the use

Download English Version:

<https://daneshyari.com/en/article/7246306>

Download Persian Version:

<https://daneshyari.com/article/7246306>

[Daneshyari.com](https://daneshyari.com)