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A qualitative study on the role of the built environment for short walking trips

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ABSTRACT

The present study uses a qualitative approach with the aim to identify built environmental factors influencing short walking distances for transportation among adults (18–65 years), with special attention to micro-scale attributes. Three focus groups were held in Valencia (Spain) and conducted with participants who undertook, at least once a week, one short non-shopping trip in any travel mode (were “short trip” is defined as less than 30–45 min walking distance). A thematic analysis of the data was performed and six categories of factors emerged related to the built environment. Factors were also classified as either barriers to walking, or secondary factors related to the attractiveness of the walking experience and the pedestrian route choice. Results show that factors related to safety from crime are the most deterrent to walking (absence of people and poor street lighting), along with the availability of car parking at destination for car users. Crossing large avenues and roundabouts in Valencia can be a deterrent to walking because of the high density of pedestrian traffic signals with a poor coordination, leading to long crossing waiting times. Secondary factors such as wide sidewalks, the presence of trees, and low traffic volume roads were mentioned by almost all participants. Our findings suggest that sidewalk width may not only influence pedestrian route choice but can be a barrier to walking. Focus groups also revealed that sidewalk cafes and bollards were seen as physical obstacles by some participants.

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1. Introduction

Walking is an environmentally friendly travel mode and one of the alternatives to individual conventional transportation. Promoting sustainable travel behavior is among the objectives of the European Union to reduce CO₂ emissions from transportation (EC, 2011). Active transportation is also related to health: countries where active transportation is most common have the lowest obesity rates (Bassett, Pucher, Buehler, Thompson, & Crouter, 2008).

Many studies have provided evidence of the association between neighborhood design and active transportation. Some reviews identify how researchers in transportation and urban planning (Hodgson, Page, & Tight, 2004; Hof, 2010; Saelens & Handy, 2008; Saelens, Sallis, & Frank, 2003) and in population health (Owen, Humpel, Leslie, Bauman, & Sallis, 2004) are examining potential environmental determinants of transport-related walking.

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Most studies have focused on the meso-scale (or neighborhood scale) built environmental factors when examining the correlation with walking, such as residential density, land use mix, and street connectivity. However, meso-scale measures in general have drawbacks for capturing micro-scale (or street level) built environment characteristics, such as the presence of trees, the width of the sidewalks, and the quality of the streets (Kim, Park, & Lee, 2014). The current study examines macro and micro factors of the built environment determining the decision to walking for transportation, and also a set of factors influencing the individual perception for a pleasant walking trip. Special attention is given to micro-scale built environment factors, as the roles of micro-scale elements are not well understood due to limited data availability (Lee, Zhu, Yoon, & Varni, 2013). A qualitative approach based on focus groups is used with the aim to identify new environmental factors and to collect more detailed data on previously studied factors.

The following section presents a review of the related literature. This is followed by the description of the methods used to conduct the study and the main results. The paper ends with a discussion, conclusions, and limitations and further research.

2. Literature review

2.1. The built environment

Davison and Lawson (2006) defined the built or physical environment as objective and perceived characteristics of the physical context in which people spend their time (e.g., home, neighborhood, school) including aspects of urban design (e.g., presence and structure of sidewalks), traffic density and speed, distance to and design of venues for physical activity (e.g., playgrounds, parks and school yards), crime, safety and weather conditions.

The literature review of our study considers objective and perceived characteristics of the physical environment related to walking, according to the definition by Davison and Lawson (2006).

2.2. Walking for transportation

Some studies have pointed out the importance of distinguishing between travel for utilitarian purposes (e.g., walking to work, etc.) and travel for recreation (e.g., go to the gym, to a park, to the beach, strolling, etc.) as the factors of the built environment that influence these two categories of travelling differ significantly (Cao, Handy, & Mokhtarian, 2006; Giles-Corti & Donovan, 2002; Saelens & Handy, 2008; among others). We are only interested in built environmental factors influencing walking to reach a destination, also defined as walking for transportation. In our study, trips related to recreational purposes (e.g., go to the gym, to the swimming pool, etc.) except strolling are considered walking for transportation as well.

2.3. The built environment and walking for transportation

2.3.1. Quantitative approaches

The relationship between walking among adults and the built environment using quantitative approaches has been explored by means of objective and perceived measures of the factors of interest. The first group includes studies that use objective measures of the built environment characteristics at a micro-level or larger scale around individuals' residence (Cao, Mokhtarian, & Handy, 2009; Clark, Scott, & Yiannakoulis, 2014; Frank, Saelens, Powell, & Chapman, 2007; Greenwald & Boarnet, 2001; Lovasi et al., 2013; Saelens & Handy, 2008; Shriver, 1997; Van Dyck et al., 2010). Findings by Shriver (1997) suggest that walking-activity patterns are influenced by street connectivity, mixed use areas, and outdoor seating. Greenwald and Boarnet (2001) results suggest that regardless of the effects that land use has on individual non-work walking trips, the impacts take place at the neighborhood level. Results provided by Cao et al. (2009) show that mixed land uses, the availability of walking infrastructures, aesthetics quality and social context are associated with walking for transportation. Van Dyck et al. (2010) found that living in a high-walkable neighborhood was associated to more walking and cycling for transportation.

Similarly, objective measures of the built environment have been studied to explain their influence on physical activity and non-motorized travel (Badland & Schofield, 2005; Cervero & Kockelman, 1997; Handy & Clifton, 2001; Rodríguez & Joo, 2004). For example, Cervero and Kockelman (1997) found that density, land-use diversity and pedestrian-oriented designs reduce automobile trip rates and encourage non-auto travel modes. Rodríguez and Joo (2004) found that the presence of sloping terrain decreases the attractiveness of walking and cycling. In addition, some studies have developed trip mode choice models incorporating residential environmental characteristics as explicative factors (Kim & Ulfarsson, 2008; Lee, Nam, & Lee, 2014; Singleton & Wang, 2014). Singleton and Wang (2014) suggested that higher densities of more comfortable facilities for walking (low-traffic streets), higher densities of traffic signals and traffic calming installations were associated with increased levels of walking.

The second group of studies examines the relationship between walking and perceptions of attributes of the local neighborhood (Craig, Brownson, Cragg, & Dunn, 2002; Panter, Griffin, & Ogilvie, 2014). Craig et al. (2002) modeled the relationship between walking to work and an environment score based on 18 neighborhood characteristics, and found that with the exception of visual interest and aesthetics, each neighborhood characteristic was correlated with walking (e.g., safety from

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