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Long term effects of an intervention in the outdoor environment—a comparison of older people's perception in two residential areas, in one of which accessibility improvements were introduced

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ABSTRACT

Walking and participating in activities outdoors in old age can be restricted both by the physical capacity of the individual and by the maintenance and/or the design of the outdoor environment. The purpose of this paper is to compare frequency of walking and frequency of activity outside the home, reported environmental barriers and valuation of the outdoor environment between two areas, in one of which there was an intervention in the outdoor environment 5–8 years prior to this study. The paper is based on a questionnaire sent out in 2011, to all residents 65 years and older in two different areas, the Study Area, an area with an intervention, and the Reference Area. The results show that reports on functional limitations, use of mobility devices and walking difficulties were similar in both areas. Despite that, respondents in the Study Area had a significantly higher frequency of walking and they also participated to a higher degree in activities than respondents in the Reference Area, even though they reported more environmental barriers. The valuation of the outdoor environment was, however, similar in both areas. The results indicate that older people benefit from interventions in the outdoor environment. However, the results also emphasize the importance of good maintenance of the environment.

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1. Introduction

For older people, mobility is one of the prerequisites for most activities (Wessels et al., 2004), high quality of life (Banister and Bowling, 2004) and continued independence (Iwarsson et al., 2013). Recent literature has demonstrated that older people will rely more heavily on car transport in the future (Arentze et al., 2008; Hjorthol, 2012). However, as they grow older their ability to drive is often compromised and they decide, or are advised, to cease driving (Hjorthol, 2012). Therefore, to ensure that their quality of life is not compromised it is important that older peoplés mobility with means of transport other than the car, such as walking, bicycling and public transport, are not restricted. Older people's ability to walk can be restricted by their own limitations, or restrictions in the environment. On a personal level, functional limitations, which may be experienced at later stages in people's lives, can have a negative effect on older people's ability to walk (Iwarsson, 2005; Smith, 2001; Tollen et al., 2008). From an environmental point of view, poor design or maintenance of the outdoor environment can put restrictions on people with functional limitations. This would make walking even more challenging for this group of people (Clarke et al., 2008; Hovbrandt et al., 2007b; Iwarsson et al., 2013; Levasseur et al., 2008; Nordbakke, 2013; Rosenberg et al., 2013). Accessibility problems in the outdoor environment can therefore constrain older people from staying active and participating in society.

Fortunately, accessibility problems for older people and other people with functional limitations have been gaining more attention, and the need for improvements has been emphasized on both international (ECMT, 2013; Euro Access, 2008; United Nations, 1982, 1993, 2006; World Health Organization, 2002, 2007) and national levels in Sweden (BFS, 2011:5, ALM2; BFS, 2011:13, HIN2; Prop., 1999/2000:79). On the international level, the United Nations with its Standard Rules of Equalization of Opportunities for People with Disabilities (United Nations, 1993) and Convention on the Rights of Persons with Disabilities (United Nations, 2006), have stressed the rights of people with limitations to full participation in society. They have emphasized the need of member states to take measures regarding accessibility in housing, public transport, streets and other outdoor environments (United Nations, 1993). The World Health Organization has also stressed the need of accessibility in their guide, which is to encourage cities to become more age friendly (World Health Organization, 2007).

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On the national level in Sweden, the aim of achieving an accessible environment for all has also received the deserved attention. In 1999 an action plan was implemented to ensure an accessible society for people of all ages, with all kinds of disabilities. This action plan included new legislation stating that public places and areas should be accessible for all (Prop., 1999/2000:79). This involves the elimination of all easily removed barriers in the outdoor environment. In most cases, it is up to the municipality to take actions regarding accessibility. Therefore, to support the municipalities, governmental directives were linked to the Planning and Building Act, providing municipalities with guidelines for making the environment more accessible and usable. According to these directives, all existing (BFS, 2011:13 HIN2) and all new (BFS, 2011:5, ALM2) public buildings, places and outdoor environments in Sweden should be accessible and usable for people of all ages and with all kinds of functional limitations.

Lawton's Ecological Model of Ageing denotes that there is a relationship between the environment and the person (Lawton and Nahemow, 1973). Some environments impose greater environmental pressure than others, especially for a person who has less functional capacity. Iwarsson and Ståhl (2003) conceptualised accessibility and usability by using Lawton's model. They defined accessibility as *'the encounter between the persons or group's functional capacity and the demands of the physical environment'*. Accessibility is objective in its nature, and relates to standards and official norms. However, while a place can be accessible as defined by norms or standards, some people can find it not usable. Therefore, *usability* is defined as a subjective concept, referring to the personal perceptions of the usability of the given environment. Thus, in addition to the personal and environmental components, usability also accounts for activity in the given environment. Nevertheless, in order to make an environment usable and accessible for older people and people with functional limitations, it is important to know which features in the environment are challenging to older people and which are supportive.

Over the years, a number of studies have reported, from different aspects, on which features in the outdoor environment that support or challenge older people when walking (Amann et al., 2006; Banister and Bowling, 2004; Dawson et al., 2007a; Eronen et al., 2014; Hjorthol, 2013; Hovbrandt et al., 2007b; Lavery et al., 1996; Li et al., 2005; Michael et al., 2006; Phillips et al., 2013; Rosenberg et al., 2013; Saelens and Papadopoulos, 2008; Sugiyama and Thompson, 2006; Wennberg et al., 2009; Yen et al., 2009). For example, a study within the fields of transport and urban planning showed that to improve their mobility, older people themselves emphasized, among other factors, improved condition of pavements (Amann et al., 2006). Also, a review focusing on walking among older people showed that proximity of destinations, personal safety, and traffic safety could be associated with more walking (Saelens and Papadopoulos, 2008). For older people, safety is an important prerequisite to keep on walking, where accessibility problems in the form of environmental barriers play an important role. Research has shown that the most frequent accidents older people are involved in as pedestrians are falls mainly caused by barriers in the outdoor environment (Ståhl and Berntman, 2007). One fall can result in older people developing a fear of falling, and that fear can lead to a person avoiding mobility tasks such as walking (Delbaere et al., 2004). Avoiding walking increases the risk of mobility decline (Rantakokko et al., 2009), which again could increase the risk of falls (Delbaere et al., 2010), resulting in a vicious circle. Nevertheless, not all environmental barriers cause falls, but they often result in accessibility and usability problems for the older pedestrian. These barriers have, amongst others, been identified as narrow pavements, poor crossing facilities, high kerbs, uneven or slippery surfaces, poor winter maintenance, stairs without handrails, lack of benches, poor lighting, inconsiderateness of other road users etc. (Hjorthol, 2013; Lavery et al., 1996; Nordbakke, 2013; Risser et al., 2010; Rosenberg et al., 2013; Valdemarsson et al., 2005). The severity of the challenge from these environmental barriers can differ depending on the degree and type of functional limitation that the older person have; with higher age people may suffer not just from one functional limitation but several simultaneously (Hovbrandt et al., 2007b) which could make this group particularly vulnerable to a demanding environment. Some older people adapt to the situation by avoiding environments that they feel are challenging to them (Shumway-Cook et al., 2003). Eventually, this could also mean that the older person stop walking, which can have severe consequences for those with functional limitations, because walking in itself can protect them from further immobility (DiPietro, 2001; Simonsick et al., 2005) as well as cognitive decline (Weuve et al., 2004).

Despite increased knowledge within the field of transport planning for older people, literature studying real interventions in the outdoor environment to increase accessibility or usability is scarce. Therefore, there is limited knowledge about whether measures, such as the Swedish governmental directives suggest, improve the situation for older people. Research studies focusing on effects of interventions in the outdoor environment, are made quite soon after implementation and show similar results, i.e. older respondents appreciate the interventions as such, but their frequency of walking are not necessarily increased (Ståhl et al., 2013; Ward Thompson et al., 2012; Risser et al., 2010). Thus, literature is lacking that focuses on long term effects of interventions in the outdoor environment. Furthermore, comparisons with other areas where no interventions have been carried out are also scarce. Information of this kind is often called for among planners and municipalities, as knowledge on long term effects of interventions might clarify which interventions in the outdoor environment are most beneficial for older people. It could also give knowledge on how to prioritize in the daily planning in investments as well as maintenance strategies. Therefore, the overarching aim of this study is to compare two areas in one and the same city, where one area was subjected to an intervention for increased accessibility and usability 5–8 years ago and another was not. The comparison comprises frequency of walking and activity, as well as overall valuation of the outdoor environment.

The specific research questions were:

- Is there any difference in frequency of walking and activity between the two areas? If so, what background variables and/or reported environmental barriers are associated with such differences?
- Are there any differences in reported environmental barriers in the two areas? If so, what background variables are associated with such differences?
- Is there any difference in valuation of the outdoor environment between the two areas? If so, what background variables are associated with such differences?

This study was approved by the Ethical Review Board at Lund University.

2. Method

2.1. Study context

This study is a part of a larger, ongoing project in a middle-sized Swedish city, Kristianstad (population ~40.000), in which an intervention in the outdoor environment with focus on improved accessibility/usability and, safety/security for older people was carried out in one area, the Study Area (SA), between 2003 and

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