The elderly in green spaces: Exploring requirements and preferences concerning nature-based recreation

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ABSTRACT

As demographic changes abound, landscape planners should increase their understanding of both elderly people's preferences concerning nature-based recreation and approaches to consider those preferences in planning. This study aims to synthesize existing knowledge about elderly people's preferences, namely, how they interact with green spaces, what landscape characteristics they prefer or dislike, and how practitioners can improve planning to better meet elderly people's needs. A systematic literature review based on the PRISMA method was conducted, including an in-depth analysis of 44 peer-reviewed journal articles. We find that published studies focus primarily on elderly people's recreational activities in urban parks. Across different contexts, elderly people seem to have common preferences: landscape features that are natural, aesthetic, comprehensible, and diverse, with accessible and well-maintained infrastructure and facilities. Moreover, interactions between people and nature may affect the relative importance levels of the preferences. We recommend that landscape planning practitioners consider both scientific evidence and local conditions that could affect elderly people's preferences, and explore the degree to which design options may fulfill these preferences. Further research is needed to explore differences in preferences between urban and rural dwellers, to quantify preferences, and to enhance understanding of elderly people's emotional ties with nature.

1. Introduction

Demographic change has raised growing concerns in many countries for landscape planners (Anderson & Hussey, 2000; United Nations, 2002; United Nations, Department of Economic and Social Affairs, & Population Division, 2015). Since aging is a gradual process of human body function decline (Atkinson et al., 2007), defining 'elderly people' is hard and inaccurate. However, most developed countries have adopted age of 65 as a threshold. Some countries have adopted age 60, and some African countries have even adopted 50, the age roughly following local retirement (World Health Organisation, 2002). Many countries are already seeing a larger proportion of elderly people in the total population, and this trend is expected to increase towards the middle of the century (United Nations, 2002). For example, in Japan, the percentage of people over 65 in the total population is expected to rise from 22.5% in 2010 to 29.6% in 2030, and onward to 35.7% in 2050 (Japanese National Institute of Population and Social Security Research, 2002). In Germany, the percentage of people over 65 is expected to increase from 20.7% in 2009 to 29% in 2030, and then to 31% in 2050 (German Federal Statistical Office, 2009). The shifting age structure challenges landscape planners with the elderly's higher risks

for health problems, social isolation, and increasing needs for recreation in green space (Loukaitou-Sideris, Levy-Storms, & Brozen, 2014; World Health Organization, 2007). In response, landscape planners should consider the elderly's specific needs and preferences for nature-based recreation, which refers to any recreational activities in green space supported by natural, cultural and historical resources and infrastructures (Shrestha, Stein, & Clark, 2007).

Nature-based recreation plays a role in improving the elderly's well-being (Bell, Phoenix, Lovell, & Wheeler, 2014; Lee & Maheswaran, 2011; Sugiyama & Ward Thompson, 2007). By interacting with green spaces on a daily base, the elderly can garner physical and mental health benefits, pleasure, and active social contacts (Kessel et al., 2009; Lee & Maheswaran, 2011; Ward Thompson & Aspinall, 2011). Walking or bicycling to green spaces can promote physical activity and reduce the odds of obesity; having physical activity can strengthen the bones, muscles, as well as heart and lung function (Lee & Maheswaran, 2011; Pereira et al., 2013; Samawi, 2013). Moreover, the elderly may feel stress relieved when immersed in the quietness of nature (Hung & Crompton, 2006; Kemperman & Timmermans, 2014; Milligan, Gatrell, & Bingley, 2004). When sightseeing or gardening in nearby green space, elderly people can experience an enhanced sense of belonging to local

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communities (Matsuoka & Kaplan, 2008; Phillips, Walford, & Hockey, 2011). In urban parks, they can feel motivated to enjoy active social contacts and group activities (Hung & Crompton, 2006). All these benefits of nature-based recreation have a significant influence on elderly people's wellbeing.

In order to help senior citizens garner these wide-ranging benefits, some institutions have published generic planning and design recommendations. The World Health Organization (2007) published a global age-friendly city guideline, recommending that outdoor and green spaces should be barrier-free, attractive, well equipped, and accessible to elderly people. The Lewis Centre for Regional Policy Studies (Loukaitou-Sideris et al., 2014) published guidelines for senior-friendly parks, listing critical design elements that include safety, natural attributes, facilities, physical activities, social support network, and proper age composition (e.g., seniors-only parks to avoid potentially uncomfortable, embarrassing, or frightening interactions with young people). However, apart from studies that review the benefits of green spaces, few studies have synthetized evidence of how elderly people recreate and what environmental attributes they prefer. When elderly people across contexts have different interactions with nature, they may have different expectations of and diverse interests in green spaces. A lack of understanding of preferences may lead to a failure to support planning practices which achieve diverse goals and take into consideration the complexity of human nature. The main objective of this paper is to synthesize evidence of the elderly's preferences for landscape characteristics to analyze the similarities and differences in their preferences, and then to make suggestions regarding future landscape planning.

Therefore, the main research questions of this review are:

- What landscape characteristics do elderly people prefer?
- Are those preferences similar across contexts and interactions?
- How can we improve landscape planning based on the understanding of elderly people's preferences?

2. Theoretical framework

2.1. Elderly people's preferences for green spaces

Previous studies defined preference as a cognitive process where some people appreciate a landscape more than another, considering it 'more aesthetic, lively, or desirable' (Kaplan, 1987; Kaplan, Kaplan, & Brown, 1989). In terms of landscape preference, many studies focused on aesthetics. Theories to explain aesthetic preferences were mainly developed by two schools – the objective approach and the subjective approach (Maulan & Miller, 2006). The former considers aesthetics as the internal qualities of a landscape and can be measured objectively; the latter considers people's emotional response which cannot be captured objectively (Kaplan, 1987; Kaplan et al., 1989; Maulan & Miller, 2006; Zube, Pitt, & Evans, 1983). In these paradigms of landscape architecture and management, preferences are often believed to be associated not only with landscape characteristics, but also with the way people interact with them, the specific setting of interactions, and the characteristics of people (Dramstad, Tveit, Fjellstad, & Fry, 2006; Hetherington, Daniel, & Brown, 1993; Kaymaz, 2009; Maulan & Miller, 2006). Our review followed the understanding that landscape preferences are user-dependent, and we developed a theoretical framework (Fig. 1) to address relationships between elderly people's preferences for nature-based recreation and landscape characteristics, and how the relationships may be explained and moderated.

Elderly people's physical condition and cognition have aged, so they may find some green spaces more attractive than young people would. Some studies found that elderly people liked natural environments more than built environments and visited parks more frequently than young people did (Jorgensen & Anthopoulou, 2007; Kemperman & Timmermans, 2006). Other studies, however, argued that elderly

people showed less interest in green spaces compared to young people (Lyons, 1983; Sayan & Karagüzel, 2010).

Empirical studies on the elderly's preferences not only focus on landscape aesthetics but also on other human needs. Relevant studies about needs can be categorized into five interrelated groups:

(1) Green spaces and open spaces that can promote elderly people's walking and other physical activities (see Joseph & Zimring, 2007; Kaczynski, Johnson, & Saelens, 2010).
(2) Parks that can promote participation (see Kemperman & Timmermans, 2006).
(3) Green spaces that can support social contacts and wellbeing (see Kemperman & Timmermans, 2014; Yung, Ho, & Chan, 2017).
(4) Therapeutic gardens and space (see Milligan et al., 2004).
(5) Aesthetic and attractive green spaces (see Alves et al., 2008; Aspinall et al., 2010)

Thus, a green space's possibilities to fulfill needs can be conceptualized as explanations to understand elderly people's preferences for nature-based recreation.

2.2. Landscape characteristics that affect preferences

For different purposes, some recent studies reviewed or summarized landscape characteristics that affect the elderly's preferences and needs. Yung et al. (2017) proposed a conceptual framework to address design factors that affect the elderly's satisfaction when they visit parks in highly-dense urban districts. The categories in this framework include proximity, accessibility, social inclusion, social connection, supporting facilities, and connection to nature. Yen, Flood, Thompson, Anderson, and Wong (2014) reviewed 120 articles to study how environmental attributes affect the elderly's mobility, and they concluded that safety is the central factor that links other factors such as connectivity, aesthetics and shopping services. Barnett, Barnett, Nathan, Van Cauwenberg, and Cerin (2017) reviewed 100 articles to study the elderly's physical activities, and they found that safety, walkability, access to parks, natural and aesthetic pleasing scenery, and recreational facilities play roles.

However, previous reviews that synthesized evidence of preferences focused on parks and physical activity, and they seldom considered different types of green spaces and activities that may have required different landscape characteristics. We need to know the general and special preferences. General preferences refer to landscape characteristics that elderly people across contexts like or dislike when they have a range of activities in green spaces. Specific preferences are those only elderly people from certain background prefer, or attributes preferred only in special human-nature interactions. Interactions are explained below.

2.3. Interactions and demographic differences as moderators

This review considers that interactions have three aspects – types of green spaces, types of activities, and basic needs to be fulfilled. The term 'green space' can be any type of greenery in urban or rural contexts, including house greenery, neighborhood greenery, institutional greenery, park, garden, grassland, woodland, greenery near sports facilities, and greenery near waterways (Rall et al., 2015). The term 'basic needs', according to Max-Neef (1992), includes 'subsistence, protection, affection, understanding, participation, leisure, creativity, identity, and freedom'. Moreover, demographic differences refer to that elderly people may have different demographic characteristics, including socioeconomic status, health conditions, household sizes, and geographic locations (Takano, 2002). For example, elderly people may use wheelchair or not, live in care facilities or their own homes, suffer from dementia or not. The differences in demographic characteristics and the way they interact with landscape may play a role in moderating preferences for nature-based recreation.