Linking green space to neighborhood social capital in older adults: The role of perceived safety

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ABSTRACT

This study examines the moderating effect of perceived safety on the association of green space with neighborhood social capital in older adults. Green space may play an important role for promoting neighborhood social capital and health for older adults; however, safety remains a significant challenge in maximizing the benefits of green space. Data were drawn from 647 independent-living seniors who participated in the Senior Neighborhood Quality of Life Study in the Seattle/King County and Baltimore/Washington DC region. The results suggest that certain green space elements, such as natural sights, may be beneficial to neighborhood social capital of older adults. However, other types of green space, such as parks and street trees, may be less advantageous to older adults who perceive their neighborhoods as unsafe for pedestrians. Findings highlight the importance of pedestrian safety in examining associations of green space with neighborhood social capital in older adults. Further studies using a longitudinal design are warranted to confirm the causality of the findings.

1. Introduction

Social capital has emerged as an important concept of healthy aging. Although many definitions of social capital exist (Moore and Kawachi, 2017), health researchers have paid particular attention to neighborhood social capital (Kawachi et al., 1999; Kawachi and Berkman, 2003; Ziersch et al., 2005). A growing body of research indicates that neighborhood social capital, defined as social resources inherent within community networks, is relevant to the formation of trust, social norms, reciprocity, and mutual support among older people (Agampodi et al., 2015; Berkman and Kawachi, 2000; Cramm et al., 2013; Forrest and Kearns, 2001). With a rise in older adults living alone, collective features of social structures that facilitate social cohesion and interaction are especially important for older adults to gain access to appropriate services and support (Bedney et al., 2010) and maintain an independent and healthy life (Pollack and von dem Knesebeck, 2004; Sirven and Debrand, 2008). However, older adults are more likely to experience shrinking social capital and networks in their community (Glass and Balfour, 2003) due to deteriorating physical and cognitive ability that often leads to functional limitation and

mobility decline (Metz, 2000).

Green space may play an important role for improving older adults' social capital and related health outcomes (Frank et al., 2010a; Michael et al., 2006). Exposure to green space has been shown to promote healthy behaviors, such as walking, cycling, and community gardening (Gebel et al., 2011; Gong et al., 2014). Access to public parks near the home has been associated with higher levels of walking and physical activity (Frank et al., 2007; Giles-Corti et al., 2005) Mounting evidence suggests that green space contributes to mental health through providing social support, and reducing mental stress and fatigue (Frumkin, 2001; Groenewegen et al., 2006; Hartig et al., 2014; Yen et al., 2009). Parks and green space provide shared locations for community interaction (Maas et al., 2009b), increase levels of social support (Seaman et al., 2010), and promote engagement in socially oriented activities (Kingsley and Townsend, 2006). A small but growing number of studies have found similar benefits in older adults, suggesting that green space may provide a healthy place for seniors to convene and retain social cohesion, in addition to enhancing their mental health and emotional wellbeing (Coley et al., 1997; Kweon et al., 1998; Maas et al., 2009a).

Despite the growing interests in green space, various factors related

to safety, such as crime and traffic hazards, may impede access to green space (Weiss et al., 2011) and reduce physical activity among older adults in public outdoor spaces (Mowen et al., 2007). A number of studies have shown that perception of neighborhood safety is associated with the likelihood that residents will participate and interact with their neighbors (Baum et al., 2009; Lindquist and Duke, 1982; Young et al., 2004). In addition to perceptions of crime influencing the desire to walk, the presence of nuisance or unattended dogs (Brownson et al., 2001; Garrett et al., 2012; King et al., 2000; Sallis et al., 1997) lack of adequate lighting (Adams et al., 2009; Troped et al., 2003) and perceived safety walking during the day and at night (Cerin et al., 2009; Giles-Corti, 2002) have also been found to be associated with reduced physical activity.

Although perceived safety can be enhanced through improvement in neighborhood environments (Austin et al., 2002), certain green space elements, such as parks and dense vegetation, are associated with increased fear of crime (Jansson et al., 2013; Maruthaveeran and van den Bosh, 2015) and crime activities (Groff and McCord, 2012; Tower and Groff, 2016) in urban environments. Because older people are more likely to express concerns about safety and crime (Lindquist and Duke, 1982), safety remains a significant challenge in maximizing the benefits of green space for older adults. Older adults' access to and use of green space may thus be restricted by their perception of safety in the neighborhood (Cho et al., 2005; King, 2008).

To our knowledge, few studies have examined the extent to which older adults' perception of safety may influence the observed relationship between green space and neighborhood social capital. Therefore, the goal of this study is to investigate whether perceptions of traffic, pedestrian, and personal safety moderate the associations of green space with neighborhood social capital in older adults. It is hypothesized that older adults with greater access to green space report increased social capital, after adjusting for socio-demographic characteristics. It is also hypothesized that older adults with greater safety concerns report lower levels of social capital than would otherwise be predicted based on their green space access.

2. Methods

2.1. Study design

This investigation used cross-sectional data from the Senior Neighborhood Quality of Life Study (SNQLS), conducted in the Seattle-King County region of Washington State and the Baltimore-Washington DC region in Maryland. SNQLS aimed to investigate the relationships between the built environment and older adults' health and wellbeing outcomes. Detailed study design and sampling methods are described elsewhere (King et al., 2011). In brief, data collection for the study occurred between 2005 and 2008 and comprised participant recruitment and multiple primary data acquisitions over the course of a full year within each region so that seasonal variation could be considered. Eligible seniors (aged > 65 years) were recruited from 216 Census block groups (Seattle- King County = 116; Baltimore-Washington DC region = 100), differing in median household income and neighborhood walkability characteristics. Number of participants per block group ranged from 1 to 22, with a median of two. Walkability and income characteristics of each block group were crossed to create four distinct quadrants: higher walkable/higher income, higher walkable/ lower income, lower walkable/higher income, and lower walkable/ lower income (Frank et al., 2010b; Sallis et al., 2009). Block groups in each quadrant met both income and walkability criteria for that quadrant to obtain a representative pooled sample across the two study regions.

2.2. Participant recruitment and assessment procedures

A total of 3359 participants were initially contacted by mail and

telephone, and were invited to participate in the study. Individuals were eligible to participate if they were aged 65 years and over, able to complete the survey in English, and able to walk more than 10 feet at a time. Initial telephone screening interview in person ascertained that study participants had sufficient cognitive ability to complete the survey by mail, online, or via telephone interview.

The final sample consisted of 647 participants, excluding 205 participants who lived in retirement communities or assisted living facilities. The reasons for our focus on community-dwelling older adults were two folds: 1) reported difference in perceptions of neighborhood resources between community-dwelling older adults vs. older adults in retirement communities or assisted living conditions (Cho et al., 2012); and 2) the growing interest in policy-relevant research regarding aging in place, i.e. older adults who wish to remain independent in their current residence. Survey response rate (participants/eligible contacts) was 19.3% overall (n = 647, Seattle = 319; Baltimore regions = 328) and did not differ significantly by region. Also, the demographic characteristics between the initial recruitment and the final sample did not differ significantly.

In terms of sample representation, King et al. (2011) reported comparisons of the SNQLS participants with 2000 Census regional characteristics on available key demographic variables including age, education and ethnicity. Age and education of study participants were comparable to 2000 Census distributions within each region. In the Baltimore region, the percentage of white/non-white participants was comparable to Census data; however, in the Seattle region white participants were slightly over-represented. Institutional Review Boards at the participating academic institutions approved the study, and participants provided written informed consent before participating.

2.3. Measures

2.3.1. Neighborhood social capital

For the purpose of this investigation, neighborhood social capital was defined using two constructs: social cohesion and social interaction. Social cohesion captures an individual's perception of how closely connected he or she feels with neighbors. Social interaction captures the presence of informal contacts within the neighborhood. Taken together, these constructs represent attitudinal and behavioral dimensions of neighborhood social environment.

Social cohesion was defined using the mean of five survey items adapted from Sampson et al. (1997). Participants were asked how strongly they agreed with the following statements: 1) People around my neighborhood are willing to help their neighbors; 2) This is a close-knit neighborhood; 3) People in this neighborhood can be trusted; 4) People in this neighborhood generally don't get along with each other; and 5) People in this neighborhood do not share the same values. Each item was rated using a five-point scale from strongly dissatisfied (1) to strongly satisfied (5) on a scale developed by the investigators, and the last two items were reverse coded to match the scale order of other survey items.

Social interaction was measured using three survey items adapted from Parker et al. (2001). The original instrument included nine items asking on how many days in the past month the respondent has performed various activities with a neighbor. The present study used the first three items to represent the construct of social greetings. The respondents were asked on how many days in the past month they interacted with their neighbors on the following items: 1) Waved to a neighbor; 2) Said hello to a neighbor; and 3) Stopped and talked with a neighbor. These items were averaged to create a measure of social interaction with their neighbors.

2.3.2. Exposure to green space

Green space exposure was captured by both objective and perceived measures. The objective green space measure was distance (meters) to the nearest park of any size from participants' home address. Park data