



Research Paper

Does happiness data say urban parks are worth it?

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ABSTRACT

Urban planners emphasize that urban nature plays an important role in providing social and psychological benefits to urban dwellers. Particularly, it provides space not only for the improvement of public health, but also for social interaction and community cohesion. However, less scientific attention has been paid to the effects of urban parks on the subjective well-being of urban dwellers who live in high density cities. In this study, we examine the relationship between individual subjective well-being and urban parks with individual survey data for self-reported happiness in Seoul. We obtain longitudinal Seoul Survey Data (SSD) conducted by the Seoul government between 2005 and 2015, and employ pooled cross-section data analysis with location-specific and time-specific fixed-effects to estimate the effects of urban parks on the subjective well-being of urban dwellers. In addition, we estimate the monetary value of urban parks using the average marginal rate of substitution between urban parks and household income. Our findings show that urban parks are associated with residents' subjective well-being. Specifically, on average, an individual household has an implicit willingness-to-pay of approximately 129,300 won (approximately 110 U.S. dollar) in monthly household income for a 100 m² increase in urban parks. High-income residents' willingness-to-pay is approximately seventeen times more than that of low-income residents. Seniors also have more willingness-to-pay for urban parks.

1. Introduction

Contemporary urban life generates numerous physical illnesses and chronic stress that lead to disease and cancer. Residents who live in large cities (e.g., New York, Tokyo, London, and Seoul) are likely to experience such physical stresses that decrease individual subjective well-being (Lewis & Booth, 1994; White, Alcock, Wheeler, & Depledge, 2013). Scholars have emphasized that urban parks, green spaces, and recreational places are important for providing residents with physical and emotional benefits in a variety of ways (Grahn & Stigsdotter, 2010). More specifically, people can relieve mental fatigue in urban green spaces, which serve as a resource for physical activities as well as relaxation and restoration (Booth, Roberts, & Laye, 2012). There is much empirical evidence to support the idea that natural amenities (e.g., urban parks, forests, and green belts) in an urban area contribute to the quality of life of urban dwellers. For example, natural amenities not only function as important environmental services such as purifying air and water, filtering noise and wind, and stabilizing microclimate in urban contexts, but also provide social and psychological services that improve residents' subjective well-being (Chiesura, 2004). Urban parks also offer opportunities for contact with other people, which enhances social engagement and cohesion of those who live alone or are isolated (Pfeiffer & Cloutier, 2016).

In spite of the recognition of these important roles of urban parks, less scientific attention has been paid to the effects of urban parks on the subjective well-being of urban dwellers. In addition, most previous studies have not addressed the relationship between urban parks and human well-being as a concept that encompasses the physical, mental, and social domains (van Kamp, Leidelmeijer, Marsman, & Hollander, 2003). They have only focused on specific functions of urban parks, such as the improvement of physical health (Maas, Verheij, Groenewegen, Vries, & Spreeuwenberg, 2006; Mitchell & Popham, 2007), reductions in stress (Berman, Jonides, & Kaplan, 2008), and increases in recreational activities (Santos, Mendes, & Vasco, 2016). This leaves a gap in our understanding of how providing urban parks affects urban residents' subjective well-being, especially their overall happiness.

Recently, scholars have begun to use happiness data measured using one question to assess experienced life satisfaction, in order to examine how neighborhoods or environmental factors affect individual subjective well-being. (Brereton, Clinch, & Ferreira, 2008; Dolan & Kahneman, 2008; Frey, Luechinger, & Stutzer, 2010; Kahneman & Sugden, 2005; Levinson, 2012). They have argued that subjective well-being (Individual self-reported "subjective well-being", "happiness", or "life satisfaction" can be used as an empirical approximation to "experienced utility", see MacKerron, 2012) is affected not only by

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individual characteristics such as age, marital status, income, and physical health, but also by living environment characteristics such as public services, transportation infrastructures, and natural amenities. Although increasing attention has been paid to the function of urban parks on the subjective well-being of urban dwellers in various cities (Ambrey & Fleming, 2014; Scopelliti et al., 2016), there is still not enough understanding of the effects of urban parks on residents' overall happiness. Particularly, there is only a few studies to connect the benefits of urban parks and individual happiness using self-reported happiness data (Ambrey & Shahni, 2017). A more comprehensive assessment of urban parks based on individual subjective well-being with additional case studies focusing on large cities is worthwhile for reconsidering the importance of urban parks for residents in large urban areas (Cloutier & Pfeiffer, 2015).

Seeking to address this gap, we explore the relationship between individual subjective well-being and urban parks using individual survey data for self-reported subjective well-being focusing on Seoul, one of the highest density cities in the world. Specifically, the objective of this study is to address two questions that are pertinent to the issue of the relationship between urban parks and subjective well-being. First, we focus on how urban parks affect the subjective well-being of local residents who live in Seoul. Second, we estimate how much residents value urban parks. We use the Seoul Survey Data (SSD) conducted by the Seoul government between 2005 and 2015, and employ pooled cross-section data analysis with location-specific and time-specific fixed-effects to estimate the effects of urban parks on the subjective well-being of urban dwellers. And then, we estimate the monetary value of urban parks using the average marginal rate of substitution between urban parks and household income. The fact that urban parks are positively associated with individual well-being is not new, but this approach with the self-reported survey data is novel in terms of providing evidence of the relationship between urban parks and overall happiness of urban dwellers. Valuing public urban parks can also provide useful information to local government agencies, especially on the benefits of providing urban parks.

The rest of the paper is organized as follows. In the next section, we review previous studies relevant to the relationship between happiness and urban parks. Section 3 presents an empirical model to estimate the effect of urban parks on individual subjective well-being, and to estimate the monetary value of urban parks. In section 4, we describe the data used in this study. Section 5 presents the empirical results and estimated values of urban parks. In the last section, we summarize and discuss our findings and suggest policy implications.

2. Literature review

2.1. Urban parks and happiness

Traditionally, scholars and scientists have focused on large ecosystem protection because it provides considerable benefits to human society (Lindsey & Knaap, 1999). For example, ecosystem services include water purification, water retention, soil fertility, carbon sequestration, and coastal protection. Thus, small-scale green spaces in urban areas are often disregarded (Chiesura, 2004). However, over the past couple of decades, interest in urban parks has increased because of growing attention to the quality of life for people who live in urban areas. Urban green spaces include a wide range of different components such as parks, woodland, street tree and square plantings, green roofs, sports complexes, and community gardens. Such green spaces and natural amenities contribute to personal physical and mental health by reducing stress, offering opportunities for restoration, and increasing physical activities (Grahn & Stigsdotter, 2010; Hansmann, Hug, & Seeland, 2007; Laforteza, Carrus, Sanesi, & Davies, 2009; Troy & Grove, 2008). Urban planners emphasize that urban nature plays an important role in providing social and psychological benefits to urban dwellers. For example, it provides space not only for the improvement

of public health, but also for social interaction and community cohesion (Loukaitou-Sideris, Levy-Storms, Chen, & Brozen, 2016).

Moreover, a number of empirical studies have demonstrated the positive relationship between urban parks and quality of life of urban dwellers. For example, when people have better access to parks, they exercise more. Such increased physical activities have been shown to improve personal health conditions and reduce psychological stresses, anxiety, and depression (Berman et al., 2008). Urban residents with greater exposure to green spaces (green colors) can directly benefit from lower mental distress, reduced stress, and refreshed mood (White et al., 2013), and urban parks also indirectly increase personal happiness by providing space for physical exercise and social interaction (Saw, Lim, & Carrasco, 2015). However, evaluations of the effects of urban parks have been partial rather than comprehensive (van Kamp, Leidelmeijer, Marsman, & de Hollander, 2003) because studies have focused on the functions of urban parks separately. That is, while some have examined their effect on physical health (Zhai & Baran, 2016), others have focused on mental health (Grahn & Stigsdotter, 2010; Hansmann et al., 2007; Thompson et al., 2012). Hence, little is still known about the relationship between urban parks and overall happiness of urban dwellers. Scholars have pointed out that an overall assessment that can evaluate the effects of urban parks on mental and physical health, human well-being, quality of life, and life satisfaction is needed to establish efficient and appropriate plans for urban green spaces (Ambrey & Fleming, 2014; Pfeiffer & Cloutier, 2016).

Recently, scholars have become interested in the concept of individual subjective well-being, which is a comprehensive framework to address physical, psychological, and social indicators, that can be used to assess the impact of public goods, especially urban parks (Ambrey & Fleming, 2014; Loukaitou-Sideris et al., 2016; White et al., 2013). In addition, several planning scholars have emphasized that open spaces and urban parks are considered to be important contributing factors to the happiness of local residents (Loukaitou-Sideris et al., 2016; Pfeiffer & Cloutier, 2016). They have also pointed out that urban parks improve the subjective well-being of low-income people and seniors by providing important physiological and psychological benefits (Loukaitou-Sideris et al., 2016).

2.2. Research on happiness

Economists and psychologists have recently paid growing attention to happiness research (Diener & Seligman, 2002; Dolan, Peasgood, & White, 2008; Frey & Stutzer, 2002; MacKerron, 2012). Since Richard Easterlin's (1974) pioneering work on happiness, numerous scholars have examined the role of demographic characteristics such as age, gender, and marital status as well as socioeconomic characteristics such as income, employment status, and household tenure on individual subjective well-being. They have demonstrated that these personal characteristics directly influence individual subjective well-being. For example, happiness has a U-shaped relationship with age (Blanchflower & Oswald, 2004). There is a positive relationship between income and happiness, but diminishing returns to income (Frey & Stutzer, 2002). Marriage is positively associated with life satisfaction (Blanchflower & Oswald, 2004; Stutzer & Frey, 2006). Poor health conditions and unemployment both lower individual happiness levels (Powdthavee & van Praag, 2011). In addition to these socioeconomic factors, numerous studies have found that psychological factors such as social interactions and social capital improve happiness levels (Diener & Seligman, 2002; Dolan et al., 2008).

More recently, scholars have become interested in neighborhood environmental factors, which are also associated with individual happiness (Ambrey & Fleming, 2014; Cloutier & Pfeiffer, 2015; Dolan et al., 2008; Ferreira & Moro, 2010). They have argued that good neighborhood environments are positively related to the quality of life, and thus local governments' public policies are important in improving local residents' happiness. For example, scholars have found that there is

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