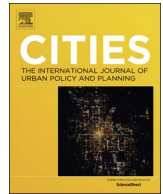




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Assessment and determinants of satisfaction with urban livability in China

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ABSTRACT

Building livable cities has been an important goal for new urbanization in China. Thus, understanding residents' satisfaction with urban livability in China and its determinants is beneficial for urban planning and policy making regarding livable cities construction. However, scientific evidence on satisfaction with urban livability towards Chinese cities is still lacking. Drawing on large-scale questionnaire surveys conducted in 2015 in 40 major cities in China, this paper aims to explore the characteristics of satisfaction with urban livability and the effect magnitude of its determinants using the geographical detector model. The results show that the respondents are just moderately satisfied with urban livability in China (2.996). With respect to the dimensions of urban livability, the respondents are relatively satisfied with the convenience of public facilities (3.118), the natural environment (3.057) and the sociocultural environment (3.056), while slightly dissatisfied with urban security (2.788), environmental health (2.912) and convenient transportation (2.929). The result of the geographical detector model further reveals that all the six dimensions of urban livability have significant and positive impacts upon overall satisfaction with urban livability, of which the natural environment, convenient transportation, environmental health are the greatest contributing factors. Moreover, individual socioeconomic attributes such as geographical location, type of housing, education, family size, age, *hukou* status, also exert significant effects on overall satisfaction with urban livability in descending order, but the magnitude of their effects is far less than that of the dimensions of urban livability.

1. Introduction

With rapid economic growth and urbanization, the past few decades have witnessed tremendous changes in the built and sociocultural environments in the urban areas of China. However, the rapid development in many Chinese cities has also led to many urban issues, such as crime, air pollution, traffic congestion, and inadequate public facilities particularly in new districts, as well as socio-spatial disparities in metropolitan regions (Li & Wu, 2007; Ouyang et al., 2017; Zhang & Gao, 2008), posing great challenges to urban livability. Nevertheless, research has suggested that the quality of the urban environment is positively associated with individual wellbeing (Dong & Qin, 2017; Kytta et al., 2016) and urban competitiveness (Dragin-Jensen, Schnittka, & Arkil, 2016). To this end, Chinese central government has called for

building livable cities with people-oriented ideas in recent years, and a series of livable cities promotion policies were issued successively, including the National Plan on New Urbanization in 2014, the Central Urban Work Conference held in 2015, and the 13th Five-Year Plan announced in 2016. Therefore, understanding the characteristics of satisfaction with urban livability in China and its determining factors is essential for offering new insights into livable city construction and enhancing residents' life satisfaction in urban China.

Urban livability is a multifaceted concept associated with many domains of the living environment in urban areas, involving both the physical and sociocultural environments (Kashef, 2016; Norouziyan-Maleki et al., 2015). Past studies have provided a better understanding of the assessment and influencing factors of the quality of the urban environment (Mahmoudi, Ahmad, & Abbasi, 2015; Saitluanga, 2013).

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These studies, however, have several limitations. First, a majority of the extant studies have overemphasized the role of economic factors in affecting the quality of the urban environment. They often yielded counterintuitive findings that are contrary to local residents' actual lived experiences (Easterlin et al., 2012; Okulicz-Kozaryn, 2011). Therefore, a scientific evaluation framework of urban livability is needed in order to reflect urban residents' real expectations about their living environment. Second, most studies have evaluated the quality of the urban environment from an objective perspective (Ogneva-Himmelberger, Rakshit, & Pearsall, 2013), but little is known about residents' subjective evaluation of the urban environment because of the lack of relevant data, especially at the regional and national scales in developing countries. Lastly, from a methodological point of view, previous research has seldom compared the effect intensity of the influencing factors on people's satisfaction with their urban environment due to the limitations of traditional regression methods (Fleming, Manning, & Ambrey, 2016; Permentier, Bolt, & van Ham, 2010).

To fill these knowledge gaps, this study pays special attention to residents' satisfaction with urban livability in China at the national scale and uses the geographical detector method to identify the effect intensity of its determinants. Although extensive efforts have been devoted to the analysis of residential satisfaction focusing on the urban environment at the neighborhood scale (Gentile, 2005; Mohit, Ibrahim, & Rashid, 2010; Shon, 2007), it should be noted, however, that there is important difference between satisfaction with urban livability and residential satisfaction. As articulated as the uncertain geographic context problem (UGCoP) (Kwan, 2012a; Kwan, 2012b), individual health outcomes or life satisfaction is influenced not only by where one lives (the residential context) but also by where one travels to or visits to undertake one's daily activities. For instance, several recent studies on wellbeing (Schwanen & Wang, 2014), individual air pollution exposure (Park & Kwan, 2017), and healthcare satisfaction (Cabrera-Barona, Blaschke, & Gaona, 2017) have all underscored the importance of taking into account the influence of people's non-residential contexts on their health and wellbeing (Kwan, 2013). Likewise, individual satisfaction with urban livability is also associated with the satisfaction people experience when they travel and undertake their daily activities within and outside their residential areas - in other words, their life experiences of both their residential and non-residential environments.

Guided by the notion of the UGCoP, this study aims to examine residents' satisfaction with urban livability and its determinants across 40 major cities in China using large-scale questionnaire surveys conducted in 2015. In particular, we seek: (1) to build an appropriate conceptual framework for evaluating residents' satisfaction with urban livability in Chinese cities; (2) to explore the characteristics of satisfaction with urban livability in China to provide evidence for livable cities construction; (3) to identify the effect magnitude of the factors that influence the overall satisfaction with urban livability.

2. Literature review on urban livability

2.1. Definitions and measurements of urban livability

As one of the most crucial elements of urban quality of life and city attraction, urban livability has received increasing attention in various fields (Badland et al., 2014; Norouzi-Maleki et al., 2015; Pacione, 1990). However, there is still no unified definition and measurement of urban livability in the literature due to its complex and multi-dimensional nature. For instance, livability has been defined as suitability for human living (Merriam-Webster, 2017), the quality of life experienced by the residents of a city or region (Timmer & Seymoar, 2005), and the standard of living or general wellbeing of the population in an area (Okulicz-Kozaryn, 2011), all of which indicate that livability is a broad term encompassing a number of urban environment characteristics that affect the attractiveness of a place (Norouzi-Maleki et al., 2015). More specifically, some claimed that livability refers to the human

requirement for social amenity, health, and wellbeing, and includes both individual and community wellbeing (Newman, 1999). Some authors posited that a livable city facilitates a healthy life, increases the chance for easy mobility, and serves as the city for all people (Hahlweg, 1997), while others argued that both livelihood and ecological sustainability are crucial for making cities livable (Evans, 2002). In this study, urban livability is defined as the urban quality of life and individual wellbeing related to the local urban environment, and its level is measured by the difference between one's actual and expected urban environment quality from the perspective of satisfaction.

Consistent with the diversified conceptualizations of urban livability, no consensus has been reached on the measurement of urban livability to date. This is perhaps because the evaluation criteria of urban livability vary across different places (Ruth & Franklin, 2014) and different people according to their personality, culture, national backgrounds, traditions, and expectations (Sofeska, 2017). A case study in Australia, for example, showed that urban livability assessment comprised of 11 specific domains, involving natural environment, crime and safety, education, employment and income, health and social services, housing, leisure and culture, local food and other goods, public open space, social cohesion and local democracy, and transport (Badland et al., 2014). In another case on urban livability in India, objective indicators such as economic, social, household dimensions and accessibility, as well as subjective indicators such as satisfaction from the socio-economic environment and satisfaction from the physical and infrastructural environments were combined in the study (Saitluanga, 2013).

In addition, many organizations also focused on ranking globe livable cities using different evaluation criteria. For instance, the Economist Intelligence Unit's (EIU) Global Livability rankings incorporated 30 qualitative and quantitative indicators from 5 dimensions of stability, healthcare, culture and environment, education, and infrastructure (EIU, 2017), whereas the Merce's Quality of Living rated livability according to 39 factors grouped from 10 dimensions, including political and social environment, economic environment, socio-cultural environment, medical and health considerations, schools and education, public services and transportation, recreation, consumer goods, housing, and natural environment (Mercer, 2017). Despite ongoing debates about the measurement of urban livability in academic literature and organizations, their evaluation criteria were largely identical but with minor differences. In most cases, both physical environment and socio-cultural environment have been taken into consideration when evaluating the level of urban livability, including aspects of economic development, urban security, public facilities provision, traffic conditions, environment amenity, and socio-culture environment.

2.2. Determinants of residents' satisfaction with urban livability

The urban environment has been evaluated by both objective and subjective measurement methods in past literature. Notably, much objective research has emphasized the role of economic development in affecting the quality of the urban environment (Xu et al., 2012; Zanella, Camanho, & Dias, 2014). Despite the fact that economic factors could well support the construction of livable cities, economically developed cities tend to concurrently witness enormous pressure like high costs of housing and living, which in turn poses challenges to urban livability (Ogneva-Himmelberger et al., 2013). Consequently, this study is mainly concerned with the subjective evaluation of the urban environment based on residents' satisfaction with urban livability while overlooking economic benefits and other conceivable economic pressure. Conceptually, the determining factors affecting people's satisfaction with urban livability can be summarized in terms of the following aspects.

2.2.1. Urban security

Urban security is often considered as a prerequisite in shaping

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