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Salient attributes of urban green spaces in high density cities: The case of Hong Kong

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ABSTRACT

This study aimed to elicit users' perceptions of key attributes of urban green spaces (UGS) in Hong Kong, a compact and land-hungry city, and assess their associations with perceptions of the usefulness, quality, and the frequency of visits in a sample of users of these spaces. This study first employed the repertory grid technique to interviews with 21 respondents to elicit users' assessment of key attributes of green spaces. Second, the factors that emerged were used to develop a questionnaire, which was administered telephonically to 263 individuals who were users of these spaces. The responses were then analysed by multiple regression to assess the extent to which the attributes predicted users' attitudes regarding usefulness and quality and users' behaviour regarding frequency of use of the spaces. The results suggested that the four factors of attributes (features, naturalness, accessibility, and variety of facilities) significantly predicted both of the attitudes and the behaviour relevant to UGS in Hong Kong. Accessibility was most important to the frequency of use and features were the most important to attitudes regarding usefulness and quality. The results imply that policymakers and urban planners could more effectively and sustainably utilise limited land resources by considering users' nuanced meanings and perceptions of urban green spaces. Limitations of the study and future research directions are discussed.

1. Introduction

Hong Kong is one of the most densely populated cities in the world, averaging 6544 persons per square kilometre (Census and Statistics Department, 2011). More than 80% of its total area is hilly terrain which is unfavourable for urban development (Lo & Jim, 2012; Ye, 1998), this physical limitation squeezed the urban areas into approximately 24% of its total land (Planning Department, 2013). Hong Kong is therefore a high density and 'land-hungry' city (Tang, Wong, & Lee, 2007). Despite this, the government acknowledged the importance and positive aspects of urban green spaces (UGS), such as their contribution to relieving psychological stress and the enhancement of the physical well-being of residents (Planning Department, 2005). In Hong Kong, there are 25 square kilometer zoned for open spaces, this occupies a significant proportion (9%) of the developed land area of the city (Planning Department, 2013). In the global context, compared to cities of similar size, Hong Kong's proportional provision of UGS is among the lowest in the world (Lo & Jim, 2012; Tan, Wang, & Sia, 2013).

Previous research had examined some important characteristics of UGS, such as park facilities and features, park maintenance, distance, size, and perceived safety (Bedimo-Rung, Mowen, & Cohen, 2005; Giles-Corti et al., 2005; Van Herzele & Wiedemann, 2003). Although these characteristics were found to be important factors influencing the use of UGS, some studies disagree (Schipperijn, Bentsen, Troelsen, Toftager, & Stigsdotter, 2013). For example, Lo and Jim (2010) found that the quality of UGS was not correlated with the frequency with which individuals visited them; Schipperijn, Stigsdotter, Randrup, and Troelsen (2010) found no reliable socioeconomic, size, or travel distance predictors of visitation frequency to the most often used UGS. These inconsistent results may be due to cultural differences among cities. Tang and Wong (2008) suggested that the concept of UGS depends on a given city's cultural context. For example, in Hong Kong, UGS are broadly defined to include parks, gardens, playgrounds, and sitting-out areas (Koon Kwai Wong, 2009) of vegetated and open spaces within the city's limits (Lo & Jim, 2010). Moreover, the lack of consensus on desirable UGS planning criteria regarding location,

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quantity, and use may be related to the contextual and cultural diversity among cities (Maruani & Amit-Cohen, 2007). In addition, previous studies have also neglected the complexity of users' psychological evaluation of UGS (Wang, Brown, Liu, & Mateo-Babiano, 2015), focussing instead on socioeconomic variables and intrinsic park features (Grove et al., 2006). Thus, while we have some understanding of UGS characteristics, a knowledge gap exists regarding users' psychological preferences on UGS attributes, particularly in high-density cities, such as Hong Kong.

Therefore, cultural differences regarding UGS may be accounted for by gaining a better understanding of the preferences of a given city's residents for their UGS. Policy makers and city planners would likely benefit from such a perspective, which could help them to develop reasoned understandings of the culturally specific needs and preferences of a city's residents (Schipperijn, Stigsdotter, et al., 2010). This study's goals were to identify the salient attributes of Hong Kong's UGS from the perspectives of its residents and then assess the extent to which those attributes mattered to users' attitudes and behaviour towards UGS. In this study, attributes are defined as UGS features or qualities psychologically perceived by users (e.g. the perceived adequacy of facilities, the perceived level of accessibility), and the salience of these attributes is based on the extent to which the attributes influence the users' attitudes and behaviour toward the UGS. Thus, the study aims to accomplish three objectives:

- identify the salient attributes of UGS in Hong Kong;
- examine the ways that these attributes influence users' attitudinal evaluations and behaviours; and
- discuss the policy implications and offer suggestions for the planning, management, and design of UGS.

2. Literature review

Users appreciate UGS if they are well maintained and able to fulfil specific inhabitants' needs within the city (Bonnes, Passafaro, & Carrus, 2011; Burgess, Harrison, & Limb, 1988). They should be open and accessible to the public, well equipped and maintained, and offer opportunities for both social and physical activities. Bonnes et al. (2011) argued that missing features may lead to users' complaints and dissatisfaction. Chiesura (2004) and Shan (2014) studied motives and emotional dimensions of experience from the perspectives of users, through predetermined variables such as use for sport, relaxation, meditation. Certain design attributes such as amenities, perceived usefulness, accessibility (Lo, Yiu, & Lo, 2003) were suggested to be part of most users' preferences and, subsequently, their use of UGS. Lo and Jim (2012) found that Hong Kong citizens preferred high level of greenery, more seats and large UGS.

Accessibility, size, facilities, naturalness and safety are the key attributes of UGS identified by previous studies. Distance is an important attribute influencing the use of UGS (Giles-Corti et al., 2005; Grahn, 1994; Lee & Moudon, 2008; Van Herzele & Wiedemann, 2003). However, Wang et al. (2015) argued that current planning models have simplistically been using physical proximity in measuring accessibility, and the study found that perceived access is more important than geographic proximity. Van Herzele and Wiedemann (2003) suggested that distance and size criteria should be considered simultaneously because people are willing to trade proximity for size of UGS (Poudyal, Hodges, & Merrett, 2009). In addition, facilities are important attributes to support users' activities in UGS (Carr, 1992; Giles-Corti et al., 2005; Kaczynski, Potwarka, & Saelens, 2008; Van Herzele & Wiedemann, 2003). The facilities and their conditions (e.g. maintenance and quality) influence users' preference in choosing UGS (Lee & Maheswaran, 2011). Provision of variety of facilities can satisfy various groups of users because of their different purposes to use UGS (Jay & Schraml, 2009; Sanesi & Chiarello, 2006; Shan, 2014). Besides, living in green environment, people are more likely to have better physical health (De Vries, Verheij, Groenewegen, & Spreeuwenberg, 2003) and psychological health (Grahn & Stigsdotter, 2010). People desire to contact and experience natural environment (Bonnes et al., 2011; Burgess et al., 1988; Van den Berg & Ter Heijne, 2005). Natural features, e.g. trees, birdlife, water, are needed for UGS (Chiesura, 2004; Coley, Sullivan, & Kuo, 1997; Giles-Corti et al., 2005). Schipperijn, Ekholm, et al. (2010) and Chiesura (2004) suggested that natural setting in UGS provides experience of quietness and peacefulness to users which motivates users to visit UGS (Coles & Bussey, 2000; Shan, 2014). Finally, perceived safety in UGS is operationalized as presence of lighting, visibility of surrounding houses or roads, type of surrounding roads, and presence of crossings (Giles-Corti et al., 2005). Van Herzele and Wiedemann (2003) argued that the safety level is a basic condition to determine whether users would visit a particular UGS. Therefore it is essential to plan and design a green and safe environment (Luymes & Tamminga, 1995).

Although the above attributes were identified in the prior studies, there is no comprehensive list of important attributes regarding individuals' psychological considerations regarding UGS (Home, Bauer, & Hunziker, 2010). Previous studies tend to use objective measures, such as expert assessment or geographic information system (Hillsdon, Panter, Foster, & Jones, 2006; Lafortezza, Carrus, Sanesi, & Davies, 2009; Van Herzele & Wiedemann, 2003). However users' evaluations could be different from the expert opinions (Coles & Bussey, 2000). Scott, Evenson, Cohen, and Cox (2007) suggested that users' perceptions are better predictors of behaviour than objectively measured environmental factors and Kaczynski, Potwarka, Smale, and Havitz (2009) found that objective and subjective assessments did not correlate closely. However, Hur, Nasar, and Chun (2010) suggested that the relationship between UGS′ physical characteristics and overall evaluations of the environment is mediated by users' perceptions. In other words, subjective factors are associated with objective factors through users' perceptions (Schipperijn, Stigsdotter, et al., 2010). In addition, previous studies have generally relied on structured surveys that may have ignored factors that individuals use when they evaluate and compare among UGS. Coshall (2000) suggested that understanding individual preferences is important because, for example, although natural features are often employed in UGS studies, the meaning of 'natural features' may vary among users. Naturalness may refer to green elements, wildlife, clean air, and/or a sense of peacefulness to varying extents, singly or in some combination. Therefore, less structured ways to tap into users' perceptions and preferences could be a more valid method of identifying the salient UGS attributes held by users (Olson & Muderrisoglu, 1979). From this perspective, in addition to planning physical adaptations to UGS, planners and managers should consider users' subjective assessments.

3. Methods

3.1. Repertory grid interviews

Kelly (1955) developed the Repertory Grid Technique (RGT) primarily for use in the field of clinical psychology. This instrument allows patients to elicit personal propositions in their own words and to explain how they make sense of the world. The process of unfolding these hidden constructs helps clinicians to develop a deeper understanding of individuals' thoughts and behaviours. RGT