



Encouraging the use of urban green space: The mediating role of attitude, perceived usefulness and perceived behavioural control



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ABSTRACT

Urban green space (UGS) contributes to the psychological and physical well-being of urban population. Therefore, public authorities have been identifying ways to encourage the use of UGS. Although prior studies identified important UGS attributes, the influence of these attributes on UGS use remains inconsistent. To address this inconsistency, the mediating effects of attitude, perceived usefulness and perceived behavioural control were investigated in the present study. A telephone survey was conducted in Hong Kong. The results of this survey showed that the three factors have a mediating role between UGS attributes and the behavioural intention to use UGS. The findings suggested that UGS attributes do not directly influence behaviour, but rather indirectly via attitudinal factors and perceived behavioural control. This conclusion provides insightful implications for public authorities and UGS management. The findings indicated that while UGS attributes would influence users' appreciation and their use of UGS, promotional campaigns should be launched to change users' attitudes and to position their use of UGS as a social trend.

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1. Introduction

Hong Kong is one of the world's densest cities, with an average population density of 6544 persons per km² (Census and Statistics Department, 2011). In addition, more than 80% of the total area of Hong Kong comprises a hilly terrain that is unfavourable for urban development (A. Y. Lo & Jim, 2012; Ye, 1998). Tang, Wong, and Lee (2007) described Hong Kong as a 'land-hungry' city where the competition for land use is high. This has also caused physical constraints on urban greening in Hong Kong (Jim, 2000). Regardless of the constraints, the government acknowledges the importance of urban green spaces (UGS) and their positive effects such as enhanced psychological and physical well-being of the population (Planning Department, 2005). The provision of UGS is widely regarded as an important indicator of sustainable development, for example, indicators of urban sustainability (Mega & Pedersen, 1998), environmental dimensions for being a green community (United States Environmental Protection Agency, 2013) and natural capital indicators of environmental sustainability for urban areas

(Olewiler, 2006).

Prior studies identified important attributes of UGS, which are regarded as important predictors of UGS use (Bedimo-Rung, Mowen, & Cohen, 2005; Van Herzele & Wiedemann, 2003). However, other studies exhibited inconsistent results, such as those in Schipperijn, Stigsdotter, Randrup, and Troelsen (2010) who failed to identify a reliable predictor of UGS use. A. Y. Lo and Jim (2010) found that UGS quality is not correlated with visit frequency. Therefore, the important attributes of UGS are yet to be clearly and comprehensively identified (Maruani & Amit-Cohen, 2007). Schipperijn et al. (2010) suggested that these inconsistent findings are due to contextual differences of the studies. Wang, Brown, Liu, and Mateo-Babiano (2015) suggested adopting behavioural theories to better understand users' attitudes and behavioural intentions in using UGS. According to the theory of planned behaviour (TPB), a robust and widely adopted attitude–behaviour model, in which attitude, compared with belief, is a more stable evaluative disposition that predicts the behaviour of individuals (Ajzen, 1991). In the context of UGS, we argue that beliefs are formed through association with UGS attributes. These beliefs are mediated by attitudes in influencing the behaviours of users.

This study aims to investigate the mediating effects of attitudinal measures, namely, attitude, perceived usefulness and perceived behavioural control. The findings would fill the gap of the relationship between UGS attributes and users' behaviour. Filling

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this gap is important to enable policy makers and planners develop a better understanding of why and how frequent users visit UGS. This finding would have significant implications for decision making and the effective usage of valuable land resources, particularly in a compact city such as Hong Kong and in a global context with increasing urban intensification.

2. Literature review and conceptual framework

2.1. UGS attributes

Previous research has examined a few important physical characteristics of UGS, such as park facilities and features, park maintenance, distance, size and perceived safety (Bedimo-Rung et al., 2005; Hillsdon, Panter, Foster, & Jones, 2006; Van Herzele & Wiedemann, 2003). These characteristics are important factors that influence the use of UGS. Meanwhile, a comprehensive list of important attributes which a UGS should possess is yet to be produced (Maruani & Amit-Cohen, 2007). For example, Schipperijn et al. (2010) conducted a study focussing on socio-economic variables, size and distance to green spaces. However, a reliable predictor for the frequency of most used UGS was not found, particularly when a UGS has reasonable size (>5 ha) within a reasonable distance (<600 m). One of the possible explanations is that desirable planning criteria regarding the location, quantity and use of UGS vary among cities because of contextual and cultural diversity. Therefore, policymakers and planners should develop a reasonable understanding of the specific needs and preferences of city dwellers, in addition to general solutions for UGS because of the uniqueness of each UGS (Schipperijn et al., 2010; Wan & Shen, 2015).

Besides an objective assessment of environmental features, Millington et al. (2009) suggested a commonly used method, namely, the self-reported environmental perception by users. Scott, Evenson, Cohen, and Cox (2007) reported that perceived attributes is a better predictor of behaviour than objectively measured environmental factors. Although objective and subjective assessments may not be well-correlated (Kaczynski, Potwarka, Smale, & Havitz, 2009), Schipperijn et al. (2010) explained that the subjective measurement of factors is associated with the objective measurement of factors through users' experience. Perceived environmental attributes had been proven to influence the quality of life (Sugiyama, Thompson, & Alves, 2009), leisure activities (Giles-Corti et al., 2005; Sugiyama, Leslie, Giles-Corti, & Owen, 2009), stress restoration (Grahn & Stigsdotter, 2010) and psychological well-being (Gidlöf-Gunnarsson & Öhrström, 2007). Although perceived safety and presence of wildlife had been often considered in prior studies (Bedimo-Rung et al., 2005; Grahn, 1991; Van Herzele & Wiedemann, 2003), perceived safety is a psychological construct rather than an attribute of UGS, and the presence of wildlife is not applicable in Hong Kong where UGS sites are small, have limited ecological features and have poor environmental quality (A. Y. Lo & Jim, 2012). In the present study, three perceived attributes, namely, facilities, naturalness and perceived accessibility are proposed to be included in the conceptual framework, and these attributes are considered important for UGS (Bedimo-Rung et al., 2005; Grahn & Stigsdotter, 2010; Home, Bauer, & Hunziker, 2010; Wang et al., 2015). Therefore, the following hypotheses are formulated.

Hypothesis 1 (H1). Perceived provision of facilities relates positively to the behavioural intention to use UGS.

Hypothesis 2 (H2). Perceived naturalness relates positively to the behavioural intention to use UGS.

Hypothesis 3 (H3). Perceived accessibility relates positively to the behavioural intention to use UGS.

2.2. The theory of planned behaviour (TPB)

The theory of reasoned action (TRA) (Ajzen, Heilbroner, Fishbein, & Thurow, 1980) is a model that reliably demonstrates the relationship between attitude and behaviour (Burton, 2004). This model suggests that attitude and subjective norm are two key factors influencing an individual's intention to behave, and the behavioural intention subsequently influences actual performance of the behaviour. Attitude refers to an individual's subjective evaluation of a behaviour, that is, whether the individual favours or does not favour the behaviour (Fishbein & Ajzen, 1975). Subjective norm is an individual's perceived social influence from other people such as friends and family members (Fishbein & Ajzen, 1975). The key assumption of TRA is that individuals can control the conduct of a behaviour (Armitage & Conner, 2001; Tonglet, Phillips, & Read, 2004). Liska (1984) argued that behaviour may be facilitated or constrained by internal factors such as knowledge and skills and by external factors such as convenience. Extending from the TRA, Ajzen (1991) developed TPB by including an additional factor, perceived behavioural control (PBC), into the model. PBC refers to an individual's perceived ability and ease to perform certain behaviour.

TPB is a general and parsimonious theory that includes the major factors in explaining different behaviours (Armitage & Conner, 2001; Heath & Gifford, 2002). The review paper by Armitage and Conner (2001) showed that the efficacy of TPB in explaining behaviours has been well-proven. For example, prior attitude-behaviour studies had applied TPB in the area of smoking (Godin, Valois, Lepage, & Desharnais, 1992), diet (De Bruijn et al., 2007; Povey, Conner, Sparks, James, & Shepherd, 2000), the use of online platforms (Cheung & Vogel, 2013; Mathieson, 1991), driving violations (Parker, Manstead, Stradling, Reason, & Baxter, 1992) and pro-environmental behaviours (Bamberg & Schmidt, 2003; Tonglet et al., 2004). TPB had also been applied in predicting behaviours to use UGS (Glanz, Rimer, & Viswanath, 2008; Rhodes, Brown, & McIntyre, 2006; Wang et al., 2015). Thus, the following hypotheses are proposed based on the TPB.

Hypothesis 4 (H4). Attitude relates positively to the behavioural intention to use UGS.

Hypothesis 5 (H5). Subjective norms relate positively to the behavioural intention to use UGS.

Hypothesis 6 (H6). PBC relates positively to the behavioural intention to use UGS.

Hypothesis 7 (H7). Behavioural intention to use UGS relates positively to behaviour.

2.3. The mediating role of attitude, perceived usefulness and PBC

While the perceived attributes significantly influence users' behaviour in the use of UGS, the TPB model by Ajzen (1991) assumes that all other factors, such as socio-demographics, general beliefs and values, indirectly influence behaviour intentions via the three components, namely, attitude, subjective norms and PBC. Miller (1956) suggested that although individuals may hold many beliefs (an internal cognitive content), they can only invest their efforts to a limited number of them. Attitudes are fairly stable evaluative dispositions that determine the behaviour of individuals towards an object. In the context of UGS use, a high number of UGS attributes, including facilities, green features and maintenance, shape behaviours. Fishbein and Ajzen (1975) explained that beliefs are formed through association with certain attributes of a specific object. Therefore, as discussed previously, UGS users cannot invest

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