Fostering Visitors' Pro-environmental Behaviour in an Urban Park

Recognizing the increasing importance of sustainable environment, this research explored visitors' pro-environmental decision-making process in an urban park context. This study investigated the relationships among attitudes, subjective norms, perceived behaviour control, positive and negative anticipated emotions as well as behavioural intentions. The results suggest that positive anticipated affects positively influenced low effort and high effort pro-environmental behavioural intentions. In addition, positive anticipated affects mediated the relationship between cognitive factors and behavioural intentions. Interestingly negative anticipated affects did not influence behavioural intentions. Further analysis revealed subjective norm was the strongest predictor of intentions, especially the low effort pro-environmental behavioural intentions. The research advances the conceptual understanding of the role of each construct in generating park visitors' intentions to perform environmentally responsible behaviours while visiting an urban park.

Keywords: Pro-environmental behaviour; Intentions; Positive anticipated affect; Negative anticipated affect; Urban parks; Theory of Planned Behaviour; Ecotourism; Park visitors; Subjective norms; China

Introduction

Urban parks contribute to physical and mental health, in addition to the preservation of biodiversity (Weiler, Moore, & Moyle, 2013). Parks in urban locations are also critical for public recreation, providing outdoor activities that foster socialization, connectivity and community engagement (Wei, 2017). However, an increasing number of visitors, coupled with both conscious and unconscious behaviours, have been identified to place additional pressure on the management of the environment in urban parks (Pickering, 2010). To minimize human impacts on the natural environment, scholars have sought to encourage pro-environmental behaviour (Bamberg & Moser, 2007; Chiu, Lee, & Chen, 2014; Steg, Bolderdijk, Keizer, & Perlaviciute, 2014), which refers to the behaviour minimizing damage to the environment or in some cases even benefit the environment (Cottrell, 2003; Steg & Vlek, 2009).

The Theory of Planned Behaviour (TPB) has been applied to study a variety of pro-environmental behaviours, such as recycling at school (De Leeuw, Valois, Ajzen, & Schmidt, 2015), selecting green hotel (Han & Kim, 2010), using public transportation (Bamberg, Hunecke, & Blöbaum, 2007) and purchasing green products (Chan & Lau, 2002). As suggested by Kals, Schumacher, and Montada (1999), ecological behaviour cannot be viewed as a mere result of cognitive process. The behaviour-related processes comprise affective responses, such as the anticipated emotions (Perugini & Conner, 2000). According to Onwezen, Bartels, & Antonides (2014b) and Harth, Leach, and Kessler (2013), both positive and negative anticipated emotions are explicitly relevant to pro-environmental behaviour. Anticipated emotions have also been empirically identified as important

contributors to guiding environmental decisions or pro-social behaviours (Conner, Godin, Sheeran, & Germain, 2013; Han & Hyun, 2017; Kim, Njite, & Hancer, 2013).

A key rationale behind the integration of new constructs (e.g. anticipated emotions) into TPB is to provide much needed conceptual clarification on the theoretical mechanisms which underpin PEB to better understand individuals' decision-making process (Chan & Lau, 2001; Lee, Song, Bendle, Kim, & Han, 2012; Onwezen, Antonides, & Bartels, 2013). Nevertheless, in tourism, the effect of anticipated emotions has received relatively less attention than that of cognitive factors in TPB theoretical framework (Curtis, Ham, & Weiler, 2010). In particular, limited studies have critically examined the relationship between anticipated affective variables and pro-environmental behaviour in an urban park setting.

As suggested by Ramkissoon, Weiler, & Smith (2012), encouraging visitors' pro-environmental behavioural practice may contribute to the improvement of the environment in parks and thus benefit the future generations. Generating a better understanding of visitors' behaviours helps to more effectively realizing management objectives in natural settings, such as cost savings on litter collection and fewer detrimental impacts on wildlife (Brown, Ham, & Hughes, 2010). Recognizing these benefits, park authorities are increasingly interested in peoples' decision-making process to promote the sustainability of natural resources and environment (Halpenny, 2010). A better understanding of pro-environmental decision-making process, how it arises, how it is perceived by visitors, is therefore necessary to encouraging pro-environmental behaviour and promoting environment sustainability of urban parks.

This study aims to integrate affective drivers into TPB model to understand visitor's

pro-environmental behaviour in an urban park setting. Specifically, this research assessed the comparative importance of five variables (i.e., positive and negative anticipated emotions, attitudes, subjective norms, and perceived behaviour control) in generating pro-environmental decisions and tested the mediating role of affective processes.

Pro-environmental Behaviour (PEB) in Parks

"Pro-environmental behaviour" (Bamberg & Moser, 2007) or "Environmentally supportive behaviours" (Huddart-Kennedy, Beckley, McFarlane, & Nadeau, 2009) are used by researchers to describe behaviours that minimize ecological harm, advocate natural resource conservation and promote sustainability of the environment (Larson, Stedman, Cooper, & Decker, 2015). This research adopts the term pro-environmental behaviour to refer to the behaviour that aims to reduce the damage to the environment or even promote the sustainability of environment (Cottrell, 2003; Steg & Vlek, 2009).

Increasing visitation has been demonstrated in previous studies to lead to cumulative negative impacts, placing additional pressure on the environment of parks (Marion & Reid, 2007; Ramkissoon, Smith, & Weiler, 2013). This has lead researchers to explore mechanisms to promote pro-environmental behaviours in natural settings and protect natural resources (Lehman & Geller, 2004). Ramkissoon et al. (2012), for instance, proposed a conceptual framework that comprises four sub-constructs of place attachment and critically examined the likely influence of place attachment on visitors' PEB in parks and PEB in daily life. They also empirically demonstrated that the place attachment has a positive influence on place satisfaction and pro-environmental intentions (Ramkissoon et al., 2013).

Scholars suggested different types of PEB might be influenced by different variables, which subsequently has an impact on our understanding of individuals' PEB and environmental management (Lee, Jan, & Huang, 2015; Lee, Jan, & Yang, 2013). For example, Lee, Jan, and Huang (2015) conceptualized PEB as general and site-specific PEB to measure tourists' behavioural intentions while visiting intertidal zones. The results showed that general and site-specific PEB are respectively affected by different aspects of a recreation experience. Halpenny (2010) measured the two kinds of PEB (general and park-related) and found that place attachment is an important precursor to individuals' place-related pro-environmental intentions. Ramkissoon et al. (2013) classified PEB into low effort PEB and high effort PEB according to its easiness or the effort that park visitors need to make. The place satisfaction was found to positively influence low effort PEB but negatively influence high effort PEB (Ramkissoon et al., 2013).

The scope of behaviours associated with sustainable tourism is much larger (Landon, Woosnam, & Boley, 2018). Given that, this study employed low effort and high effort PEB measures in Ramkissoon et al. (2013) and the items assessing PEB were revised in accordance with the study context. The low effort PEB refers to eco-friendly behaviours that requires less effort (e.g. picking up letter or learning about the environment of parks), whereas high effort PEB comparatively need more time and attention investment and other efforts (e.g. volunteering time to park-protecting projects).

The Theory of Planned Behaviour

The Theory of Planned Behaviour is designed to account for human behaviours in specific settings (Ajzen, 1991). This theory assumes that an individual tends to perform a particular behaviour to the degree that he or she has a positive attitude toward the behaviour, perceives pressure to perform the behaviour from social environment, and expects to have control over performing the behaviour (Richard, Pligt, & Vries, 1996). According to Ajzen (1991), attitude is the extent to which a person has either a favorable or unfavorable assessment of the behaviour in question; subjective norms refer to an individual's perception of the social pressure to perform or not to perform the specific behaviour; and perceived behavioural control refers to the perceived ease or difficulty of behaving. It is important to distinguish social norms from subjective norms, as the social norms involve a wide range of acceptable behaviours in a social group or society but these norms might not be fully absorbed by individuals. At this point, subjective norms indicate individuals' perceived norms which may or may not reflect what most important others think should be done (Fishbein & Ajzen, 2011).

The effects of attitude, subjective norms and perceived behavioural control in predicting intention have been examined in previous studies, although the significance of each factor is incongruent in terms of different behaviours and situations (Teng, Wu, & Liu, 2015). For example, in investigating visitors' willingness to pay for the conservation of parks, López-Mosquera and Sánchez (2012) found perceived behavioural control was the strongest determinant, while perceived social pressure was the next strongest determinant. Chen and Tung (2014) demonstrated that attitudes toward green hotels, subjective norms, and perceived

behavioural control exerted a positive influence on consumers' intention to visit green hotels. In a study on non-compliance in national parks, Goh, Ritchie and Wang (2017) reported subjective norms and attitudes as the key antecedents of PEB. Similarly, Lee and Jan (2017) showed that environmental attitudes, subjective norms, perceived behavioural control have positive impacts on ecotourism behavior among nature-based tourists. Based on these notions, this study proposes that an increase in positive attitudes toward eco-friendly behaviours, perceived pressure to perform, and the control over performing the behaviours positively influence low effort and high effort pro-environmental intentions.

H1. Attitude positively influences low effort pro-environmental intention.

H2. Attitude positively influences high effort pro-environmental intention.

H3. Subjective norms positively influence low effort pro-environmental intention.

H4. Subjective norms positively influence high effort pro-environmental intention.

H5. Perceived behavioural control positively influences low effort pro-environmental intention.

H6. Perceived behavioural control positively influences high effort pro-environmental intention.

Anticipated Affect and its Relationships with TPB Variables

Existing studies also indicate that affective variables make an independent contribution to the formation of intentions to perform a PEB (Han, Hwang, & Lee, 2017; Han & Hyun, 2017; Hur & Jang, 2015; Kim et al., 2013). The affect results from an evaluative perception of actual, imagined, or anticipated relationship between a person and the environment (Lazarus,

1982). Rivis, Sheeran, and Armitage (2009) argue that anticipated feelings refer to the prospect of experiencing positive or negative affects along with performing or not performing a specific behaviour. Although affect is generally regarded as an umbrella concept that covers emotion and feeling (Bagozzi, Gopinath, & Nyer, 1999; Cohen, Pham, & Andrade, 2008), the anticipated affect, anticipated emotion, and anticipated feeling have been used interchangeably to refer to similar measurements of imagined emotional responses in the studies on PEB integrating affective factors (e.g. Han, 2014; Han & Hur, 2016; Han & Hyun, 2017).

Notably, the construct of attitudes in the TPB model also denote affective responses or feelings towards the attitude object (Ajzen, 2005), but the anticipated affect can be distinguished in two important ways. First, attitudes are evaluative in nature while the anticipated affective responses are emotional in nature. In this regard, attitudes are assessed by means of overall evaluation measures and anticipated affect tends to be assessed through emotion indicators (Fishbein & Ajzen, 2011). Second, anticipated affect tends to examine not only the positive affect expected after performing certain behaviours, but also the negative affect associated with non-performance of those behaviours (Conner et al., 2013). In the present study, positive and negative anticipated affects are constituents of affective factors.

Kim et al. (2013) indicated that inducing more anticipated regret can increase consumers' intentions to select eco-friendly restaurants. In examining convention travellers' pro-environmental intentions, Han, Hwang and Lee (2017) empirically identified that anticipated emotions (i.e. anticipated guilt and pride) are important drivers of intention to practice green activities. Similar results can be found in a museum context, which showed

positive and negative anticipated affects are contributors to increasing pro-environmental decisions (Han & Hyun, 2017). However, to date, applications of anticipated affects in investigating PEB in urban park settings are scarce. Given these, the present study hypothesizes that anticipated affects positively influence low effort and high effort pro-environmental intentions.

H7. Positive anticipated affect positively influences low effort pro-environmental intention.

H8. Positive anticipated affect positively influences high effort pro-environmental intention.

H9. Negative anticipated affect positively influences low effort pro-environmental intention.

H10. Negative anticipated affect positively influences high effort pro-environmental intention.

Additionally, scholars seek to integrate anticipated affects into existing theoretical frameworks such as TPB (De Leeuw et al., 2015). Onwezen, Bartels, & Antonides (2014a) found that anticipated emotions (i.e., guilt and pride) play a mediating role between attitude, descriptive norms and intentions to buy organic products across individualistic and collectivistic countries. Moreover, it has been revealed that when anticipated emotions were added into TPB, attitudes and subjective norms contribute to activating an individual's anticipated emotions (Hynie, MacDonald, & Marques, 2006; Onwezen et al., 2014a, 2014b). It is also suggested that cognitive evaluations have great power to shed light on emotional responses (Breitsohl & Garrod, 2016; Lazarus, 1991). The effects of attitudes, subjective norms and perceived behavioural control on anticipated affect in TPB model in nature-based settings have been unexplored and require conceptual clarification and theoretical refinement.

Therefore, the following hypotheses were developed:

H11. Attitude positively influences positive anticipated affect.

H12. Subjective norms positively influence positive anticipated affect.

H13. Perceived behavioural control positively influences positive anticipated affect.

H14. Attitude positively influences negative anticipated affect.

H15. Subjective norms positively influence negative anticipated affect.

H16. Perceived behavioural control positively influences negative anticipated affect.

Based on the assertions of previous studies, we proposed 16 research hypotheses and the basic conceptual model is illustrated in Figure 1.

FIGURE 1 NEAR HERE

Methodology

Measurement Instruments

The questionnaire included seven parts (please refer to Supplementary data). A Seven-point Likert-type scale from "Strongly disagree" (1) to "Strongly agree" (7) was applied to all latent variables. Demographic variables, i.e., age, gender, occupation, education and income, were also included in the instrument. The questionnaire was reviewed by academics, practitioners, and park visitors (63 tourists at the park) for face validity. The outcome of this process was minor adjustments to the wording, phrasing and formatting.

The attitude, subjective norms and perceived behavioural control were measured with three items respectively and were adopted from Ajzen (1991) and Han (2015). One item in attitude measures (i.e. For me, behaving eco-friendly at park is Good) in Han (2015) was omitted as it

had almost the same meaning in Chinese as another item (i.e. For me, behaving eco-friendly at park is Beneficial). Positive anticipated affect and negative anticipated affect were employed from Onwezen et al. (2013) and Han and Hyun (2017). The positive anticipated affect was evaluated with four items (i.e. If I practice environmentally responsible actions at park that minimizes its negative impact on the environment, I would feel [1] proud, [2] accomplished, [3] confident and [4] worthwhile). However, due to low factor loadings, the third item was deleted from final analysis. The negative anticipated affect was evaluated with three items (i.e. If I fail to practice environmentally responsible actions at park that minimizes its negative impact on the environment, I would feel [1] guilty, [2] remorseful and [3] bad). Low effort and high effort pro-environmental behavioural intention items were operationalized by three items respectively. They were adapted from Ramkissoon et al. (2013) and modified in accordance with the demands of the study context (e.g. I am willing to learn more about the state of the park environment; I am willing to talk to site managers about the environmental issues at this park.).

Data Collection and Sample Profile

The focus of this research is Beijing Olympic Forest Park of China (BOFP), covering an area of approximately 680 square hectometers (Huo et al., 2014). As an area for tourism and recreation BOFP has easy access locating along the Beijing Subway and requires no admission fee. BOFP is also a wildlife protection area, with abundant ecological resources, fine infrastructure and entertainment facilities and is extremely popular among locals and tourists from different parts of China.

Data was collected in November and December of 2016. The convenience sampling

method was adopted to identify the respondents. At the exit of the park, the first participant was chosen by trained university students investigators, and following that, every fifth person passing in front of the investigator was approached and asked to complete the questionnaires on a voluntary basis (Balomenou & Garrod, 2014). The questionnaire was distributed and returned on-site in order to increase the response rate. In total, 300 park visitors were surveyed and 290 questionnaires were returned. After excluding the unusable cases with incomplete responses, we used 257 completed responses for data analysis. The sample size is acceptable for the latent variable model in this study where the estimation method is maximum likelihood and where all outcomes are continuous and normally distributed (Kline, 2015). According to the *N:q* rule in Jackson (2003), the ratio of the number of cases (N) in our research to the number of model parameters (q) is about 16:1, which is far above the less ideal ration (10:1) and near the recommended sample-size-to-parameters ration (20:1).

Furthermore, there is a need to examine the common method bias (CMB) in this study, as the variable measurements were collected using the same manner from the same participants (Podsakoff & Organ, 1986). The present study applied two measures to identify and safeguard against common method variance. First, the Harman's single-factor test was performed by loading all of the self-reported items into an exploratory factor analysis. A total of six factors appeared in EFA results and each of them explained less than 34% of the total variance between the variables. When one factor has less than 50% of the variance from the variables, it means there is no serious CMB (Podsakoff, MacKenzie, & Lee, 2003). Also, when the common method variance appears, a confirmatory factor analysis involving all the constructs should generate a single method factor (Podsakoff & Organ, 1986). The results

revealed a significantly worse fit of the single-factor model with IFI, CFI, and TLI values lower than 0.9 and RMSEA higher than 0.2. Accordingly, the common method variance did not significantly influence the study results based on the evidence from two statistical tests.

Of the 257 respondents, 115 participants were males (45%) and 142 participants were females (55%). In particular, about 48.2% indicated that they earned a bachelor's degree; 45.9% earned a graduate degree (Table 1). Sample demographics are not very balanced in terms of gender and are characterized by predominantly younger and well-educated target group. Therefore, care should be taken in the interpretation of the results due to sampling characteristics.

TABLE 1 NEAR HERE

Data Analysis

SPSS version 18.0 and AMOS version 21.0 were used for correlation, factor analyses and Structural Equation Modeling (SEM). Structural Equation Modeling has been widely suggested to be the most appropriate technique for complex model testing (Kiatkawsin & Han, 2017; Nunkoo, Ramkissoon, & Gursoy, 2013). As suggested by Anderson and Gerbing (1988), a measurement model using Confirmatory Factor Analysis (CFA) was evaluated at the first step (Table 2 & 3). Indicators of each construct were all acceptable indicating that constructs have a unidimensional measurement scale (Sethi & King, 1994). Results showed that the model includes an appropriate fit to the data (χ^2/df=1.752, RMSEA=.054, CFI=.962, IFI=.962, NFI=.916).

All the standardized loadings for the indicators of each construct were higher than .50, and all factor loadings were significant at $p < .001$. Composite reliability was calculated using

standardized factor loadings and indicator error variances for each variable. Values of composite reliability for every construct fell between .680 and .927, which were greater than Bagozzi and Yi's (1988) suggested cutoff of .600. That is, the measurement items for each study variable are internally consistent. Subsequently, average variance extracted (AVE) values were computed. AVE values fell between .519 and .810 which is more than Fornell and Larcker's (1981) suggested threshold of .500. In addition, AVE values were higher than the squared correlation between variables. The results indicated the convergent and discriminant validity of the measurement model have been established (Fornell & Larcker, 1981).

TABLE 2 & 3 NEAR HERE

A structural equation model comprising all research variables was constructed. Table 4 and Figure 2 present the summary of the results. An examination of the goodness-of-fit statistics revealed that the final model fit to the collected data well (χ^2=312.586, df=213, p<.001, χ^2/df=1.468, RMSEA=.043, CFI=.976, IFI=.976, TLI=.971) (Byrne, 2001).

FIGURE 2 NEAR HERE

TABLE 4 NEAR HERE

Subjective norms exerted a positive and significant influence on visitors' low effort and high effort PEB ($\beta = .429, \rho < .001$; $\beta = .181, \rho < .05$), supporting Hypotheses 3 and 4. Yet, attitude and perceived behavioural control did not directly affect pro-environmental intention in this sample, rejecting Hypotheses 1, 2, 5 and 6. Regarding the endogenous variable, positive anticipated affect play a critical role in increasing both low effort and high effort PEB ($\beta = .308, \rho < .001$; $\beta = .318, \rho < .001$), supporting Hypotheses 7 and 8.

Yet, the impact of negative anticipated affect was not significant, rejecting Hypotheses 9 and 10. The hypothesized associations among cognitive factors and anticipated emotions were tested (H11-H16).

Results demonstrated that the impacts of attitude ($\beta = .424$, $\rho < .001$), subjective norms ($\beta = .143$, $\rho < .05$) and perceived behavioural control ($\beta = .382$, $\rho < .001$) on positive anticipated affect were significant and positive. These results supported Hypotheses 11, 12 and 13. The relationships between cognitive variable and negative anticipated affect were assessed. As expected, attitude ($\beta = .289$, $\rho < .001$), subjective norms ($\beta = .266$, $\rho < .01$) and perceived behavioural control ($\beta = .238$, $\rho < .05$) exerted a significant and positive influence on negative anticipated affect, thus supporting Hypotheses 14, 15 and 16.

The indirect impacts of constructs were also examined by performing a bootstrap analysis, which provides a relatively straightforward manner to identify the significance of indirect effects (Han & Hyun, 2017). Results indicated that attitude, subjective norms and perceived behavioural control have a significant indirect impact on the endogenous variables through positive anticipated affect: on low effort PEB ($\beta = .149$, $\rho < .01$; $\beta = .045$, $\rho < .05$; $\beta = .117$, $\rho < .01$) and on high effort PEB ($\beta = .177$, $\rho < .01$; $\beta = .054$, $\rho < .05$; $\beta = .140$, $\rho < .01$) (Table 5). These findings suggested that positive anticipated affect plays a significant mediating role in the proposed conceptual framework. Overall, positive anticipated affect fully mediates attitudes, perceived behavioural control and PEB but partially mediates subjective norms and PEB.

As for the total influence on low effort PEB, subjective norms was the greatest among research variables ($\beta = .488$, $\rho < .05$), followed by positive anticipated affect ($\beta = .308$,

$\rho < .001$), attitude ($\beta = .149$, $\rho < .01$), and perceived behavioural control ($\beta = .117$, $\rho < .01$). For the total impact on high effort PEB, positive anticipated affect was the greatest among research variables ($\beta = .318$, $\rho < .001$), followed by subjective norms ($\beta = .269$, $\rho < .05$), attitude ($\beta = .177$, $\rho < .01$), and perceived behavioural control ($\beta = .140$, $\rho < .01$).

TABLE 5 NEAR HERE

Discussion

The study advances the conceptual understanding of the role of each construct in TPB model and anticipated affects in generating visitors' intentions to perform environmentally responsible behaviours in an urban park, which has as of yet hardly been explored in the existing park literature. The research indicated that positive anticipated affect positively influenced both low effort and high effort PEB. It is also identified that the impact of attitude, subjective norms, and perceived behavioural control on park visitors' intention were asymmetric. This study thus delivers meaningful implications to park practitioners. In particular, positive anticipated affect and subjective norms should be the priority for the design of urban park interpretation and environment education activity in collective culture to maximize individuals' pro-environmental intentions.

Theoretical Implications

The study revealed different impact levels of positive and negative anticipated affects on pro-environmental behaviours. Park visitors' positive anticipated affect plays a significant and direct role in intentions to perform pro-environmental behaviours. The total impact of positive anticipated affect on low effort PEB was not significantly different from the total

impact on high effort PEB. This echoes the findings of previous studies that positive anticipated affect strongly affected pro-environmental behavioural intentions (Han & Hyun, 2017; Onwezen et al., 2013; Onwezen et al., 2014a, 2014b). The result suggests that as the level of positive anticipated affect increased, park visitors had more pro-environmental behavioural intentions. As indicated in previous literature, this may be because individuals are strongly motivated to seek out positive feelings, which often guide intentions to engage in pro-environmental behaviour (Baumeister, Vohs, DeWall, & Zhang, 2007; Han & Hyun, 2017; Onwezen et al, 2014a).

Interestingly, negative anticipated affect did not regulate pro-environmental behavioural intentions in this sample. The result is inconsistent with Han and Hyun (2017), Onwezen et al. (2014a), and Onwezen et al. (2013)'s assertions that negative anticipated emotional process guides pro-environmental decision-making. Nevertheless, Lazarus (1991) indicated that coping with negative emotions might either by deploying attention or by altering the meaning of the person-environment relationship. In this study setting, park visitors might choose to cope with negative feelings by attention deployment (e.g. avoidance) or by denial or distancing, in which the distressing emotion associated with harm or threat on the environment is made moot. Therefore, it is not surprising that negative anticipated affect did not directly impact pro-environmental behavioural intentions in this study.

Another key contribution of this research is identifying the mediating role of positive anticipated affect. In other words, cognitive responses (i.e. attitude, subjective norms and perceived behavioural control) influence PEB through the anticipated affective factors, especially the positive anticipated affect. In addition, cognitive factors exert a significant and

positive influence on both positive and negative anticipated affects. This result supported Onwezen et al. (2014a) and Hynie et al.'s (2006) indication that attitudes and subjective norms play an important role in the formation of anticipated emotional outcomes. It is also consistent with the essence of appraisal theory that emotions are triggered by cognitive evaluations of situations and events (Roseman & Smith, 2001).

Meanwhile, the study contributed to the literature by identifying the different impact of each cognitive variable on behavioural intention within urban park settings. Subjective norms had a direct and greatest influence on low effort and high effort PEB, which is consistent with earlier findings from the study by Borges and Lansink (2016). They emphasized the role of the collective culture in accounting for the higher impact of subjective norms in increasing farmers' intentions to use improved natural grassland. The effect of subjective norm in the present study reveals the decisive role of perceived social pressure of important persons, family or friends on park visitors' PEB, especially low effort PEB (i.e. recycling, learning, persuading). This result connects to the sample from China, where a collective culture remains relatively dominant in many aspects of daily life.

Attitude had an insignificant direct impact and marginal total effect on park visitors' PEB. Due to the potential of social desirability bias (Fisher, 1993) the insignificant relationship between attitude and behavioural intention might be connected to respondent's tendencies to respond in a socially desirable way, which is probably inconsistent with some visitors' real behavioural intentions at the park. For example, visitors tended to agree that behaving eco-friendly (e.g. not feeding animals with bread) in park was beneficial, but felt that if they did not feed animals, others would probably feed them anyway. This phenomenon was

described as “denial of responsibility” in Juvan and Dolnicar (2014)’s study, which was believed to be a contributor to attitude-behaviour gap. This research also found that perceived behavioural control in an urban park did not predict behavioural intentions. According to Carrus, Passafaro, and Bonnes (2008), a person might feel that an individual’s intention to recycle is because of the willingness to contribute to environmental conservation, without considering whether such an action is under their control or not (i.e., perceived behavioural control).

Managerial Implications

In addition to the theoretical implications arising from this research, this study provides significant managerial implications for park management and practice. Notably, caution should be taken when applying the findings into practice, as the sample of this study are comparatively younger. The findings revealed that in an urban park context an increase in positive anticipated feelings was positively related to park visitors’ environmentally responsible intentions. Considering park visitors’ positive anticipated affect in environment education and interpretation therefore should be the priority for site managers to maximize individuals’ pro-environmental intentions.

Specifically, park managers should strive to encourage visitors’ positive attitudes and enhance their perceived behavioural control in order to induce their positive anticipated affect. These may involve making necessary pro-environmental resources and opportunities available to visitors and communicating the benefits and significance of eco-friendly behaviours to visitors through the on-site interpretation system and the relevant social media. On the other hand, the findings showed that visitors’ negative feelings did not trigger PEB in

this research. Park visitors might choose to cope with negative feelings by attention deployment (e.g. avoidance) or by denial, in which the distressing emotion associated with harm or threat on the environment is made moot. Therefore, considering park visitors' negative anticipated affect should not be the priority for site managers to maximize individuals' pro-environmental intentions in this study setting.

The significant effect of subjective norms indicates that in order to increase visitors' PEB intentions, especially low effort intention, it could be effective for practitioners to increase perceived social pressure on park visitors. That is, park managers should always remind themselves of the power of opinion leadership in disseminating pro-environmental messages in a Chinese cultural setting (Chan & Lau, 2002). For example, Pro-environmental campaigns in parks led by the mayors, community officials or celebrities are likely to generate awareness and engagement towards sustainable behaviours. In addition, if park visitors' friends, family members and community gain more knowledge about sustainability of environment and support pro-environmental practices, then they might share the relevant knowledge or beliefs with park visitors, which could be a powerful force in favour of promoting eco-friendly behaviours by visitors. It is also worth noticing that subjective norms exert more influence on low effort behavioural intention than on high effort behavioural intention. Therefore, using subjective norms to encourage recycling, learning, and persuasion might be more effective than to encourage high effort PEB.

Limitations and future research

Inevitably, this study has several limitations, many of which were mitigated, however some need to be addressed in future research. First, this research is limited by its focus on one

urban park in China. As such, future studies should be replicated in conceptually related contexts. Another limitation of this study concerns the use of pro-environmental intention instead of real behaviour in the model. An ideal approach for future studies would be to investigate actual behaviour (e.g., using CCTV monitoring, GPS tracking etc.), which increases the external validity of the results. Third, the participants in the on-site surveys were younger and hence more representative sample should be investigated in future replications and extensions. Finally, future studies need to consider the impact of contextual factors or outside environment in addition to cognitive and affective factors. This analysis could help industry experts to better develop strategies and customize interventions even further, and therefore increase the efficacy of pro-environmental behaviour in an urban park setting.

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Table 1. Respondent profile

Demographic traits	Distribution	Valid percentage (%)
Gender		
Male	115	45
Female	142	55
Age		
≤ 18	2	0.8
19-30	119	46.3
31-45	84	32.7
46-60	37	14.4
≥ 61	15	5.9
Educational level		
Primary	3	1.2
High school	12	4.7
University or college	124	48.2
Postgraduate	118	45.9
Monthly income (CNY)		
≤ 2000	69	26.8
2001-4000	48	18.7
4001-6000	57	22.2
6001-8000	40	15.6
≥ 8000	43	16.7

Table 2. Correlation, Mean, Standard Deviation, Average Variance Extracted and Composite Reliability

	AT	SN	PBC	PAA	NAA	LEPBI	HEPBI
AT	.927[a]						
SN	.574[b](.329)[c]	.926					
PBC	.584(.341)	.643(.413)	.721				
PAA	.770(.593)	.636(.404)	.713(.508)	.889			
NAA	.581(.338)	.571(.326)	.583(.340)	.787(.619)	.910		
LEPBI	.519(.269)	.634(.402)	.488(.238)	.577(.333)	.459(.211)	.680	
HEPBI	.415(.172)	.392(.154)	.388(.151)	.420(.176)	.350(.123)	.691(.477)	.823
Mean	6.429	6.174	5.485	6.253	6.309	6.669	4.908
SD	.793	.905	1.058	.906	.899	.603	1.184
AVE	.810	.714	.568	.727	.773	.519	.609

Note. AT=Attitude; SN=Subjective norms; PBC=Perceived behavioural control; PAA=Positive anticipated affects; NAA=Negative anticipated affects; LEPBI =Low effort pro-environmental behavioural intention; HEPBI =High effort pro-environmental behavioural intention.
Goodness-of-fit statistics: $\chi^2/df = 1.752$*, RMSEA=.054, CFI=.962, IFI=.962, NFI=.916.*
[a]Composite reliability, [b]correlation, [c]squared correlation.

Table 3. Result of confirmatory factor analysis

Constructs	Items	Standardized factor loadings
LEPBI	LEPBI1	.675
	LEPBI2	.521***
	LEPBI3	.728***
HEPBI	HEPBI1	.783
	HEPBI2	.748***
	HEPBI3	.808***
PAA	PAA1	.828
	PAA2	.864***
	PAA3	.862***
NAA	NAA1	.764
	NAA2	.934***
	NAA3	.929***
AT	AT1	.877
	AT2	.905***
	AT3	.917***
SN	SN1	.864
	SN2	.965***
	SN3	.818***
PBC	PBC1	.773
	PBC2	.554***
	PBC3	.706***

Table 4. Coefficient, t-value, R^2 and hypotheses testing

	Independent variables		Dependent variables	Standardized estimates	t-Values	Test of hypothesis
H1	AT	→	LEPBI	.079	.738	Rejected
H2	AT	→	HEPBI	.181	1.690	Rejected
H3	SN	→	LEPBI	.429	4.602***	Supported
H4	SN	→	HEPBI	.181	2.001*	Supported
H5	PBC	→	LEPBI	-.055	-.407	Rejected
H6	PBC	→	HEPBI	.111	.813	Rejected
H7	PAA	→	LEPBI	.308	3.341***	Supported
H8	PAA	→	HEPBI	.318	3.434***	Supported
H9	NAA	→	LEPBI	-.098	-.823	Rejected
H10	NAA	→	HEPBI	.018	.153	Rejected
H11	AT	→	PAA	.424	6.408***	Supported
H12	SN	→	PAA	.143	2.069*	Supported
H13	PBC	→	PAA	.382	4.428***	Supported
H14	AT	→	NAA	.289	3.930***	Supported
H15	SN	→	NAA	.266	3.219**	Supported
H16	PBC	→	NAA	.238	2.478*	Supported
Total variance explained (R^2) R^2 for Positive anticipated affect =.678 R^2 for Negative anticipated affect =.463 R^2 for Low effort pro-environmental intention =.448 R^2 for High effort pro-environmental intention =.208			*p < .05; **p < .01; ***p < .001			

Table 5. Standardized total impact and indirect impact

Independent variables		Dependent variables	Direct impact	Indirect impact	Total impact
AT	→	LEPBI	.079	.149**	.149**
SN	→	LEPBI	.429***	.045*	.488*
PBC	→	LEPBI	-.055	.117**	.117**
PAA	→	LEPBI	.308***	-	.308***
NAA	→	LEPBI	-.098	-	-.098
AT	→	HEPBI	.181	.177**	.177**
SN	→	HEPBI	.181*	.054*	.269*
PBC	→	HEPBI	.111	.140**	.140**
PAA	→	HEPBI	.318***	-	.318***
NAA	→	HEPBI	.018	-	.018

Supplementary data:
Figure 1. Conceptual model.
Figure 2. Structural results of the proposed model.
Questionnaire