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Assessing Public Support on the Latest Green Deck Scheme

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Project Title: Assessing Public Support for the Latest Green Deck Scheme

Executive Summary

This project examines public opinion about the Green Deck Scheme. Although numerous studies have been conducted to demonstrate the feasibility and benefits of the Green Deck Scheme little is known about what the general public thinks about the Scheme. This project fills this gap by assessing public opinion about the Green Deck Scheme in terms of levels of support, attitudes, perceived instrumentality (i.e., benefits and costs), and perceived social norms of support. We also examine the factors associated with people's support for the implementation of the Green Deck Scheme. Drawing on the theory of planned behavior and its extensions with additional predictors, we examine whether attitudes toward the Green Deck Scheme, perceived social norms of support, institutional trust, general pro-environmental orientations, perceived instrumentality, and place-based evaluations predict support for the Scheme. We provide insights into the profiles of public opinion by conducting person-centered latent profile analyses and examining the correlates of these profiles. Finally, we discuss the findings of a focus-group interview study we conducted, in order to offer insights into how people think about the Green Deck Scheme and their concerns about its implementation.

We conducted two survey studies and a focus-group interview study. In Study 1, we commissioned Social Policy Research Limited to conduct a street intercept survey, which allowed us to recruit a random sample of participants with diverse backgrounds. In total, 1,000 adults participated. We found that the majority of the respondents were in favor of the Green Deck Scheme in general, but tended to be neutral about using public resources to implement the Scheme. The majority also tended to agree with the benefits of the Green Deck Scheme and had positive attitudes toward it. Our partial least square-structural equation modeling (PLS-SEM) showed that attitudes, perceived social norms of support, institutional trust, and perceived instrumentality were positive and significant predictors of support for the Scheme, with effect sizes ranging from small to medium. Furthermore, perceived instrumentality was a positive and significant predictor of attitude. Finally, latent profile analyses revealed three distinct profiles of opinions: neutral but not supportive (Profile 1: 26.2%), positive and leaning supportive (Profile 2: 39.5%), and positive and supportive (Profile 3: 34.4%). We are further able to reveal that respondents who were younger, trusted institutions more, and perceived public green spaces to be more important were more likely to be members of profiles holding positive and supportive opinions toward the Green Deck Scheme.

In Study 2, we conducted an online survey with a sample of 674 PolyU members. In general, the PolyU members tended to support the Green Deck Scheme, hold positive attitudes, and perceived the Scheme to be beneficial. Our PLS-SEM showed consistent results, as in Study 1. LPA also identified three distinct profiles of opinions: neutral (Profile 1: 20.5%), positive and supportive (Profile 2: 48.7%), and strongly positive and supportive (Profile 3: 30.9%). Consistent with Study 1, individuals with higher levels of institutional trust and perceived importance of public green spaces were more likely to be members of profiles with more positive and supportive opinions.

Supplementing our findings in Studies 1 and 2, in Study 3, we found that participants commonly agreed that the benefits of the Green Deck Scheme concerned the physical environment, social environment, and Hong Kong as a whole. Study 3 corroborated the way in which the cost-benefit evaluation was central to public support for the implementation of the Green Deck Scheme.

Overall, our findings suggest that the general public tend to be positive and leaning supportive of the Green Deck Scheme. About half of the respondents from the general public viewed the Scheme to be beneficial. Yet, they tended to be more cautious about how its implementation should be funded, which might suggest the need to identify alternative funding resources or lobby the public to support its implementation through public resources by communicating how the benefits of the Scheme outweigh the costs. Indeed, our findings suggest that perceived instrumentality and perceived importance of public green spaces are crucial factors for positive attitudes toward the Scheme and mobilizing public support. It is noteworthy that about 30% to 40% of the general public respondents had neutral perceptions about the benefits versus costs of the Green Deck Scheme, while percentages of neutral responses were lower among the PolyU community.

These findings may reflect the need to communicate the potential benefits of public green spaces in general and the Green Deck Scheme specifically. Relatedly, respondents from the focus group interview suggested that better communication was needed with the public in terms of how the project would be funded and how the construction of the Green Deck would influence the traffic and daily commuting routes of neighborhood areas. Accordingly, more public communication is needed to enhance public support for the Green Deck Scheme.

1. Background of Research

The inclusion of public green spaces in urban planning is essential to create a more vibrant, sustainable, and livable city. It is well-documented that urban green spaces contribute significantly to citizens' quality of life, physical health, and mental well-being (e.g., De Vries, et al., 2013; Ulrich, 1981; for reviews, see Reyes-Riveros et al., 2021; Van den Berg et al., 2018). Considering the need to improve environmental conditions and revitalize the Hung Hom cross-harbor tunnel toll plaza regions, the Hong Kong Polytechnic University (PolyU) proposed the concept of the "Green Deck." The Green Deck is a multi-functional green infrastructure that aims to improve air quality and community health, restore community connectivity, satisfy social needs, revitalize urban centers, and boost the local economy.

In 2014, PolyU conducted a preliminary feasibility study, which received positive responses from local communities, the district council, and the government. PolyU scholars from different disciplines also undertook several research projects on enhancing the neighborhood environment, reducing different types of pollution through the use of innovative products and technologies, improving pedestrian flow, and exploring how the Green Deck could upgrade community health, enhance value, and improve business and job opportunities for different types of stakeholders. While these projects and efforts have demonstrated the feasibility of the Green Deck, little is known about how the general public perceive the Green Deck Scheme. For this innovative social, environmental, and community project to succeed, public funds from the Hong Kong government need to be used. Accordingly, it is crucial to understand public opinion about the project and assess the public's levels of support.

The current study aims to investigate public opinions about the Green Deck Scheme. We have two objectives. First, we aim to assess the level of public support for the latest Green Deck Scheme. Second, we aim to identify factors that may influence the level of public support for the Scheme. To provide a comprehensive understanding of public opinions from different groups, we conducted three studies using both quantitative and qualitative methods. More specifically, we conducted two survey studies (Studies 1 and 2) and one focus group interview study (Study 3). For both survey studies, we conducted variable-centered analyses to provide insights into the factors that predict people's support for the Scheme and person-centered analyses to uncover the profiles of public opinions about the Scheme. In the following, we first review the theoretical framework guiding our work, followed by a description of the three studies. Finally, we discuss our findings and their implications for practices.

2. Theoretical Framework

2.1 Variable-Centered Analysis

We refer to the theory of planned behavior (TPB; Ajzen, 1991) as our guiding theoretical framework. The TPB is a framework that is widely used to understand individuals' pro-environmental consumptions, choices, and support and willingness to pay for greener, cleaner, and more sustainable environments (e.g., Chan et al., 2020; Sanchez et al., 2018; Tan et al., 2023; Wan et al., 2018; Zhang et al., 2019). The TPB postulates that behavioral intention is the most proximal predictor of actual behavior; this intention is

determined by attitudes, subjective norms, and perceived behavioral control. For outcome variables that involve no actual behavior (i.e., public support and willingness to pay), researchers consider attitudes, subjective norms, and perceived behavioral control as direct predictors (e.g., Sanchez et al., 2018).

Based on the TPB, in this study, attitudes refer to people's cognitive and affective appraisals of the behavioral option (in this case, the implementation of the Green Deck Scheme). Subjective norms refer to individuals' perceptions of significant others' approval and engagement in the behavior. In the original TPB model, subjective norms are included to enable researchers to consider the influence of social endorsement on behavioral choice. In the case of support for public policy or social innovative projects, we consider perceived social norms (descriptive and injunctive norms; Cialdini et al., 1991) as a more appropriate predictor than subjective norms, given that the consideration of social endorsement is beyond one's own private and interpersonal spheres. Indeed, previous studies have found that perceived social norms are a crucial predictor of support for green infrastructure and transition (e.g., Chan et al., 2022). We thus include perceived social norms instead of subjective norms in our model. Similarly, given that individuals do not act directly to implement the Green Deck Scheme, perceived behavior control is less relevant to their decisions about whether to support the Scheme. We postulate that the perceived ability to carry out the Scheme originates from their trust in the stakeholders involved in implementing the Scheme. These stakeholders include scientists and professionals, environmental non-governmental organizations, district and legislative councils, and the Hong Kong SAR government. We thus include institutional trust in our model to capture the component of perceived behavioral control in the TPB model. Together, we expect attitudes, perceived social norms, and institutional trust to have a positive association with support for the Green Deck Scheme (Hypotheses 1 to 3).

Additionally, the TPB is flexible, enabling researches to include additional predictors in the model (Ajzen, 1991; Gardner & Abraham, 2008; Klöckner, 2013). In the case of support for the Green Deck Scheme, in addition to the three components proposed by the basic TPB, we further hypothesize that individuals make their decisions based on: (1) a general consideration of the importance of a greener and cleaner environment (i.e., general pro-environmental orientations); (2) a benefit–cost evaluation (i.e., perceived instrumentality); and (3) a place-based evaluation. Previous studies have demonstrated the incremental validity of including these factors in order to understand pro-environment-related behavioral choices and decision-making (e.g., environmental self-identity: Chan et al., 2020; e.g., perceived usefulness of a behavioral choice: Wan et al., 2018; place attachment: Wan et al., 2021). Figure 1 depicts the conceptual model of our extended TPB model.

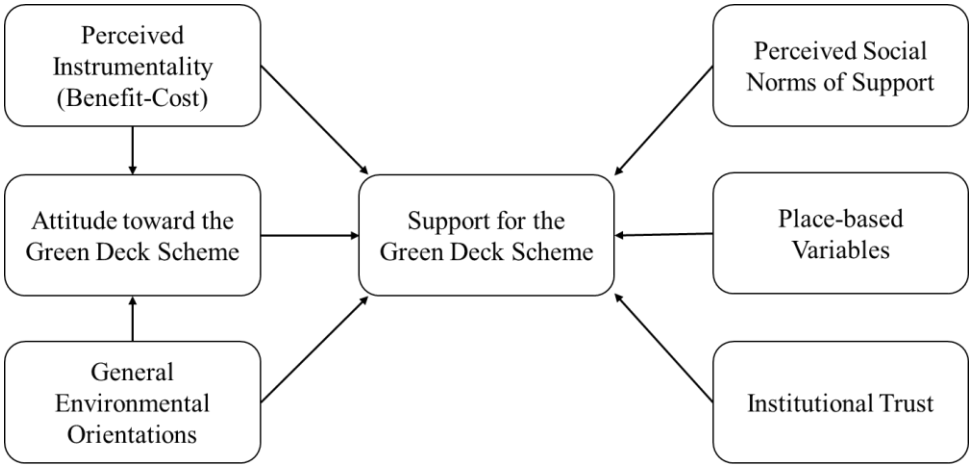

Figure 1. Illustration of the conceptual model.

General pro-environmental orientations reflect the pro-environmental disposition of an individual. Previous studies have demonstrated that dispositional factors (e.g., personality, personal values, environmental self-identity) are crucial determinants of pro-environmental choices and decision-making (e.g., Chan et al., 2020; Chan & Tam, 2021). In general, individuals who are more pro-environment should be more supportive of public policies and projects that can improve the quality of the environment. We thus include environmental self-identity as an additional predictor in the TPB model. Additionally, given that the Green Deck Scheme aims to provide more public green spaces, people who emphasize the importance of our connection to nature and public green spaces should be more supportive of the Scheme. Together, we include environmental self-identity, connectedness to nature, and perceived importance of public green spaces to capture general pro-environmental orientations. We expect these three predictors to have positive associations with support for the Green Deck Scheme (Hypotheses 4a to 4c). Furthermore, as demonstrated by previous studies (Chan et al., 2020), general pro-environmental orientations may influence how people evaluate behavioral choices (i.e., support for the Green Deck Scheme). We thus expect that these three general pro-environmental orientation variables will be positively related to attitudes toward the Green Deck Scheme (Hypotheses 5a to 5c) and, in turn, positively related to support for the Scheme.

Perceived instrumentality reflects people's cost–benefit evaluation of the implementation of the Green Deck Scheme. A cost–benefit evaluation is crucial not only for governmental policy decisions but also for people's subjective judgments of whether the policy and public projects in question are desirable and should be implemented (Steg & Vlek, 2009). Furthermore, studies have found that perceived instrumentality is a robust predictor of people's adoption of novel technologies and products (e.g., residential photovoltaic systems; for a meta-analysis, see Schulte et al., 2022). We thus consider it crucial to extend the basic TPB model by including perceived instrumentality as an additional predictor (Hypothesis 6). Furthermore, people may form a more favorable attitude if they perceived the Scheme to be beneficial. We thus expect that perceived instrumentality would be positively related to attitudes toward the Green Deck Scheme (Hypothesis 7) and, in turn, positively related to support for the Scheme.

Lastly, place-based evaluations reflect people's perceptions of and psychological attachment to the areas affected by the Green Deck Scheme (i.e., the Hung Hom and Tsim

Sha Tsui East areas). Multiple studies have demonstrated that place-based variables would influence people's motivation to improve places that are meaningful to them (e.g., Anton & Lawrence, 2016; Wan et al., 2021). We thus include two variables that capture the evaluation of the problems faced by the local areas: the severity of air pollution and satisfaction with greenness, public green spaces, and recreational facilities. We expect the perceived severity of air pollution to be positively and satisfaction with the local area to be negatively related to support for the Green Deck Scheme (Hypotheses 8a and 8b). We also measured individuals' attachment to the local area, which captures individuals' psychological bonding between the self and the place. Strong place attachment indicates that individuals consider the place to be psychologically meaningful and special to them (Daryanto & Song, 2021). Based on previous studies, we expect attachment to the local area to be positively related to support for the Green Deck Scheme (Hypothesis 8c), as the Scheme aims to significantly improve the local area. As the Scheme can also enhance the quality of Hong Kong's environment as a whole, we also include attachment to Hong Kong as an additional place-based variable. We expect attachment to Hong Kong to be positively related to support for the Scheme (Hypothesis 8d).

2.2 Person-Centered Analysis

Person-centered analysis enables us to identify distinct profiles of public opinions about the Green Deck Scheme. More specifically, we conduct latent profile analysis (LPA; Vermunt, 2010) to uncover subgroups of individuals who share similar opinions about the Green Deck Scheme. This approach allows us to estimate the segments of the public who tend to support (versus not support) the Scheme and identify the psychosocial factors that predict the differences in public opinion. Accordingly, LPA provides an alternative and complementary perspective through which to understand public opinion about the Green Deck Scheme and the factors are associated with these opinions. As the current research focuses on public opinion about the Green Deck Scheme, we include all Green Deck Scheme-specific constructs as indicator variables. We derive the same predictions based on the extended TPB model proposed in the above section. That is, we expect general pro-environmental orientations, institutional trust, and favorable place-based evaluations to be positively related to the profiles with more positive opinions about the Green Deck Scheme.

3. Study 1 (Street Intercept Survey)

3.1 Research Methodology

Participants. In total, 1,000 adults participated in this study. We commissioned Social Policy Research Limited to conduct a street intercept survey from 15 April to 27 April 2023. The target respondents of the survey were aged 18 years or above. We targeted two groups of participants: frequent users of the neighborhood regions of the Greek Deck (i.e., the Hung Hom, Tsim Sha Tsui, and Yau Ma Tei regions) and all other Hong Kong citizens. We recruited 400 and 600 participants for the two groups, respectively. Furthermore, as Study 1 mainly focuses on the opinions of the general public, we excluded individuals who are currently studying or working at the Hong Kong Polytechnic University. The response rate was 59.1%. The precision level of the estimate ranges from plus or minus 3.1% at a 95% confidence level. Table 1 depicts the unweighted demographic characteristics of the participants.

Table 1. Unweighted demographic characteristics.

Demographic variables	Count (%)
Gender	
Female	470 (47%)
Male	530 (53%)
Age	39.49 (12.06)[a]
18–34	374 (37.4%)
35–44	301 (30.1%)
45–54	176 (17.6%)
>55	149 (14.9%)
Education Level	
Primary school or below	13 (1.3%)
Secondary 1 to 3	105 (10.5%)
High school or equivalent (Secondary 4 to 6/advanced level/diploma)	457 (45.7%)
Associate degree or diploma	143 (14.3%)
Bachelor's degree	248 (24.8%)
Master's degree or above	27 (2.7%)
Refuse to answer	7 (0.7%)
Monthly Family Income	
Less than $25,000	205 (20.5%)
$25,000 to $49,999	459 (45.9%)
$50,000 to $99,999	278 (27.8%)
More than $100,000	33 (3.3%)
Refuse to answer	25 (2.5%)

Note. [a] mean (standard deviation) of age.

Sample weight. We computed the sample weight based on the latest age-sex group distribution provided by the Census and Statistics Department (C&SD) (i.e., persons aged 18 and over, excluding foreign domestic helpers, in 2021). We calculated the weighting factor by dividing the age-sex ratio of a particular age group in the population by the age-sex ratio of a particular age group in our sample. While applying the sample weight helps reduce the biases induced by sampling error, our conclusions remained consistent with and without using the sample weight in our analyses.

Procedures. The fieldwork was conducted in locations near 10 major mass transit railway (MTR) stations. To recruit respondents with diverse backgrounds, interviews were conducted on both weekdays (i.e., Monday to Friday) and weekends (i.e., Saturday and Sunday) from 9 am to 9 pm. During the fieldwork, the trained interviewers invited the fifth person of every five people they saw in the street to complete the survey. This systemic sampling method helps minimize biased sampling. An on-site face-to-face interview method was adopted to solicit views from the respondents. In each interview, the interviewers first solicited oral consent from the respondents and then used web-computer-assisted personal interviewing (Web-CAPI) to conduct the interviews. Respondents were presented with a Green Deck information leaflet before they answered questions related to the Green Deck Scheme. Respondents could refuse to answer any question. The data collection procedure has been reviewed and approved by the survey and behavioral research ethics committee of the university affiliated with the principal investigator of the project (reference no.: HSEARS20230207004).

Measures. As discussed in the background of this research, we identified six predictors of support for the Green Deck Scheme: (1) general pro-environmental orientations, (2) perceived instrumentality of the Green Deck Scheme, (3) attitudes toward the Green Deck Scheme, (4) perceived social norms of support for the Green Deck Scheme, (5) institutional trust, and (6) place-based evaluation and attachment. We summarize these measures below.

General pro-environmental orientations. We measured general pro-environmental orientations with three constructs: environmental self-identity (two items; e.g., "I see myself as an environmentally-friendly person"; r = .63), connectedness to nature (one item: "I often feel a sense of oneness with the natural world around me"), and perceived importance of public green spaces to the self and to Hong Kong (five items; e.g., "Having public green spaces is important to me" and "Public green spaces improve the quality of life of Hong Kong people"; Cronbach's α = .83). Participants used a five-point scale to indicate the extent to which they agreed or disagreed with each question item (1 = strongly disagree to 5 = strongly agree).

Perceived instrumentality of the Green Deck Scheme. We created a 12-item measure to capture different aspects of the benefits and costs of the Green Deck Scheme, based on previous studies (e.g., Chan et al., July 2014). Specifically, participants reported the extent to which they perceived the Green Deck Scheme could benefit the physical environment (i.e., reduce air pollution and make the region greener), the walkability of the area (not making the areas overcrowded), the social environment (i.e., improve residents' quality of life, facilitate communication among residents, and become a place for leisure activities and relaxation), and Hong Kong as a whole (i.e., improve the image of Hong Kong, attract tourism, and make the region more attractive). Regarding the cost, respondents reported the extent to which they felt the Green Deck Scheme would become a financial burden to Hong Kong. Finally, they reported whether they thought the benefits of the Green Deck Scheme would outweigh the financial costs. These two items reflect participants' perceived benefits versus financial costs. Participants reported on a five-point scale (1 = not at all to 5 = very much). We computed an average score for each domain and an overall score (Cronbach's α = .86), with higher scores indicating more perceived benefits. The factor structure of the five domains is supported by confirmatory factor analysis (chi-square = 296.77, df = 44; CFI = .938, TLI = .907; RMSEA = .076, SRMR = .041).

Attitudes toward the Green Deck Scheme. We adopted a three-item measure of attitude from previous studies using the theory of planned behavior (e.g., Chan et al., 2020). In particular, participants reported on a five-point bipolar scale to indicate to what extent they considered the Green Deck Scheme to be wise (versus foolish), worthwhile (versus worthless), and pleasant (versus unpleasant). We computed an average score (Cronbach's α = .78), with higher scores indicating a more positive attitude toward the Scheme.

Perceived social norms of support for the Green Deck Scheme. We adopted a three-item measure of perceived social norms from previous studies (e.g., Chan et al., 2022). In particular, participants indicated the extent to which they agreed or disagreed with the following three statements on a five-point scale (1 = strongly disagree to 5 = strongly agree): (1) Many people in Hong Kong consider it important to support the Green Deck Scheme (i.e., descriptive norms); (2) many people in Hong Kong will support it if I support the Green Deck Scheme (i.e., injunctive norms); and (3) a growing number of Hong Kong people would

support the Green Deck Scheme (i.e., dynamic norms). We computed an average score (Cronbach's α = .82), with higher scores indicating stronger perceived social norms of support.

Institutional trust. We identified a four-item measure of institutional trust from previous studies (e.g., Smith & Mayer, 2018). Specifically, participants indicated the extent to which they trust or distrust scientists and experts, environmental organizations, district and legislative councils, and the Hong Kong government in regard to tackling environmental problems (1 = distrust strongly to 5 = trust strongly). We computed an average score (Cronbach's α = .83), with higher scores indicating stronger institutional trust.

Place-based evaluation and attachment. We measured two aspects of place-based evaluation: perceived severity of air pollution in the Hung Hum and Tsim Sha Tsui East regions (one item) and satisfaction with public green spaces, greenness, and recreational facilities in these regions (three items; Cronbach's α = .71). Participants reported on a five-point scale to indicate their perceived levels of severity or levels of satisfaction (1 = not at all to 5 = very much). As for place attachment, we used a two-item measure to capture respondents' sense of attachment to the Hung Hum and Tsim Sha Tsui East regions (i.e., "These areas are very special to me" and "I am very attached to these areas"; r = .83). We also used a three-item measure to capture respondents' sense of attachment to Hong Kong as a whole: "Hong Kong is very special to me," "I am very attached to Hong Kong," and "I identify strongly with Hong Kong" (Cronbach's α = .84). Participants reported on a five-point scale to indicate their degree of agreement or disagreement with these statements (1 = strongly disagree to 5 = strongly agree).

Support for the Green Deck Scheme. We created a two-item measure to capture public support for the Green Deck Scheme, based on past studies (e.g., Chan et al., 2022; Davidovic & Harring, 2020). Specifically, participants reported the extent to which they would support the implementation of the Green Deck Scheme and the use of public resources to implement the Scheme (1 = not at all to 5 = very much). We computed an average score to indicate the overall support for the Green Deck Scheme (r = .65).

Demographic and other variables. Participants reported their gender, age, monthly household income, and highest level of educational attainment.

Open-ended question. Finally, we included an open-ended question to probe into participants' further opinions about the Green Deck Scheme. A total of 179 participants offered their opinions in response to this question.

3.2 Data Analysis

We conducted both variable-centered and person-centered analyses to understand (1) the level of public support for the Green Deck Scheme and (2) what factors predict people's support for the Green Deck Scheme. As for the variable-centered approach, we conducted a series of ordinary least square (OLS) regression analyses to examine the relationship between each set of factors and support for the Green Deck Scheme. To examine the unique effects of each set of factors, we constructed and tested an overall model using partial least square-structural equation modeling (PLS-SEM) in R (Hair et al., 2021). We deemed PLS-SEM suitable for two reasons. First, PLS-SEM is useful for estimating complex models with many

latent and manifest variables (Hair et al., 2019, 2021), which fits the purpose of our analysis. Second, the current analysis focuses more on prediction rather than theory testing. Our goal is to identify the most relevant predictors shaping support for the Green Deck Scheme. As such, PLS-SEM is useful for our analysis.

As for the person-centered approach, we conducted a series of latent profile analyses (LPA) to identify profiles of public opinions about the Green Deck Scheme. More specifically, we included Green Deck Scheme-related constructs as indicator variables to uncover the latent profiles of opinions. We constructed five models, with the number of latent profiles ranging from two to six. We selected the optimal number of latent profiles based on the Bayesian information criteria (BIC), the theoretical interpretation of the profiles, the size of the smallest profile, and the Lo-Mendell-Rubin likelihood ratio test (LMR LRT). To achieve a global solution, we used a random start of more than 1,000 times for each model. We also adopted the three-step approach with corrections to analyze the relationship between the latent profiles and the predictor variables.

3.3 Results and Discussion

3.3.1 Descriptive findings

Public support for the Green Deck Scheme. We present the sample weight-adjusted distribution of the key constructs in Table 2. About 52.4% of respondents tended to support the Green Deck Scheme (i.e., a score of four or five), while 32.2% tended to be neutral (i.e., a score of three). Only 19.5% of respondents tended not to support the Scheme (i.e., a score of one or two). About 36.3% of respondents tended to support using public resources to implement the Green Deck Scheme, while 36.9% tended to be neutral. About 26.8% of respondents tended not to support using public resources to implement the Green Deck Scheme. Among those who supported the implementation of the Green Deck Scheme, 5.9% tended not to support using public resources to implement it. In addition, we conducted a one-sample t-test to examine if the overall score of public support was higher than the mid-point of the scale (i.e., a score of three). The result was statistically significant with a small to medium effect size ($t = 10.06$, $df = 999$, $p < .001$, Cohen's $d = 0.32$). These findings indicate that, on average, the public tends to support the Green Deck Scheme in general and is neutral leaning positively toward spending public resources for its implementation. We also compared the levels of support between frequent users of the neighborhood and other Hong Kong citizens. We observed that other Hong Kong citizens showed higher levels of support for the Scheme than frequent users, although the effect size is small ($t = 3.48$, $df = 998$, $p = .001$, Cohen's $d = 0.22$).

Attitudes toward the Green Deck Scheme. About 51.2%, 48.5%, and 55.4% of the respondents tended to consider the idea of the Green Deck Scheme to be wise**,** worthy, and pleasant, respectively (see Table 2). Only 9.8%, 12.9%, and 8.9% of the respondents tended to consider it to be unwise, worthless, and unpleasant, respectively. The average score of attitudes was also statistically significantly different from the mid-point of the scale (i.e., three) ($t = 22.37$, $df = 999$, $p < .001$, Cohen's $d = 0.70$), with a medium to large effect size. Similar to the general support for the Green Deck Scheme, the respondents tended to hold positive attitudes toward the Green Deck Scheme. The mean difference between the frequent user group and the other Hong Kong citizen group was non-significant ($t = .24$, $df = 998$, $p = .813$, Cohen's $d = 0.02$).

Perceived instrumentality of the Green Deck Scheme. In general, the respondents tended to agree with the benefits of the Green Deck Scheme (see Table 2). Specifically, more than half of the participants perceived the Green Deck Scheme to be beneficial to the physical environment, the social environment (except for enhancing communication among local residents; 37.8% perceived the Green Deck Scheme as having this benefit), and Hong Kong as a whole. Less than 20% of the respondents believed the Green Deck Scheme would not benefit these domains. Regarding the perceived cost, 34.4% of participants perceived the Green Deck Scheme to be a financial burden (versus 37.3% not perceiving it as a financial burden). About 16.0% of participants believed the Scheme would make Hung Hom and Tsim Sha Tsui East overcrowded (versus 33.55% who did not consider the Scheme in this way). Importantly, 38.6% of participants believed the benefits of the Green Deck Scheme would outweigh the financial cost (versus 24.8% who believed the benefits would not outweigh the financial cost). The average score of perceived instrumentality was also statistically significantly different from the mid-point of the scale (i.e., three) ($t = 25.92$, $df = 999$, $p < .001$, Cohen's $d = 0.82$), with a medium to large effect size. Overall, the respondents tended to hold positive views about the benefits of the Green Deck Scheme.

Perceived social norms of support for the Green Deck Scheme. About 46.4%, 39.6%, and 38.1% of the respondents agreed or strongly agreed with supporting dynamic, injunctive, and descriptive social norms, respectively (versus 13.1%, 21.3%, and 20.2% who disagreed or strongly disagreed with such social norms, respectively) (see Table 2). The average score of perceived social norms was also statistically significantly different from the mid-point of the scale (i.e., three) ($t = 11.50$, $df = 999$, $p < .001$, Cohen's $d = 0.36$), with a small to medium effect size. These findings indicate that, on average, respondents were neutral leaning toward supportive social norms for the Green Deck Scheme.

Table 2. Descriptive statistics of the Green Deck Scheme: Specific items (Study 1).

Perceived Instrumentality of the Green Deck Scheme	Not at all				Very much
Reduce air pollution in the Hung Hom and Tsim Sha Tsui East areas	1 (.1%)	92 (9.2%)	310 (31.0%)	537 (53.7%)	59 (5.9%)
Make the Hung Hom and Tsim Sha Tsui East areas more walkable	4 (.4%)	85 (8.5%)	416 (41.6%)	421 (42.1%)	73 (7.3%)
Make the Hung Hom and Tsim Sha Tsui East areas greener	0 (.0%)	55 (5.5%)	359 (35.9%)	477 (47.7%)	110 (11.0%)
Attract tourism	32 (3.2%)	159 (15.9%)	308 (30.8%)	424 (42.4%)	77 (7.7%)
Beautify the Hung Hom and Tsim Sha Tsui East areas	1 (.1%)	49 (4.9%)	327 (32.7%)	531 (53.1%)	91 (9.1%)
Improve the image of Hong Kong	11 (1.1%)	119 (11.9%)	328 (32.8%)	445 (44.5%)	98 (9.8%)
Be a place for relaxation and leisure activities	1 (.1%)	61 (6.1%)	307 (30.7%)	533 (53.3%)	98 (9.8%)
Improve the quality of life of people nearby	3 (.3%)	111 (11.1%)	346 (34.6%)	470 (47.0%)	69 (6.9%)
Improve the communicability of the Hung Hom and Tsim Sha Tsui East areas	3 (.3%)	153 (15.3%)	467 (46.7%)	320 (32.0%)	56 (5.6%)
The benefits of the Green Deck Scheme outweigh the financial costs	23 (2.3%)	225 (22.5%)	366 (36.6%)	334 (33.4%)	52 (5.2%)
Become a financial burden for Hong Kong	54 (5.4%)	319 (31.9%)	283 (28.3%)	316 (31.6%)	29 (2.9%)
Make the Hung Hom and Tsim Sha Tsui areas overcrowded	33 (3.3%)	302 (30.2%)	505 (50.5%)	141 (14.1%)	18 (1.8%)
Public Support for the Green Deck Scheme	Not at all				Very much
To what extent would you support the implementation of the Green Deck Scheme	5 (.5%)	148 (14.8%)	322 (32.2%)	463 (46.3%)	61 (6.1%)
To what extent would you support using public resources to implement the Green Deck Scheme	51 (5.1%)	217 (21.7%)	369 (36.9%)	320 (32.0%)	43 (4.3%)
Attitudes toward the Green Deck Scheme					
For me, the idea of the Green Deck Scheme is	Foolish				Wise
	15 (1.5%)	83 (8.3%)	391 (39.1%)	473 (47.3%)	39 (3.9%)
For me, the idea of the Green Deck Scheme is	Worthless				Worthwhile
	10 (1.0%)	119 (11.9%)	387 (38.7%)	417 (41.7%)	68 (6.8%)
For me, the idea of the Green Deck Scheme is	Unpleasant				Pleasant
	4 (.4%)	85 (8.5%)	357 (35.7%)	486 (48.6%)	68 (6.8%)
Perceived Social Norms of Support for the Green Deck Scheme	Strongly disagree				Strongly agree
A growing number of Hong Kong people would support the Green Deck Scheme	8 (.8%)	124 (12.4%)	405 (40.5%)	418 (41.8%)	45 (4.5%)
Many people in Hong Kong will support it if I support the Green Deck Scheme	11 (1.1%)	202 (20.2%)	411 (41.1%)	345 (34.5%)	31 (3.1%)
Many people in Hong Kong consider it important to support the Green Deck Scheme	9 (.9%)	193 (19.3%)	417 (41.7%)	341 (34.1%)	40 (4.0%)

3.3.2 Variable-centered analysis: Relationship between public support and predictor variables

To further understand the factors predicting public support for the Green Deck Scheme, we first explored the zero-order correlation among the key constructs. Figure 2 illustrates the strength of the zero-order correlations among the key variables. As expected, public support was positively correlated with general pro-environmental orientation variables (i.e., environmental self-identity and perceived importance of public green spaces), perceived instrumentality variables (i.e., benefits for physical environment, social environment, and Hong Kong, enhanced walkability, and benefit over financial costs), attitudes toward the Green Deck Scheme, perceived social norms of support for the Green Deck Scheme, institutional trust, perceived severity of air pollution, and place attachment variables (i.e., attachment to the local areas and Hong Kong). Unexpectedly, it was also positively related to stronger satisfaction with the local area in terms of greenness and recreational facilities.

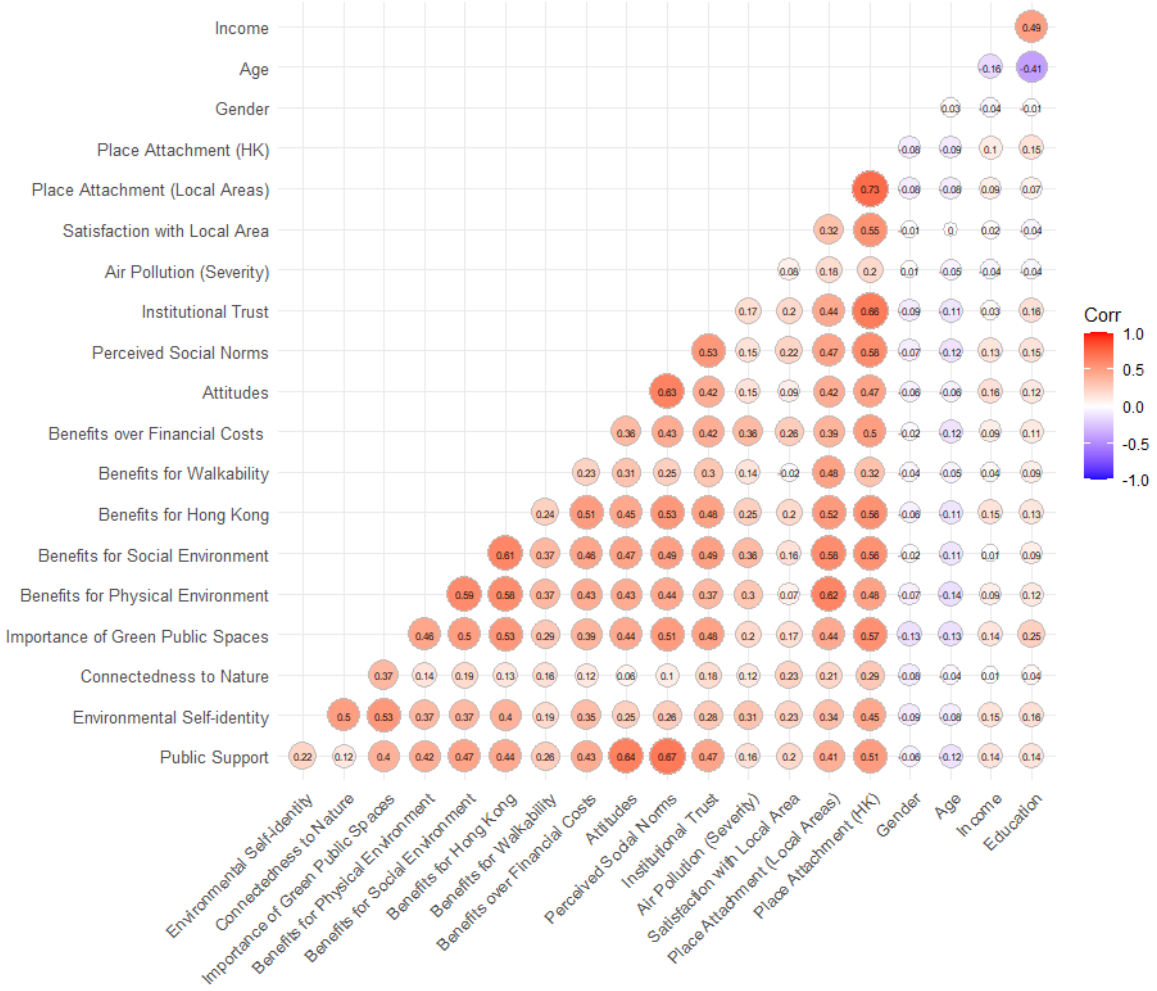

Figure 2. Illustration of the zero-order correlations among the key variables.

We conducted a series of regression models to examine how each set of factors relates to support for the Green Deck Scheme. We first examined the relationship between the

perceived instrumental variables and support for the Green Deck Scheme. Table 3 shows the results. As expected, all variables were positive and significant, except perceived benefits for Hong Kong. Overall, these variables explained 30.5% of the variance in support for the Green Deck Scheme. These findings indicate that, taking all perceived benefits into consideration, the perceived benefit of the Scheme to Hong Kong could be less important in shaping public support for the Scheme. Next, we examined the relationship between the core theory of planned behavior variables (i.e., attitudes, social norms, and institutional trust) and support for the Scheme. Table 3 shows the results. As expected, all three variables were positive and significant. These variables explained 52.7% of the variance in support for the Green Deck Scheme. We then considered the relationship between the three general pro-environmental orientation variables and support for the Green Deck Scheme. Only perceived importance of public green spaces was positive and significant. These variables explained 17.2% of the variance of support for the Scheme. Finally, we examined the relationship between the place-based variables and support for the Scheme. We found that perceived severity of air pollution, attachment to the local area, and attachment to Hong Kong were positive and significant, while satisfaction with the local area was negative and significant. These findings indicate that public support was related to the perception of more severe air pollution, less satisfaction with the local facilities, and a strong attachment to the local area and Hong Kong. Together, these variables explained 26.8% of the variance in support for the Scheme.

Finally, we conducted an overall model to examine the unique contributions of these variables in predicting support for the Green Deck Scheme. Specifically, we conducted partial least square-structural equation modeling (PLS-SEM) analysis. We constructed the model based on the theoretical prediction of the extended theory of planned behavior. Figure 3 shows the model. We first evaluated the reliability of the model based on the reliability indexes (i.e., Cronbach's α, composite reliability, and exact reliability) and indicator loadings of the model (Hair et al., 2021). Table 4 shows the results. The Cronbach's α coefficients and exact reliability coefficients were higher than .70, except for the perceived benefits for the physical environment, social environment, and walkability. The composite reliability coefficients of all constructs were higher than .80 and less than .95. All indicator loadings in the model were higher than .70. Together, these indicators support the reliability of the measurement model. Next, we evaluated the validity of the model based on the values of average variance extracted (AVE) and the heterotrait-monotrait ratios of correlations. Tables 4 and 5 show the results. The AVE coefficients of all constructs were higher than .50, indicating sufficient convergent validity. The heterotrait-monotrait ratios of correlations were less than .85 for conceptually distinct constructs and less than .90 for conceptually similar constructs, reflecting sufficient discriminant validity. The only exception was among the perceived benefits constructs, in which a higher-order latent construct (i.e., perceived instrumentality) was created to reduce the redundancy. The values of variance inflation factor (VIF) coefficients of the latent variables were less than five, suggesting no multicollinearity problems in the model.

Table 3. Results of the OLS regression models with support for the Green Deck Scheme as the outcome variable (Study 1)

DV: Support for the Green Deck Scheme	*b* (SE)	*p*-value	95% *CI*
Model 1: Perceived Instrumentality			
Benefits for Physical Environment	.16 (.05)	.001	[.06, .25]
Benefits for Social Environment	.37 (.05)	.000	[.27, .47]
Benefits for Hong Kong	.06 (.04)	.169	[-.03, .15]
Benefits for Walkability	.09 (.04)	.014	[.02, .16]
Benefits over Financial Costs	.19 (.03)	.000	[.13, .25]
Adjusted R^2	.310		
Model 2: TPB Variables			
Attitudes toward the Green Deck Scheme	.43 (.04)	.000	[.36, .51]
Perceived Social Norms of Support for the Green Deck Scheme	.44 (.04)	.000	[.37, .51]
Institutional Trust	.13 (.03)	.000	[.07, .18]
Adjusted R^2	.527		
Model 3: General Pro-Environmental Orientations			
Environmental Self-Identity	.04 (.04)	.348	[-.04, .12]
Connectedness to Nature	-.03 (.03)	.309	[-.09, .03]
Perceived Importance of Public Green Spaces	.55 (.05)	.000	[.45, .64]
Adjusted R^2	.172		
Model 4: Place-based Variables			
Perceived Severity of Air Pollution in the Local Area	.07 (.03)	.007	[.02, .12]
Satisfaction with the Local Area	-.14 (.04)	.001	[-.22, -.06]
Attachment to Local Area	.08 (.04)	.021	[.01, .15]
Attachment to Hong Kong	.49 (.05)	.000	[.40, .58]
Adjusted R^2	.279		

Table 4. The convergent validity and reliability of the key constructs of the PLS-SEM (Study 1)

	Loadings	α	rhoC	rhoA	VIF	AVE
Environmental Self-Identity		.75	.89	.76		.80
A1: I see myself as an environmentally friendly person	.88				1.56	
A2: Acting in an environmentally friendly way is an important part of who I am	.91				1.56	
Connectedness to Nature (Single Item):						
A3: I often feel a sense of oneness with the natural world around me		1.00	1.00	1.00		1.00
Perceived Importance of Public Green Spaces		.82	.87	.83		.58
A4: Having public green spaces is important to me	.75				1.62	
A5: Time in public green spaces contributes to my quality of life	.78				1.74	
A6: It is important to have convenient public green spaces in Hong Kong	.78				1.70	
A7: Public green spaces are important to the image of Hong Kong	.72				1.60	
A8: Public green spaces improve the quality of life of Hong Kong people	.79				1.66	
Perceived Instrumentality		.82	.88	.84		.59
Benefits for Physical Environment	.81	.58	.83	.58	1.87	.71
B1: Reduce air pollution in the Hung Hom and Tsim Sha Tsui East areas	.85				1.28	
B3: Make the Hung Hom and Tsim Sha Tsui East areas greener	.84				1.28	
Benefits for Social Environment	.84	.65	.81	.66	2.03	.59
B7: Be a place for relaxation and leisure activities	.73				1.18	
B8: Improve the quality of life of people nearby	.84				1.51	
B9: Improve the communicability of the Hong Hom an Tsim Sha Tsui East areas	.72				1.37	
Benefits for Hong Kong	.82	.73	.85	.74	1.95	.65
B4: Attract tourism	.76				1.48	
B5: Beautify the Hung Hom and Tsim Sha Tsui East areas	.80				1.34	
B6: Improve the image of Hong Kong	.84				1.56	
Benefits for Walkability	.56	.64	.84	.73	1.24	.73
B2: Make the Hung Hom and Tsim Sha Tsui East areas more walkable	.92				1.20	
B12: Make the Hung Hom and Tsim Sha Tsui East areas overcrowded (reverse-coded)	.78				1.20	
Benefits over Financial Costs	.71	.83	.92	.86	1.44	.85
B10: Benefits outweigh the financial costs	.94				2.01	
B11: Become a financial burden for Hong Kong (reverse-coded)	.91				2.01	
Attitudes toward the Green Deck Scheme		.78	.87	.78		.69
C1: Wise (versus foolish)	.83				1.62	
C2: Worthwhile (versus worthless)	.85				1.59	

C3: Pleasant (versus unpleasant)	.82				1.57	
Perceived Social Norms of Support for the Green Deck Scheme		.82	.89	.82		.73
D1: A growing number of Hong Kong people would support the Green Deck Scheme	.84				1.68	
D2: Many people in Hong Kong will support it if I support the Green Deck Scheme	.89				2.10	
D3: Many people in Hong Kong consider it important to support the Green Deck Scheme	.85				1.83	
Institutional Trust		.83	.89	.83		.66
F1: Scientists and professionals	.78				1.73	
F2: Environmental non-governmental organizations	.78				1.81	
F3: District and legislative councils	.87				2.57	
F4: Hong Kong government	.82				2.15	
Place Attachment		.84	.93	.87		.86
Attachment to the Local Area	.94				2.09	
Attachment to Hong Kong	.91				2.09	
Perceived Severity of Air Pollution in the Local Area (Single Item)		1.00	1.00	1.00		1.00
Satisfaction with the Local Area		.72	.84	.73		.64
A10: Have sufficient public green spaces	.81				1.60	
A11: Have sufficient public recreational facilities	.85				1.62	
A12: Satisfied with the greenness of the area	.74				1.25	
Support for the Green Deck Scheme		.79	.90	.79		.83
E1: Support the implementation of the Green Deck Scheme	.91				1.73	
E2: Support using public resources for implementing the Green Deck Scheme	.90				1.73	

Note. α = Cronbach's α; rhoC = composite reliability; rhoA = exact reliability; VIF = variance inflation factor; AVE = average variance extracted.

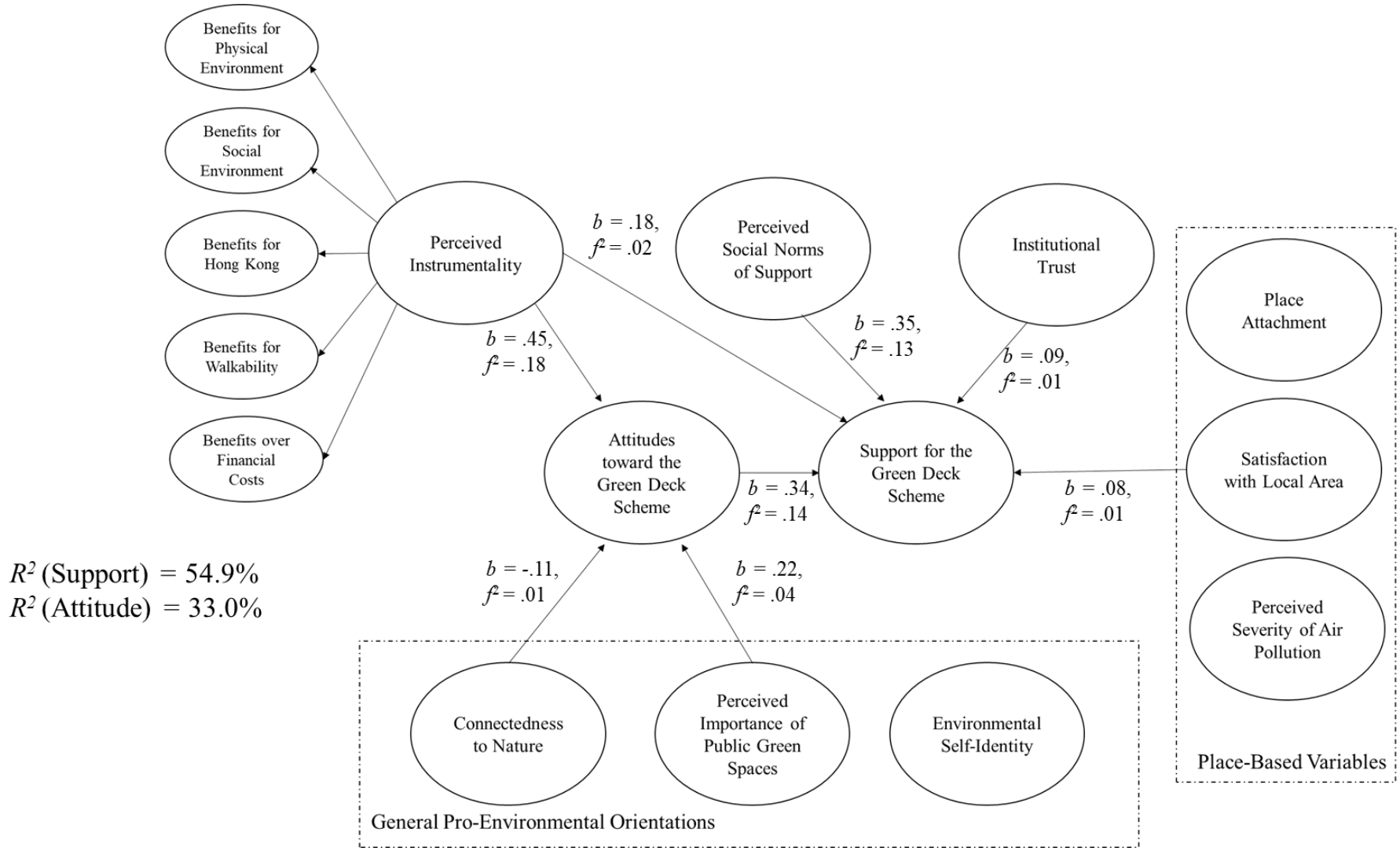

Figure 3. Illustration of the PLS-SEM (Study 1).

Note. The non-significant paths and indicator variables (i.e., items) are omitted for the sake of parsimoniousness.

Table 5. The heterotrait-monotrait ratio of correlations (Study 1)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Environmental Self-identity															
2. Connectedness to Nature	.59														
3. Perceived Importance of Public Green Spaces	.68	.42													
4. Perceived Instrumentality	.57	.23	.73												
5. Attitudes toward the Green Deck Scheme	.32	.06	.55	.69											
6. Perceived Social Norms of Support	.33	.12	.61	.71	.80										
7. Institutional Trust	.36	.21	.58	.68	.52	.63									
8. Place Attachment	.53	.30	.66	.90	.59	.67	.71								
9. Perceived Severity of Air Pollution in Local Area	.36	.13	.23	.43	.16	.17	.23	.23							
10. Satisfaction with Local Area	.31	.27	.22	.23	.12	.28	.25	.61	.08						
11. Support for the Green Deck Scheme	.29	.14	.49	.68	.82	.83	.57	.60	.18	.26					
12. Benefits over Financial Costs	.44	.14	.47	.86	.44	.53	.51	.58	.40	.33	.53				
13. Benefits for Social Environment	.52	.25	.70	1.14	.66	.66	.67	.84	.45	.21	.65	.64			
14. Benefits for Physical Environment	.55	.19	.67	1.18	.64	.63	.53	.86	.40	.09	.61	.63	.97		
15. Benefits for Hong Kong	.53	.16	.70	1.04	.61	.68	.62	.75	.31	.26	.58	.65	.90	.89	
16. Benefits for Walkability	.29	.21	.41	.83	.42	.34	.42	.60	.19	.03	.37	.32	.58	.61	.37

We bootstrapped the model with 5,000 subsamples to estimate the standard errors of the path coefficients. Table 6 shows the results. Attitudes (*bootstrap b* = .34, bootstrap *SE* = .04, 95% *CI* = [.26, .41], f^2 = .137), perceived social norms (*bootstrap b* = .35, bootstrap *SE* = .04, 95% *CI* = [.28, .43], f^2 = .127), perceived instrumentality (*bootstrap b* = .17, bootstrap *SE* = .04, 95% *CI* = [.09, .26], f^2 = .019), institutional trust (*bootstrap b* = .09, bootstrap *SE* = .03, 95% *CI* = [.04, .15], f^2 = .01), connectedness to nature (*bootstrap b* = .05, bootstrap *SE* = .03, 95% *CI* = [.001, .10], f^2 = .004), and satisfaction with the local area (*bootstrap b* = .08, bootstrap *SE* = .03, 95% *CI* = [.03, .13], f^2 = .009) were positive and significant predictors of support for the Green Deck Scheme. All other variables were non-significant. Furthermore, perceived importance of green public spaces (*bootstrap b* = .22, bootstrap *SE* = .03, 95% *CI* = [.16, .29], f^2 = .041) and perceived instrumentality (*bootstrap b* = .45, bootstrap *SE* = .03, 95% *CI* = [.38, .51], f^2 = .184) were positive and significant predictors of attitudes toward the Green Deck Scheme. Unexpectedly, connectedness to nature was a negative and significant predictor of attitudes (*bootstrap b* = -.11, bootstrap *SE* = .03, 95% *CI* = [-.18, -.05], f^2 = .013), while the relationship between environmental self-identity and attitudes was non-significant. The indirect effects of perceived instrumentality (*bootstrap indirect effect* = .15, bootstrap *SE* = .02, 95% *CI* = [.12, .19]) and perceived importance of public green spaces (*bootstrap indirect effect* = .08, bootstrap *SE* = .01, 95% *CI* = [.05, .10]) via attitudes regarding support for the Green Deck Scheme were significant. The indirect effect of connectedness to nature via attitudes was also significant (*bootstrap indirect effect* = -.04, bootstrap *SE* = .01, 95% *CI* = [-.07, -.02]). In total, these variables explained 54.9% of the variance in support for the Green Deck Scheme and 33.0% of the variance in attitudes toward the Green Deck Scheme. Overall, our findings indicate that attitudes, perceived social norms, institutional trust, and perceived instrumentality are crucial for understanding public support for the Green Deck Scheme. Furthermore, we demonstrated that such attitudes are related to the perceived importance of public green spaces and the perceived instrumentality of the Green Deck Scheme.

Table 6. Estimated coefficients of the structural pathways of the PLS-SEM (Study 1)

DV:	Support for the Green Deck Scheme			Attitudes toward the Green Deck Scheme		
	Est. (SE)	95% *CI*	f^2	Est. (SE)	95% *CI*	f^2
Environmental Self-Identity	-.05 (.03)	[-.10, .01]	.003	-.03 (.03)	[-.09, .04]	.001
Connectedness to Nature	.05 (.03)	[.001, .10]	.004	-.11 (.03)	[-.17, -.04]	.012
Perceived Importance of Public Green Spaces	-.05 (.03)	[-.11, .02]	.002	.22 (.03)	[.16, .28]	.040
Perceived Instrumentality	.18 (.04)	[.09, .26]	.020	.45 (.03)	[.39, .52]	.183
Attitudes toward the Green Deck Scheme	.34 (.04)	[.26, .41]	.137			
Perceived Social Norms of Support	.35 (.04)	[.27, .42]	.125			
Institutional Trust	.09 (.03)	[.04, .15]	.011			
Place Attachment	-.06 (.04)	[-.13, .02]	.002			
Perceived Severity of Air Pollution in Local Areas	.00 (.02)	[-.05, .05]	.000			
Satisfaction with Local Area	.08 (.03)	[.03, .13]	.008			
Adjusted R^2	.549			.330		

Note. Est. = bootstrapped estimate coefficient; SE = bootstrapped standard error.

3.3.3 Person-centered analysis

We conducted a series of latent profile analyses (LPA) to identify the latent profiles of public support for the Green Deck Scheme. More specifically, we included the Green Deck Scheme-related questions as the indicators of the latent profiles. As shown in the descriptive findings, there was heterogeneity in people's support for the Scheme and the spending of public resources to implement it. We thus used the two items as indicator variables instead of their composite score, which can provide a more nuanced understanding of public support for the Green Deck Scheme. We identified three latent profiles of participants. Table 7 shows the BIC and other model indexes of the latent profile models. Although BIC was smaller, with more profiles, the Vuong-Lo-Mendell-Rubin likelihood ratio test and the Lo-Mendell-Rubin adjusted likelihood ratio test showed that a four-profile solution was not better than a three-profile solution. Furthermore, a three-profile solution was better than a two-profile solution. We thus considered a three-profile solution as the optimal solution. The entropy of a three-profile solution is .83 (> .80), indicating a good classification of individuals into each class. Figure 4 illustrates how the latent profiles differed in terms of the estimated means of the indicator constructs. The percentages of participants who were classified into the three latent profiles were 26.15% (Profile 1: neutral but not supportive), 39.50% (Profile 2: positive and leaning supportive), and 34.35% (Profile 3: positive and supportive). Profile 1 comprises individuals who were leaning neutral in their attitudes toward the Green Deck Scheme and perceived instrumentality of the Scheme, except for benefits over financial costs. These individuals tended not to support the Green Deck Scheme, perceived weak social norms of support and did not believe the benefits outweighed the financial costs. As such, we refer to this profile as "neutral but not supportive." Profile 2 comprises individuals who were leaning positively toward the Green Deck Scheme. The profile showed positive attitudes toward the Green Deck Scheme and perceived the Scheme to be beneficial in general. Yet, these individuals also tended to be more neutral in whether the benefits of the Scheme could outweigh the financial costs, and in their support for using public resources to implement the Scheme. We thus refer to this profile as "positive and leaning supportive." Finally, Profile 3 comprises individuals who support the Green Deck Scheme. The profile showed positive attitudes toward the Green Deck Scheme, perceived the Scheme to be beneficial, and perceived strong social norms of support. These individuals also supported the Scheme and supported using public resources to implement it. We thus refer to this profile as "positive and supportive." The three profiles were consistent with the descriptive analyses, in that the majority of the respondents were either supportive or leaning supportive of the Green Deck Scheme (i.e., Profiles 2 and 3).

Table 7. Fit-statistics of the latent profile models (Study 1).

Profile	AIC	BIC	ABIC	Entropy	VLMR LR-Test
2	17108.65	17246.06	17157.13	.856	.000
3	16452.06	16638.56	16517.87	.830	.005
4	16067.28	16302.86	16150.41	.850	.443
5	15879.68	16164.33	15980.12	.837	.775
6	15766.62	16100.34	15884.37	.838	.695

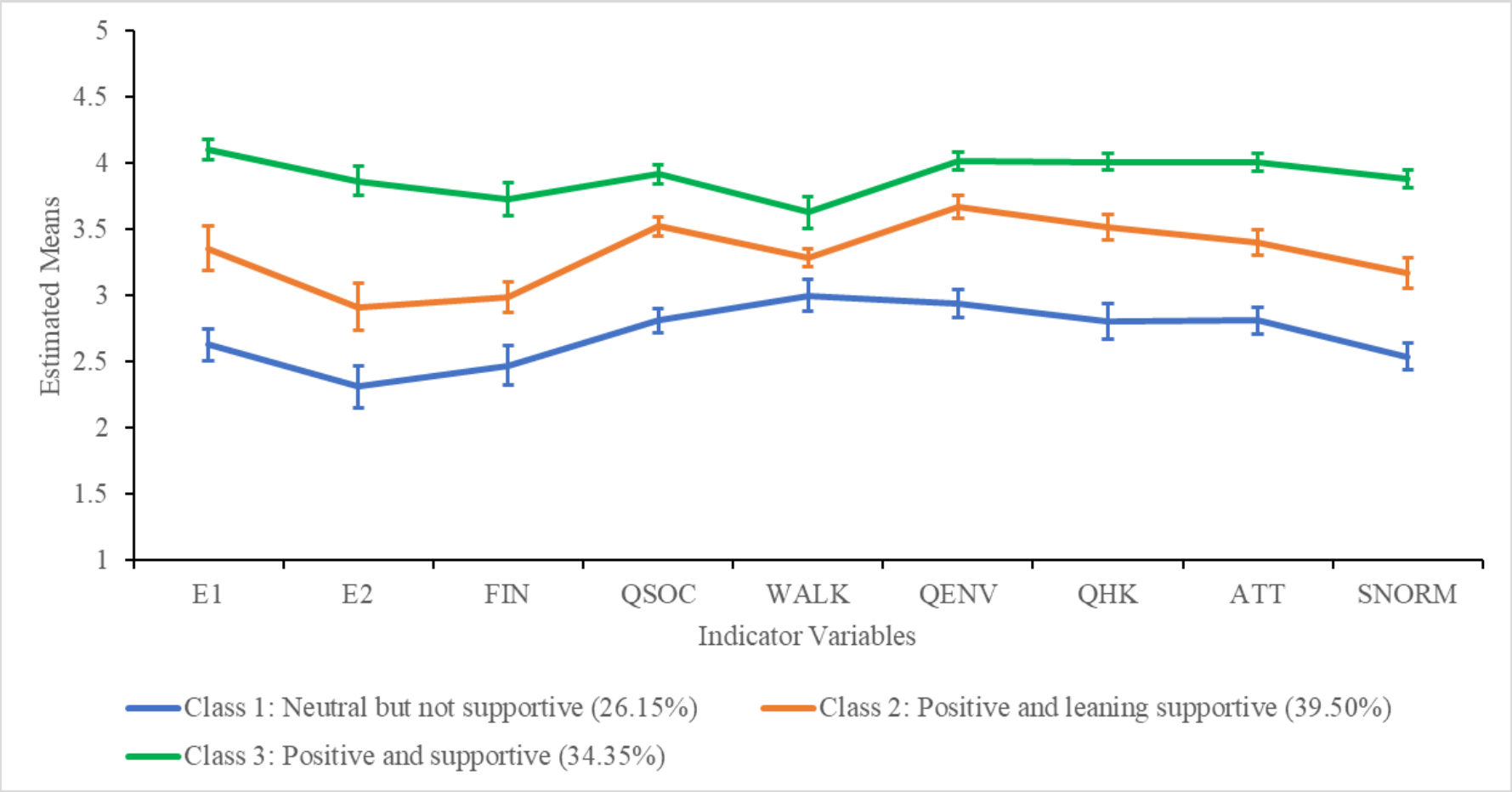

Figure 4. Illustration of the three latent profiles of the LPA (Study 1)

Note. E1 = support for the Green Deck Scheme; E2 = support for using public resources to implement the Green Deck Scheme; FIN = benefits outweigh financial burdens; QSOC = benefits for the social environment; WALK = benefits for walkability; QENV = benefits for physical environment; QHK = benefits for Hong Kong; ATT = attitudes toward the Green Deck Scheme; SNORM = social norms of support for the Green Deck Scheme.

We examined the relationship between profile membership and psychosocial variables (i.e., environmental self-identity, connectedness to nature, perceived importance of public green spaces, institutional trust, perceived severity of air pollution, satisfaction with the local area, attachment to the local area, and attachment to Hong Kong). We also included demographic variables as the predictors. Table 8 shows the results of the multinomial logistic regressions using the three-step LPA approach. We first considered the probability of being a member of Profile 3 (positive and supportive) versus Profile 1 (neutral but not supportive) or Profile 2 (positive and leaning supportive). People who were younger and less connected to nature, considered public green spaces to be more important and air pollution to be more severe, trusted institutions more, and had a stronger attachment to the local area and Hong Kong were more likely to be a member of Profile 3 than Profile 1. Similarly, people who considered public green spaces to be more important and trusted institutions more but were less connected to nature were more likely to be members of Profile 3 than Profile 1. Finally, we compared the probability of being a member of Profile 2 versus Profile 1. Individuals who were younger and less satisfied with the local area, considered public green spaces to be more important and air pollution to be more severe, and had a stronger attachment to the local area and Hong Kong were more likely to be a member of Profile 2 than Profile 1. Overall, these findings suggest that supporters of the Green Deck Scheme were more likely to be younger and aware of the importance of public green spaces and the severity of environmental issues. They also trusted institutions to be able to tackle environmental issues and were strongly attached to the local area and Hong Kong.

Table 8. Results of the multinominal logistic regression with profile membership as the outcome variable (Study 1).

Reference group:	Profile 3			Profile 1		
	b (*SE*)	*OR*	*p*-value	*b* (*SE*)	*OR*	*p*-value
Profile 1 versus						
Environmental Self-Identity	.03 (.45)	1.03	.949			
Connectedness to Nature	1.14 (.38)	3.12	.002			
Perceived Importance of Public Green Spaces	-4.30 (.76)	.01	.000			
Institutional Trust	-3.36 (.67)	.03	.000			
Perceived Severity of Air Pollution in Local Area	-1.05 (.39)	.35	.007			
Satisfaction with Local Area	.76 (.72)	2.14	.289			
Attachment to the Local Areas	-3.31 (.72)	.04	.000			
Attachment to Hong Kong	-1.79 (.88)	.17	.042			
Gender	-.71 (.48)	.49	.140			
Age	.68 (.26)	1.98	.008			
Household Income	-.57 (.37)	.56	.126			
Education	-.08 (.27)	.92	.758			
Profile 2 versus						
Environmental Self-Identity	.44 (.37)	1.55	.236	.41 (.32)	1.51	.199
Connectedness to Nature	.78 (.31)	2.19	.011	-.36 (.26)	.70	.166
Perceived Importance of Public Green Spaces	-3.05 (.62)	.05	.000	1.24 (.50)	3.47	.013
Institutional Trust	-2.93 (.64)	.05	.000	.43 (.28)	1.54	.127
Perceived Severity of Air Pollution in Local Area	-.36 (.31)	.70	.247	.69 (.26)	2.00	.008
Satisfaction with Local Area	-.50 (.50)	.61	.317	-1.26 (.57)	.28	.026
Attachment to the Local Area	-.93 (.42)	.40	.028	2.38 (.61)	10.85	.000
Attachment to Hong Kong	-.44 (.68)	.65	.518	1.35 (.64)	3.85	.035
Gender	-.10 (.36)	.90	.783	.61 (.36)	1.84	.090
Age	.14 (.18)	1.15	.441	-.54 (.19)	.58	.005
Household Income	-.02 (.28)	.98	.952	.55 (.29)	1.74	.054
Education	-.25 (.19)	.78	.189	-.17 (.23)	.85	.471

Note. SE = standard error; OR = odd ratio.

3.3.4 Open-Ended Question

We identified 221 codable items from the 179 responses. Table 9 summarizes the results. The majority of the respondents offered suggestions about the facilities they considered important for the Green Deck (80.54%). The top three suggestions were “adding washrooms (14.93%)”, “increasing recreational spaces and facilities for children, the elderly, and amusement (14.03%)”, and “installing air conditioning and ventilation equipment in waiting areas (11.31%).” About 9.95% of the comments raised concerns about the construction of the Green Deck, with 4.98% of the comments focusing on the construction costs. About 6.79% of the comments outrightly opposed the Green Deck Scheme, of which 5.43% considered the Scheme as “wasting government resources.” Overall, the open-ended question provided additional insights about what facilities are crucial when building the Green Deck. It also corroborates that financial cost is one crucial reason underlying people’s opposition to the Green Deck Scheme.

Table 9. Summary of the open-ended responses.

	Count (N)	*Percentages (%)*
Codable Responses		
Total codable items	221	
Facilities		
Adding washrooms	33	14.93%
Increasing recreational space and facilities (for children, the elderly, and amusement)	31	14.03%
Installing air conditioning and ventilation equipment in waiting areas	25	11.31%
Adding fitness equipment	23	10.41%
Providing water dispensers	13	5.88%
Adding seats	11	4.98%
Providing shaded areas	8	3.62%
Increasing accessible facilities	6	2.71%
Adding Hong Kong themed elements	6	2.71%
Incorporating more environmental elements	6	2.71%
Utilizing renewable energy	4	1.81%
Adding first aid stations	3	1.36%
Adding vending machines	2	0.90%
Addressing mosquito breeding issues	2	0.90%
Installing additional streetlights	2	0.90%
Including spots for taking photos	1	0.45%
Adding a cinema nearby	1	0.45%
Developing a theme park	1	0.45%
Construction concerns		
Addressing traffic and pedestrian issues	7	3.17%
Managing air pollution caused by construction	3	1.36%
Concerns about high construction costs	11	4.98%
Implementing construction as soon as possible, and considering multiple areas	1	0.45%
Opposing Comments		
Wasting government resources	12	5.43%
Worthless	3	1.36%
Others		
Strengthening publicity efforts	3	1.36%
Contributing funding from private developers	1	0.45%
Including security personnel	1	0.45%
Including more small businesses	1	0.45%
Non-Codable Responses		
No comments	821	

4. Study 2 (PolyU Community)

4.1 Research Methodology

Participants. In total, 420 students and 254 staff members of the Hong Kong Polytechnic University participated in the survey study. We recruited participants via the university's mass electronic mail service.

Procedures and measures. Each participant completed an online survey. Similar to Study 1, participants first read information about the Green Deck Scheme before they answered specific questions about it. All measures were the same as in Study 1. The data collection procedure has been reviewed and approved by the survey and behavioral research ethics committee of the university affiliated with the principal investigator of the project (reference no.: HSEARS20230207004). Table 10 shows the means, standard deviations, and reliability indexes of the key constructs.

Table 10. Means, standard deviations, and reliability indexes of the key constructs (Study 2).

	Mean	SD	α
Environmental Self-Identity	3.70	.80	.82
Connectedness to Nature	3.64	.92	-
Perceived Importance of Public Green Spaces	4.31	.66	.91
Perceived Instrumentality	3.76	.66	.89
Attitudes toward the Green Deck Scheme	4.21	.76	.89
Perceived Social Norms of Support	3.72	.73	.88
Support for the Green Deck Scheme	3.90	.81	.84
Institutional Trust	3.29	.83	.76
Perceived Severity of Air Pollution in Local Area	3.18	.97	-
Satisfaction with Local Area	2.33	.75	.82
Attachment to the Local Area	3.82	.82	.83
Attachment to Hong Kong	4.07	.75	.88

4.2 Data Analysis

We adopted the same analytical approach as in Study 1. That is, we conducted multiple regression analyses and partial least squared-structural equation modeling (PLS-SEM) to examine the associations between the predictor variables and support for the Green Deck Scheme. Next, we conducted a series of latent profile analyses to identify the profiles of public opinions of the Green Deck Scheme and explored the psychosocial correlates of these profiles.

4.3 Results and Discussion

4.3.1 Descriptive findings

Support for the Green Deck Scheme. Overall, PolyU staff and students tended to support the Green Deck Scheme. Table 11 shows the relevant distributions. More specifically,

about 74.5% and 66.3% of the respondents supported the Green Deck Scheme and supported using public resources to implement the Scheme, respectively (i.e., a score of four or five), while 3.6% and 6.2% of the respondents tended to not support these issues (i.e., a score of one or two). Only 1.6% ($N = 8$) of those who supported the Green Deck Scheme tended not to support using public resources to implement it. In addition, we conducted a one-sample t-test to examine if the overall score of public support was higher than the mid-point of the scale (i.e., a score of three). The result was statistically significant, with a small to medium effect size ($t = 28.71$, $df = 673$, $p < .001$, Cohen's $d = 1.11$). These findings indicate that, on average, PolyU staff and students tended to support the Green Deck Scheme in general, as well as spending public resources for its implementation.

Attitudes toward the Green Deck Scheme. About 82.6%, 86.2%, and 84.0% of the respondents tended to consider the idea of the Green Deck Scheme to be wise, worthwhile, and pleasant, respectively (see Table 11). Only 2.8%, 4.0%, and 4.6% of the respondents tended to consider it to be unwise, worthless, and unpleasant, respectively. The average score of attitudes was also statistically significantly different from the mid-point of the scale (i.e., three) ($t = 41.20$, $df = 673$, $p < .001$, Cohen's $d = 1.59$), with a large effect size. Overall, the respondents tended to hold positive attitudes toward the Green Deck Scheme.

Perceived instrumentality of the Green Deck Scheme. In general, the respondents tended to agree with the benefits of the Green Deck Scheme (see Table 11). Specifically, more than half of the participants perceived the Green Deck Scheme to be beneficial to the physical environment, social environment, and Hong Kong as a whole. Less than 20% of the respondents believed the Green Deck Scheme would not benefit these domains. Regarding the perceived cost, only 11.1% of participants perceived the Green Deck Scheme to be a financial burden (versus 61.5% not perceiving it as a financial burden). About 9.1% of participants on average believed the Scheme would make Hung Hom and Tsim Sha Tsui East overcrowded (versus 61.5% who did not believe the Scheme would make the regions overcrowded). A total of 47.9% of participants believed the benefits of the Green Deck Scheme would outweigh the financial cost of it (versus 17.4% believed the benefits would not outweigh the financial cost). The average score of perceived instrumentality was also statistically significantly different from the mid-point of the scale (i.e., three) ($t = 30.00$, $df = 673$, $p < .001$, Cohen's $d = 1.16$), with a large effect size. Overall, the respondents tended to hold positive views about the benefits of the Green Deck Scheme.

Perceived social norms of support for the Green Deck Scheme. About 71.8%, 55.8%, and 62.5% of the respondents agreed or strongly agreed with supporting dynamic, injunctive, and descriptive social norms (versus 3.6%, 7.7%, and 6.4% who disagreed or strongly disagreed with such social norms) (see Table 11). The average score of perceived social norms was also statistically significantly different from the mid-point of the scale (i.e., three) ($t = 25.47$, $df = 673$, $p < .001$, Cohen's $d = 0.98$), with a large effect size. These findings indicate that, on average, respondents perceived supportive social norms for the Green Deck Scheme.

Table 11. Descriptive statistics of the Green Deck Scheme: Specific items (Study 2).

Perceived Instrumentality of the Green Deck Scheme	Not at all				Very much
Reduce air pollution in the Hung Hom and Tsim Sha Tsui East areas	10 (1.5%)	74 (11.0%)	210 (31.2%)	262 (38.9%)	118 (17.5%)
Make the Hung Hom and Tsim Sha Tsui East areas more walkable	7 (1.0%)	49 (7.3%)	203 (30.1%)	274 (40.7%)	141 (20.9%)
Make the Hung Hom and Tsim Sha Tsui East areas greener	7 (1.0%)	24 (3.6%)	151 (22.4%)	299 (44.4%)	193 (28.6%)
Attract tourism	21 (3.1%)	96 (14.2%)	199 (29.5%)	207 (30.7%)	151 (22.4%)
Beautify the Hung Hom and Tsim Sha Tsui East areas	8 (1.2%)	31 (4.6%)	127 (18.8%)	282 (41.8%)	226 (33.5%)
Improve the image of Hong Kong	19 (2.8%)	55 (8.2%)	170 (25.2%)	245 (36.4%)	185 (27.4%)
Be a place for relaxation and leisure activities	5 (.7%)	29 (4.3%)	132 (19.6%)	288 (42.7%)	220 (32.6%)
Improve the quality of life of people nearby	11 (1.6%)	36 (5.3%)	144 (21.4%)	274 (40.7%)	209 (31.0%)
Improve the communicability of the Hung Hom and Tsim Sha Tsui East areas	21 (3.1%)	98 (14.5%)	207 (30.7%)	203 (30.1%)	145 (21.5%)
The benefits of the Green Deck Scheme outweigh the financial costs	21 (3.1%)	96 (14.3%)	234 (34.8%)	235 (34.9%)	87 (12.9%)
Become a financial burden for Hong Kong	155 (23.0%)	259 (38.5%)	184 (27.3%)	59 (8.8%)	16 (2.4%)
Make the Hung Hom and Tsim Sha Tsui areas overcrowded	208 (30.9%)	254 (37.7%)	151 (22.4%)	47 (7.0%)	14 (2.1%)
Public Support for the Green Deck Scheme	Not at all				Very much
To what extent would you support the implementation of the Green Deck Scheme	8 (1.2%)	16 (2.4%)	148 (22.0%)	330 (49.0%)	172 (25.5%)
To what extent would you support using public resources to implement the Green Deck Scheme	12 (1.8%)	30 (4.5%)	185 (27.4%)	270 (40.1%)	177 (26.3%)
Attitudes toward the Green Deck Scheme					
For me, the idea of the Green Deck Scheme is	Foolish				Wise
	7 (1.0%)	12 (1.8%)	98 (14.5%)	299 (44.4%)	258 (38.3%)
For me, the idea of the Green Deck Scheme is	Worthless				Worthwhile
	9 (1.3%)	18 (2.7%)	66 (9.8%)	302 (44.8%)	279 (41.4%)
For me, the idea of the Green Deck Scheme is	Unpleasant				Pleasant
	10 (1.5%)	21 (3.1%)	77 (11.4%)	263 (39.1%)	302 (44.9%)
Perceived Social Norms of Support for the Green Deck Scheme	Strongly disagree				Strongly agree
A growing number of Hong Kong people would support the Green Deck Scheme	5 (.7%)	19 (2.8%)	166 (24.7%)	372 (55.3%)	111 (16.5%)
Many people in Hong Kong will support it if I support the Green Deck Scheme	10 (1.5%)	42 (6.2%)	246 (36.5%)	282 (41.8%)	94 (13.9%)
Many people in Hong Kong consider it important to support the Green Deck Scheme	9 (1.3%)	34 (5.0%)	210 (31.2%)	311 (46.1%)	110 (16.3%)

4.3.2 Variable-centered analysis: Relationship between support for the Green Deck Scheme and predictor variables

To further understand the factors predicting support for the Green Deck Scheme, we first explored the zero-order correlation among the key constructs. Figure 5 illustrates the strength of the zero-order correlations among the key variables. As expected, public support was positively correlated with general pro-environmental orientation variables (i.e., environmental self-identity and perceived importance of public green spaces), perceived instrumentality variables (i.e., benefits for physical environment, social environment, and Hong Kong, enhance walkability, and benefits over financial costs), attitudes toward the Green Deck Scheme, perceived social norms of support for the Green Deck Scheme, institutional trust, perceived severity of air pollution, and place attachment variables (i.e., attachment to the local area and Hong Kong). Unexpectedly, public support was unrelated to satisfaction with the local area in terms of greenness and recreational facilities.

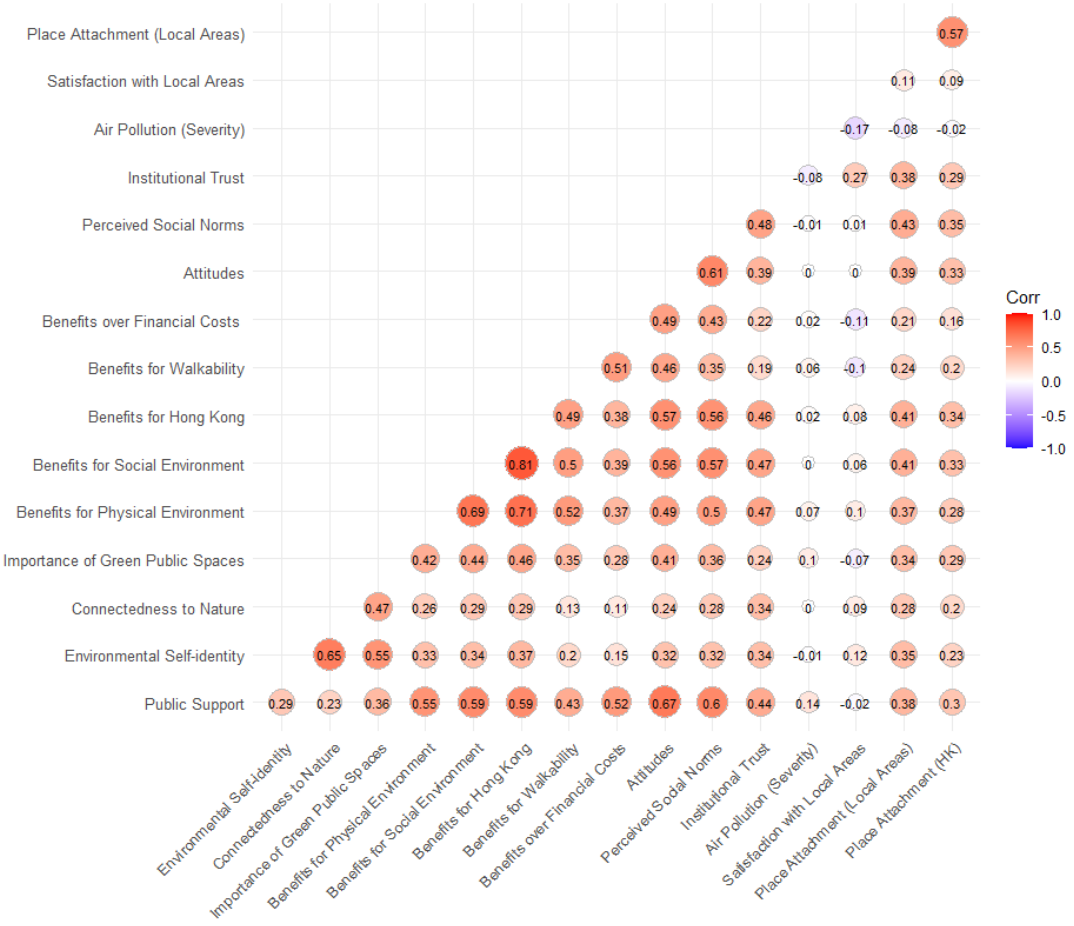

Figure 5. Illustration of the zero-order correlations among key variables (Study 2).

We conducted a series of regression models to examine how each set of factors relates to support for the Green Deck Scheme. We first examined the relationship between the perceived instrumental variables and support for the Green Deck Scheme. Table 12 shows the results. As expected, all variables were positive and significant, except perceived benefits for

walkability. Overall, these variables explained 47.0% of the variance in support for the Green Deck Scheme. These findings indicate that, taking all perceived benefits into consideration, the perceived benefits of the Scheme for walkability could be less important in shaping PolyU staff and student support for the Scheme.

Next, we examined the relationship between the core theory of planned behavior variables (i.e., attitudes, social norms, and institutional trust) and support for the Scheme. Table 12 shows the results. As expected, all three variables were positive and significant. These variables explained 51.5% of the variance in support for the Green Deck Scheme. We then considered the relationship between the three general pro-environmental orientation variables and support for the Green Deck Scheme. Perceived importance of public green spaces and environmental self-identity were positive and significant. These variables explained 14.2% of the variance in support for the Scheme. Finally, we examined the relationship between the place-based variables and support for the Scheme. We found that perceived severity of air pollution, attachment to the local area, and attachment to Hong Kong were positive and significant. These findings indicate that support was related to the perception of more severe air pollution and a strong attachment to the local area and Hong Kong. Together, these variables explained 18.3% of the variance in support for the Scheme.

As in Study 1, we constructed a series of PLS-SEM to examine the unique effects of the predictor variables. We first evaluated the reliability and validity of the measurement model. All reliability indexes were higher than .70 and less than .95, except for two subscales of perceived instrumentality (i.e., benefits outweigh financial costs and benefits for walkability). Although the AVE coefficients of all constructs were above .50, the heterotrait-monotrait ratios of correlations of the subscales of perceived instrumentality were higher than the cutoff of .90. We thus considered it necessary to modify the measurement model. More specifically, we constructed a revised measurement model by decomposing perceived benefit items from the two perceived cost items (i.e., the reverse-coded items). The revised measurement model showed good reliability and validity (see Tables 13 and 14). All reliability indexes were higher than .70 and less than .95. The loadings were higher than .70 (except for two items, which were higher than .60). The AVE coefficients of all constructs were above .50 and the heterotrait-monotrait ratios of correlations were below the cutoff of .85 for conceptually distinct constructs and less than .90 for conceptually similar constructs. Finally, the VIF coefficients of the items and latent variables were less than five, suggesting there was no multicollinearity problem. All these indicators suggest that the revised measurement model had sufficient reliability and validity.

Table 12. Results of the OLS regression models with support for the Green Deck Scheme as the outcome variable (Study 2).

DV: Support for the Green Deck Scheme	*b* (SE)	*p*-value	95% *CI*
Model 1: Perceived Instrumentality			
Benefits for Physical Environment	.14 (.04)	.001	[.06, .23]
Benefits for Social Environment	.21 (.05)	.000	[.11, .31]
Benefits for Hong Kong	.18 (.05)	.000	[.09, .28]
Benefits for Walkability	-.01 (.04)	.758	[-.09, .07]
Benefits over Financial Costs	.33 (.04)	.000	[.26, .40]
Adjusted R^2	.470		
Model 2: TPB Variables			
Attitudes toward the Green Deck Scheme	.48 (.04)	.000	[.41, .55]
Perceived Social Norms of Support for the Green Deck Scheme	.29 (.04)	.000	[.21, .37]
Institutional Trust	.14 (.03)	.000	[.08, .20]
Adjusted R^2	.515		
Model 3: General Pro-Environmental Orientations			
Environmental Self-Identity	.13 (.05)	.014	[.03, .23]
Connectedness to Nature	.02 (.04)	.723	[-.07, .10]
Perceived Importance of Public Green Spaces	.35 (.05)	.000	[.25, .46]
Adjusted R^2	.142		
Model 4: Place-based Variables			
Perceived Severity of Air Pollution in the Local Area	.14 (.03)	.000	[.08, .20]
Satisfaction with the Local Area	-.04 (.04)	.244	[-.12, .03]
Attachment to Local Area	.33 (.04)	.000	[.25, .42]
Attachment to Hong Kong	.12 (.05)	.007	[.03, .21]
Adjusted R^2	.183		

Table 13. The convergent validity and reliability of the key constructs of PLS-SEM (Study 2).

	Loadings	α	rhoC	rhoA	VIF	AVE
Environmental Self-Identity		.82	.92	.82		.85
A1: I see myself as an environmentally friendly person	.92				1.92	
A2: Acting in an environmentally friendly way is an important part of who I am	.92				1.92	
Connectedness to Nature (Single Item):						
A3: I often feel a sense of oneness with the natural world around me		1.00	1.00	1.00		1.00
Perceived Importance of Public Green Spaces		.91	.93	.91		.73
A4: Having public green spaces is important to me	.82				2.17	
A5: Time in public green spaces contributes to my quality of life	.85				2.48	
A6: It is important to have convenient public green spaces in Hong Kong	.88				2.98	
A7: Public green spaces are important to the image of Hong Kong	.87				2.67	
A8: Public green spaces improve the quality of life of Hong Kong people	.87				2.61	
Perceived Benefits		.93	.94	.91		.61
B1: Reduce air pollution in the Hung Hom and Tsim Sha Tsui East areas	.74				2.02	
B2: Make the Hung Hom and Tsim Sha Tsui East areas more walkable	.79				2.22	
B3: Make the Hung Hom and Tsim Sha Tsui East areas greener	.79				2.55	
B4: Attract tourism	.78				2.20	
B5: Beautify the Hung Hom and Tsim Sha Tsui East areas	.84				3.08	
B6: Improve the image of Hong Kong	.82				2.71	
B7: Be a place for relaxation and leisure activities	.84				3.04	
B8: Improve the quality of life of people nearby	.82				2.78	
B9: Improve the communicability of the Hong Hom an Tsim Sha Tsui East areas	.72				1.96	
B10: Benefits outweigh the financial costs	.63				1.41	
Perceived Costs		.69	.87	.72		.76
B11: Become a financial burden for Hong Kong	.90				1.39	
B12: Make the Hung Hom and Tsim Sha Tsui East areas overcrowded	.84				1.39	
Attitudes toward the Green Deck Scheme		.89	.93	.89		.82
C1: Wise (versus foolish)	.91				2.61	
C2: Worthwhile (versus worthless)	.92				2.84	
C3: Pleasant (versus unpleasant)	.89				2.37	
Perceived Social Norms of Support for the Green Deck Scheme		.88	.92	.88		.80
D1: A growing number of Hong Kong people would support the Green Deck Scheme	.89				2.15	
D2: Many people in Hong Kong will support it if I	.89				2.48	

support the Green Deck Scheme						
D3: Many people in Hong Kong consider it important to support the Green Deck Scheme	.90				2.60	
Institutional Trust		.76	.85	.77		.59
F1: Scientists and professionals	.76				1.38	
F2: Environmental non-governmental organizations	.65				1.33	
F3: District and legislative councils	.85				3.02	
F4: Hong Kong government	.79				2.68	
Place Attachment		.72	.88	.75		.78
Attachment to the Local Area	85				1.47	
Attachment to Hong Kong	.91				1.47	
Perceived Severity of Air Pollution in the Local Area (Single Item)		1.00	1.00	1.00		1.00
Satisfaction with the Local Area		.82	.88	.88		.71
A10: Have sufficient public green space	.76				1.95	
A11: Have sufficient public recreational facilities	.89				1.68	
A12: Satisfy the greenness of the areas	.88				1.95	
Support for the Green Deck Scheme		.85	.93	.86		.87
E1: Support the implementation of the Green Deck Scheme	.94				2.17	
E2: Support using public resources to implement the Green Deck Scheme	.92				2.17	

Note. α = Cronbach's α; rhoC = composite reliability; rhoA = exact reliability; VIF = variance inflation factor; AVE = average variance extracted.

Table 14. The heterotrait-monotrait ratio of correlations (Study 2).

	1	2	3	4	5	6	7	8	9	10	11
1. Environmental Self-Identity											
2. Connectedness to Nature	.72										
3. Perceived Importance of Public Green Spaces	.64	.50									
4. Perceived Benefits	.43	.32	.53								
5. Perceived Costs	.03	.01	.21	.20							
6. Attitudes toward the Green Deck Scheme	.37	.25	.45	.69	.35						
7. Perceived Social Norms of Support	.37	.30	.41	.68	.21	.70					
8. Institutional Trust	.43	.39	.29	.61	.09	.48	.59				
9. Place Attachment	.42	.32	.44	.54	.07	.50	.55	.51			
10. Perceived Severity of Air Pollution in Local Area	.02	.00	.11	.06	.04	.01	.04	.15	.08		
11. Satisfaction with Local Area	.15	.10	.08	.09	.28	.05	.05	.34	.15	.20	
12. Support for the Green Deck Scheme	.36	.26	.42	.75	.28	.77	.71	.56	.49	.16	.03

We bootstrapped the model with 5,000 subsamples to estimate the standard errors of the path coefficients. Table 15 shows the results and Figure 6 illustrates the structural model. Similar to Study 1, attitudes (*bootstrap b* = .32, bootstrap *SE* = .04, 95% *CI* = [.26, .41], f^2 = .122), perceived social norms (*bootstrap b* = .16, bootstrap *SE* = .04, 95% *CI* = [.09, .24], f^2 = .033), institutional trust (*bootstrap b* = .11, bootstrap *SE* = .04, 95% *CI* = [.04, .18], f^2 = .018), perceived benefits (*bootstrap b* = .29, bootstrap *SE* = .04, 95% *CI* = [.22, .37], f^2 = .094), and perceived severity of air pollution (*bootstrap b* = .14, bootstrap *SE* = .03, 95% *CI* = [.09, .19], f^2 = .046) were positive and significant predictors of support for the Green Deck Scheme, whereas perceived costs (*bootstrap b* = -.07, bootstrap *SE* = .04, 95% *CI* = [-.12, -.01], f^2 = .010) was a negative and significant predictor of support for the Green Deck Scheme. All other variables were non-significant. Furthermore, environmental self-identity (*bootstrap b* = .09, bootstrap *SE* = .04, 95% *CI* = [.01, .17], f^2 = .007) and perceived benefits (*bootstrap b* = .54, bootstrap *SE* = .04, 95% *CI* = [.46, .60], f^2 = .374) were positive and significant predictors of attitude toward the Green Deck Scheme, whereas perceived costs was a negative and significant predictor of attitude toward the Green Deck Scheme (*bootstrap b* = -.18, bootstrap *SE* = .03, 95% *CI* = [-.24, -.12], f^2 = .054). Inconsistent with Study 1, the perceived importance of public green spaces was unrelated to both attitudes and support for the Green Deck Scheme. The indirect effects of environmental self-identity (*bootstrap indirect effect* = .03, bootstrap *SE* = .01, 95% *CI* = [.001, .06]), perceived benefits (*bootstrap indirect effect* = .17, bootstrap *SE* = .03, 95% *CI* = [.12, .22]), and perceived costs (*bootstrap indirect effect* = -.06, bootstrap *SE* = .01, 95% *CI* = [-.08, -.03]) via attitudes toward the Green Deck Scheme were significant. In total, these variables explained 59.4% of the variance in support for the Green Deck Scheme and 43.4% of the variance in attitude toward the Green Deck Scheme. Consistent with Study 1, our findings suggest that attitude, perceived social norms, institutional trust, and perceived instrumentality (cost–benefit evaluation) are crucial for predicting support for the Green Deck Scheme. Among the PolyU students and staff members, perceived instrumentality appears to be the critical factor for forming a positive attitude toward the Green Deck Scheme.

Table 16. Estimated coefficients of the structural pathways of the PLS-SEM (Study 2).

DV:	Support for the Green Deck Scheme			Attitude toward the Green Deck Scheme		
	Est. (SE)	95% *CI*	f^2	Est. (SE)	95% *CI*	f^2
Environmental Self-Identity	.02 (.04)	[-.06, .11]	.001	.09 (.04)	[.01, .17]	.007
Connectedness to Nature	-.01 (.04)	[-.08, .06]	.000	-.02 (.05)	[-.11, .07]	.000
Perceived Importance of Public Green Spaces	-.04 (.04)	[-.11, .03]	.002	.07 (.05)	[-.02, .16]	.005
Perceived Benefits	.29 (.04)	[.22, .37]	.094	.54 (.04)	[.46, .60]	.374
Perceived Costs	-.07 (.03)	[-.12, -.01]	.010	-.18 (.03)	[-.24, -.12]	.054
Attitude toward the Green Deck Scheme	.32 (.04)	[.24, .40]	.122			
Perceived Social Norms of Support	.16 (.04)	[.09, .24]	.033			
Institutional Trust	.11 (.04)	[.04, .18]	.018			
Place Attachment	.04 (.03)	[-.02, .10]	.003			
Perceived Severity of Air Pollution in Local Areas	.14 (.03)	[.09, .19]	.046			
Satisfaction with Local Area	-.04 (.04)	[-.11, .04]	.004			
Adjusted R^2	.594			.434		

Note. Est. = bootstrapped estimate coefficient; SE = bootstrapped standard error.

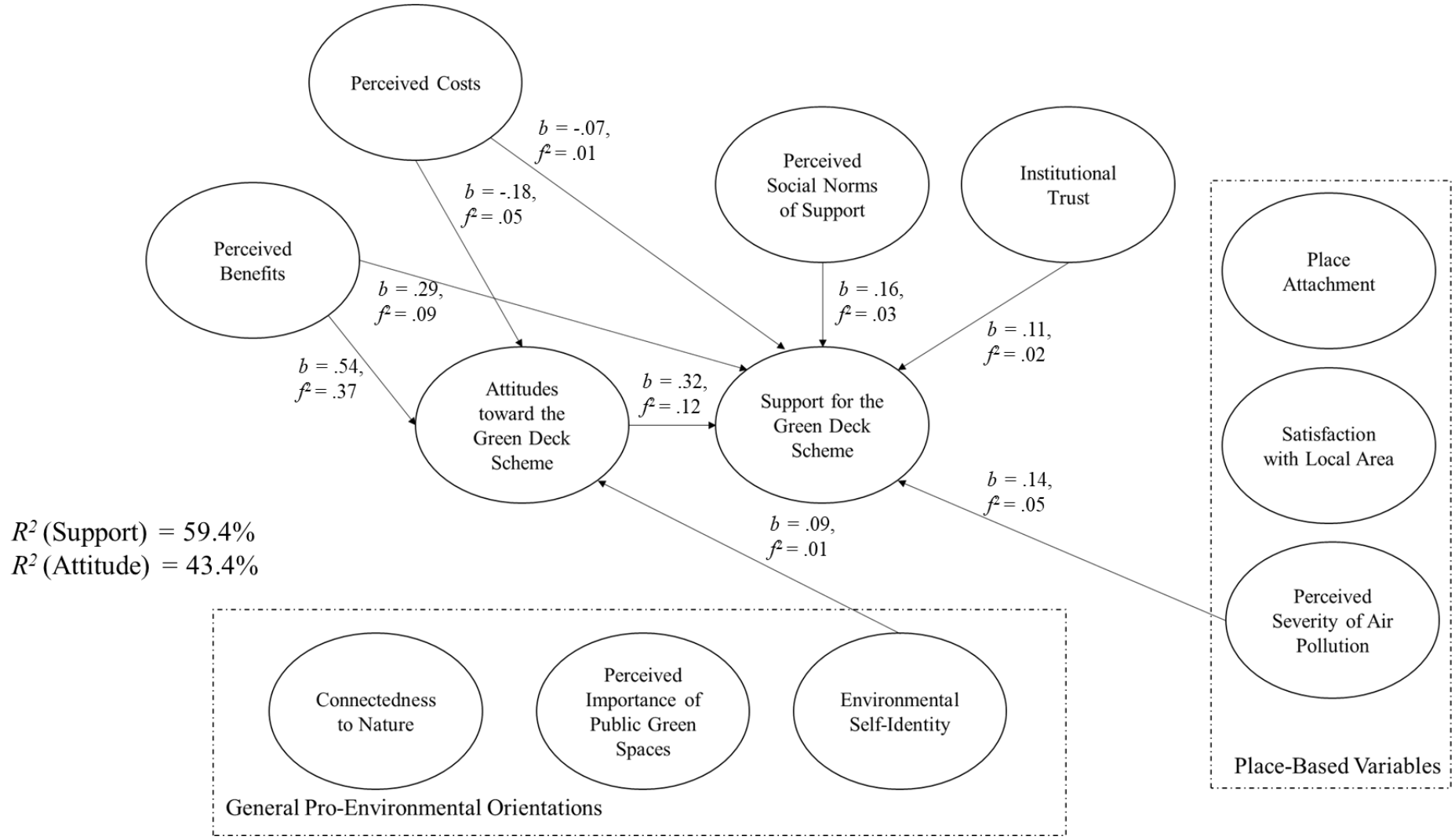

Figure 6. Illustration of the PLS-SEM (Study 2).

Note. The non-significant paths and indicator variables (i.e., items) were omitted for the sake of parsimoniousness.

4.3.3 Person-centered analysis

As in Study 1, we conducted a series of LPA to identify the latent profiles of public support for the Green Deck Scheme. To enable comparisons between the studies, we used the same set of indicator variables to identify the latent profiles. Consistent with Study 1, we identified three latent profiles of participants. Table 17 shows the BIC and other model indexes of the latent profile models. Although a four-profile solution showed a better model fit than a three-profile solution, the additional profile was small in size (N = 13 or 1.93%). It thus provided little new information in terms of understanding public support for the Green Deck Scheme. The entropy of the three-profile solution was .88 (>.80), indicating a good classification of individuals into each profile. Figure 7 illustrates how the latent profiles differed in terms of the estimated means of the indicator constructs. The percentages of participants who were classified into the three latent profiles were: 20.48% (Profile 1: neutral), 48.66% (Profile 2: positive and supportive), and 30.86% (Profile 3: strongly positive and supportive). Profile 1 comprised individuals who were leaning neutral (a score of three) in their support for the Green Deck Scheme, perceived social norms, and perceived instrumentality of the Scheme, except for benefits for Hong Kong and the social environment. These individuals tended to have positive attitudes toward the Green Deck Scheme. Taken together, we refer to this profile as "neutral." Profile 2 comprised individuals who held positive opinions toward the Green Deck Scheme. These individuals tended to support the Scheme in general, as well as using public resources to implement it. They also had positive attitudes, perceived the Scheme to be beneficial, and perceived supportive social norms. We thus refer to this profile as "positive and supportive." Finally, Profile 3 comprised individuals who strongly supported the Scheme. These individuals also held strong positive opinions in terms of attitudes, perceived instrumentality, and perceived social norms of support. We thus refer to this profile as "strongly positive and supportive." The three profiles were consistent with the descriptive analyses, in that the majority of the respondents were supportive of the Green Deck Scheme (i.e., Profiles 2 and 3).

Table 17. Fit-statistics of the latent profile models (Study 2).

Profile	AIC	BIC	ABIC	Entropy	VLMR LR-Test
2	17108.65	17246.06	17157.13	.856	.000
3	16452.06	16638.56	16517.87	.830	.005
4	16067.28	16302.86	16150.41	.850	.443
5	15879.68	16164.33	15980.12	.837	.775
6	15766.62	16100.34	15884.37	.838	.695

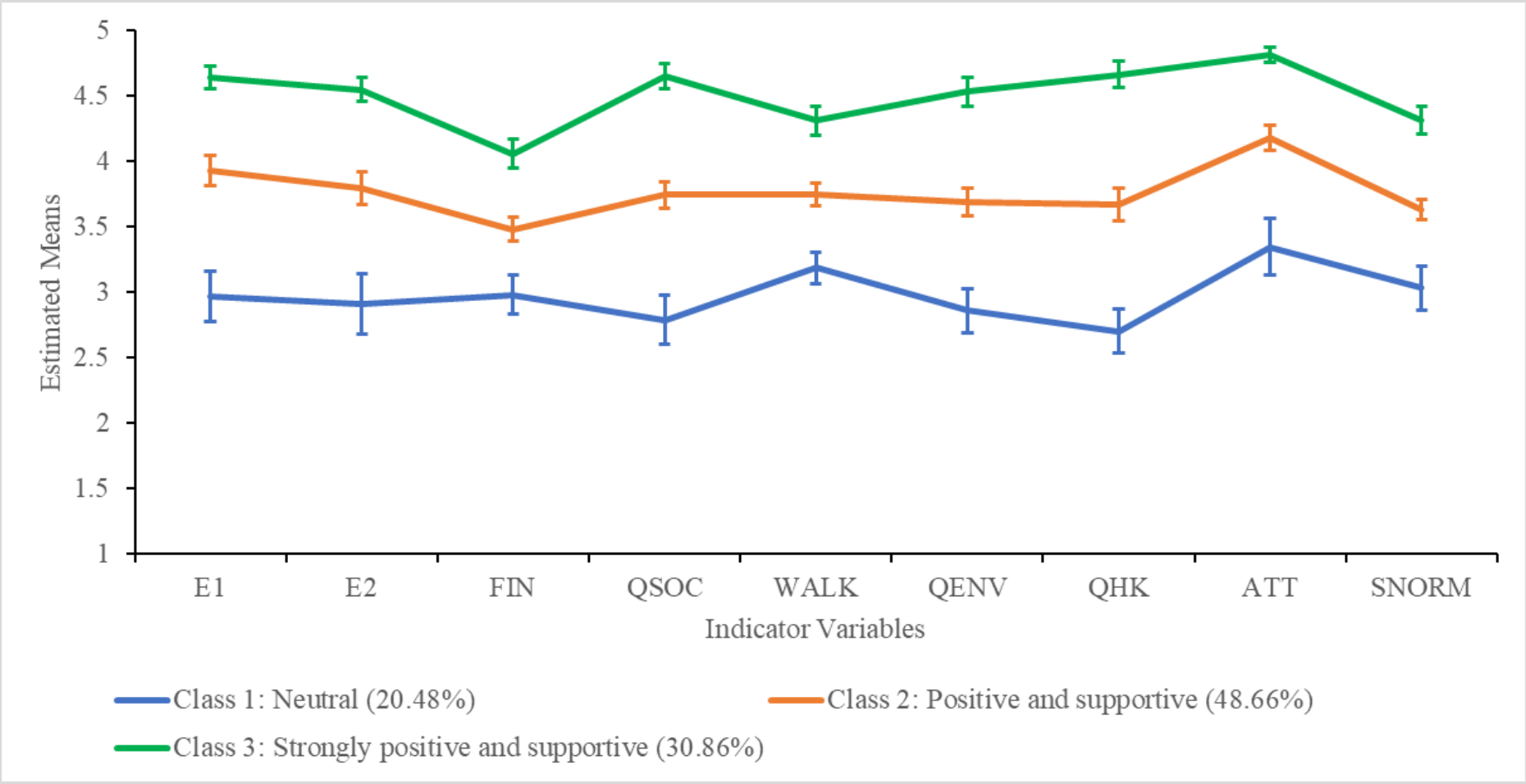

Figure 7. Illustration of the three latent profiles of the LPA (Study 2).

Note. E1 = support for the Green Deck Scheme; E2 = support for using public resources to implement the Green Deck Scheme; FIN = benefits outweigh financial burdens; QSOC = Benefits for the social environment; WALK = benefits for walkability; QENV = benefits for the physical environment; QHK = benefits for Hong Kong; ATT = attitudes toward the Green Deck Scheme. SNORM = social norms of support for the Green Deck Scheme.

Next, we conducted multinomial logistic regressions using the LPA three-step approach to examine the relationship between profile membership and the predictor variables. Table 18 shows the results. PolyU staff members and students who considered public green spaces to be more important, trusted institutions more, and had a stronger sense of attachment to the local area were more likely to be a member of Profile 3 than Profile 1 or Profile 2. Respondents with these characteristics were also more likely to be a member of Profile 2 than Profile 1. Furthermore, respondents who were satisfied with the local area were more likely to be a member of Profile 2 than Profile 3. Overall, these findings suggest that the perceived importance of public green spaces, institutional trust, and attachment to the local area were related to profiles with stronger support for the Green Deck Scheme (i.e., Profiles 2 and 3).

Table 18. Results of the multinominal logistic regression with profile membership as the outcome variable (Study 2).

Reference group:	Profile 3			Profile 1		
	b (*SE*)	*OR*	*p*-value	*b* (*SE*)	*OR*	*p*-value
Profile 1 versus						
Environmental Self-Identity	-.45 (.42)	.64	.288			
Connectedness to Nature	.18 (.27)	1.20	.508			
Perceived Importance of Public Green Spaces	-3.39 (.51)	.03	.000			
Institutional Trust	-2.24 (.30)	.11	.000			
Perceived Severity of Air Pollution in Local Area	-.16 (.23)	.85	.493			
Satisfaction with Local Area	.49 (.28)	1.63	.086			
Attachment to the Local Area	-1.76 (.32)	.17	.000			
Attachment to Hong Kong	-.02 (.34)	.99	.964			
Gender	.66 (.38)	1.93	.081			
Age	-.04 (.03)	.96	.128			
Household Income	-.82 (.22)	.44	.000			
Participant Group (Staff = 1; Student = 0)	.07 (.53)	1.08	.890			
Profile 2 versus						
Environmental Self-Identity	-.53 (.37)	.59	.154	-.08 (.25)	.92	.737
Connectedness to Nature	-.14 (.19)	.87	.443	-.32 (.23)	.72	.150
Perceived Importance of Public Green Spaces	-1.90 (.37)	.15	.000	1.49 (.41)	4.41	.000
Institutional Trust	-.97 (.21)	.38	.000	1.27 (.24)	3.56	.000
Perceived Severity of Air Pollution in Local Area	.12 (.16)	1.13	.429	.28 (.19)	1.32	.138
Satisfaction with the Local Area	.42 (.21)	1.51	.048	-.07 (.22)	.93	.736
Attachment to the Local Area	-.92 (.24)	.40	.000	.84 (.25)	2.30	.001
Attachment to Hong Kong	-.06 (.26)	.95	.832	-.04 (.25)	.96	.871
Gender	.22 (.29)	1.24	.447	-.44 (.29)	.64	.131
Age	-.03 (.02)	.97	.059	.00 (.02)	1.00	.858
Household Income	-.31 (.15)	.73	.042	.51 (.19)	1.66	.006
Participant Group (Staff = 1; Student = 0)	.05 (.40)	1.05	.905	-.03 (.39)	.98	.948

Note. SE = standard error; OR = odd ratio.

5. Study 3 (Focus Group Interview Study)

We conducted a focus group interview study to gain a more in-depth understanding of how people think about the Green Deck Scheme and what issues concerned them when considering the implementation of the Scheme. This study included only PolyU members for two reasons. First, PolyU members are one of the groups that have been influenced the most during the construction of the Green Deck. Second, PolyU members are more familiar with the Scheme than are the general public. As the focus group interview required informants to generate and exchange ideas through a discussion, it was crucial for them to have sufficient knowledge about the discussion topic. The current study does not aim to obtain opinions that are representative of the general public, as this goal has been addressed by Study 1. Instead, we aim with Study 3 to investigate issues we might have overlooked in the two quantitative studies. We thus deem it appropriate to interview PolyU members.

5.1 Research Methodology

Participants. We recruited a student group and a staff group of respondents from the PolyU community. Each group involved four respondents.

Procedures. We obtained informed consent from each participant. Before we started the focus group interview, participants were asked to read a leaflet about the Green Deck Scheme to further familiarize themselves with the Scheme. During the interview session, the moderator asked guiding questions and allowed participants to freely discuss each question. The moderator only asked follow-up questions saturation of ideas was reached. The guiding questions were:

1. What do you think about the Green Deck Scheme? Could you tell us whether you would support it or not and why or why not?
2. What are the possible impacts of the Green Deck Scheme to the local neighborhood areas and Hong Kong as a whole?
3. What are the factors that would influence Hong Kong citizens' support for the Green Deck Scheme?
4. What issues should be prioritized if the Green Deck Scheme is implemented?

5.2 Results

Among the eight participants, only one opposed the implementation of the Green Deck Scheme and one was neutral about the Scheme. The remaining six participants supported the Scheme. This proportion of support is consistent with our findings in Study 2. We summarize the major themes across responses based on the four guiding questions.

Reasons for Supporting the Green Deck Scheme

Many informants supported the Green Deck Scheme, as they perceived that it would benefit both them and their neighborhood area. These benefits include providing more leisure and relaxation spaces, more dinning choices, more green spaces, and more comfortable and convenient places to wait for buses; making the neighborhood more vibrant; reducing air pollution; and connecting the neighborhood with the renovated Tsim Sha Tsui area. In

particular, respondents mentioned that the current infrastructure or amenities in the Hung Hom and Tsim Sha Tsui areas have not kept pace with the overall development of other Hong Kong areas, such as the Avenue of Stars and the Kai Tak areas.

Reasons for Not Supporting the Green Deck Scheme

One informant mentioned that their neighborhood and PolyU facilities are sufficient as they are. For example, their catering needs can be satisfied by PolyU canteens; it is not necessary to have a new infrastructure. Furthermore, the informant expressed concerns about whether the Green Deck would become another shopping mall, such as the K11. As such, this respondent believed the Green Deck would not benefit the general public.

Possible Impacts of the Green Deck Scheme

Positive impacts. In general, the informants agreed that the Green Deck Scheme would benefit the local area. First, they suggested that the Green Deck Scheme could provide amenities such as sports, recreation, and relaxation. They mentioned that the Green Deck could be a good place for jogging. The enhanced walkability brought about by the Scheme could also encourage people living in the neighborhood to exercise more and improve their physical health. One informant mentioned that it would be good to have recreational facilities for children. The Green Deck could also be a place for citizens to rest and celebrate various festivals. Second, respondents agreed that the Green Deck could improve the quality of the physical environment, including reducing air pollution and increasing greenness. The informants suggested that the improved environmental quality could enhance the physical and mental health of the local residents, PolyU students, and PolyU staff. Next, they mentioned that the Green Deck could bring about economic benefits for the local area, including making local regions more vibrant, stimulating economic activities, providing local job opportunities, attracting business investments, and offering more dining options. In particular, informants suggested that the Green Deck could attract visitors and staycation customers to nearby hotels. The Green Deck could also help connect nearby areas and attracts customers and visitors to those areas. Finally, informants suggested that the Green Deck could improve the image and international reputation of Hong Kong. In particular, informants suggested that the Green Deck could showcase Hong Kong as a green and sustainable city. It could be an exemplar of sustainable infrastructure. Informants also believed that the Green Deck could attract tourism and become a new tourist attraction. In particular, one informant suggested that the Green Deck could be a new place to enjoy a view of Victoria Harbor.

Negative impacts. Informants mentioned that the Green Deck would influence traffic during its construction. In particular, one informant expressed concerns about changes in bus station locations and traffic regulations during the construction of the Green Deck.

Possible Factors Influencing Public Support

Informants have raised concerns about the costs of implementing the Green Deck. Such costs include the costs of building the Green Deck, the impact on traffic during construction, the duration of construction, and the noise pollution associated with Green Deck activities. For example, one informant suggested that construction would negatively influence the local residents, especially if the duration of the construction is long. Informants agreed that Hong Kong citizens would be concerned about whether the implementation of the Green

Deck would solely use public resources or have alternative funding schemes. They believed that the public would also consider whether the Green Deck can create job opportunities.

Issues that should be prioritized

Informants suggested that the implementation of the Green Deck should prioritize environmental benefits. For example, one informant mentioned that it would be crucial to select appropriate types of trees and provide sufficient coverage. Informants also mentioned the need to promote public knowledge of the Green Deck. They believed that the public might not have sufficient knowledge about why the Green Deck is needed and what the Green Deck can provide. Finally, the informants suggested the need to consider construction costs and duration.

5.3 Discussion

Overall, our informants agreed that the Green Deck has various potential benefits for both the local area and Hong Kong more broadly. Our findings are consistent with correlational studies suggesting that cost–benefit evaluation is central to people's support (versus opposition) in regard to the implementation of the Green Deck Scheme. As such, it is crucial to devote efforts to promoting the Green Deck Scheme by highlighting the potential benefits of the Green Deck. The focus group interview study further suggests that construction costs and implications for traffic during construction are two critical cost factors influencing public support.

6. General Discussion

The current research aims to understand public opinion about the Green Deck Scheme. In particular, we aim to assess the levels of support for the Scheme and the factors related to these levels of support. Across two survey studies, we observed that the majority of respondents (including frequent users, general Hong Kong citizens, and PolyU communities) tended to hold positive attitudes toward the Scheme and agreed with its proposed benefits. They also leaned toward supporting the implementation of the Scheme in general. Yet, their opinions about how the Scheme should be funded are mixed. When asked about whether they support using public resources to implement the Scheme, among the general public sample (Study 1), there were equal amounts of participants who tended to be neutral (36.9%) and tended to support it (36.3%). These patterns of public opinions were further corroborated by latent profile analyses, which revealed that the majority of the general public was either positive and leaning supportive (39.5%) or positive and supportive (34.4%) of the Scheme. PolyU members also held positive views toward the Scheme; our LPAs showed that the majority of were either positive and supportive (48.7%) or strongly positive and supportive (38.9%). Overall, our patterns of results suggest that Hong Kong citizens view the Green Deck Scheme positively. One major issue concerning its implementation is whether or not public resources should be used. Study 3 further highlighted this worry among participants. Informants commonly believed that construction costs and how such costs would be funded were two major factors influencing public support for the Scheme. These findings thus suggest the need to either identify alternative funding resources and plans for its implementation or provide better communication regarding how the benefits of the Scheme outweigh its costs.

In both studies, we found that attitudes, perceived social norms of support, institutional trust, and perceived instrumentality were positive and significant predictors of support for the Green Deck Scheme. These findings indicate that increases in overall public support can be achieved by enhancing attitudes, highlighting a supportive social norm, strengthening institutional trust, and promoting the benefits of the Scheme. Perceived instrumentality was also a positive and significant predictor of attitudes. The findings of Study 3 further corroborate that the cost–benefit analysis of the Scheme is crucial for individuals' evaluation of and support for it. It is noteworthy that, in Study 1, about 30% to 40% of the general public respondents had neutral perceptions about the benefits versus costs of the Green Deck Scheme. As such, one possible way to increase overall public support for the Green Deck is to communicate the potential benefits of the Green Deck to the public. Relatedly, the LPAs found that the perceived importance of public green spaces was a positive and significant predictor of profiles with more positive and supportive opinions. It may also be beneficial to communicate the benefits of having public green spaces in urban areas in order to promote public support for the Scheme.

There are two caveats in the present research. First, we used a cross-sectional design in the two survey studies. Our results thus do not suggest the causal direction of the associations between the predictor variables and support for the Green Deck Scheme. Although we carefully derived our hypotheses based on theories and previous studies, future studies would benefit from using a longitudinal design to test the directionality of the associations. A longitudinal design also enables researchers to track changes in public opinions over time. Second, we recruited only Hong Kong citizens and PolyU members in the present research. Our findings may therefore not be generalizable to the opinions of other stakeholders. In particular, we were unable to recruit district and legislative council members to participate in the current research. It is crucial for future studies to obtain opinions beyond citizens and PolyU communities.

To conclude, our findings suggest that the general public tends to feel positive and supportive in regard to the Green Deck Scheme. About half of the respondents from the general public viewed the Scheme to be beneficial. These percentages were higher among PolyU communities. The public tended to be more cautious about how the implementation of the Scheme should be funded, which might suggest the need to identify alternative funding resources or lobby the public to support the use of public resources by communicating how the benefits of the Scheme outweigh the costs. Indeed, both the correlational and interview studies revealed that perceived instrumentality would be a crucial factor for construing positive attitudes toward the Scheme and mobilizing public support.

Reference

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179-211.

Anton, C. E., & Lawrence, C. (2016). The relationship between place attachment, the theory of planned behaviour and residents' response to place change. *Journal of Environmental Psychology*, *47*, 145-154.

Chan, E. H. W., Yung, E., & Conejos, S. (July 2014). A framework for stakeholder engagement to formulate the proposed Green Deck project at cross harbour tunnel. Retrieved from: https://www.polyu.edu.hk/cpa/greendeck/pdf/8_Prof_Edwin_Chan_A_framework_for_stakeholder_engagement_to_formulate_the_proposed_Green_Deck_project_at_Cross_Harbour_Tunnel.pdf

Chan, H. W., & Tam, K. P. (2021). Do people's assumptions about the social world matter? The effects of social axioms on environmental attitude and efficacy beliefs. *Journal of Environmental Psychology*, *75*, 101598.

Chan, H. W., Pong, V., & Tam, K. P. (2020). Explaining participation in Earth Hour: The identity perspective and the theory of planned behavior. *Climatic Change*, *158*, 309-325.

Chan, H. W., Udall, A. M., & Tam, K. P. (2022). Effects of perceived social norms on support for renewable energy transition: Moderation by national culture and environmental risks. *Journal of Environmental Psychology*, *79*, 101750.

Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In *Advances in Experimental Social Psychology* (Vol. 24, pp. 201-234). Academic Press.

Daryanto, A., & Song, Z. (2021). A meta-analysis of the relationship between place attachment and pro-environmental behaviour. *Journal of Business Research*, *123*, 208-219.

Davidovic, D., & Harring, N. (2020). Exploring the cross-national variation in public support for climate policies in Europe: The role of quality of government and trust. *Energy Research & Social Science*, *70*, 101785.

De Vries, S., Van Dillen, S. M., Groenewegen, P. P., & Spreeuwenberg, P. (2013). Streetscape greenery and health: Stress, social cohesion and physical activity as mediators. *Social Science & Medicine*, *94*, 26-33.

Gardner, B., & Abraham, C. (2008). Psychological correlates of car use: A meta-analysis. *Transportation Research Part F: Traffic Psychology and Behaviour*, *11*, 300-311.

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*. Springer Nature.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*, 2-24.

Klöckner, C. A. (2013). A comprehensive model of the psychology of environmental behaviour—A meta-analysis. *Global Environmental Change*, *23*, 1028-1038.

Reyes-Riveros, R., Altamirano, A., De La Barrera, F., Rozas-Vásquez, D., Vieli, L., & Meli, P. (2021). Linking public urban green spaces and human well-being: A systematic review. *Urban Forestry & Urban Greening*, *61*, 127105.

Sánchez, M., López-Mosquera, N., Lera-López, F., & Faulin, J. (2018). An extended planned behavior model to explain the willingness to pay to reduce noise pollution in road transportation. *Journal of Cleaner Production*, *177*, 144-154.

Schulte, E., Scheller, F., Sloot, D., & Bruckner, T. (2022). A meta-analysis of residential PV adoption: The important role of perceived benefits, intentions and antecedents in solar energy acceptance. *Energy Research & Social Science*, *84*, 102339.

Smith, E. K., & Mayer, A. (2018). A social trap for the climate? Collective action, trust and climate change risk perception in 35 countries. *Global Environmental Change*, *49*, 140-153.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, *29*, 309-317.

Tan, Y., Ying, X., Gao, W., Wang, S., & Liu, Z. (2023). Applying an extended theory of planned behavior to predict willingness to pay for green and low-carbon energy transition. *Journal of Cleaner Production*, 135893.

Ulrich, R. S. (1981). Natural versus urban scenes: Some psychophysiological effects. *Environment and Behavior*, *13*, 523-556.

van den Berg, A. E., Joye, Y., & de Vries, S. (2018). Health benefits of nature. In L. Steg & J. I. M. de Groot (Eds.), Environmental psychology: An introduction (p.55-64). https://doi.org/10.1002/9781119241072.ch6

Vermunt, J. K. (2010). Latent class modeling with covariates: Two improved three-step approaches. *Political Analysis*, *18*, 450-469.

Wan, C., Shen, G. Q., & Choi, S. (2018). The moderating effect of subjective norm in predicting intention to use urban green spaces: A study of Hong Kong. *Sustainable Cities and Society*, *37*, 288-297.

Wan, C., Shen, G. Q., & Choi, S. (2021). The place-based approach to recycling intention: Integrating place attachment into the extended theory of planned behavior. *Resources, Conservation and Recycling*, *169*, 105549.

Zhang, L., Fukuda, H., & Liu, Z. (2019). Households' willingness to pay for green roof for mitigating heat island effects in Beijing (China). *Building and Environment*, *150*, 13-20.