The place-based approach to recycling intention: Integrating place attachment into the extended theory of planned behavior

Abstract

This study addresses the research gap that not much is known about how does place attachment play a role in decision-making process of engaging in recycling behavior. It examines recycling intention by integrating place attachment into the framework of extended theory of planned behavior (TPB). We posit that pathways of attitudes, subjective norms, moral norms, and awareness of consequences identified in the extended TPB are responsible for the indirect effect of place attachment on recycling intention. Collecting data from an online survey conducted in Hong Kong, we test the hypotheses using partial least squares structural equation modeling. Results suggest that impact of place attachment on recycling intention is primarily indirect; moreover, it is mainly mediated by attitudes, moral norms, and awareness of consequences. Indirect effect via awareness of consequences is the strongest among the three significant mediated paths. The extended TPB provides a useful framework to conceptualize the effect of place attachment on recycling intention. The theoretical and practical implications of the findings are highlighted.

Keywords: place attachment; recycling; TPB; mediating effect

1. Introduction

Place attachment refers to bonds between people and places (Low & Altman, 1992). Research on place attachment has been increasingly expanding over the past decades (Lewicka, 2011). Studies have established a direct link between place attachment and environmentally responsible behaviors (see Daryanto & Song, 2021, for review). The construct is positively related to pro-environmental behaviors or intentions (Walker & Chapman, 2003; Scannell & Gifford, 2010b; Halpenny, 2010), general environmental behaviors (Vaske & Kobrin, 2001), and increasing awareness of changes that may affect the environment of a place (Vorkinn & Riese, 2001). Despite the growing support of the direct effect, not much is known about processes by which place attachment is associated with environmental behaviors through other variables (Scannell & Gifford, 2010b). The mechanisms of how people-place bonds play in the decision-making processes of taking pro-environmental behaviors are underexplored.

Place attachment is a place-specific psychological process that is important for understanding environmentally responsible behaviors and individuals' responses to local environmental changes (Brehm, Eisenhauer, & Stedman, 2013; Clayton et al., 2016). The bonds between people and places are stemmed from specific contexts. Place-attached people express care and concern to a place (Relph, 1976). They are motivated to protect places that are meaningful to them (Manzo & Perkins, 2006; Stedman, 2002). A strong connectedness to a place is associated with more self-reported pro-environmental behaviors (e.g., Clayton, 2003; Scannell & Gifford, 2010b; Vaske & Kobrin, 2001). People with stronger place attachment are more likely to prevent environmental degradation by taking place protective behaviors (Vorkinn & Riese, 2001; Payton, Fulton, & Anderson, 2005). Thus, the localized experiences in specific places can and should be drawn accordingly when studying pro-environmental behaviors (Devine-Wright & Clayton, 2010).

Private-sphere pro-environmental behaviors such as recycling are conducted in local context, thereby what shape pro-environmental behaviors are highly context-specific. The investigation would require a greater emphasis on transactions between people and their everyday life settings over time (Clayton et al., 2016). Previous research used to focus on developing universally applicable predictors to explain environmental behaviors (Vorkinn & Riese, 2001). However, local context is more personally relevant to individuals when investigating local environmentally responsible behaviors because people are embedded in their everyday life settings while they actively define and shape the environment (Williams & Patterson, 1996). Context-dependent effects should be considered when studying environmentally significant local behaviors. Place attachment as a contextualized psychological process (Clayton et al., 2016) its effects on place-protective behaviors should be counted.

It is against this backdrop that we need to consolidate the understanding of place attachment and the role it plays in decision-making processes of taking recycling behavior. We made use of the extended theory of planned behavior (TPB) and integrated place attachment into the framework for investigation. We postulated that place attachment is associated with recycling intention via the pathways identified in the extended TPB. The study would be different from previous studies from two aspects. On one hand, it fills the literature gap by exploring the mechanisms of place attachment that give rise to pro-environmental intention. On the other hand, the place-specific effects are integrated into the framework of the extended TPB to examine recycling intention; it responses to the call by studies (Devine-Wright, 2009; Lewicka, 2011) suggesting that place attachment should be placed in a wider theoretical context for investigation and, thus, achieves greater understanding of individuals' pro-environmental behaviors from a place-based perspective. The study will shed new light on the role of place-based psychological motivation that contributes to decision-making processes of taking environmental behaviors. Findings are expected to be useful for designing cost-effective policy interventions to boost environmentally responsible behaviors.

2. Theoretical background and hypothesis development

2.1. Place attachment

Place attachment is portrayed as bonding developed between people and places (Low & Altman, 1992). It emerges through personal experiences by interacting with the physical environment over time (Proshansky, Fabian, & Kaminoff, 1983) and is a commonly observed phenomenon across cultures, place types, and eras (Scannell & Gifford, 2017). It can predict behaviors of individuals and promote collective actions on behalf of a place (Manzo & Perkins, 2006).

Place attachment is typically operationalized as a two-dimensional construct which consists of place identity and place dependence (Williams & Roggenbuck, 1989; Kyle, Absher, & Graefe, 2003; Vaske & Kobrin, 2001). The former focuses on a place as part of an individual's identity, that is, the personal identity in relation to the physical environment of that place (Proshansky, 1978). It is the result of an individual who psychologically invests in a place over time and assigns symbolic meanings to that place. Place identity involves feelings, ideas, and memories associated with that place and people (Williams & Patterson, 1996). Place dependence is defined as functional attachment to a place (Stokols & Shumaker, 1981). Stokols and Shumaker suggested that a place provides individuals with resources that support or facilitate their goal attainment can lead to functional connection to that place. It reflects the degree to which the

physical environment provides conditions to support an individual's intended use (Raymond, Brown, & Weber, 2010).

Recently, scholars have noted that the two-dimensional place attachment underscores other aspects of a physical setting (e.g., Lewicka, 2011) and have included additional dimensions to the construct. For example, *place affec*t which represents affective and emotional bonds individuals developed toward a place (Manzo, 2003; Kals, Schumacher, & Montada, 1999) was considered as a subdimension of place attachment in various recreation studies (Halpenny, 2010; Ramkissoon, Smith, & Weiler, 2013a; Ramkissoon, 2015; Han, Kim, Lee, & Kim, 2019). *Nature bonding* which stems from interactions with the natural environment was considered as another subconstruct of place attachment (Raymond et al., 2010; Scannell & Gifford, 2010b). Nature is a fundamental element forming our living environment in which an individual is expected to develop a set of emotional bonding with the nature (Clayton, 2003). According to Ramkissoon (2015), people who possess more experiences with natural environments would result in stronger emotional ties or affective links with a place. *Social bonding* refers to individuals' social connection with a place. Individuals interact with family members, friends, neighbors, and social groups in daily life; they develop social ties and establish networks with others through interactions (Perkins & Long, 2002; Song & Soopramanien, 2018). Attachments to a place would be stronger if more close family and friends lived in that place (Hidalgo & Hernández, 2001; Mesch & Manor, 1998). Social bonding was also termed as civic place attachment by Scannell and Gifford (2010b).

Given the multifaceted nature of place, scholars have also tested the dimensionality of place attachment and the representativeness of subdimensions. Kyle and his colleagues (2005) found that place attachment can be framed as a higher-order construct with place identity, place dependence, and social bonding as lower-order constructs; the hierarchical component model empirically demonstrated plausible and valid explanations of place attachment. More recently, studies have confirmed that place attachment is a second-order overarching concept which consists of four first-order factors including place identity, place dependence, place affect and social bonding (Han et al., 2019; Ramkissoon, Smith, & Weiler, 2013b).

In this study, we followed conceptualization validated by Raymond et al. (2010) that place attachment was measured by place identity, place dependence, nature bonding, family bonding, and friend bonding, but we grouped family and friend bonding as social bonding. Environmental psychology strand mainly focuses on individuals' attachment to place (Kyle et al., 2005). Accordingly to Raymond et al. (2010), both place identity and place dependence are highly individualized attachments. They have been widely validated in the literature (e.g., Williams & Roggenbuck, 1989; Williams & Vaske, 2003), and form a fundamental basis for place attachment conceptualization (Lewicka, 2011). Meanwhile, scholars agree that physical and social aspects share attachments to places (Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani, 1999; Scannell & Gifford, 2010b). A growing evidence shows that pro-environmental behaviors increase with affective attachment to the natural setting of a place (Gosling & Williams, 2010); social interactions among individuals also construct meanings of pro-environmental behaviors (Nye & Hargreaves, 2009). Thereby, nature bonding and social bonding, representing the physical and social aspects of a place, respectively, are worth examining when studying environmental behaviors. We did not include place affect in the operationalization because place identity and nature bonding have already captured individuals'

emotional affinity toward a place (Raymond et al., 2010), possessing overlapping meaning with place affect. Besides, we drawn reference from previous work (e.g., Kyle et al., 2005; Han et al., 2019) and framed place attachment as a hierarchical component model which consists of four lower-order constructs loading into a single higher-order construct (see Figure 1).

2.2. Place attachment and pro-environmental behaviors

Place attachment is an important concept for understanding pro-environmental concern and behaviors (Gifford & Nilsson, 2014). According to attachment theory, place attachment is an extension of mother-child positive bonds which could lead to positive behaviors across the entire lifespan of an individual (Ainsworth & Bowlby, 1965; Bowlby, 1969); the place protective behaviors represent a symbol of behavioral systematic tendencies of positive affective bonds (Manzo & Perkins, 2006). Thus, environmentally responsible behaviors are considered as explicit behavioral representation of place attachment (Scannell & Gifford, 2010b). Another theoretical prediction draws from the work of Social Identity Theory (Brown, 2000). People are expected to behave in the interest of a group if they were strongly identified with it, so is for people who are highly attached to a place. Thus, attached individuals are more likely to prioritize the interest of the place over self-interest and devote their efforts to improve the wellbeing of the community (Fornara, Scopelliti, Carrus, Bonnes, & Bonaiuto, 2020), such as offering social contribution (Rollero & De Piccoli, 2010) and having civic activism of protecting the environment (Scannell & Gifford, 2013; Lewicka, 2005).

Empirical evidence provides support that people with stronger place attachment are prone to make environmentally sustainable decisions and take actions that benefit the environment (see Uzzell, Pol, & Badenas, 2002 for exception). For instance, identity-based attachment can promote self-reported pro-environmental behaviors such as sorting recyclables in a natural resource setting (Vaske & Kobrin, 2001). Stedman (2002) noted that identity salience of a place positively contributes to intention of engaging in local environmental protective behaviors. Place attachment was related to pro-environmental intentions of natural park visitors (Walker & Chapman, 2003), place protective behaviors (Halpenny, 2010; Vorkinn & Riese, 2001), and low and high effort environmental intention (Ramkissoon et al., 2013b). Moreover, people take pro-environmental actions as a result of connecting to the natural environment or established social networks of a place. For instance, individuals who are identified with the natural environment tend to have more ecological behaviors Clayton (2003). Engaging in pro-environmental behaviors is significantly affected by natural place attachment (Scannell & Gifford, 2010b). Other studies found environmental behaviors are associated with social ties among residents (Song & Soopramanien, 2018; Larson, Cooper, Stedman, Decker, & Gagnon, 2018). Aside from environmental behaviors and intentions, increased concern for a specific place (Bricker & Kerstetter, 2000) and attitude toward place-protective programs (Kyle et al., 2003) are also positively related to place identity.

2.3. Rationale for integrating place attachment to the extended TPB

Place attachment would be meaningless unless it became part of a larger theoretical context (Lewicka, 2011). Devine-Wright (2009) also suggested that place attachment should be made more explicit in conceptual frameworks. Although Anton and Lawrence (2016) has proposed place attachment as a parallel antecedent together with the TPB variables in determining civic behavior (i.e., protesting), the construct did not significantly predict protesting behavior while

the TPB variables did. Moreover, the article did not investigate if place attachment could influence the TPB variables which in turn determine pro-social intentions, given that the impact of place attachment mediated by other variables was reported in the existing literature. For instance, recreation literature (Han et al., 2019; Ramkissoon et al., 2013b) has demonstrated an indirect causal link between place attachment and behaviors/intentions via third variables, though the focus are tourist sites but not the physical settings in which our daily activities are conducted. In the environmental domain, Hernández, Martín, Ruiz, and Hidalgo (2010) found that the role of place identity in determining behaviors can be mediated by social and personal norms; yet the study did not fit the concept into established theoretical frameworks for investigation. To address the research gap, we attempt to adopt the extended TPB as the framework that allows the integration of place attachment and propose the impact of place attachment on behaviors/intentions to be mediated by the TPB constructs.

The theory of planned behavior (Ajzen, 1991) has been a useful framework to understand, explain, and predict intention to perform environmental behaviors (Armitage & Conner, 2001). The theory states that a behavior is predicted by behavioral intention which is in turn determined by attitudes, subjective norms, and perceived behavioral control. Attitudes refer to positive or negative evaluation of a behavior or object. Subjective norms are the perceived pressure from significant others to perform or not to perform the behavior. Perceived behavioral control is the perceived capability of carrying out the behavior. To increase the explained variance in behavioral intention, scholars have extended the TPB by adding new variables to it. Moral norms and awareness of consequences are two frequently added variables. Moral norms refer to an individual's belief of moral correctness or incorrectness of performing the behavior. Thøgersen (1996) suggested that there must be moral consideration when performing recycling behavior because the action is costly in time and effort while offering no extrinsic reward. Schwartz (1977) referred to the moral consideration as internalized rules that prescribe what behaviors are deemed to be right or wrong in particular contexts. In a meta-analysis by Bamberg and Möser (2007), moral norms have been found to account for a significant portion of the variance in behavioral intention. Awareness of consequences captures an individual's knowledge of the outcomes of performing the behavior (Tonglet, Phillips, & Read, 2004). Research studies suggested that attitudes toward a behavior should be represented by components of experiential (i.e., the attitudes construct identified in the TPB) and instrumental (Ajzen, 2002; Ajzen & Driver, 1992; Davies, Foxall, & Pallister, 2002). Thus, it is appropriate to include awareness of consequences (i.e., instrumental aspect of attitudes) within the TPB model. Utility of including these two constructs in the TPB model was empirically supported by substantial research studies (e.g., Chen & Tung, 2010; Tonglet et al., 2004; Wan, Shen, & Choi, 2017; Chan & Bishop, 2013).

We selected the extended TPB for integration because the situation-specific antecedents identified in the model (i.e., attitudes, subjective norms, perceived behavioral control, moral norms, and awareness of consequences) may serve as a causal link that connects general factors (e.g., place attachment) and specific behaviors or intentions (e.g., recycling intention). General constructs in the environmental domain such as environmental concern and general attitude toward the environment usually have weak predictive power for specific behaviors (Ajzen & Fishbein, 1977; Bamberg, 2003). Scholars have asserted that general constructs possess indirect causal impact but not direct influence on specific behaviors or intentions (Bamberg, 2003; Eagly & Chaiken, 1993). In other words, general constructs may influence specific

behaviors or intentions via situation-specific constructs (Bamberg, 2003). Immediate antecedents of intention identified in the TPB are framed at specificity of the behavior (Kan & Fabrigar, 2017; Bamberg, 2003). Meanwhile, place attachment is considered as a general construct (Han et al., 2019; Jorgensen & Stedman, 2006) which refers to attitudes toward a place without reference to any particular action. Thereby, we posit that components of the extended TPB could mediate the relationship between place attachment and recycling intention. Elaboration of the relationships between each component of the extended TPB and place attachment were presented below.

Place attachment could be an important antecedent of pro-environmental attitude (Scannell & Gifford, 2010b). Back to early 70s, Bem (1970) has already pointed out that meanings associated with a place form a part of attitudes toward behavior. Bonaiuto, Carrus, Martorella, and Bonnes (2002) shared a similar view and justified the need of giving more attention to situations and places when examining attitudes toward behavior by arguing that most pro-environmental behaviors occur in specific situations or places. Given that attitudes refer to individuals' responses to an event or object (Fishbein & Ajzen, 1975) and physical settings can be treated as attitude objects, some studies even counted place attachment as an attitude (Jorgensen & Stedman, 2001; Kyle, Graefe, Manning, & Bacon, 2004). Studies have established a positive correlation between the concept of place and attitudes toward behavior. For example, sense of place is a predictor of attitudes toward environmental changes (Devine-Wright, 2009). Drawing inference from Turner's (1991) rationalization that individuals' identification with group membership has impact on their attitudes, Hernández et al. (2010) proved an indirect effect of place identity on illegal anti-ecological behavior via environmental attitude. In sum, place attachment could make contribution to the understanding of pro-environmental attitude. The attitude could be considered as a place-situated phenomenon (Bonaiuto et al., 2002) and it is highly related to a broader notion of place attachment.

It is expected that higher levels of place attachment would enhance individuals' perceptions of approval or disapproval of behaviors. Attachment can stem from a place that facilitates social relationships and group identity as well as supporting social interactions (Scannell & Gifford, 2010a). Social bonding has been validated as a subdimension of place attachment by past studies (e.g., Kyle et al., 2005; Ramkissoon et al., 2013b). Thus, for people who have developed higher levels of attachment to a place, they are more likely to experience social pressures in decision-making process (Han et al., 2019) and greater conformity with group norms (Hernández et al., 2010). It is because the stronger an individual attach to a place, the higher the frequency of social processes with others and the greater chance to feel social pressure and the likelihood of abiding by social norms (Contractor & DeChurch, 2014).

Place attachment is suggested to be an antecedent of moral norms that influence individuals' moral obligation to perform a behavior. A higher level of place attachment facilities the development of norms which makes the public to be more resistant to changes of physical nature of the place (Mesch, 1996). The argument has been evidenced in prior research that, place attachment can activate moral norms of conserving native vegetation among landholders (Raymond, Brown, & Robinson, 2011) and water conservation (Valizadeh et al., 2020). Moral norms in the environmental domain have been observed a certain degree of similarity with attitudes (Kaiser & Scheuthle, 2003). For example, perceived moral obligation may produce predictive effect on attitudes (Raats, Shepherd, & Sparks, 1995); attitude items of good/bad

and responsible/not responsible are inherently concerned with moral issue (Chan & Bishop, 2013). Empirical evidence supports the viewpoint by revealing that the two constructs are perfectly correlated and there is much overlap in between (Klöckner, 2013; Kaiser, 2006), implying that they fail to demonstrate discriminant validity. It is expected that place attachment would impose similar impact on moral norms as it does on attitudes toward behavior.

People with strong place attachment are likely to pay more attention to the development and changes of the local environment (e.g., Williams, Patterson, & Roggenbuck, 1992; Vorkinn & Riese, 2001). Since place attachment is developed from the environment in which people are interacting to and dependent on, people inevitably pay more attention to events which may have effects on the environment they valued and be aware of consequences that will have on the environment. The stronger an individual attach to a setting, the greater awareness of impact of human activity on the environment (Stedman, 2003). Awareness of consequences is also the first stage of psychological response to place change (Devine-Wright, 2009); the direct experience with the place could initiate people's aware of change taken in the place. Raymond and his colleagues (2011) found that place attachment, nature bonding in particular, significantly predicts native vegetation conservation behavior. Recreation and landscape literature also provided empirical evidence to the positive relationship between place attachment and awareness of contemporary environmental issues such as disaster's consequences in tourism sites (e.g., Zhang, Zhang, Zhang, & Cheng, 2014) and rural landscape conservation (e.g., Walker & Ryan, 2008). Thus, place attachment is an important precondition of developing awareness of consequences of performing a behavior.

Perceived behavioral control is not considered to be a potential mediator between place attachment and recycling intention. Prior establishment of affective bonds between people and places is not necessarily for an individual to perceive the ease or difficulty of performing recycling behavior; instead, a sense of control to engage in the behavior of interest depends on perceived resources and opportunities available to an individual in the environmental domain. Thus, it can reasonably presume that perceived behavioral control is not a potential mediator of the relationship.

2.4. Research aims and hypotheses

The study seeks to assess the impact of place attachment on decision-making processes of performing recycling behavior within the extended TPB framework. The scope of this study is confined to the investigation of recycling behavior in the context of Hong Kong. It tests if place attachment indeed related to recycling intention via attitudes, subjective norms, moral norms, and awareness of consequences. Accordingly, the following hypotheses are developed:

Hypotheses 1a to 1e. Constructs of the expanded TPB (i.e., attitudes, subjective norms, moral norms, awareness of consequences, perceived behavioral control, respectively) are positively associated with recycling intention.

Hypothesis 2. Place attachment as a higher-order construct is positively related to recycling intention.

Hypotheses 3a to 3d. Place attachment as a higher-order construct is hypothesized as positively predicting constructs of the extended TPB, namely, attitudes, subjective norms, moral norms, and awareness of consequences, respectively.

Hypotheses 4a to 4d. Place attachment as a higher-order construct could have an indirect effect on recycling intention through attitudes, subjective norms, moral norms, and awareness of consequences, respectively.

Figure 1 illustrates the hypothesized research model.

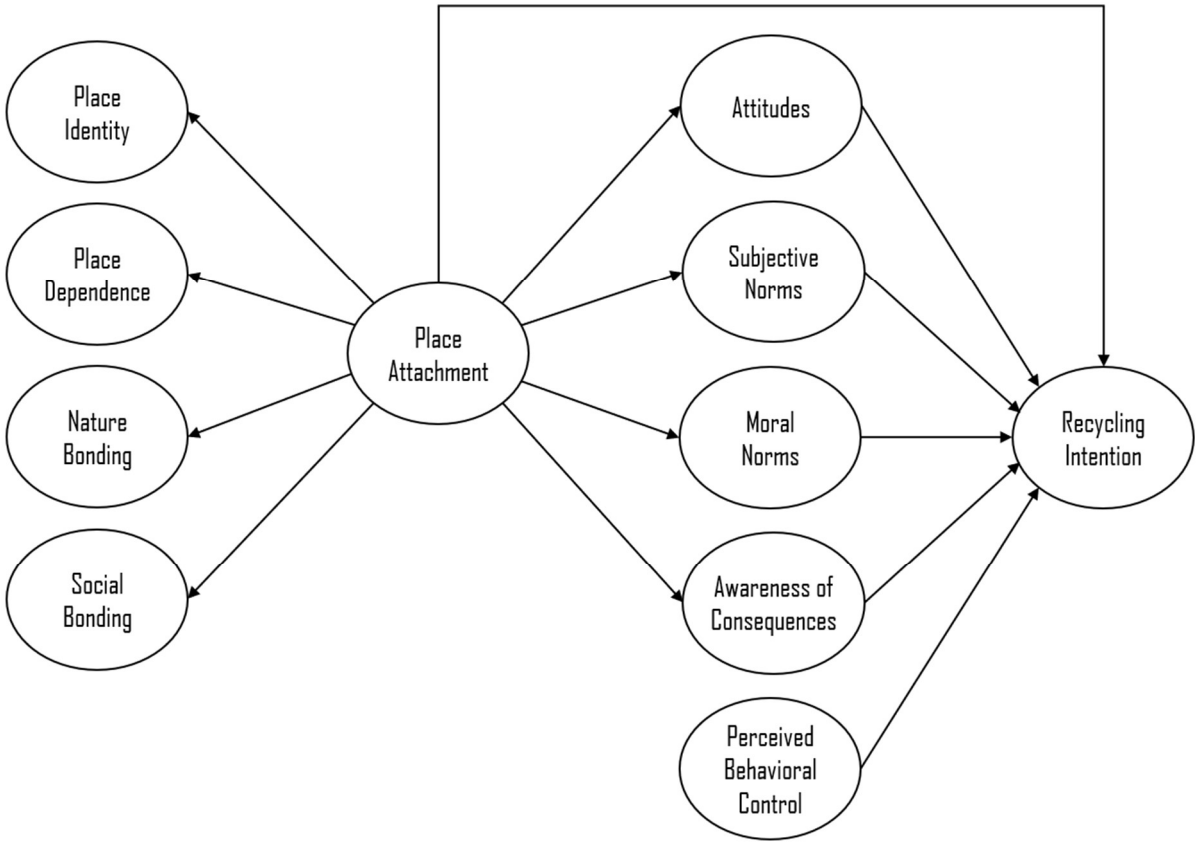

Figure 1. Proposed research model

3. Method

3.1. Study context

The study was conducted in Hong Kong. The city is highly populated with around 7.5 million habitants updated to December 2019. Waste management has long been a challenging task in Hong Kong because of the high density of population and shortage in land resources. The prevalence of consumerism in daily life results in over-consumption and that further increases the difficulty in waste management. As revealed in the latest waste figures, the city's per capita daily disposal of municipal solid waste (MSW) is 1.53kg in 2018, a record high since 1991; however, only 30% of MSW is recycled (Hong Kong Environmental Protection Department, 2020). The waste problem in Hong Kong is far more severe than in its counterparts such as Singapore (1.36kg per capita MSW, 61% recycling rate) (Singapore National Environment Agency, 2019) and Taiwan (1.32kg per capita MSW; 60.5% recycling rate) (Environmental Protection Administration Executive Yuan, 2020).

3.2. Sampling and data collection

We have conducted an online questionnaire survey for data collection. Ethical review of the research project was conducted by the first author's institutional committee and approval had

been granted. Hong Kong permanent residents aged eighteen and older were recruited. The questionnaire was randomly distributed to eligible members of an internet research panel through a research company in November 2019. A total of 6,658 invitation were sent to panel members and 1,614 respondents started the survey. 1,102 valid samples were returned for analysis.

In regard to respondents' profile, just more than half were female (52%). Respondents were mainly represented by young and middle age groups. Nearly half of the sample were composted of respondents from 18-24 years (23.3%) and 25-34 years (26.0%). The rest of respondents were in 35-44 years (23.0%), 45-54 years (17.4%), 55-64 years (7.4%), and 65 or above years of age (2.8%). In terms of education level, only a few had completed primary or below education (2.4%), a considerable number of respondents possess secondary level education (31.0%) and non-degree tertiary education (19.6%), many have attended degree tertiary education (47.0%). Respondents' incomes were fairly dispersed with nearly one-third (28.6%) earning less than HKD15,000 per month, 31.4% earning between HKD15,000 and HKD24,999, 22.8% between HKD25,000 and HKD39,999, and the remaining 17.1% earning HKD40,000 or above.

3.3. Measures

This study is part of a larger project about recycling behavior. Participants' responses on the following measures and questions were analyzed to address the research questions of this study. The analyzed measures include original constructs of the TPB, moral norms, awareness of consequences, four sub-constructs of place attachment, and recycling intention. Demographic data of participants including gender, age, education level, and personal monthly income level were enquired at the last section of the questionnaire. Except demographic enquiries, all items were rated with a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

All measurement items are presented in Appendix A. Items for constructs of the TPB (i.e., attitudes, subjective norms, and perceived behavioral control) were adapted from past studies which investigated recycling behavior (e.g., Tonglet et al., 2004; Chen & Tung, 2010). Indicators of moral norms and awareness of consequences were drawn reference from previous studies (e.g., Chen & Tung, 2010); both constructs served as a newly added variable and formed the extended TPB for studying recycling behavior in the past studies. Constructs of the TPB, moral norms, and awareness of the consequences in this study all referred specifically to recycling behavior. Items of sub-constructs of place attachment were adapted from a study on measurement of place attachment with minor modification (Raymond et al., 2010). Sample items of these sub-constructs are *"I am very attached to Hong Kong"* (place identity), *"Hong Kong is the best place for the activities I like to do"* (place dependence), *"I am very attached to the natural environment of Hong Kong"* (nature bonding), and *"I live in Hong Kong because my family is here"* (social bonding). Recycling intention was measured with three items adopted from a previous study by Wan et al. (2017).

3.4. Specification of the type of constructs

Place attachment in this study was considered as a multidimensional construct with four sub-dimensions. We modelled the concept as a higher-order reflective construct. Specifically, the higher-order construct (i.e., place attachment) held a reflective relationship with its reflectively

measured lower-order constructs (i.e., place identity, place dependence, nature bonding, social bonding). A higher-order construct modeling reduces model complexity, making the path model more theoretical parsimonious; it also reduces bias due to collinearity issue and solves potential discriminant validity problem (Hair, Hult, Ringle, & Sarstedt, 2017).

In reference to the decision rules for determining the type of constructs listed by Jarvis, MacKenzie, and Podsafoff (2003), we justified the hypothesized model of this study as a reflective-reflective hierarchical component model. The four subconstructs are manifestations of place attachment. They share a common theme and dropping one of them should not alter the definition of place attachment. Results of correlation matrix of variables also indicated that four sub-constructs are significantly covary with each other (Appendix B), a necessary condition for reflective indicator model. Moreover, the subconstructs have the same antecedents and consequences because they are all caused by place attachment. Thus, place attachment is appropriate to be modeled as having reflective indicators.

3.5. Data analysis

We used partial least squares structural equation modeling (PLS-SEM) to evaluate the model. PLS-SEM was chosen with the following reasons. First, the focus of this study is prediction-oriented which aims to maximize the explained variance of the endogenous variable (i.e., recycling intention) and to identify key predictors of the variable (Hair, Hult, et al., 2017). Second, PLS-SEM is more appropriate when the study is exploring theoretical extensions of established theory (i.e., the TPB) (Hair, Risher, Sarstedt, & Ringle, 2019). Third, the variance-based approach can easily be used with higher-order model (Hair, Matthews, Matthews, & Sarstedt, 2017).

PLS-SEM involves a two-step estimation process: measurement model assessment and structural model assessment. For the measurement model, contribution of each indicator in representing its associated latent variable and how well combined set of indicators representing the latent variable will be evaluated. The assessment of the structural model involves examining the path relationships between the latent variables and determine predictive capability of the hypothesized model (Hair, Hult, et al., 2017).

Parameters in both the lower-order reflective model and in the higher-order reflective model were estimated using a path weighing scheme. A repeated indicator approach (Lohmöller, 1989; Wold, 1982) was used to model the higher-order construct. In other words, the approach measured the higher-order construct by using the observable indicators from all the lower-order constructs. The repeated indicator approach was chosen because the lower-order constructs of this study have a similar number of indicators; thereby, the weights for the lower-order constructs on the higher-order construct will not be biased (Ringle, Sarstedt, & Staraub, 2012). All data analyses of this study were performed using SmartPLS version 3.3.2.

4. Results

4.1. Measurement model

Internal consistency reliability (Cronbach's alpha, composite reliability), convergent validity (indicator reliability, average variance extracted), and discriminant validity were assessed for both lower-order and higher-order constructs.

Internal consistency reliability evaluates the extent to which indicators that are proposed to measure the same construct produce similar results (Hair, Hult, et al., 2017). The rule of thumb for adequate reliability is a Cronbach's alpha > 0.70 and a composite reliability > 0.60. Reliability was supported in this study. Convergent validity is the degree to which an indicator correlates positively with other indicators of the same construct (Hair, Hult, et al., 2017). Measures of all constructs exhibited convergent validity with factor loadings of all indicators were greater than 0.70 and the average variance extracted (AVE) values exceeded 0.50. Table 1 summarizes results of internal consistency reliability and convergent validity.

The measurement model of the higher-order construct is described by place attachment's path relationships with place identity, place dependence, nature bonding, and social bonding. The four lower-order constructs became the observed indicators of the higher-order construct. Path coefficients of these lower-order constructs were interpreted as factor loadings of place attachment. Loadings of four lower-order constructs exceeded 0.70. The results provide support for indicator reliability. The higher-order construct's reliability and validity need to be manually calculated by using these indicator loadings and the correlation between the lower-order constructs. Details of calculation procedures are presented elsewhere (Sarstedt, Hair, Cheah, Becker, & Ringle, 2019). The values of Cronbach's alpha, composite reliability, and average variance extracted of place attachment were greater than suggested rule of thumb. Corresponding reliability and validity statistics of place attachment are italicized in Table 1.

Table 1. Reliability and validity statistics

Construct	Cronbach's α	Composite reliability	Average variance extracted (AVE)
ATTD	0.923	0.942	0.764
SN	0.887	0.922	0.747
PBC	0.910	0.930	0.689
MN	0.877	0.909	0.668
AC	0.916	0.937	0.748
PI	0.933	0.949	0.788
PD	0.903	0.928	0.721
NB	0.873	0.913	0.725
SB	0.877	0.916	0.732
PA	*0.888*	*0.922*	*0.747*
INT	0.888	0.930	0.817

Note. Italics used for higher-order construct values. ATTD = Attitudes; SN = Subjective Norms; PBC = Perceived Behavioral Control; MN = Moral Norms; AC = Awareness of Consequences; PI = Place Identity; PD = Place Dependence; NB = Nature Bonding; SB = Social Bonding; PA = Place Attachment; INT = Recycling Intention.

Discriminant validity denotes that a construct is empirically distinct from other constructs in the model (Hair, Hult, et al., 2017). Results of discriminant validity assessment using Heterotrait-Monotrait ratio (HTMT) is displayed in Table 2. We did not consider discriminant validity between four lower-order constructs and their higher-order component (i.e., place attachment). It is because the measurement model of the higher-order construct repeats the indicators of its lower-order constructs. All other HTMT values were lower than threshold value of 0.85, implying that discriminant validity of most constructs was established.

Table 2. Discriminant validity using HTMT ratio

Construct	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) ATTD											
(2) SN	0.535										
(3) PBC	0.511	0.667									
(4) MN	0.628	0.618	0.643								
(5) AC	0.772	0.457	0.533	0.683							
(6) PI	0.548	0.448	0.452	0.499	0.572						
(7) PD	0.347	0.446	0.487	0.441	0.394	0.792					
(8) NB	0.389	0.533	0.557	0.531	0.436	0.646	0.753				
(9) SB	0.518	0.445	0.443	0.497	0.598	0.815	0.714	0.710			
(10) PA	*0.433*	*0.443*	*0.452*	*0.451*	*0.476*	-	-	-	-		
(11) INT	0.638	0.513	0.626	0.671	0.683	0.561	0.419	0.456	0.551	0.557	

Note. Italics used for higher-order construct values. ATTD = Attitudes; SN = Subjective Norms; PBC = Perceived Behavioral Control; MN = Moral Norms; AC = Awareness of Consequences; PI = Place Identity; PD = Place Dependence; NB = Nature Bonding; SB = Social Bonding; PA = Place Attachment; INT = Recycling Intention.

4.2. Structural model

Structural model assessment was performed to find out significance of hypothesized paths and overall predictive capability of the model. A bootstrapping procedure with 5,000 samples was performed to assess the significance of the hypothesized paths. A *p*-value less than 0.05 denotes as statistically significant. Predictive capability of the model is determined by the coefficient of determination (R^2) for endogenous variables. The R^2 values of 0.25, 0.50, and 0.75 are respectively considered as weak, moderate, and substantial effects in PLS structural model (Hair, Hult, et al., 2017). The value of standardized root mean square residual (SRMR) and root mean square residual covariance (RMS_{theta}) were used as model fit measures. The value of SRMR is 0.074, less than the suggested threshold of 0.08 and is considered as good fit (Hu & Bentler, 1998). RMS_{theta} value below 0.12 indicates a well-fitting model (Henseler et al., 2014). The proposed model exhibited a barely good fit with a value of 0.127. Summarized results of the research model are presented in Table 3. Appendix C depicts the graphical format of path analysis results of the extended TPB model and the proposed research model.

Table 3. Summary of structural model results

Path	Direct effect		Indirect effect	
	β	95% CI	β	95% CI
H1a: ATTD → INT	0.137**	[0.053, 0.224]		
H1b: SN → INT	0.002^{ns}	[-0.091, 0.099]		
H1c: PBC → INT	0.222***	[0.141, 0.303]		
H1d: MN → INT	0.189***	[0.099, 0.275]		
H1e: AC → INT	0.224***	[0.135, 0.314]		
H2: PA → INT	0.122**	[0.044, 0.202]		
H3a: PA → ATTD	0.480***	[0.413, 0.547]		
H3b: PA → SN	0.480***	[0.421, 0.537]		
H3c: PA → MN	0.511***	[0.452, 0.568]		
H3d: PA → AC	0.527***	[0.464, 0.590]		
H4a: PA → ATTD → INT			0.066**	[0.024, 0.113]
H4b: PA → SN → INT			0.001^{ns}	[-.044, 0.048]
H4c: PA → MN → INT			0.097***	[0.050, 0.143]
H4d: PA → AC → INT			0.118***	[0.070, 0.168]

Note. CI = Confidence Intervals. ATTD = Attitudes; SN = Subjective Norms; PBC = Perceived Behavioral Control; MN = Moral Norms; AC = Awareness of Consequences; PI = Place Identity; PD = Place Dependence; NB = Nature Bonding; SB = Social Bonding; PA = Place Attachment; INT = Recycling Intention. Demographic variables (gender, age, education level, and income level) were included as covariates; income level was statistically significant (β = 0.048, $p < .05$).
**$p < .01$, two-tailed. ***$p < .001$, two-tailed. *ns* denotes not statistically significant.

Constructs of the extended TPB were positively associated with recycling intention. Awareness of consequences (H1e: β = 0.224, $p < .001$) had the strongest effect on intention, followed by perceived behavioral control (H1c: β = 0.222, $p < .001$), moral norms (H1d: β = 0.189, $p < .001$), and attitudes (H1a: β = 0.137, $p < .01$). However, subjective norms did not relate to recycling intention (H1b: β = 0.002, $p = 0.972$). The findings support Hypotheses 1a, 1c, 1d, and 1e.

Place attachment was a positive and significant predictor of recycling intention (H2: β = 0.122, $p < .01$). Hypothesis 2 is supported. Besides, the higher-order construct was positively and significantly associated with attitudes (H3a: β = 0.480, $p < .001$), subjective norms (H3b: β = 0.480, $p < .001$), moral norms (H3c: β = 0.511, $p < .001$), and awareness of consequences (H3d: β = .527, $p < .001$). Findings support Hypotheses 3a to 3d.

A mediation analysis was performed to test the association between place attachment and recycling intention via attitudes, subjective norms, moral norms, and awareness of consequences. As expected, place attachment had significant indirect effect on recycling intention via attitudes (H4a: β = 0.066, $p < .01$), moral norms (H4c: β = 0.097, $p < .001$), and awareness of consequences (H4d: β = 0.118, $p < .001$). However, subjective norms are not a significant mediator (H4b: β = 0.001, $p = .972$). Hypotheses 4a, 4c, and 4d are supported.

Place attachment explained 23.1%, 23.0%, 26.1%, and 27.8% of variance in attitudes, subjective norms, moral norms, and awareness of consequences, respectively. It is considered to explain a weak level of variance for the four proposed mediators. The hypothesized research model explains a medium level of variance for recycling intention (52.9%).

5. Discussion

5.1. Theoretical implications

This is the first study using the extended TPB as a framework for investigating the role of place attachment in determining recycling intention. We proposed that place attachment as a higher-order construct of four subdimensions is the antecedent of attitudes, subjective norms, moral norms, and awareness of consequences, and, in turn, predicts recycling intention.

The study offers new insights into the relationship between place attachment, recycling intention, and constructs of the extended TPB. Notably, findings revealed that effect of place attachment on recycling intention can be mediated by attitudes, moral norms, and awareness of consequences. Attached individuals are more likely to develop favorable attitudes toward recycling, consider the behavior as a moral action, and be more aware of the consequences of performing the behavior (Bonaiuto et al., 2002; Hernández et al., 2010; Scannell & Gifford, 2010b) which, in turn, contribute to a higher intention of engaging in recycling behavior. Going beyond the role of place attachment in directly determining place-protective behaviors (e.g., Halpenny, 2010; Scannell & Gifford, 2010b; Vaske & Kobrin, 2001; Walker & Chapman, 2003), the integration enhances current knowledge of the mechanism of place attachment that gives rise to pro-environmental behaviors. Moreover, the extended TPB not only allows the reservation of specificity of particular places and provides place attachment a voice in the established theoretical context (cf. Seamon, 2014), it also offers a useful framework to conceptualize the causal role of place attachment on pro-environmental behaviors.

The study also disentangled what kind of effect (i.e., direct or indirect) and the magnitude of the effect that place attachment would have on pro-environmental behaviors. The relationship between place attachment and recycling intention can be both direct and indirect. However, the relative strength of the total mediated effects is almost equal to 70% whereas the magnitude of direct effect of place attachment on recycling intention is about 30% (Table 4). Findings suggest that the major effect of place attachment on recycling intention is primarily indirect (cf. Han et al., 2019). It empirically acknowledges the strength of indirect effect of place attachment on recycling intention and identifies important mediators in between (cf. Ramkissoon et al., 2013b). Besides, it revealed that the extended TPB which includes moral norms and awareness of consequences as newly added variables is a useful framework that it can transmit a greater extent of place attachment effect on recycling intention. Findings enhances our understanding regarding the magnitude that are responsible for the relationship between place attachment and recycling intention, facilitating policy formulation for encouraging adaptation of pro-environmental behaviors.

Table 4. Relative strength of direct and indirect effect of place attachment

Path	Relative strength of hypothesized path
Direct effect: PA → INT	30.20%
Indirect effect: PA → ATTD → INT	16.33%
Indirect effect: PA → SN → INT	0.25%
Indirect effect: PA → MN → INT	24.01%
Indirect effect: PA → AC → INT	29.21%

Note. Relative strength of hypothesized path is computed as the ratio of the strength of the direct or indirect effect to the total effect. Total effect of place attachment on recycling intention is equal to 0.404 (= 0.122 + 0.066 + 0.001 + 0.097 + 0.118). ATTD = Attitudes; SN = Subjective Norms; MN = Moral Norms; AC = Awareness of Consequences; PA = Place Attachment; INT = Recycling Intention.

The indirect effect of place attachment on recycling intention via awareness of consequences is the strongest among the three significant mediated paths. Awareness of consequences in this study was operationalized as awareness of positive impact on the environment by engaging in recycling behavior. The result is consistent with previous studies (e.g., Raymond et al., 2011; Vorkinn & Riese, 2001; Williams et al., 1992) that there is a positive association between place attachment and greater sensitivity to human activity on the ecosystem. It also supports the framework of psychological response to place change proposed by Devine-Wright (2009) that, people with stronger place attachment are more aware of place change and take necessary actions against changes that are evaluated as negative. Besides, a larger proportion of indirect effect of place attachment transmitted by the awareness of consequences may be because the focus of three mediators is in minor difference. Both attitudes and moral norms could be considered as an assessment of recycling behavior; the former represents the subjective evaluation of recycling actions (Ajzen, 1991) whereas the later refers to the belief of moral correctness of engaging in recycling behavior (Kaiser & Scheuthle, 2003). The focus of both constructs is the recycling behavior itself. By contrast, in addition to capturing the instrumental aspect of attitude of performing recycling behavior (e.g., Chen & Tung, 2010; Wan et al., 2017), awareness of consequences relates the concern to specific contexts or environments of a place. Place attachment as a matter would have a greater predictive capability in this case.

The hypothesized paths which involve subjective norms (i.e., H1b and H4b) were statistically non-significant in this study. In fact, meta-analysis studies have showed that subjective norms possess limited predictive power across behaviors (e.g., Armitage & Conner, 2001). The non-significant results may due to that subjective norms do not have direct impact on intentions/behaviors but possess indirect effect through personal (moral) norms (Thøgersen, 1999; Bratt, 1999). These results are supported by Schwartz's theory of moral decision making (1977) that people may have internalized others' expectations (i.e., subjective norms) as personal (moral) norms. Individuals engage in recycling behavior because they follow internalized personal norms which inform them the correctness of behaviors instead of being subject to social pressure of important others.

5.2. Practical contributions

The research may have some practical implications for designing cost-effective environmental programs to boost recycling behavior. Place attachment could be an alternative psychological guiding principle to waste management planning processes. Specifically, marketing managers may consider enhancing place attachment as a key principle underpinning environmental programs in the future. As elaborated below, recycling behavior is likely to increase if managers adopted the principle, along with other behavior-specific constructs identified from the extended TPB, for designing environmental programs to boost recycling behavior.

Results of this study call for refinement of environmental programs from a place-based perspective. Place attachment is an antecedent of specific behavior constructs which immediately determines recycling intention. Prior studies used to advocate strategies of encouraging pro-environmental behaviors by directly targeting at single aspect of motivational factors, such as attitude (Geiger, Steg, van der Werff, & Ünal, 2019; Gifford & Sussman, 2012). The results indicated that place attachment should be integrated into programs that specifically

aim to improve individuals' attitudes, moral norms, and awareness of consequences of performing recycling behavior. Compared to programs only targeting at enhancing either place attachment or specific behavior constructs, the integration is expected to further leverage people-place relationship and make a greater impact on motivating recycling behavior. The findings also revealed that a majority of place attachment effect is mediated via the path of awareness of consequences. It is believed that environmental programs that pertain both ideas of enhancing place attachment and awareness of consequences would achieve greatest effect on motivating recycling behavior; the findings would be important for the development of cost-efficient environmental programs, as they will tell which specific behavior constructs transmitted the largest proportion of place attachment effect.

5.3. Limitations and future research

There are several issues that required consideration in future research. First, length of residence is a consistent predictor of place attachment (Lewicka, 2011). Although respondents of this study are permanent residents of Hong Kong (i.e., people who have lived in Hong Kong for 7 years or above), we did not consider individuals' mobility within the city. Future studies may analyze the variation when examining the role of place attachment in predicting pro-environmental behaviors. Second, results of this study may subject to bias because of the data collection method. Due to the nature of online survey, young people with high academic qualifications are overrepresented; also, senior participants with lower education level are easily excluded from the poll of being contacted. A comprehensive populated survey is thus highly recommended for future research. Third, though place attachment has been studied for decades in the field of environmental psychology, conceptualization of the concept remain unclear and inconsistent. Future research may develop their own measures of place attachment that are relevant to the target population. The practice would definitely benefit the accuracy of collected data and to ensure that the data are as relevant to the target population as possible.

6. Conclusion

The place-based practice of environmental actions is a reminder of the powerful influence that attached to the local context is associated with environmental attitudes and actions. The present study considers place attachment as a higher-order construct with four lower-order dimensions including place identity, place dependence, nature bonding, and social bonding. It redirects theoretical and empirical attention back to an understanding of the relationship between place influence and pro-environmental behaviors. Results show how people-place relations can play out in local environmental actions (Devine-Wright, 2009). This is the first study investigating the indirect effect of place attachment on environmentally friendly behavioral intention by integrating the concept into the extended TPB framework. While previous studies considered the direct impact of place attachment on environmental behaviors, this study found that place attachment is made salient by first influencing constructs of the extended TPB (i.e., attitudes, moral norms, awareness of consequences) and that in turn determines behavioral intention. The significant indirect effect offers a possible explanation for the role of place attachment works for recycling intention. Policy interventions shifting from attitudes to place-based psychological effect and the combination of place attachment and specific TPB constructs are recommended. Research practices addressing the limitations of this research are suggested for future studies.

Appendix A

Construct	Indicator	Measurement item	Sources
Attitudes (ATTD)	ATTD1	Recycling is good.	Tonglet et al. (2004)
	ATTD2	Recycling is useful.	
	ATTD3	Recycling is rewarding.	
	ATTD4	Recycling is a responsible behavior.	
	ATTD5	Recycling is sensible.	
Subjective Norms (SN)	SN1	Most people who are important to me think I should recover recyclable waste.	Tonglet et al. (2004)
	SN2	Most people who are important to me would approve of me recycling my recyclable waste.	
	SN3	My family expects me to recycle household recyclable waste.	
	SN4	My friends expect me to recycle household recyclable waste.	
Perceived Behavioral Control (PBC)	PBC1	I have plenty of opportunities to recycle recyclable materials.	Tonglet et al. (2004)
	PBC2	Doing recycling is an easy job.	
	PBC3	Doing recycling is convenient.	
	PBC4	I know how to recycle recyclable materials.	
	PBC5	There is enough time for me to do recycling practices.	
	PBC6	There is enough space for me to do recycling practices.	
Moral Norms (MN)	MN1	I feel I should not waste anything if it could be used again.	Chen & Tung (2010)
	MN2	It would be wrong of me not to recycle my recyclable waste.	
	MN3	I would feel guilty if I did not recycle my recyclable waste.	
	MN4	Not recycling goes against my principles.	
	MN5	Everybody should share the responsibility to recycle recyclable waste.	
Awareness of Consequences (AC)	AC1	Recycling helps to protect the environment.	Chen & Tung (2010)
	AC2	Recycling reduces wasteful use of landfills.	
	AC3	Recycling preserves natural resources.	
	AC4	Recycling saves energy.	
	AC5	Doing recycling practices can provide a better environment for next generation.	
Place Identity (PI)	PI1	Hong Kong means a lot to me.	Raymond et al. (2011)
	PI2	I am very attached to Hong Kong.	
	PI3	I have a lot of fond memories about Hong Kong.	
	PI4	Hong Kong is very special to me.	
	PI5	I identify strongly with Hong Kong.	
Place Dependence (PD)	PD1	I get more satisfaction out of living in Hong Kong than any other place.	Raymond et al. (2011)
	PD2	Hong Kong is the best place for the activities I like to do.	
	PD3	Doing my activities in Hong Kong is more important to me than doing them in any other place.	
	PD4	I would not substitute any other area for the activities I do in Hong Kong.	
	PD5	No other place can compare to Hong Kong.	

Construct	Indicator	Measurement item	Sources
Natural Bonding (NB)	NB1	When I spend time in the natural environment in Hong Kong, I feel a deep feeling of oneness with the natural environment.	Raymond et al. (2011)
	NB2	I learn a lot about myself when spending time in the natural environment in Hong Kong.	
	NB3	I am very attached to the natural environment of Hong Kong.	
	NB4	When I spend time in the natural environment of Hong Kong, I feel at peace with myself.	
Social Bonding (SB)	SB1	I live in Hong Kong because my family is here.	Raymond et al. (2011)
	SB2	My relationships with family in Hong Kong are very special to me.	
	SB3	The friendships developed in my daily life strongly connect me to Hong Kong.	
	SB4	My relationships with friends in Hong Kong are very special to me.	
Recycling Intention (INT)	INT1	I intend to recycle my recyclables in the next four weeks.	Wan et al. (2017)
	INT2	I will recycle my recyclables every time I have it for disposal.	
	INT3	I am willing to participate in recycling scheme in the future.	

Appendix B

Construct	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	*M*	*SD*
(1) ATTD	1											6.077	0.880
(2) SN	0.491***	1										5.205	1.089
(3) PBC	0.474***	0.601***	1									5.242	1.036
(4) MN	0.586***	0.548***	0.579***	1								5.438	0.984
(5) AC	0.710***	0.417***	0.493***	0.635***	1							5.943	0.911
(6) PI	0.508***	0.411***	0.422***	0.466***	0.528***	1						5.831	1.031
(7) PD	0.317***	0.401***	0.441***	0.394***	0.358***	0.730***	1					5.317	1.158
(8) NB	0.351***	0.468***	0.497***	0.466***	0.390***	0.585***	0.669***	1				5.274	1.081
(9) SB	0.463***	0.398***	0.402***	0.450***	0.533***	0.737***	0.638***	0.624***	1			5.749	0.977
(10) PA	0.481***	0.480***	0.504***	0.511***	0.528***	0.905***	0.882***	0.806***	0.861***	1		5.581	0.918
(11) INT	0.578***	0.461***	0.567***	0.605***	0.618***	0.510***	0.377***	0.403***	0.484***	0.517***	1	5.731	1.008

Note. ATTD = Attitudes; SN = Subjective Norms; PBC = Perceived Behavioral Control; MN = Moral Norms; AC = Awareness of Consequences; PI = Place Identity; PD = Place Dependence; NB = Nature Bonding; SB = Social Bonding; PA = Place Attachment; INT = Recycling Intention.
***Correlation is significant at the 0.001 level (two-tailed).

Appendix C

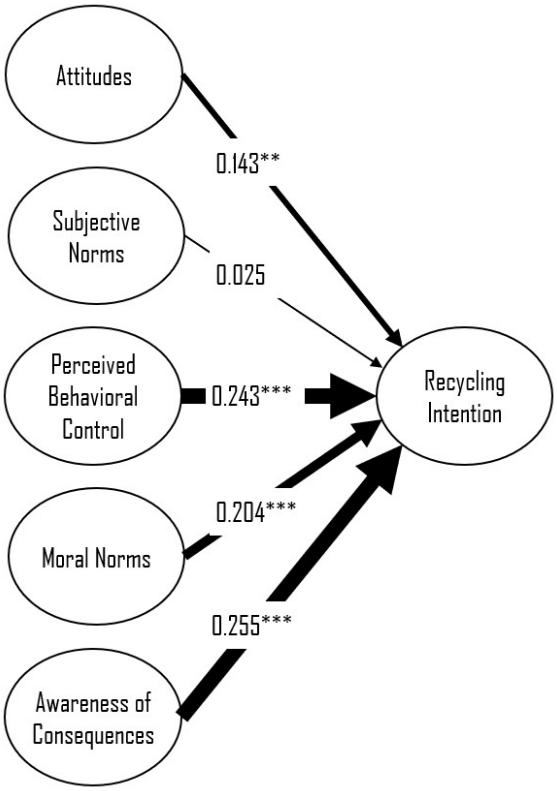

Figure C1. Results of extended TPB model.

Note. Demographic variables (gender, age, education level, and income level) were included as covariates; income level was statistically significant ($\beta = 0.047$, $p < .05$). R^2 of Recycling Intention = 0.520. SRMR = 0.059; RMS_{theta} = 0.118.
**$p < .01$, two-tailed. ***$p < .001$, two-tailed.

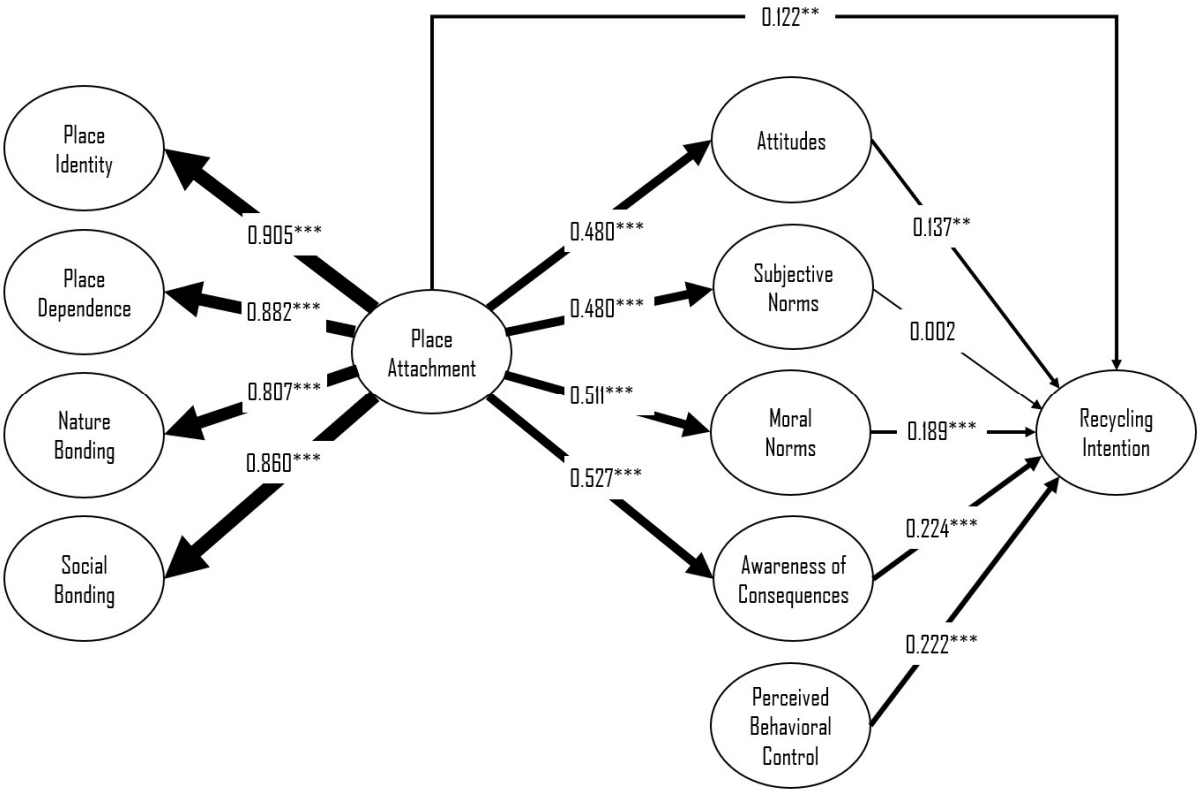

Figure C2. Results of proposed research model.

Note. Demographic variables (gender, age, education level, and income level) were included as covariates; income level was statistically significant (β = 0.048, $p < .05$). R^2 of Attitudes = 0.231; R^2 of Subjective Norms = 0.230; R^2 of Moral Norms = 0.261; R^2 of Awareness of Consequences = 0.278; R^2 of Recycling Intention = 0.529. SRMR = 0.074; RMS_{theta} = 0.127.
**$p < .01$, two-tailed. ***$p < .001$, two-tailed.

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