



## Determinants of young vacationers' recycling and conservation behavior when traveling

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We investigated key cognitive determinants that predict young vacationers' recycling and water/energy/local resources conservation intention when traveling. We also examined the role of gender in this intention formation, used structural equation modeling, and tested for metric invariance. Results showed that environmental values, concern, and awareness significantly contribute to the generation of young vacationers' intention to engage in recycling and to conserve water, energy, and local resources at a destination. In addition, environmental values had the strongest relationship with recycling and conservation intention, and gender significantly moderated the impact of environmental awareness on their intention. Overall, the findings inform researchers and practitioners about young vacationers' environmentally sustainable tourism behavior.

### Keywords

young vacationers;  
environmentally  
sustainable tourism  
behavior; water  
conservation; energy  
conservation; local  
resources conservation;  
recycling intention;  
environmental values;  
environmental concern;  
environmental awareness

Sustainable tourism behavior is broadly recognized as a vital topic in the youth tourism context (del Mar Alonso-Almeida, 2013; Han, Meng, & Kim, 2017b; Le-Klähn & Edwards, 2014; Meng & Han, 2016). As the growing demand for environmentally responsible traveling has influenced many changes in the tourism industry (Kwok, Huang, & Hu, 2016; Meng & Han, 2016), it has also affected young vacationers' and leisure travelers' behavior (Han et al., 2017b). Many destinations are now aware of sustainability as a vital strategic issue needing dedicated massive efforts and monetary and nonmonetary resources (Han, Meng, & Kim, 2017a; Han et al., 2017b). Young vacationers are also increasingly recognizing the necessity of sustainable behavior, not only in their everyday lives but also in their consumption and use of hospitality, tourism, and leisure products (Han et al., 2017b; Kiatkawsin & Han, 2017).

Diverse research results have shown that environmental values (Steg, Bloderdijk, Keizer, & Perlaviciute, 2014; Steg, Perlaviciute, van der Werff, & Lurvink, 2014), environmental concern (Akehurst, Afonso, & Gonçalves, 2012; Mostafa, 2006), and environmental awareness (Chan, Hon, Chan, & Okumus, 2014; Kollmuss & Agyeman, 2002; Stern, Dietz, Abel, Guagnano, & Kalof, 1999) are important in the generation of a sustainable decision-making process and in the behavior of individuals. However, although the prominent role of these cognitive variables has been well documented (Chan et al., 2014; Gao, Mattila, & Lee, 2016; Han, 2015; Hedlund, 2011), few researchers have compared their relative superiority in the determination of young vacationers' sustainable behavior when traveling.

In addition, although the critical role of gender in travelers' prosocial and proenvironmental decision



formation and behavior has often been stressed (del Mar Alonso-Almeida, 2013; Han et al., 2017a), few researchers have examined the influence of gender on young vacationers' internal perceptions and responses (e.g., environmental values, concern, and awareness) and external responses (e.g., recycling intention and water/energy/local resources conservation intention) in the tourism industry.

We thus designed this study to examine the impact of environmental values, environmental concern, and environmental awareness on young vacationers' environmentally sustainable tourism behavior, such as recycling, and water/energy/local resources conservation intention when traveling. We also investigated the relative criticality of these cognitive factors in determining environmentally sustainable tourist intention at a destination, and examined whether there is a gender difference in the relationship between cognitive drivers and sustainable tourism intention.

## Literature Review and Hypothesis Development

### Young Vacationers and Environmentally Sustainable Tourism Behavior

*Environmentally sustainable behavior* refers to “any actions that protect the environment or minimize the negative impacts of human activity on the environment in either general daily practice or specific outdoor settings” (Miller, Merrilees, & Coghlan, 2015, p. 28). In this study, environmentally sustainable tourism behavior refers to young vacationers' actions that preserve, or reduce their harmful impact on, the environment when traveling. These environmentally sustainable practices include saving water, saving electricity and energy, reusing hotel towels, walking up the stairs instead of using an elevator, reusing plastic bottles, disposing of garbage properly, protecting local resources, and avoiding disturbing wildlife. According to Halder, Pietarinen, Havu-Nuutinen, Pöllänen, and Pelkonen (2016), young individuals' environmentally sustainable intention and behavior are based on cognitive variables. Likewise, Kiatkawsin and Han (2017) asserted that young travelers build intention to travel in an environmentally sustainable way through an intricate decision-making process. In Kiatkawsin and Han's theoretical framework, a major aspect of this decision formation is a cognitive process comprising variables such as biospheric environmental values, problem awareness, the New Environmental Paradigm, and ascription of responsibility.

### Environmental Values

Human values are defined as desirable transsituational goals that vary in importance and serve as guiding principles in the life of an individual or other social entity (Schwartz, 1994). The three main components of this responsible behavior are biospheric environmental, altruistic, and egoistic values (Stern et al., 1999). These values are vital because they affect human behavior and the formation of intention and decision (Han, 2015; Stern & Dietz, 1994). That is, when individuals value environmental well-being, they have a propensity toward its protection (Kiatkawsin & Han, 2017). The *biospheric value* is often described as an environmental value (Han, 2015), as its emphasis is on the conservation of the natural environment (van der Werff, Steg, & Keizer, 2013). This environment-specific value is closely related to proenvironmental intention and behavior (Steg, Perlaviciute, et al., 2014; van der Werff et al., 2013). When individuals value saving natural resources, preventing pollution, preserving nature, and protecting other species as guiding principles in their life, they are more likely to behave in an environmentally sustainable way when traveling. Therefore, we proposed the following hypotheses:

**Hypothesis 1:** Environmental values will have a positive influence on recycling intention.

**Hypothesis 2:** Environmental values will have a positive influence on water/energy/local resources conservation intention.

### Environmental Concern

The concepts of environmental and ecological concern are frequently used in environmental psychology literature. According to Lee, Kim, Kim, and Choi (2014), *environmental concern* indicates individuals'

general attitude toward, and emotional involvement in, the natural environment, which reflect their concern about environmental issues and threats. Recent findings are fairly conclusive that the level of environmental concern is a crucial constituent in individuals forming an ecological intention and determination of proenvironmental behavior (Akehurst et al., 2012; Chan et al., 2014; Lee et al., 2014; Mostafa, 2006). When individuals are seriously concerned about the environment (i.e., believe that the environment is being severely abused by humans and that the balance of nature is extremely delicate; Cordano, Welcomer, Scherer, Pradenas, & Parada, 2010; Stern et al., 1999), they are more likely to travel proenvironmentally, for instance, engaging in recycling and natural-local-resources-conservation behavior when traveling. Thus, we proposed the following hypotheses:

**Hypothesis 3:** Environmental concern will have a positive influence on recycling intention.

**Hypothesis 4:** Environmental concern will have a positive influence on water/energy/local resources conservation intention.

### Environmental Awareness

Kollmuss and Agyeman (2002) and Han and Yoon (2015) described *environmental awareness* as an individual's knowledge of the harmful effects and negative consequences of human behavior on the environment. Previous researchers have found that awareness provides explanatory power to subsequent constructs, such as environmental behavior, perceived responsibility, and personal norms (Han, 2015; Kiatkawsin & Han, 2017).

Environmental awareness leads to individuals' environmentally sustainable behavior (Bamberg & Schmidt, 2003; Han, 2015). According to Chan et al. (2014), individuals' environmental awareness increases their ecological behavior and decision to implement ecofriendly practices at work. Han and Yoon (2015) also asserted that ecofriendly customers who are highly aware of the influence of human behavior on the natural environment tend to practice proenvironmental activities in their everyday life, and seek services and products produced by environmentally responsible companies. Thus, we proposed the following hypotheses:

**Hypothesis 5:** Environmental awareness will have a positive influence on recycling intention.

**Hypothesis 6:** Environmental awareness will have a positive influence on water/energy/local resources conservation intention.

### Gender and Its Impact

In findings in consumer behavior literature, gender often affects the relationships between cognitive (e.g., quality-assessment value), affective (e.g., emotion, satisfaction), and conative (e.g., intention, attitudinal loyalty) variables (Mittal & Kamakura, 2001; Oliver, 1997; Sharma, Chen, & Luk, 2012). For instance, Sharma et al. (2012) provided empirical evidence that gender influenced the relationships between cognitive assessment of product attributes, value perception, satisfaction evaluation, and loyalty in the retail sector. That is, in their service-evaluation model, gender moderated the magnitude of the relationship strengths among the variables. Gender is also considered a critical construct in tourism literature, with researchers finding gender differences in travelers' behavior (del Mar Alonso-Almeida, 2013; Han et al., 2017a; Hwang, Han, & Kim, 2015; King & Wan, 2014). Gender differences are also evident in young vacationers' tourism activities. For example, in their examination of young leisure travelers' behavior, Han et al. (2017a) empirically identified that the impact of their cognition and perception on affective evaluation and loyalty intention was significantly moderated by gender. Therefore, we proposed the following hypotheses:

**Hypothesis 7a:** Gender will significantly moderate the relationship between environmental values and recycling intention.

**Hypothesis 7b:** Gender will significantly moderate the relationship between environmental concern and recycling intention.

**Hypothesis 7c:** Gender will significantly moderate the relationship between environmental awareness and recycling intention.

**Hypothesis 7d:** Gender will significantly moderate the relationship between environmental values and



water/energy/local resources conservation intention.

**Hypothesis 7e:** Gender will significantly moderate the relationship between environmental concern and water/energy/local resources conservation intention.

**Hypothesis 7f:** Gender will significantly moderate the relationship between environmental awareness and water/energy/local resources conservation intention.

## Method

### Participants and Procedure

We collected data at seven universities in metropolitan cities in Korea for approximately 2 weeks. We chose university students as participants as they are representative of young vacationers (Howe & Strauss, 2000). The questionnaires were distributed to about 550 students, to whom we gave a detailed explanation of the research objectives. Their participation in the survey, conducted during the class hour, was voluntary. The students were from diverse departments (e.g., tourism, hospitality, business administration, economics, and international trade). We collected 428 usable questionnaires.

Of the 428 participants, 64.5% were women and 35.5% were men. The majority were aged 19 years (25.7%), followed by 20 years (23.8%), 21 years (14.7%), 22 years (13.8%), 23 years (8.9%), 18 years (5.6%), 24 years (4.0%), and others (3.5%). In regard to education, 36.5% were sophomores, 31.9% freshmen, 22% juniors, and 9.6% seniors. When participants were asked about their frequency of travel experiences within the past 3 years, the majority indicated two to four times (50.6%), followed by five to six times (17.6%), more than 10 times (11.2%), one time (10.8%), seven to eight times (7.7%), and nine to 10 times (2.1%). The latest travel experience that the participants had had was within 1 year, with 26.6% reporting that their most recent traveling experience was within 1 month, 29.9% within 3 months, 19.2% within 6 months, and 24.3% within 1 year.

### Measures

We used validated items from previous tourism and environmental behavior studies (Abdul-Muhmin, 2007; Bamberg & Schmidt, 2003; De Groot & Steg, 2007; Stern et al., 1999).

**Environmental values.** We measured environmental values with four items adopted from De Groot and Steg (2007). A sample item is “Please indicate to what extent the followings are important as a guiding principle in your life: (1) Protecting the environment and preserving nature.” Participants evaluated the items on a 7-point Likert scale ranging from (1) *extremely unimportant* to (7) *extremely important*.

Participants evaluated the items for the other study constructs on a 7-point Likert scale ranging from (1) *extremely disagree* to (7) *extremely agree*.

**Environmental concern.** We evaluated environmental concern with four items from Stern et al. (1999). A sample item is “The balance of nature is very delicate and easily upset.”

**Environmental awareness.** We assessed environmental awareness with three items from Bamberg and Schmidt (2003). A sample item is “Tourists can cause environmental deterioration of the host community such as waste and excessive use of energy/water/fuel.”

**Recycling intention.** We measured recycling intention with two items adopted from Abdul-Muhmin (2007). A sample item is “While I travel, I try to dispose of garbage properly if possible, e.g., sort my garbage into separate containers for paper, plastic, glass, etc.”

**Conservation intention.** To evaluate water/energy/local resources conservation intention, we used two

items from Abdul-Muhmin (2007). A sample item is “While I travel, I try to save water and electricity, e.g., turning off the tap while washing/brushing teeth, turning off the lights if I leave the room for more than 10 minutes, walking up the stairs if only need to go one floor up, and using hotel towels more than once.”

The measures, a description of the study, and personal characteristics questions (e.g., gender, age, income, academic major) comprised the survey questionnaires, which were pretested by tourism academics and industry practitioners. The questionnaire was translated into Korean using a translation-back-translation method. After the questionnaires had been slightly amended, they were finalized through a review of academic experts. We calculated composite reliability and found that the value for each item was greater than .60 (see Table 1), thus supporting the internal consistency of each item (Bagozzi & Yi, 1988).

## Results

### Measurement Model

We conducted a confirmatory factor analysis to generate the five-construct measurement model that demonstrated a satisfactory fit to the data,  $\chi^2 = 152.536$ ,  $df = 78$ ,  $p < .001$ ,  $\chi^2/df = 1.956$ , root mean square error of approximation (RMSEA) = .047, comparative fit index (CFI) = .973, incremental fit index (IFI) = .974, Tucker–Lewis index (TLI) = .964. We used a maximum likelihood estimation procedure to generate the model. All items were significantly loaded to their respective latent factors ( $p < .01$ ). All average variance extracted values were greater than the recommended level of .50 (Fornell & Larcker, 1981). Thus, convergent validity was established, and as these values were also generally higher than between-construct correlations, discriminant validity was supported.

Table 1. *Measurement Model Results and Correlations*

	EV	EC	EA	RI	WELRCI	<i>M</i>	<i>SD</i>	CR	AVE
Environmental values	1.000	–	–	–	–	5.758	0.940	.817	.528
Environmental concern	.301** <sup>a</sup> (.091) <sup>b</sup>	1.000	–	–	–	5.295	0.895	.883	.656
Environmental awareness	.251** (.063)	.432** (.187)	1.000	–	–	5.121	1.041	.855	.663
Recycling intention	.302** (.091)	.284** (.081)	.296** (.088)	1.000	–	5.306	1.080	.719	.563
Conservation intention	.346** (.120)	.286** (.082)	.276** (.076)	.751** (.564)	1.000	5.201	1.111	.684	.520

*Note.* EV = environmental values, EC = environmental concern, EA = environmental awareness, RI = recycling intention, WELRCI = water/energy/local resources conservation intention, CR = composite reliability, AVE = average variance extracted. <sup>a</sup> correlations between constructs, <sup>b</sup> squared correlations.

\*\*  $p < .01$ .

### Structural Model

We conducted structural equation modeling to evaluate the structural model and test the hypotheses, and we used a maximum likelihood estimation method. Our results showed that the model had an acceptable level of fit to the data,  $\chi^2 = 157.987$ ,  $df = 79$ ,  $p < .001$ ,  $\chi^2/df = 2.000$ , RMSEA = .048, CFI = .972, IFI = .972, TLI = .962 (see Table 2). All observed variables were significantly loaded to their respective latent factors ( $p < .01$ ). Three cognitive variables accounted for about 24% and 30.4% of the total variance in young vacationers’ recycling intention and water/energy/local resources conservation intention when traveling, respectively.



Table 2. *Structural Model Results and Hypothesis Testing*

Hypotheses	Links	$\beta$	$t$
Hypothesis 1	EV $\rightarrow$ RI	.230	3.671**
Hypothesis 2	EC $\rightarrow$ RI	.211	2.429*
Hypothesis 3	EA $\rightarrow$ RI	.186	2.473*
Hypothesis 4	EV $\rightarrow$ WELRCI	.321	4.665**
Hypothesis 5	EC $\rightarrow$ WELRCI	.213	2.270*
Hypothesis 6	EA $\rightarrow$ WELRCI	.169	2.074*

Variance explained:

$R^2$  (RI) = .240

$R^2$  (WELRCI) = .304

*Note.* EV = environmental values, EC = environmental concern, EA = environmental awareness, RI = recycling intention, WELRCI = water/energy/local resources conservation intention.

\*  $p < .05$ , \*\*  $p < .01$ .

We assessed the hypothesized influence of cognitive factors on recycling intention. As expected, environmental values, environmental concern, and environmental awareness had a significant positive influence on young vacationers' recycling intention when traveling. Therefore, Hypotheses 1, 2, and 3 were supported. We tested the proposed impact of cognitive variables on water/energy/local resources conservation intention when traveling. Our results showed that environmental values, environmental concern, and environmental awareness significantly positively affected young vacationers' conservation intention. Thus, Hypotheses 4, 5, and 6 were supported.

### Structural Invariance Model

We conducted a metric invariance test to assess the moderating role of gender in our proposed theoretical framework. The 428 responses were split into male ( $n = 152$ ) and female ( $n = 276$ ) groups. A baseline model was calculated by constraining all factor loadings to be equal across gender groups. As shown in Table 3, the baseline model demonstrated a satisfactory fit to the data,  $\chi^2 = 297.154$ ,  $df = 168$ ,  $p < .001$ ,  $\chi^2/df = 1.769$ , RMSEA = .042, CFI = .956, IFI = .956, TLI = .945. We next conducted a comparison between the baseline model and a series of nested models by employing a chi-square difference test.

As the results showed a significant difference in the link from environmental awareness to recycling intention,  $\Delta\chi^2(1) = 4.681$ ,  $p < .05$ , Hypothesis 7c was supported. However, the environmental values–recycling intention,  $\Delta\chi^2(1) = .006$ ,  $p > .05$ , and the environmental concern–recycling intention links,  $\Delta\chi^2(1) = 2.269$ ,  $p > .05$  were not significantly different across gender groups. Therefore, Hypotheses 7a and 7b were not supported. We then tested the gender impact on the relationships between water/energy/local resources conservation intention and its cognitive drivers. As the results showed that there was a significant difference in the link from environmental awareness to conservation intention,  $\Delta\chi^2(1) = 4.276$ ,  $p < .05$ , Hypothesis 7f was supported. However, the paths from environmental value,  $\Delta\chi^2(1) = .362$ ,  $p > .05$ , and environmental concern,  $\Delta\chi^2(1) = .508$ ,  $p > .05$ , to conservation intention were not significantly different between gender groups. Thus, Hypotheses 7d and 7e were not supported. The structural invariance model results are reported in Table 3.

Table 3. *Baseline and Structural Invariance Model Results*

Paths	Men ( <i>n</i> = 152)		Women ( <i>n</i> = 276)		Baseline model (freely estimated)	Nested model (constrained to be equal)
	$\beta$	<i>t</i>	$\beta$	<i>t</i>		
EV → RI	.216	1.935	.199	2.679**	$\chi^2(168) = 297.154$	$\chi^2(169) = 297.160$
EC → RI	.388	2.686**	.111	1.033	$\chi^2(168) = 297.154$	$\chi^2(169) = 299.423$
EA → RI	.077	0.647	.266	2.727**	$\chi^2(168) = 297.154$	$\chi^2(169) = 301.835$
EV → WELRCI	.407	3.213**	.252	3.171**	$\chi^2(168) = 297.154$	$\chi^2(169) = 297.516$
EC → WELRCI	.337	2.074*	.160	1.371	$\chi^2(168) = 297.154$	$\chi^2(169) = 297.662$
EA → WELRCI	.059	0.438	.228	2.184*	$\chi^2(168) = 297.154$	$\chi^2(169) = 301.430$

*Note.* EV = environmental values, EC = environmental concern, EA = environmental awareness, RI = recycling intention, WELRCI = water/energy/local resources conservation intention.

\*  $p < .05$ , \*\*  $p < .01$ .

## Discussion

In this study, we attempted to uncover the individual role of cognitive determinants of sustainable tourism behavior in the formation of young vacationers' recycling intention and water/energy/local resources conservation intention when traveling, and to identify the moderating role of gender. Our empirical results demonstrated the significant role of each cognitive factor in determining each intention for sustainable tourism behavior. In addition, we identified environmental values as the strongest influence of the cognitive factors on sustainable tourism intention. Moreover, our results provide crucial theoretical information that both the environmental values–recycling intention and the environmental values–water/energy/local resources conservation intention relationships are significantly influenced by gender. Overall, our study construct theory was strongly supported. Our proposed theoretical framework also adequately accounted for the total variance in both intentions at a destination. A move toward sustainable tourism undoubtedly necessitates the promotion of young travelers' sustainable behavior, as the tourism industry and destinations face rising environmental threats. Our results should thus help destination marketers comprehend the underlying mechanism that generates young tourists' decision to engage in recycling and diverse natural resources conservation behavior.

As each relationship in our research framework was significant, this indicates that environmental values, concern, and awareness play a vital role in explicating intention, and the adequateness of the three dimensions of cognitive determinants in young vacationers' sustainable tourism behavior was demonstrated. Although Kollmuss and Agyeman (2002) and López-Mosquera, Garcia, and Barrera (2014) found that environmental conservation and sustainable tourism activities are not a priority for young vacationers when traveling, our findings show that young travelers' sustainable behavior can be facilitated through the eliciting of their environmental values, concern, and awareness. To develop a comprehensive robust framework that explicates young vacationers' sustainable behavior when traveling, future destination researchers should examine these cognitive factors. Our results showed that these multiple cognitive drivers are important contributors to the prediction of diverse proenvironmental and prosocial behaviors related to tourism.

Within our conceptual framework, environmental awareness was the most salient factor among study constructs in generating young vacationers' decision to practice recycling and to conduct water/energy/local resources conservation behavior. This finding is in line with previous results in which the criticality of environmental values in explaining individuals' proenvironmental behavior in many contexts is stressed



(e.g., Steg, Bloderdijk et al., 2014; Steg, Perlaviciute et al., 2014). For environmental values to increase, it is essential for individuals to understand the fragility of the environment and the importance of protecting it (Han, 2015). The provision to young individuals of up-to-date information about diverse environmental issues, and news, books, and articles about the criticality of the reduction of environmental threats, will help them learn the importance of sustainable behavior and enhance their perception and belief that it is invaluable to protect the environment, respect the earth, and conserve natural resources to create a brighter future for themselves and future generations.

In this study, we identified environmental awareness and environmental concern as important direct drivers of young vacationers' sustainable decisions. This result is consistent with previous findings in tourism and environmental behavior research (Akehurst et al., 2012; Chan et al., 2014; Mostafa, 2006; Stern et al., 1999). The raising of environmental awareness and concern is crucial to elicit sustainable behavior, and thus tour organizers and destination marketers should inform young individuals, prior to visiting a destination, of the cause and effect problems that harm the environment through travel behavior (e.g., tourists generate a great deal of solid waste on either land or in water at destinations, much of which is composed of products that need to be disposed of).

Our empirical test for metric invariance demonstrated that the relationships between environmental awareness and recycling intention, and between environmental awareness and water/energy/local resources conservation, were significantly influenced by gender. The strength of both relationships was stronger for female vacationers than for male vacationers. These empirical findings imply that, at a similar level of environmental awareness, female, in contrast to male, young vacationers build stronger levels of intention to conduct recycling behavior and to conserve water/energy/local resources when traveling.

From a theoretical point of view, our results provide valuable information that the level of young female vacationers' awareness of harmful consequences when not traveling in a proenvironmental way is consequential in their decision for sustainable tourism whereas young male vacationers' awareness level does not substantially contribute to such a sustainable decision.

From a practical point of view, our empirical results provide useful insights. Destination practitioners and tour organizers should develop different strategies for female and male vacationers to effectively trigger their intention to engage in recycling behavior and water/energy/local resources conservation activities when traveling.

There are several limitations in this study. First, we examined only the direct relationships between cognitive antecedents and environmentally sustainable intention, with no mediating variables. Previous researchers have shown that the relationship between proenvironmental/prosocial behavior and its antecedent(s) is often influenced by mediators such as responsibility and personal norm (Kiatkawsin & Han, 2017; Schwartz, 1994; Stern, 2000; Stern et al., 1999). To extend our findings, future researchers could identify critical potential mediators in young individuals' sustainable tourism behavior and integrate them into the theoretical framework. As our student participants may not, in fact, be generalizable to a wider young vacationer population, future researchers should widen the group of participants to other young tourists.

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