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Research Article

Factors influencing tourists' intention to adopt classified garbage cans in tourism destination

Yue Gong[1], Yan-Ping Guo[1], Shan-Shan Zhai[2], Philip Pong Weng Wong[3], Lei Wang[4,*]

[1] *Faculty of Hospitality and Tourism, Shanxi Vocational College of Tourism, Taiyuan 030001, China*

[2] *Faculty of Art Design, Huanghe Jiaotong University, East campus, Jiaozuo 454950, China*

[3] *School of Hospitality and Service Management, Sunway University, Petaling Jaya 47500, Malaysia*

[4] *Faculty of Hospitality and Tourism, Xuzhou University of Technology, Xuzhou 221018, China*

* Corresponding author: Lei Wang, 1136603668@qq.com

ABSTRACT

Tourists who dispose of their trash properly can reduce the environmental problems caused by careless disposal and improve the effectiveness of recycling reusable things, both of which are essential for the pro-environmental growth of tourist attractions. Therefore, it is critical to classify waste in tourist areas so that travelers can practice pro-environmental activity. Few studies, however, have looked on how tourists feel about adopting classified trash cans in tourist destinations. This study examines the relationship between four types of value (altruistic value, biospheric value, collectivistic value, hedonic value), ecological worldview, three types of images (cognitive image, affective image, overall image) and intention to use classified garbage cans. A total of 407 respondents were collected in Taiyuan Ancient County Town via an online survey. Tests of the proposed hypotheses were conducted using SPSS and AMOS, and results showed that altruistic value, biospheric value and collectivistic value positively influenced ecological worldview, and subsequently, influenced cognitive image and affective image respectively. Affective image influenced overall image, while cognitive image has a significant influence on affective image and on overall image. In addition, hedonic value positively influenced cognitive image, and overall image positively influenced intention to use classified garbage cans. Finally, the theoretical, practical implications and limitations were discussed accordingly.

Keywords: destination image; hedonic value; pro-environmental value; classified garbage cans adopt intention; value-belief-norm theory

1. Introduction

Tourism is frequently referred to as a "smoke-free industry", but as it has grown, serious environmental degradation and sustainability issues have emerged in popular tourist areas[1] many of which are the result of careless tourist behaviour (e.g., littering)[2–4]. Solid waste generation is now acknowledged as one of the most environmentally detrimental outcomes of tourism activities, and the amount of solid waste produced in tourist sites is substantial, ranging from 1 to 12 kilogrammes per visitor per day[5]. Different strategies are used in tourist areas to promote environmentally conscious behaviour among visitors and residents; however, tourists are less likely to act responsibly while on vacation[6,7]. Effective garbage disposal by tourists can both lessen

environmental issues brought on by haphazard garbage disposal (i.e., non-recyclable trash) and increase the efficiency of recycling reusable items (i.e., recyclable trash), both of which are crucial for the pro-environmental development of tourist attractions[8]. Accordingly, it is important to categorise trash in tourist sites so that visitors can engage in pro-environmental behaviour while travelling[9–11]. However, few empirical studies investigate how tourists perceive how different garbage disposal practises affect pro-environmental behaviours in tourist areas.

The destination's environmental image and visitors' support for the area's sustainable development are both correlated with tourists' ecologically friendly behaviour[12,13]. According to Stylos, et al.[14], beliefs, feelings, and impressions, all play a role in the construction of an image in the field of destination marketing. Feelings are also thought to be superior indicators of intentions[15]. Accordingly, a destination's environmental image refers to how visitors observe the environment generally[16]. This impression is linked to how visitors perceive environmental protection and environmentally friendly actions[17]. In particular, the material and appearance of trash cans have a direct impact on how people perceive them. For instance, a square trash can gives people a sense of volume and cleanliness, whereas a cylindrical trash can gives people a sense of stability and delicateness[8,18]. However, there is no empirical evidence to indicate how tourists build an impression of a destination based on categorised trash cans.

The value-belief-norm (VBN) theory has been used in the context of sustainable tourism to explain how visitors make pro-environmental decisions. Personal norms are formed by values and beliefs, and these norms then impact how people behave about the environment[19,20]. But VBN's predictive capacity was inferior to that of other rational theories (e.g., theory of reasoned action, theory of planned behaviour)[21,22]. This might be a result of the basic construct of beliefs (i.e., new ecological paradigm) of VBN, which fails to adequately account for an individual's direct, emotional experience in nature. This construct measures general rather than specific beliefs[22,23].

Stern, et al.[24], on the other hand, emphasized that people who have a strong sense of competition and selfishness are less inclined to engage in pro-environmental behaviour, which is viewed as having egoistic value. Nevertheless, Wang, et al.[25] pointed out that it is inappropriate to apply egoistic values to people who live in Eastern nations (e.g., Japan, Korea, and China) because, in contrast to most Western nations, their regions have deeply ingrained collectivistic values. Because it separates people's inclination for particular behaviours from their level of self-interpretation, collectivism is, in reality, one of the elements influencing pro-environmental behaviour[26]. However, there are not many studies done to investigate how collectivism affects how tourists act in favor of the environment[27]. While the majority of earlier studies on green marketing failed to distinguish between biospheric and altruistic value[21], pro-environmental behaviour is frequently altruistic because it takes into account trade-offs between self-interest and the larger good[26].

Overall, considering promoting locating classified trash cans in tourist destinations would increase tourists' destination image and willingness to engage in pro-environmental behaviours while travelling[8], but rare studies focus on how tourists' perceptions and intentions toward engaging in such pro-environmental behaviours in tourism destination[18]. Besides, although VBN is popularly used in prior environmental-related studies[28,29], however, utilising single VBN theory for exploring consumers green purchase behaviour seems to be ineffective[21,25]. In addition, there was limited information on pro-environmental behaviour in a developing country such as China[30]. Studies exploring influential factors in tourists' green purchase behaviours in tourism destinations while travelling remain limited[31]. Hence, using a comprehensive framework, this study aims to evaluate the values of tourists, the new environmental paradigm, and their perceptions of trash cans in tourist sites.

2. Literature review and research hypotheses

2.1. Theoretical background

According to the VBN, those who agree with a movement's core principles, think that protected areas are in danger, and think that taking actions will assist in restoring those values are obligated to take pro-environmental action[24]. To describe how people behave toward the environment and society, it blends the value theory[32], the norm-activation theory[33,34], and the new environmental paradigm (NEP)[20]. Three different value orientations – egoistic, altruistic, and biospheric are the basis of this theory, which establishes a causal link between values, beliefs, norms, and behaviours. These beliefs—an ecological worldview, awareness of negative consequences, and attribution of responsibility to oneself—lead to personal norms for pro-environmental behaviours[24]. VBN theory is widely used in the study of pro-environmental intention and behaviour of sustainable tourism[2,35]; green hotel visitation[36]; social and cultural background[37,38]; reduction of air pollution in road transport[39] and also applied in risk recognition, consequence awareness and willingness to take responsibility[40].

Besides, this study incorporated the stimulus-organism-response (SOR) framework[41] in the theoretical model. The SOR framework is one of the most popular behavioural frameworks in the area of marketing research[42] which is frequently used to explain the relationship between the stimuli individuals receive, the internal evaluations generated, and the resulting response or behaviour[43]. Accordingly, the stimuli derived from the companies were described as a set of attributes that influences individuals' perceptions[44], and the organism is the intervening internal process between the stimuli and the response of consumers[42], while this process consists of psychological and perceptual feelings, and thinking activities[45]. The response is the outcome or reaction toward the company, which may include psychological reactions such as intention and behaviour[42,45]. Prior studies demonstrated that the SOR framework provides the means to explore the effect of other contextual variables which explain certain environmental behaviours[42,43]. According to Casali, et al.[46], a destination's image is often formed by a tourist's exposure to various information sources and their perceived knowledge and experience of the destination and subsequently leads to stronger consumer purchase behaviour about green products or services[47]. Thus, for the current study, the value components (hedonic value, altruistic value, biospheric value, collectivistic value) were considered as stimuli that elicit the tourists' internal evaluations of the new environmental paradigm, cognitive image, affective image, and overall image as an organism, which can have an impact on their intention to adopt classified garbage cans as the response in tourism destination.

2.2. Values

Value is a desirable trans-situational aim of changing importance, serving as a guiding factor in the life of a person or other social institution[32]. It is an abstract concept that includes broad objects or guiding principles. For equality, freedom, and environmental preservation, for instance, sustainability and equality, which influence people's capacity for decision-making, form their attitudes and direct their participation in key behaviours[48], stabilize over time. According to Homer and Kahle[49], the structure of the value is intricate and frequently consists of several different features that can be employed as values to direct behaviour in various contexts. Personal values have received significant attention from a variety of study disciplines, and their roles as predictors of attitude have frequently been demonstrated[49–52]. Furthermore, values can influence behaviour directly by assisting individuals in prioritizing what is essential to them, or indirectly by providing a foundation for more specific beliefs, norms, and attitudes[23,32].

2.2.1. Altruistic value

According to the VBN model, three different value orientations – egoistic, altruistic, and biospheric may have an impact on general environmental concerns[53]. Those orientations are also essential for structuring sustainable behaviour[54]. Altruistic value refers to individuals who are concerned for the welfare of society and others[55], which is a crucial factor in pro-social behaviour because it reveals how much people care about other people's well-being and how far they would go to safeguard the environment[56]. In contrast, sometimes people's economic self-interest or status can be satisfied through unintentional environmental behaviour[57]. Altruistic-orientated people engage in behaviours that benefit others without expecting anything in return[27]; they act selflessly, as they promote others' welfare at their personal cost[58]. Gu[59] asserts that because altruistic value is more abstract than attitudes and embodies the fundamental traits of adaptability, it might influence customers' green buy attitudes and intention creation[60]. The altruistic value should be viewed as a forerunner of NEP and behaviour[53], while other studies found that altruistic value in tourism has been proven to significantly affect NEP[61,62]. Therefore, the following hypothesis is proposed:

• H1: Altruistic value positively influences ecological worldview.

2.2.2. Biospheric value

Another essential concept for encouraging pro-environmental behaviour is the biospheric value[63]. According to Wang, et al.[21], biospheric value refers to individuals who are concerned about the welfare of the environment itself, which demonstrates how an individual views the values of the natural environment[56] and emphasises environmental welfare[25]. Indeed, biospheric value displays care for nature and the environment without consideration for human needs, and it might be the result of witnessed environmental deterioration or even a genetic propensity to love nature[23]. Although the biospheric value provides significant support for environmental preservation[27], the concept of biospheric value in green marketing is still new and has yet to be empirically tested[25] because most previous studies did not differentiate biospheric value from altruistic value[27]. For example, Sadiq, et al.[64] presented altruistic value as a type of environmental concern that greatly influences one's eco-friendly behaviour. This is consistent with research by Hughner, et al.[65], which found that those with higher levels of biospheric value showed greater care for both plants and animals and were therefore considered to be more pro-environmentalist. According to some studies[55,66], biospheric value influences tourists' NEP toward visiting green hotels positively. In some cases, biospheric value is superior to altruistic value for explaining the formation of pro-environmental attitudes and intentions[63]. Thus, the following hypothesis is proposed:

• H2: Biospheric value positively influences ecological worldview.

2.2.3. Collectivistic value (egoistic value)

The egoistic value system, which is characterized by independence, self-reliance, freedom of choice, and intense competitiveness[25], focuses on optimizing individual results based on self-interests[21]. As a result, egoistic values like self-control, obedience, and family stability tend to have a detrimental impact on pro-environmental behaviours[20]. Because egoistic value is more about personal interests and people who possess egoistic values are more likely to have lower environmental concerns and attitudes than collectivists[67], whereas people with collectivistic consider the expectations of others before expressing their concerns about the environment[68], environmental behaviours that involve forgoing comfort or pleasure go against these values[23].

According to a recent study by Hajiheydari and Delgosha[58], egoistic values should not be used in Eastern nations (e.g., Japan, Korea, and China) because these societies practice highly collectivistic values relative to most Western nations[21,27]. Although earlier studies demonstrated that egoistic values strongly influenced

one's pro-environmental behaviour[64,69], it is unclear whether such findings remain true in more collectivistic nations[25]. In particular, collectivism is a person's fundamental value that motivates them to care more about environmental, social, or ethical issues[70]. Altruistic behaviours that address societal issues like environmental protection frequently call for collective action to yield significant results[71]. As a result, collective values tend to promote environmental awareness[72,73]. Additionally, tourists who are more collectivistic than individualistic tend to have stronger environmental mindsets and pro-environmental behavioural intentions[67,68]. Furthermore, collectivists place the demands and aims of the collective or society before the objectives and requirements of the individual[74]. Therefore, the following hypothesis is proposed:

- H3: Collectivistic value positively influences ecological worldview.

2.2.4. Hedonic value

Hedonic value refers to ecstatic and experience-based pleasure resulting from the complete decision-making process, starting from need recognition to post-purchase behaviour, including product or service consumption[21]. Hedonic value is based on the sensory and emotional components of a person's purchasing behaviour[75] and is one of the constructs utilized in the study of perceived value[76]. According to Holbrook and Hirschman[77], hedonic values are connected to the satisfaction of consumption given by enjoyment, entertainment, fantasy, excitement, and perceptual stimulation. Hedonics is one of the dimensions employed by Zuckerman[78], to quantify the need for sensations, and Carbone and Haeckel[79] noticed that clients often like to feel hedonistic after receiving service. In other words, when customers view shopping as a form of pleasure and shop to feel this pleasure, hedonic value is created throughout the purchasing process. Consumers frequently shop to enjoy the effects of consumption as well as a stimulus for enjoyment and entertainment[75]. Kim, et al.[80] and Ramseook-Munhurrun, et al.[81] found that perceived value, or hedonic value, has a favorable impact on destination image. Accordingly, the following hypothesis is formulated:

- H4: Hedonic value positively affects cognitive image.

2.3. Beliefs (new environmental paradigm)

A belief is an assertion of truth that may or may not be supported by facts[23]. The new ecological paradigm (NEP), or ecological worldview, represents the significance of human-environment interdependent relationships that motivates environmental-specific beliefs and attitudes[63], and is regarded as embodying basic value (i.e., a set of universal beliefs about the relationship between man and nature)[22]. An individual's NEP affects their belief function on awareness of consequences, where they feel that specific circumstances pose hazards to others and that they may take specific actions to prevent unfavorable outcomes[55]. Thus, NEP stands for an individual's increased public involvement with the problems of society or the environment[22], which is also known to reflect an explicit environmental attitude[29]. People who score higher on the NEP scale will be more interested in social, political, and other concerns pertaining to the preservation of the natural environment, as well as offering a variety of potential solutions[82].

Individuals with NEP may engage in a variety of pro-environmental behaviours that may directly influence public policy (e.g., joining an environmental group) or indirectly affect the environment (e.g., creating new environmental protection policies)[22]. Because an individual's explicit environmental attitude is freely available, self-reportable, and measured by common questions, the NEP scale has been utilised in several studies to assess an individual's environmental performance[83]. According to Eid, et al.[84], consumers are very concerned about the green practises used by tourism destinations (e.g., green hotels) because they demonstrate the destination's concern for societal well-being, which in turn helps consumers form a more favourable opinion of these locations[85]. Self-reports, however, are not entirely trustworthy indicators of one's actual pro-environmental behaviour[22], as demonstrated by the possibility that a particular environmental attitude and behaviour analyzed may not relate to the ecological worldview[86]. Therefore, based on above discussion, the following hypotheses are proposed for testing:

- H5: Ecological worldview positively influences cognitive image.
- H6: Ecological worldview positively influences affective image.

2.4. Cognitive image, affective image, and overall image

Image is a construct that is frequently used in marketing and behavioural sciences to reflect people's views of things, objects, behaviours, and events that are motivated by beliefs, sentiments, and impressions[87,88]. Image is viewed as a collection of tourists' impressions, thoughts, expectations, and emotions in the context of tourism marketing[89], forming information fragments pertinent to the destination[90], and is therefore thought to be a good indicator of intention[15].

Khan and Mendes[91] continued to show that the concept of destination image has two dimensions: a perception-cognitive component that captures knowledge and beliefs about the characteristics of the destination, and an emotional component that expresses sentiments toward the destination. Accordingly, the cognitive image is expressed through the sum of beliefs and knowledge reflecting evaluations of the perceived attributes of the destination[92–94]; the affective image is made up of an individual's feelings or emotional responses toward this destination[95]. The total of people's thoughts, concepts, and perceptions about a place is represented by a unified view[96], which is the outcome of both cognitive and affective judgements of a specific destination[88,90,97]. Thus, cognitive and affective images can influence tourists' willingness to return to the destination[93], and as a result, cognitive and affective images are regarded as important dimensions of the overall destination image[96,98].

In addition, Wang, et al.[42] discovered that the conative image, which is connected to future intention and behaviour and depends on the other two components, is the other component of the overall destination image[99]. While Papadimitriou[100] also suggested that cognitive and affective images can shape residents' overall images, which in turn affect their participation in rural tourism activities, Chapuis, et al.[101] and Stylos, et al.[14] found a strong correlation between affective image and overall image. Meanwhile, Stylos, et al.[14] presented holistic image as an explanatory mechanism in the relationship between affective and conative image which affects tourists' intention to visit a destination. Additionally, as emotional responses are a function of cognitive responses[102], the cognitive component of an image has a direct and positive influence on the affective component, which serves as the intermediary variable between the cognitive image and the overall image[42]. Cognitive evaluation needs to take place before the formation of an emotive image since it serves as the foundation for an overall impression of a particular destination[95]. Few studies have actually investigated the relationship between cognitive and affective image[95] despite previous research showing that cognitive image is a key antecedent to the growth of a destination's affective image[42,103]. Thus, the following hypotheses are proposed:

- H7: Cognitive image positively influences overall image.
- H8: Affective image positively influences overall image.
- H9: Cognitive image positively influences affective image.
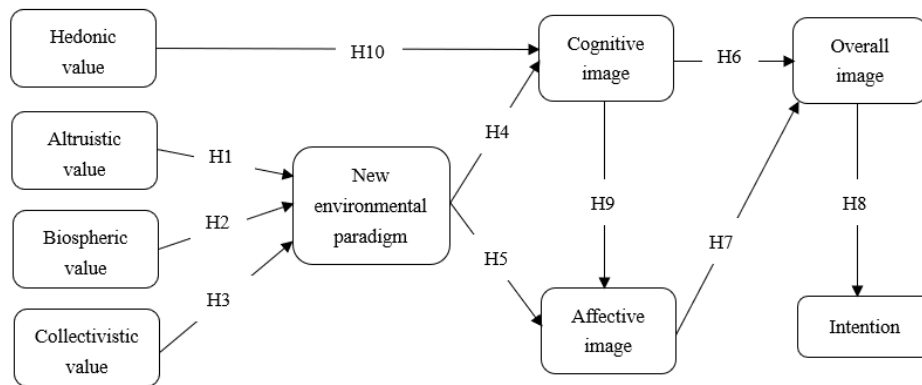- H10: Overall image positively influences intention.

Figure 1. Theoretical research model.

3. Methods

3.1. Data collection

The city in which Taiyuan Ancient Country Town and its surrounding area are located is the centre for the heavy chemical industry and is located in the moderate temperate continental monsoon climate zone. The Taiyuan Ancient Country Town, famous for its traditional and cultural landmarks like Yuhuang Tempe, Wen Temple, Guandi Temple, Chenghuang Temple, and Longen Temple was built beginning in the 14th century, and many of its buildings underwent renovation at the beginning of the 21st century. Because Taiyuan Ancient Country Town is a National Historic and Cultural District, all of its buildings, fittings, and facilities adhere to a traditional cultural design, making it a popular tourist destination in China. Specifically, in contrast to trash cans present in other tourist attractions, all of the garbage cans in this location were created utilising fake antique tile.

A non-probability sampling method was considered for this study due to it is difficult to acquire an accurate sampling frame for social science studies[104]. In addition, this study used a purposive sampling technique, which enables researchers to select respondents based on their own judgement of who will be most beneficial in attaining the objectives of the research[105]. Data were gathered based on two characteristics: 1) geography, which domestic respondents visiting Taiyuan Ancient Country Town in Taiyuan City, Shanxi Province, China; 2) time-based, which respondents selected during the Labor Day holiday in 2023 as most Chinese people would engage in tourism activities during the long-standing Chinese public holiday.

Therefore, a total of 500 questionnaires were issued to respondents (i.e., onsite interception in the front office department, ticket office, and food & beverage department) congregated in Taiyuan Ancient Country Town over the long-standing Chinese public holiday (i.e., Labor Day). A sample size greater than 200 will provide a sufficient margin of error[106], while for structural equation modelling, between 10 and 20 cases per parameter were regarded adequate[107]. Overall, 407 usable responses were gathered for analysis, yielding an 81.4% response rate. To guarantee the reliability and validity of the instrument and guard against potential data quality issues, a pilot test involving 30 respondents was conducted.

3.2. Operationalization

A self-administered, closed-ended questionnaire with validated measuring scales that were modified from earlier studies was utilised as the study instrument. A five-point Likert scale ranging from "strongly disagree" to "strongly agree" was used to back-translate all contents into Chinese. To remove item misunderstandings, green marketing professionals assessed the content validity. Six items belonging to altruistic value were adopted from Rahman and Reynolds[63]; six items belonging to biospheric value were adopted from Wang, et

al.[55]; six items belonging to collectivistic value were adopted from Wang, et al.[27]; four items belong to NEP were adopted from Kiattipoom and Han[35]; four items belong to cognitive image were adapted from Soliman[108]; four items belong to affective image were adapted from Ragab, et al.[109]; four items belong to overall image were adapted from Wang, et al.[42]; three items belong to hedonic value and four items belong to intention to use recyclable garbage cans were adapted from Wang, et al.[21]. The last section includes questions on demographic characteristics (See Appendix A).

3.3. Common method bias (CMB)

Any survey study must consider the CMB[110]. There were certain things done to lessen the threat from the CMB: 1) related experts assessed questionnaire items to ensure respondents' understanding; 2) all respondents were guaranteed confidentiality and privacy with personal information as respondents completed the questionnaires through browsing the online survey questionnaire collection website (i.e., www.wenjuan.com) using a scanned QR code; 3) the measures used multiple scale types, including Likert, bipolar and semantic; 4) Podsakoff, et al.[111] suggest that a latent variable was added to the confirmatory factor analysis model by connecting it to observable factors, and the standardised regression evaluated the new model before comparing it with the original model which showed similar results after comparison; 5) Harman's single factor test showed an exploratory factor analysis with a single factor accumulation of 46.046%, indicating CMB is not a significant issue for this study.

4. Results

The Statistic Package for Social Science version 27 was utilised for the descriptive statistics of the study. Confirmatory factor analysis (CFA) and structural equation modelling (SEM) tests were performed with AMOS to explore and describe the effects of different constructs on tourists' intentions to undertake pro-environmental behaviours in tourism destinations.

4.1. Descriptive analysis

Table 1 shows the demographic characteristics of the respondents. Most of the respondents were female (60.2%), 53.1% were aged between 46–60 years old, 33.4% earned a monthly income between 1701–3000 Chinese yuan, and 42.3% completed their 3-years diploma degree.

Table 1. Sample characteristics (N = 40.7).

Items	Characteristics	Frequency	Percentage (%)
Gender	Male	162	39.8
	Female	245	60.2
Age	Below 18	6	1.5
	18–30	73	17.9
	31–45	80	19.6
	46–60	216	53.1
	Above 61	32	7.9
Monthly income level (Chinese yuan)	Below 1700	36	8.8
	1701–3000	136	33.4
	3001–4500	102	25.1
	4501–6000	101	24.8
	Above 6001	32	7.9
Educational level	Middle school	33	8.1
	High school	133	32.7
	3-years diploma	172	42.3
	4-years bachelor	42	10.3
	Master and above	27	6.6

4.2. Measurement model

In the measurement model, factor loadings should be higher than 0.5, and ideally higher than 0.7[106]. After dropped off low factor loadings (i.e., *AV4*, *AV6*, *BV5*, *BV6*, *CV6*, *AI4*), majority of factor loadings are more than 0.7, except for *AV1* = 0.648, *AV5* = 0.614. Compositive reliability of over 0.7 with the average variance extracted (AVE) of over 0.5 indicates the convergent validity of the measurement model[106]. **Table 2** shows the convergent validity is established. Fornell-Larcker criterion and heterotrait-monotrait ratio of correlations (HTMT) were considered for discriminate validity of the measurement model. Accordingly, the AVE value should be higher than the maximum shared squared variance (MSV) and the average shared squared variance (ASV) and the Maximum H Reliability (Max R(H)) value should be higher than the compositive reliability[107]. Meanwhile, the HTMT value should be less than 0.9[112]. Therefore, discriminate validity was achieved as shown in **Table 3**. Besides, the model fit summary shows that the *CMIN* = 1701.607, *DF* = 524, *P* < 0.001, *CMIN/DF* = 3.247 < 5, *SRMR* = 0.067 < 0.8, *CFI* = 0.918 > 0.9, *PGFI* = 0.664 > 0.5, *PNFI* = 0.78 > 0.5, *PCFI* = 0.808 > 0.5, *IFI* = 0.918 > 0.9, *TLI* = 0.907 > 0.9, *RMSEA* = 0.074 < 0.1, indicating an adequate model fit.

Table 2. Convergent validity and internal reliability.

Construct	Items	Loadings	Compositive reliability	AVE	Cronbach's alpha
Altruistic value	*AV1*	0.648	0.801	0.504	0.787
	AV2	0.757			
	AV3	0.804			
	AV4	Delete			
	AV5	0.614			
	AV6	Delete			
Biospheric value	*BV1*	0.928	0.923	0.750	0.917
	BV2	0.788			
	BV3	0.916			
	BV4	0.824			
	BV5	Delete			
	BV6	Delete			
Collectivistic value	*CV1*	0.877	0.925	0.713	0.922
	CV2	0.885			
	CV3	0.893			
	CV4	0.813			
	CV5	0.743			
	CV6	Delete			
New environmental paradigm	*NEP1*	0.940	0.946	0.813	0.944
	NEP2	0.941			
	NEP3	0.854			
	NEP4	0.867			
Cognitive image	*CI1*	0.914	0.925	0.756	0.920
	CI2	0.900			
	CI3	0.915			
	CI4	0.735			
Affective image	*AI1*	0.814	0.887	0.724	0.877
	AI2	0.883			
	AI3	0.854			
	AI4	Delete			
Overall image	*OI1*	0.899	0.916	0.731	0.910
	OI2	0.888			
	OI3	0.853			
	OI4	0.775			

Table 2. (*Continued*).

Construct	Items	Loadings	Compositive reliability	AVE	Cronbach's alpha
Hedonic value	*HV1*	0.961	0.957	0.545	0.944
	HV2	0.955			
	HV3	0.898			
Intention	Inten1	0.900	0.945	0.690	-
	Inten2	0.910			
	Inten3	0.890			
	Inten4	0.903			

Table 3. Discriminate validity of the measurement model.

Fornell-Larcker criterion analysis

Variable	AVE	MSV	Max R(H)	1	2	3	4	5	6	7	8	9
1. *BV*	0.750	0.426	0.938	0.866	-	-	-	-	-	-	-	-
2. *AV*	0.504	0.438	0.818	0.394***	0.710	-	-	-	-	-	-	-
3. *CV*	0.713	0.505	0.934	0.653***	0.662***	0.844	-	-	-	-	-	-
4. *HV*	0.881	0.545	0.964	0.215***	0.424***	0.318***	0.938	-	-	-	-	-
5. *NEP*	0.813	0.690	0.955	0.601***	0.435***	0.577***	0.575***	0.902	-	-	-	-
6. *CI*	0.756	0.529	0.940	0.333***	0.570***	0.532***	0.458***	0.400***	0.869	-	-	-
7. *AI*	0.724	0.720	0.891	0.392***	0.556***	0.580***	0.496***	0.442***	0.727***	0.851	-	-
8. *OI*	0.731	0.720	0.924	0.499***	0.597***	0.711***	0.562***	0.597***	0.688***	0.848***	0.855	-
9. Inten	0.811	0.690	0.945	0.455	0.476	0.539	0.739	0.830	0.459***	0.531	0.677	0.901

HTMT analysis

Variable	1	2	3	4	5	6	7	8	9
1. *BV*	-	-	-	-	-	-	-	-	-
2. *AV*	0.449	-	-	-	-	-	-	-	-
3. *CV*	0.667	0.691	-	-	-	-	-	-	-
4. *HV*	0.240	0.437	0.334	-	-	-	-	-	-
5. *NEP*	0.621	0.479	0.593	0.602	-	-	-	-	-
6. *CI*	0.415	0.616	0.585	0.477	0.469	-	-	-	-
7. *AI*	0.446	0.591	0.611	0.508	0.490	0.778	-	-	-
8. *OI*	0.529	0.608	0.708	0.579	0.612	0.743	0.870	-	-
9. Inten	0.492	0.501	0.544	0.748	0.861	0.507	0.549	0.680	-

*** denotes $p < 0.001$.

4.3. Structural model

The model fit summary shows an acceptable structural model fit value as *CMIN* = 2475.507, *DF* = 547, *P* < 0.001, *CMIN/DF* = 4.526 < 5, *PGFI* = 0.65 > 0.5, *PNFI* = 0.767 > 0.5, *PCFI* = 0.796 > 0.5, *RMSEA* = 0.093 < 0.1. The results of the structural model conducted as illustrated in **Figure 2** and **Table 4**.
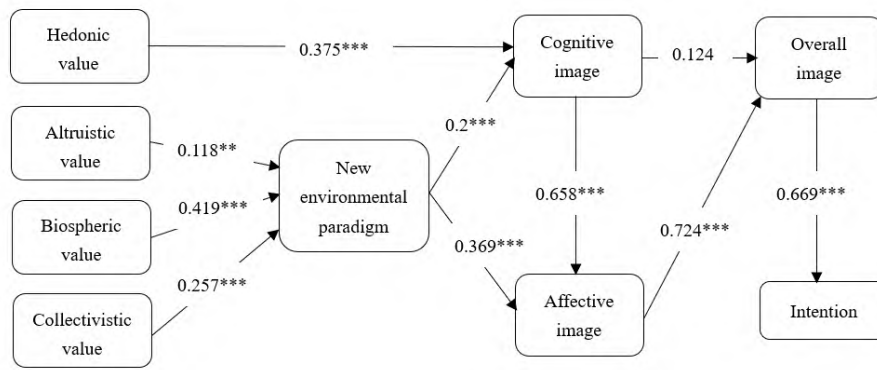
Figure 2. Results of the study.

Table 4. Results of the study.

Hypothesis	Parameter	Estimate	*p*-value	C.R.	S.E.	Decision
H1	Altruistic value > NEP	0.118	0.009	2.600	0.064	Accepted
H2	Biospheric value > NEP	0.419	***	6.992	0.089	Accepted
H3	Collectivistic value > NEP	0.257	***	4.334	0.073	Accepted
H4	Hedonic value > Cognitive image	0.375	***	7.721	0.039	Accepted
H5	NEP > Cognitive image	0.200	***	4.155	0.064	Accepted
H6	NEP > Affective image	0.369	***	8.647	0.047	Accepted
H7	Cognitive image > Overall image	0.124	0.065	1.848	0.053	Rejected
H8	Affective image > Overall image	0.724	***	11.625	0.083	Accepted
H9	Cognitive image > Affective image	0.658	***	12.552	0.044	Accepted
H10	Overall image > Intention	0.669	***	14.138	0.047	Accepted

*** denotes $p < 0.001$.

5. Discussion

The current study examined the relationships between three types of images – cognitive, affective, and overall, and NEP, as well as intention to engage in pro-environmental behaviours (i.e., using garbage cans in tourist areas) with four types of values—Altruistic, biospheric, collectivistic, and hedonic values. Accordingly to Wang and Wong[113], a path coefficient of below 0.1 indicates a slight effect, one of approximately 0.3 indicates a moderate effect, and one of 0.5 or more indicates a substantial effect.

The findings of earlier research indicated that consumers' altruistic values greatly influenced their environmental attitude towards pro-environmental purchase behaviour[64,84]. Our findings confirmed past findings in that altruistic value had a moderately beneficial influence on people's ecological worldview ($\beta = 0.118$, $p < 0.05$). This suggests that visitors who care about the welfare of others are more likely to use designated trash cans in tourism destinations. Thus, H1 is supported. According to Karimi and Mohammadimehr[114], one of the most significant value components that substantially influenced visitors' ecological worldviews in green marketing is biospheric value. The findings of this study demonstrated that tourists' ecological worldview was moderately positively influenced by biospheric value ($\beta = 0.419$, $p < 0.05$). This suggests that environmentally conscious visitors are more inclined to embrace categorized trash cans in tourist destinations. Thus, H2 is accepted.

According to earlier research, in places with a high collectivistic value orientation, collectivistic value has a considerable impact on the ecological worldview in green marketing[21,27]. According to the study's findings, there is a moderately significant link between ecological worldview and collectivistic values ($\beta =$

0.257, $p < 0.05$). This indicates that tourists are more likely to utilise classified trash cans in tourist destinations if their environmentalist objectives are group oriented. Thus, H3 is accepted. Hedonic value, according to several research, has a significant beneficial impact on how people perceive their destination[80,81]. According to the study's findings, tourist's views of the utility of specific goods and services (i.e., cognitive image) were positively influenced by hedonic value ($\beta = 0.375$, $p < 0.05$). The implication is that when tourists believed the garbage cans designs funny, engaging, and entertaining, their opinions of utilizing them in tourist destinations were more favorable. Thus, H4 is accepted.

In line with past studies[84,115] that showed NEP (i.e., ecological worldview) had a significant impact on tourists' perceptions on tourism destination selection. The results of this study demonstrated that NEP had a somewhat beneficial influence on cognitive image ($\beta = 0.2$, $p < 0.05$) and a moderately positive effect on affective image ($\beta = 0.369$, $p < 0.05$). This implies that tourists who had a strong interest in social, political, or other environmental protection-related issues would have positive opinions and impressions of the categorized trash cans at tourist attractions. Thus, H5 and H6 are supported.

According to earlier research[42,46], tourists' cognitive and affective images can be seen as a multidimensional concept of image that positively influenced their overall perception of a particular destination. The results of this study revealed that the cognitive image had no significant effect on the overall image ($\beta = 0.124$, $p > 0.05$), however, affective image had a strong positive influence on it ($\beta = 0.724$, $p < 0.05$). These implications imply that while tourists' perceptions and feelings about a certain destination may have an impact on how they feel about it, they cannot affect how tourists perceive all tourist destinations. Therefore, H7 is rejected and H8 is accepted.

In line with earlier studies that showed the high explanatory power of cognitive image for affective image[103,116], this study showed a positive relationship between cognitive and affective image with a major effect ($\beta = 0.658$, $p < 0.05$). This suggests that their views of and familiarity with various location's designated trash cans affect how they emotionally assess such locations. Thus, H9 is supported. Additionally, the results of this study also corroborated earlier studies' findings that the overall image of a destination is significant predictor of intention to engage in ecological behaviours[42], demonstrating that the overall image favorably influences intention with a major effect ($\beta = 0.669$, $p < 0.05$) to engage in pro-environmental behaviours in tourist destinations. Thus, H10 is accepted.

6. Study implications and limitations

6.1. Theoretical contributions

Few research has looked at tourists' perceptions of categorized garbage cans in tourist areas, even though beneficial rubbish disposal can minimize the environmental harm caused by tourists' behaviour[8]. This study showed that one's altruistic, biospheric, and collectivist beliefs positively influenced one's ecological worldview with regard to garbage disposal based on the design of trash cans in tourist locations. A strong interest in the usage of classified trash cans results in improved environmental protection as a result of tourists' feelings, emotions, and beliefs about a destination. Additionally, tourists' cognitive and affecting images can have a significant impact on how they perceive the many characteristics and qualities of a destination, which may also motivate them to take part in pro-environmental activities when visiting those destinations.

Few studies have made a distinction between biospheric and altruistic values[27], and the egoistic value was developed from the perspective of a Western individual, which emphasizes an individualistic value orientation as opposed to Eastern societies' emphasis on a collectivistic view[21]. Previous studies on the influence of altruistic value on visitors' pro-environmental activities lacks thorough explanatory power.

According to this study, travelers who care about the well-being of others and society, the environment (including plants and animals), and the need to protect the environment for all of society are more likely to express a strong interest in engaging in pro-environmental behaviours in tourist hotspots. The study's conclusions offer a different perspective on the pro-environmental behaviours of Eastern tourists in tourist destinations and useful information about the efficacy of the VBN and SOR model in predicting the effects of pro-environmental principles.

The impact of a destination's green image on tourists' behaviour has not received enough attention in tourism literature[42]. Recent research has hypothesized a direct relationship between cognitive image, affective image, and overall image[116]; however, this study found that only affective image positively influenced overall image, while cognitive image positively influenced affective image, and then on overall image. The results actually showed that affective image entirely mediated the association between cognitive image and overall image. The potential that cognitive image precedes affective image, which in turn can influence the overall image towards pro-environmental activities in tourist destination, should thus be considered in further research.

Lastly, tourists from developing nations have a lower level of understanding of green purchase behaviours than tourists from the most developed Western nations[108,113,117]. As a result, they lack a standard definition and sound foundation used in various fields of green marketing research. The results show that in order to forecast tourists' intentions to engage in pro-environmental behaviours in tourist destinations in developing countries and maintain the model's usefulness, researchers must take into account the multidimensional concept of pro-environmental value beliefs and images.

6.2. Practical implications

This study has some useful implications. Altruistic, biospheric and collectivistic value that positively influenced NEP, were found to shape a tourist's ecological worldview. By encouraging the usage of designated garbage cans, environmental publicity should be a part of a tourist destination's marketing. It is important to spread knowledge about how trash is classified as recyclable or not. Tourists believe that disposing of trash in the proper cans based on its characteristics will show their efforts to lessen the impact of non-recyclable trash on the environment, and that encouraging recycling of trash can demonstrate their concerns about enhancing living conditions and safeguarding the environment. In the meantime, emphasizing the use of designated garbage cans in the destination's promotional messages can be a tactic to persuade visitors to take pro-environmental behaviours, which are required for a destination to reach a more positive overall perception.

According to the findings, NEP had a favorable influence on both cognitive and affective image. Informing visitors that they are seriously misusing the natural resources and that the balance of nature is easily upset is crucial. A reduction in the use of non-recyclable products (e.g., fast-food boxes and plastics) and an increase in the use of more recyclable products (e.g., bottles) should be encouraged in tourist destinations. More importantly, natural resources are limited, positive changes in visitors' behaviours during the tourism journey are significant.

This study showed that affective image greatly influenced overall image alone, whereas cognitive image positively influenced affective image and ultimately overall image. Tourists' perceptions and awareness about classified waste have a big impact on how they feel and act toward those cans, which in turn affects how often they use those cans in tourist destinations. Therefore, labelling the different forms of trash in garbage cans is crucial for tourists since it can help them dispose of trash properly.

Finally, this study demonstrated that visitors' cognitive perception of using categorized garbage cans was favorably impacted by hedonic value. This suggests that if a garbage can's design may be interpreted as amusing and humorous, visitors will utilize it. Traditional garbage cans should be replaced by ones that are

specifically built for tourist sites based on those locations' features. For instance, in this study, which was centered on the Taiyuan Ancient Country Town, the garbage cans were built using copies of historic tiles in an antique style, which is distinct from other garbage cans in other tourist sites. This is because a memorable trash-throwing experience may enhance a tourist site's image as a green destination.

6.3. Limitations of the study

First, Taiyuan Ancient Country Town in Taiyuan City, Shanxi Province, is the sole subject of this study. The results of this study cannot be applied to other tourist spots in other areas. Second, the study suggested that the dependent variable be the intention to use designated garbage cans. Future research should use actual garbage cans used as the dependent variable because actual behaviour is not always consistent with intentions[22]. The majority of respondents in this study (53.1%) were between the ages of 46 and 60. Future green purchase behaviours appear to be more heavily influenced by younger generations[118]. Therefore, it is important to investigate the impact of pro-environmental intentions and behaviour on how young people actual use garbage cans in tourist destinations.

7. Conclusion

One of the resources helping in reducing the damage done to the environment is eco-tourism destinations. The use of classified trash cans promotes a healthy and eco-friendly lifestyle among travelers. However, there has not been enough research done on how tourists feel about using categorized trash cans in tourist destinations, especially in developing country like China. This clearly demonstrates the value-attitude-behaviour gap. This study applied the VBN and SOR frameworks in the context of eco-tourism facilities (i.e., designated trash cans) in tourist destinations in order to fill this gap. The results indicate that a greater ecological worldview is favorably and significantly influenced by altruistic, biospheric, and collectivistic values, and that hedonic value positively and significantly affects the cognition of a travel place. The ecological worldview, or new environmental paradigm, has a beneficia and profound impact on one's cognition and affect. Additionally, cognitive image significantly and favorably influences affective image, which then has an impact on the total image. Finally, cognitive image significantly and positively increases intention to use classified trash cans in tourist destinations. The current study expands the body of knowledge on sustainable tourism marketing by studying factors impacting tourists' propensity to adopt eco-facilities (i.e., classified trash cans) in tourist destinations.

Author contributions

Conceptualization, YG, SSZ and LW; methodology, YG, SSZ and LW; software, YG, SSZ and YPG; validation, YG, PPWW and LW; formal analysis, YG, YPG, and SSZ; investigation, YG, YPG and SSZ; resources, YG, YPG and SSZ; data curation, YG and YPG; writing—original draft preparation, YG and LW; wring—review and editing, PPWW and LW; visualization, YG, PPWW and LW; supervision, PPWW and LW; project administration, YG, YPG and LW. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

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Appendix

Questionnaire items	
Altruistic value	1. I have given directions to a stranger 2. I have given money or donated goods to a charity 3. I have given money to a stranger who needed it (or asked me for it) 4. I have pointed out a clerk's error (in a bank, at the supermarket) in undercharging me for an item (deleted) 5. I have let a neighbor whom I didn't know too well borrow an item of some value to me (e.g., a dish, tools, etc.) 6. I have offered my seat on a bus or train to a stranger who was standing (deleted)
Biospheric value	1. Respecting the earth 2. Unity with nature 3. Protecting the environment 4. Preventing pollution 5. Using classified garbage cans help conserve natural resources (deleted) 6. Using classified garbage cans help decrease pollution (deleted)
Collectivistic value	1. I like to work hard for the accomplishment of foals of my group 2. I like to help others in the time of need 3. I like to maintain ward relationships with others 4. To do well in life, the help of friends is crucial 5. One of the pleasures in life is to be interdependently related to others 6. One of the pleasures of life is to feel part of a large group of people (deleted)
New environmental paradigm	1. The balance of nature is very delicate and easily upset 2. Humans are severely abusing the environment 3. Earth is like a spaceship with limited room and resources 4. We are not doing enough at the moment to protect the environment
Cognitive image	1. Classified garbage cans provide a good quality of life 2. Classified garbage cans provide a clean circumstance 3. Classified garbage cans have a good name and reputation 4. Classified garbage cans are hospitable and friendly
Affective image	Classified garbage cans are: 1. Pleasant tourism destination's service 2. Relaxing tourism destination's service 3. Arousing tourism destination's service 4. exciting tourism destination's service (deleted)
Overall image	1. Using classified garbage cans fit my personality 2. My friends will think highly of me if I use classified garbage cans 3. The image of classified garbage cans is consistent with my own self-image 4. Using classified garbage cans reflects who I am
Hedonic value	I find that using classified garbage cans is: 1. Fun 2. Enjoyable 3. Entertaining
Intention	When travelling, I: 1. am willing to use classified garbage cans 2. plan to use classified garbage cans 3. plan to recommend use classified garbage cans to others 4. will make an effort to use classified garbage cans