

# Encouraging the low-carbon tourism: how perceived value and reference groups affect people's choice?

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**Abstract.** With the growth of environmental awareness, tourists pay more attention to the impact of their consumption behavior on the environment. In this study, a structural equation model of the willingness of post-90s generation to participate in low-carbon tourism is built in view of the perceived value and reference group, and the hypotheses verification are conducted. The results showed that the sentimental value and social value have a significant positive effect on post-90s generation's low-carbon tourism participation willingness, while the significant positive effect of functional value has not been verified in this study. The main reference group (parents, relatives) and the secondary reference group (classmates, friends) have a significant positive effect on post-90s generation's willingness to participate in low-carbon tourism, and the effect of the secondary reference group is greater than that of the main reference group. It is also suggested that with the active participation of post-90s generation, the newly emerged customers, the low-carbon activities can be promoted effectively. It is important to promote the perceived quality and expected performance and reduce the short-term and long-term perceived cost among post-90s generation, and to improve their willingness to participate low-carbon tourism by making full use of the role of classmates or friends.

**Key words.** Perceived value Reference group Participation willingness Low-Carbon tourism Measurement and simulation path.

## 1. Introduction

As an important component of the service industry, tourism plays a significant role in prompting the development of low-carbon economy. During the production and consumption process of food, housing, travel, transportation, shopping and en-

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tainment, the carbon emissions of tourism, along with the global warming getting worse, have aggravated the problems like unusual climate changes, sea level rising, and species decreasing, and attracted attention globally. Therefore, prompting and supporting the development of low-carbon economy and energy industry are on the top of the government agenda and has raised increasingly attention. Nowadays, low-carbon economy, which has become the new type of sustainable development of tourism, is growing up all over the world. However, to make the tourism an industry that serves customers in a true sense, it has to stand at customer's perspective, explore their real need and explore what kind of factors will influence people's participating behavior of low-carbon consumption.

At present, the studying situation of low-carbon tourism is still in the early age of China. It attempts to explore the solution by using micro qualitative study methods and, instead of considering from the consumers' perspective; it pays high attention to that of government and tourism. Consumers' satisfaction of service experiences is ignored and quantitative methods are insufficient. While it is beneficent for government to study tourists' low-carbon tourism intention when it comes to understanding their demand requirement of it, predicting their low-carbon tourism behavior, and providing evidence in formulating rational low-carbon tourism systems and design low-carbon tourism products scientifically. Post-90s, the bellwethers of social trends and consumption fashion, are new consumption power and alter consumption structure simultaneously. This research, therefore, focuses on factors that influence post-90s low-carbon tourism choice, which makes significant sense in prompting low-carbon tourism across the country.

## 2. Literature review and hypothesis development

### 2.1. *Post-90s and low-carbon consumption*

College post-90s students are the main consumption stream, for the cultural environment of campus they are in and the high education they've received. Environment make them a specific consumption generation that tends to consume rationally, pay more attention to the quality and think independently. Perceived quality is one of the recessive factors for post-90s to decide whether to purchase or not. Besides, in their consumption notions, not only will they consider the quantity and quality of products and services, but involve symbolic meanings of that, which means that they value both the practicability as well as the symbolism of products through which they can show their unique identities. At this level, low-carbon tourism caters to their desire for novelty and individualism. However, just because they have strong self-concept and thirst for freshness doesn't mean that they won't be affected by external factors. Living in China, a typical country dominated by collectivism culture, mob mentality and individualization penetrate people's social life including consumption. On the one hand, as the young generation, post-90s generations attempt to show their unique identity by purchasing unique items. According to the William McGuire and Alice Padawer-Singer's (1978) distinctiveness hypothesis, they identify what makes them unique in each particular context, and will highlight that in their

self-definition. While on the other hand, they want to be accepted by various groups they are in, because of their self-esteem, which is an internal, subjective index or marker of the extent to which we are held in high regard by others and hence be likely to be included or excluded by them (Leary, Tambor, Terdal & Downs, 1995), and they have the need to belong and thus gain safety evolutionary based. Therefore, reference group, which they are afraid of being rejected by, is a cardinal factor in people's consumption behavior.

According to Chen (2010), low-carbon consumption is a symbiotic consumption type that help to solve relevant problems caused by human activities. Fundamentally, low-carbon consumption is a series of consumption activities including selecting, purchasing and using process. Liu (2008) demonstrates that low-carbon consumption is an abstemious consumption choice, and people who adopt this usually prefer eco-products in order to cut carbon emissions in their daily life, and therefore form the sustainable consumption habit. Chen (2010) gives the definition of low-carbon consumption from two phases: products selection and consumption. When select products, consumers choose the eco-products and reject the high-carbon ones. And in the consumption process, they are careful about emission treatment. Wang (2011) describes the low-carbon consumption as a pattern that consumers 'give up the traditional consumption custom and consume in a sustainable and environment friendly way. Although those scholars are various from each other in the way of describing the definition of low-carbon consumption, they all point in a same direction, that is low-carbon consumption is a new type consumption. It advocates an environment friendly, sustainable and a high quality living way.

About the low-carbon tourism study, Huang (2008) suggests that it is a way to reduce carbon emission. Further, it contributes to the protection of local nature and cultural environment including animal, plant and other resources. Liu (2009) demonstrates that, based on eco-consumption, low-carbon tourism demands environment friendly consumption throughout the whole journey as well as the consumption process of food, housing, transportation, travel, shopping and entertainment in order to save the energy and protect the environment, which resonates with Zhang (2010). Cai and Wang (2010) indicate that low-carbon tourism is a sustainable development way, which can increase customer service satisfaction and prompt eco-tourism in a larger range with the help of low-carbon technology. In conclusion, low-carbon tourism guarantees the high quality of travel experience and services, besides, it strengthens the protection of environment.

According to the low-carbon tourism behavior study, Zhou (2010) regards this behavior shows tourists' consumption features in deciding when, where, why and how to travel, as well as the relevant traveling concepts, benefits and demand characteristics. And its object is tourists or people intend to travel around. Susanne (2013) declares the fact through his research that tourists' behavior during the journey, for example, their transportation way, housing condition and restaurants level, ect., can influence the amount of carbon emission directivity. Through the practical research in New Zealand, he finds that international tourists caused 4 times amount of carbon emission as much as that of domestic tourists and transportation is the main factors. When it comes to transportation, private cars, Tzu-Ping (2010) votes

after analyzing 5 national park, is the worst culprit.

## *2.2. Perceived value*

Zeithaml (1988) points out that different from quality and price which are just one of the standards in evaluating products and services, consumers' perceived value is based on the perception of paying and getting process, and analyzed from the value comparison angle and therefore is more comprehensive. Sheth (1991) describes consumers' general consumption value by functional, emotional, social, knowledgeable and conditional value. Mazumdar (1993) indicates that consumers make their decision after weighting the potential cost and interest, which is the evaluation result of perceived value, and is the conclusive factor of consumption behavior. Through the empirical study of retail durable goods, Sweeney and Soutar (2001) put forward that perceived value is a multidimensional variable that includes 4 dimensions, that is emotional value, quality value, social value and price value. Yang and Wang (2002) demonstrate that perceived sacrifice, which is the consumers' perception of cost when they purchase and utilize products and services, exists in perceived value, based on which, they build the model of consumer perceived value that constitute by functional clue, perceived sacrifice, social value and emotional value. And with Fan and Luo (2003)'s definition, consumers' perceived value includes three dimensions. They are emotional value, functional value (quality, function, and price) and social value. This research conceptualizes the perceived value of low-carbon tourism based on perceived sacrifice and benefit theory, indicating that tourists tend to compare their cost in participating the low-carbon tourism with the perceived value they can receive from the products and services, and therefore, acquire the overall assessment about perceived consumption utility, besides, evaluate their perceived value of low-carbon tourism from dimensions of emotional value, functional value and social value and hypothesizes the following:

**H1:** There is a prominent positive relationship between perceived value and the low-carbon participation.

**H1a:** There is a prominent positive relationship between emotional value and the low-carbon participation.

**H1b:** There is a prominent positive relationship between functional value and the low-carbon participation.

**H1c:** There is a prominent positive relationship between social value and the low-carbon participation.

## *2.3. Reference group*

A group is a collection of individuals who have relations to one another that make them interdependent to some significant degree (Cartwright & Zander, 1968). Individuals attune their attitude, behavior, opinions, preferences and value to those of their reference groups. And usually, parents, relatives, friends and colleagues are the reference groups whose value leads the individual to form consumption and participation willingness and decisions. Our attributions of social behavior are shaped

by our relationships: as people become close to us, we tend to make similar attributions for their behaviors as we do for our own (Fincham & Bradbury,1993). Hyman (1942) observed consumers' tendency in choosing their reference group when shopping, and concluded that one's psychology emotion and behavior intention will be influenced by reference groups whether he or she is a member of that group or not. By study different types of consumers (housewife and students), Park and Lessing (1977) point out that reference group relates to consumers' individual evaluation, expectation and behavior, and is the basis for people to make their consumption decision whether it is real or imagined. And his theory resonates with Moutinho's (1987). He was studying tourist's consumption behavior, indicated the reference group, real or imagined, can be either a person or a group that would influence individual's faith, attitude and decision. Bearden and Etzel (1982) conceptualize reference group as a group or an individual that has great impact on one's individual behavior according to their study about the influence reference group has on consumers 'decision-making towards products and brands. Tourists' participation behavior is significant influenced by their relatives, friends and colleagues that traveling with them (Gitelson and Deborah, 2001). Relationships serve as important categories for how we process and store social information (Fiske,1991b; Sedikides, Olsen, &Reis,1993). Rajeev (2001) and other scholars defined reference group in the study of the sensitive relation between value and normative influence, describe it as the standard group for individual's self-assessment and the ground for one to form his or her attitude and principles. Escalas and Bettman(2003), in the research of the impact reference group has on the connection between customers and brands, regards reference group as the a standard that consumers tend to compare themselves with, and therefore form their own attitude and behavior. This research focuses on information influence, which means tourist turn to their parents, classmates, friends and relatives for more information when they are uncertain about whether to participate in the low-carbon tourism or not. In summary, the extant literature leads us to hypothesize the following:

**H2:** There is a positive relationship between reference group and the low-carbon participation.

**H2a:** There is a positive relationship between the main reference group and the low-carbon participation.

**H2b:** There is a positive relationship between the secondary reference group and the low-carbon participation.

This research builds the framework based on the literature and hypotheses described above. See Fig. 1.

### 3. Study design

#### *3.1. Data resource and sample features*

This study designed questionnaire to test hypotheses. The questionnaire includes four parts: demography relevant research, perceived value research, reference group and low-carbon tourism participation willingness. All questions are tested to be

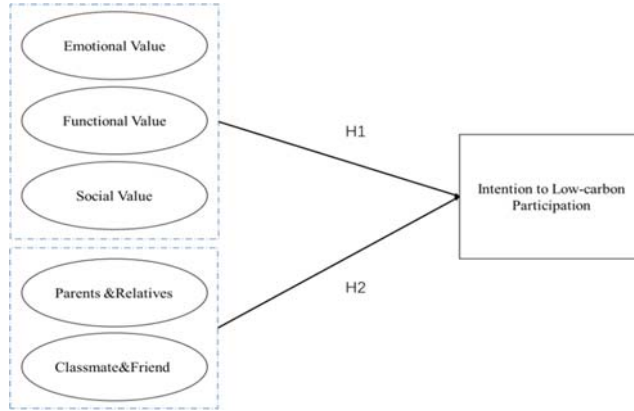


Fig. 1. Conceptual model

valid and reliable by advanced literature. Our survey was conducted in AUST, participated by post-90 students. Finally, there were 395 useable responses, see Table1. This study analyzed those data using SPSS18.0 and AMOS8.0, and mainly tested the reliability and validity, factors, models fitting degree, and path analysis.

Table 1. Sample basic information

items	category	Number	percentage%	Items	category	Number	percentage%
gender	Male	226	62	Major	SEM	71	20
	Female	139	48		SEE	32	9
grade	Freshman	112	31		SCA	41	11
	Sophomore	94	26		SCE	45	12
	Junior	92	25		SFL	68	19
	Senior	46	13		SME	52	14
	Postgraduate and above	21	5	SHS	56	15	

SEM: School of Economics and Management; SEE: School of Earth and Environment; SCA: School of Civil Engineering and Architecture; SCE: School of Chemical Engineering; SFL: School of Foreign Languages; SME: School of Materials Engineering; SHS: School of Humanities and Social Sciences.

### 3.2. Reliability and validity

This study test variables learning from the present maturity scale. There are 3 emotional value questions, 4 functional value questions in the perceived value item, and 5 main reference group questions, 4 secondary reference group questions in the reference group item, and all are measured with 7 point likert scale, and the result are provided in Table 2. Because the average Cronbach alpha of each variable is above 0.80, the consistency of them is proved to be good.

Table 2. Variable reliability test

variable name		Indicators	Cronbach a
perceived value	emotional value	3	0.846
	functional value	4	0.814
	social value	4	0.902
reference group	main reference group	5	0.897
	secondary reference group	4	0.921
willingness to participate	willingness to participate	5	0.839

The validity test uses the principal component analysis to analyze each measured variables, and presents that KMO value is 0.823, larger than 0.8, and in the Bartlette sphericity test, the value of P is extremely reaches 0.000, obviously demonstrate that there are structural and relevant relationship among the original variables, which meets the requirement of factor analysis. This study then conducts, delete factors whose Eigen-values are less than 0.6, and analyze factors using the Varimax method of orthogonal rotation. The results are presented in Table 3.

Table 3. Adjusted principal component factor load

Measurement items	Load factor	Measurement items	Load factor	Measurement items	Load factor
emotional value1	0.765	social value3	0.784	secondary reference group2	0.875
emotional value2	0.802	social value4	0.702	secondary reference group3	0.812
emotional value3	0.724	main reference group1	0.773	secondary reference group4	0.734
functional value1	0.692	main reference group2	0.692	willingness to participate1	0.756
functional value2	0.732	main reference group3	0.816	willingness to participate2	0.682
functional value3	0.824	main reference group4	0.824	willingness to participate3	0.816
functional value4	0.743	main reference group5	0.748	willingness to participate4	0.779
social value1	0.802	secondary reference group1	0.702	willingness to participate5	0.804
social value2	0.862				

### *3.3. Verification of hypotheses and the model goodness of fit*

The objective of verifying the goodness of fit is to measure the agreement between hypotheses model and the actual observation, which, if fails to achieve the expectation may implicit that there are problems exist in the model, and we have to modify it to reach the ideal fitness standard. The index of the goodness of fit

include RMSEA, GFI, AGFI, CFI, NFI ect. The fitness is tested to be acceptable in our research. See Table 4,

Table 4. Fitness of the model

Chi-square	x/df	RMSEA	GFI	AGFI	CFI	NFI	P
24.32	2.263	0.035	0.984	0.923	0.980	0.936	0.000

Based on the testing result, C.R.T value of five hypotheses are proved to reach the standard of  $P < 0.5$ . And the research shows that, except the functional value which doesn't show obvious impact on tourists' low-carbon participation willingness, all other four factors: emotional value, social value, the main and secondary reference groups show strong positive relationships with it. The result is presented in Table 5.

Table 5. Hypothetical test

Hypothesis	Path	Estimate	S.E	C.R.	P	Results
H1a	emotional value- willingness to participate	3.41	0.41	8.12	0.00	Supported
H1b	functional value- willingness to participate	2.17	2.02	1.07	0.65	Not- Supported
H1c	social value- willingness to participate	5.31	0.93	5.63	0.10	Supported
H2a	main reference group- willingness to participate	4.12	4.16	0.99	0.22	Supported
H2b	secondary reference group- willingness to participate	3.78	0.8	4.67	0.00	Supported

## 4. Conclusion

### 4.1. General discussion

Based on previous literature and experiment results, this research targets at Chinese post-90s who are participate or will to participate in the low-carbon tourism, and through analyzing the statistics collected by questionnaire responses, figures out that their perceived value mainly includes perceived emotional value, perceived functional value and perceived social value, and there are the main (parents and relatives) and the secondary (friends) reference groups respectively. Besides, different dimensions of perceived value have different impact on post-90s tourists' willingness in participating the low-carbon tourism. Furthermore, the emotional value and social value exert a strong and positive influence on it while the functional value shows a weak relationship with that. Numerous experiments have demonstrated that people are particularly drawn to comparisons with others roughly similar to themselves (Kruglanski & Maysel, 1990; Suls, Martin, & Wheeler, 2002; Suls &



Wheeler,2000). And this research also proves though that both the main and the secondary reference groups have positive effect on the participation willingness, particularly, the secondary group that is constituted mainly by peers has much stronger influence to that than the main group that mainly includes elderships. Thus, for post-90s, their peers and campus environment have more obvious influence to them in deciding whether to participate in the eco-tourism. In summary, perceived value, the internal factor, includes emotional value and social value, has a much stronger impact on College post-90s's low-carbon tourism participation behavior, but at the same time, reference group, the external factor, also affects it to a certain extend.

In conclusion, companies should realize that, post-90s, a consumer group that has the consumption ability as well as great potential, and it is beneficial to understand their consumption psychology, adopt business strategies that comply with them, satisfy their rational demands, and thus grow stronger in the fierce competition.

#### *4.2. Limitation and future study*

The theory framework of this research originates from the perceived value and reference group theory, and explores factors that will influence people's participation willingness through theory analyzing and structural equation model. However, there are scholars concluded in the previous studies that tourists' participation willingness is connected with multifactor. Markus and Kitayama (1991) have offered far reaching theories about how cultures vary in the social selves they encourage and how these different conceptions of the self-shape the emotions we feel, the motivations that drives us, and our ways of preceding the social world. Besides, different characters and traits, economy conditions and some other unproven factors can also have a great influence on it. In addition, this research aims at post-90 generations, though, as proved before, their behavior responses to external factors under certain conditions, involve different people from all walks of life can definitely help to apply the result of this research all over this country. Thus, future studies could be extending to a more comprehensive context in which multiple theory and model dimensions are evoked, explore the external and internal factors in a deeper way, and dig into factors that lead to the development of low-carbon tourism participation willingness and behavioral intentions.

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