



## Measurement and Verification of the Three-Dimensional Structure of Green Consumption Experience: A Case Study of New Energy Vehicles

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### Introduction

The proposal of the “dual carbon” goal and the arrival of the experience economy have pointed out the direction for China’s green consumption. Green consumption not only carries practical value, but also is endowed with symbolic significance. Therefore, this paper focuses on the customer group with green consumption experience of new energy vehicles, and explores the composition of green consumption experience from three dimensions: functional experience, affective experience and social experience. This study uses literature review method, in-depth interview method, questionnaire analysis method and takes new energy vehicles as an example to define the green consumption experience. The reliability analysis, validity analysis and confirmatory factor analysis are conducted using SPSS27.0 and LISREL 8.70. The research results show that green consumption experience has a three-dimensional structural characteristic including functional experience, affective experience and social experience, and that its 12 measurement items have high reliability and validity.

### The Concept of Green Consumption Experience

Green consumption experience is defined as the overall process of consumers’ functional cognition, affective feeling and social evaluation of green products, which includes three dimensions: functional experience, affective experience and social experience.

### Scale Item Design of Green Consumption Experience

This paper refers to the existing measurement items of scholars and modifies and improves the items in combination with the actual consumption scenarios of green products such as new energy vehicles. It is believed that the green consumption experience measurement scales include Functional Experience Scale, Affective Experience Scale and Social Experience Scale on the basis of related literature. The specific measurement items are shown in Table 1.

Table 1. Measurement items of green consumption experience in the pre-investigation

Variable	Initial dimension	Item coding	Measurement items
Green consumption experience	Functional experience	Q1/fe1	The new energy vehicle has good performance, safety and reliability.
		Q2/fe2	The new energy vehicle is easy to operate.
		Q3/fe3	The interior of the new energy vehicle is reasonable and comfortable.
		Q4/fe4	The driving range of the new energy vehicle batteries can meet daily needs.
		Q5/fe5	The appearance of the new energy vehicle is fashionable and novel.
	Affective experience	Q6/ae1	The new energy car is friendly to the environment and consumers, which makes me like it.
		Q7/ae2	When experiencing and using the new energy vehicle, it brings me many aspects of fun and happiness.
		Q8/ae3	The new energy vehicle is energy saving and environmentally friendly, which makes me feel comfortable when buying and using it.
		Q9/ae4	I am excited to experience and use the new energy vehicle.
		Q10/ae5	When experiencing and using the new energy vehicle, I feel positive and happy.
	Social experience	Q11/ae6	When experiencing and using the new energy vehicle, I feel satisfied with myself through my internal self-evaluation.
		Q12/se1	Using and buying the new energy vehicle will make me have a good social image.
		Q13/se2	Using and buying the new energy vehicle will make it easier for me to get social recognition.
		Q14/se3	Using and buying the new energy vehicle helps to improve my impression in the minds of others.
		Q15/se4	Using and buying the new energy vehicle can better show my status.

### Data Analysis

After removing the three items (Q4/fe4, Q10/ae5 and Q11/ae6), the reliability of the pre-investigation questionnaire will be significantly enhanced, and the internal consistency of the measurement scale will be improved and more reliable. The formal investigation questionnaire is divided into 12 measurement items on green consumption experience, the collection of the questionnaires is completed through the Credamo platform, and a total of 450 questionnaires are collected. After the questionnaires are examined, 420 valid questionnaires are obtained after excluding 30 questionnaires such as short filling time, long filling time and regular answers, and the questionnaire recovery rate is 93.3%. In the study, LISREL 8.70 will be used to conduct first-order and second-order confirmatory factor analysis for the 12-item scale, and further test the factor structure of the scale. Finally, functional experience (fe) includes fe1, fe2, fe3 and fe4. Affective experience (ae) includes ae1, ae2, ae3 and ae4. Social experience (se) includes se1, se2, se3 and se4.

Reliability analysis results in the formal investigation

Variable	Dimension	Item coding	CITC	Cronbach's $\alpha$ value after deleting this item	Cronbach's $\alpha$ value
GCE	FE	FE1	0.585	0.726	0.778
		FE2	0.606	0.712	
		FE3	0.620	0.707	
		FE4	0.534	0.755	
	AE	AE1	0.412	0.753	0.747
		AE2	0.613	0.651	
		AE3	0.587	0.663	
		AE4	0.573	0.675	
	SE	SE1	0.565	0.744	0.784
		SE2	0.582	0.736	
		SE3	0.590	0.732	
		SE4	0.627	0.713	

## Data Analysis

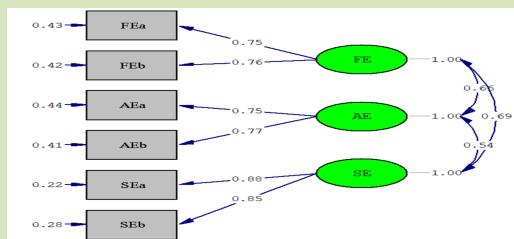
Exploratory factor analysis results of green consumption experience in the formal investigation

Variable	Item coding	Factor loading		
		1	2	3
GCE	FE1	<b>0.740</b>	0.177	0.214
	FE2	<b>0.756</b>	0.191	0.148
	FE3	<b>0.748</b>	0.220	0.176
	FE4	<b>0.666</b>	0.207	0.172
	AE1	0.101	0.183	<b>0.595</b>
	AE2	0.177	0.167	<b>0.772</b>
	AE3	0.287	0.108	<b>0.724</b>
	AE4	0.134	0.110	<b>0.778</b>
	SE1	0.148	<b>0.772</b>	0.099
	SE2	0.229	<b>0.677</b>	0.235
	SE3	0.149	<b>0.772</b>	0.151
	SE4	0.350	<b>0.693</b>	0.157

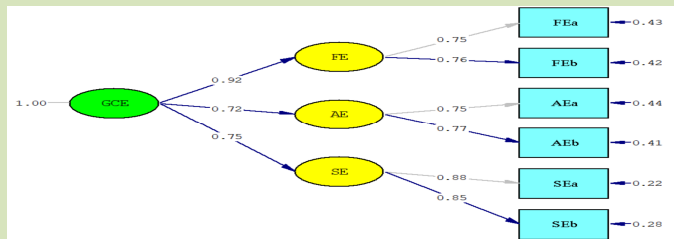
Item packing method in the formal investigation

Research variable	Sub-indicator	Including items
Functional experience (FE)	FEa	FE1, FE2
	FEb	FE3, FE4
Affective experience (AE)	AEa	AE1, AE2
	AEb	AE3, AE4
Social Experience (SE)	SEa	SE1, SE4
	SEb	SE2, SE3

The results of first-order confirmatory factor analysis in the formal investigation



The results of second-order confirmatory factor analysis in the formal investigation



## Data Analysis

The results of convergent validity in the formal investigation

variable	Sub-indicator	Factor loading	CR	AVE
GCE	FEa	0.750	0.726	0.570
	FEb	0.760		
	AEa	0.750	0.732	0.578
	AEb	0.770		
	SEa	0.880	0.856	0.749
	SEb	0.850		

The results of discriminant validity in the formal investigation

Dimension	Mean value	Standard deviation	FE	AE	SE
FE	4.071	0.681	<b>0.755</b>		
AE	3.952	0.691	0.660	<b>0.760</b>	
SE	4.080	0.669	0.690	0.540	<b>0.865</b>

## Conclusion

The study takes the customer group with green consumption experience of new energy vehicles as the survey object, and develops a green consumption experience measurement scale including three dimensions and 12 measurement items. The study initially divides green consumption experience into three dimensions: functional experience, affective experience and social experience. At the same time, reliability analysis, validity analysis and confirmatory factor analysis are carried out on the scale, and it is finally concluded that functional experience, affective experience and social experience are the first-order factors of high-order factor (green consumption experience). It shows that functional experience, affective experience and social experience are the three dimensions of green consumption experience.

The study only selects a certain number of customers with green consumption experience of new energy vehicles as the survey objects, but the coverage and representativeness of the samples still need to be improved. Future research can further expand the industry and sample scope to cover more industries and more customer groups, so as to improve the universality and applicability of research results. When measuring the research variables of green consumption experience, only questionnaire survey is used in the study. Future research can explore the use of more objective and multi-dimensional measurement methods, such as behavioral data analysis, and social media analysis, to improve the accuracy and reliability of measurement.