Analysis of Purchasing Intention of Green Home Decoration Materials Based on Extended Theory of Planned Behavior

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Abstract. Due to the increasingly serious environmental problems caused by global warming, green consumption is widely respected as an environmentally friendly consumption behavior. This study aims to use the Theory of Planned Behavior (TPB) as the basic framework and extend this model through introducing 4 variables to explore the factors that influence Chinese consumers' purchase intention for green home decoration materials. The results of this model show that consumer attitudes, subjective norms and perceived behavioral control have a significant positive impact on consumers' purchasing intention. Furthermore, our results show that environmental concern has a significant positive impact on consumer attitude, perceived behavioral control, and purchasing intention, but the impact on subjective norm is not significant. There is no significant correlation between consumers' environmental knowledge and purchasing intention. However, environmental knowledge can have an indirect impact on purchasing intention by affecting attitude and perceived behavioral control. Consumers' perceived usefulness of green home decoration materials is also significantly positively related to their purchasing intention. Consumers' product image could also impact the purchasing intention indirectly through purchasing attitude. The results of this study will help improve the understanding of purchasing intention for green home decoration materials and may help encourage the consumption of green home decoration materials.

Keywords: Purchasing intention, Extended TPB, SEM, Green Home Decoration materials

1 Introduction

With the emergence of global climate warming, the increase in extreme weather, and the frequent occurrence of major natural disasters, the earth's ecosystem and human social and economic activities are under great threat. These impacts prompt consumers begin to pay attention to the environmental problems they face[1]. Due to increasingly stringent environmental regulations and pressure, green consumption has also received increasing attention from corporate decision-makers.

For China, with the rapid economic growth and the marketization of real estate, China's construction industry has developed rapidly since 1978. To achieve carbon neutrality before 2060,

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China is facing enormous pressure to reduce carbon emission [2]. As one of the most important parts of urban development, the construction industry consumes a large amount of resource and produces greenhouse gases. Therefore, it plays an important role in China's sustainable development[3].

For individual consumers, when consumers realize that green products can help solve environmental problems and the products can meet consumers' needs for safety, quality, functionality, and ease of use, they will consider purchasing green products. But considering the Chinese market, most urban residents mainly purchase completed houses from real estate developers. Hence consumers have little involvement in the choice of building materials. But consumers are involved in almost the entire process of home decoration. Consumers can choose the home decoration materials used even if they hire a full-service decoration company.

The main purpose of this study is to explain the factors that influence the purchasing intention of green home decoration materials, and the relationship between these factors. To achieve this purpose, this study uses Ajzen's Theory of Planned Behavior (TPB) model as a framework. Based on the work of Maichum and his team[4], we introduced environmental knowledge and environmental concern into the model to measure the impact to purchasing intention from customers' environmental awareness. This study also introduces the perceived usefulness, and product image to measure consumers' evaluation of green home decoration materials in multiple dimensions and its impact on purchasing intention.

2 Literature review and hypothesis

2.1 Theory of planned behavior

Human behavior is often considered complex and difficult to explain. Ajzen's Theory of Planned Behavior (TPB) is currently the most widely accepted and practical model for understanding human behavior. This theory believes that attitudes, subjective norm, and perceived behavioral control work together to influence an individual's willingness and decision-making for specific behaviors and can effectively and extensively test personal intentions and behavioral motivations[5]. TPB is an extension of the Theory of Reasoned Action (TRA). Compared with TRA, it adds Perceived Behavioral Control (PBC)[6]. This variable is used to measure actors' perceived control over their actions and the influence on their intentions and actions.

2.2 The extension of TPB and its Components

Maichum et al.'s work shows that the previous use of the TPB model to consider the motivation for purchasing green products ignored the impact of environmental concern and environmental knowledge[4]. The neglected two factors are proven to have a significant impact on the green product purchasing intention[7][8]. Adequate environmental knowledge has also proven to be a prerequisite for consumers to comprehend the interaction between products and the natural environment. Ohtomo and Hirose's research demonstrates that a lack of knowledge about green products among consumers can lead to an attitude-behavior gap. This gap manifests as a discrepancy between consumers' environmental concerns and their actual purchasing behaviors, which can significantly influence their purchase intentions[9]. Therefore, Maichum et al. integrated environmental concern and knowledge into the TPB model framework to obtain the

extension of theory of planned behavior model (ETPB) for green product purchasing intention and it could consider the impact of consumers' green background on their green purchasing intention effectively and accurately [4]. The framework of this research model is shown in **Fig. 1**.

Attitude towards Purchasing Green Home Decoration Materials (ATT)

Attitude can be viewed as the cognitive interplay between a specific object and an overall assessment of that object, which can be used as a revelation and display of consumers' psychological evaluation of products[10]. Early related research mainly focused on the relationship between attitudes and individual's behavioral intentions. Ireland's work proved that consumers' purchasing intentions towards green products are significantly affected by their attitudes. Tsen et al.'s work stated that attitude is one of the important factors in predicting consumers' purchase intention towards green products[11]. Even under different cultural backgrounds, attitudes and behavioral intentions have a strong positive correlation. Therefore, this study proposes the following hypothesis:

H1: Consumers' attitude towards purchasing green home decoration materials is positively correlated to purchasing intention for green home decoration materials.

Subjective Norm (SN)

Subjective norm refers to the social pressure an individual perceives to perform a certain behavior. It can be considered as a personal opinion that comes from the decision maker and has an impact on his decision making[12]. Subjective norm is affected by an individual's personal experience, cultural background, and values, and will interfere with an individual's behavioral choices and guide them to take specific actions or decisions in different situations. Research shows subjective norms are important determinants of purchasing green products[7]. In most cultural backgrounds and values, adopting green living concepts is considered positive and praiseworthy. Therefore, this study proposes the following hypothesis:

H2: Consumers' subjective norm is positively correlated with the purchasing intention for green home decoration materials.

Perceived Behavioral Control (PBC)

Perceived behavioral control is viewed as an individual's assessment of how challenging it is to carry out a particular behavior. When an individual has both the ability and motivation to perform a certain behavior, the specific behavior has the potential to occur. Existing research shows that there is a positive relationship between consumers' perceived behavioral control and their purchasing intention. The development of perceived behavioral control is therefore critical to the generation of consumption intentions. Maichum et al.'s work proved that perceived behavioral control correlatives to the generation of green product purchasing intention positively[4]. Therefore, this study proposes the following hypothesis:

H3：Consumers' perceived behavioral control is positively correlated with their purchasing intention for green home decoration materials.

Environmental Concern (EC)

Environmental concern refers to the level of awareness individuals have regarding environmental issues and their willingness to address these problems. This directly influences people's attitudes and intentions towards behaviors related to the environment. The work of Diamantopoulos et al. has proven that it is an important factor in the consumer decision-making process, and consumers with higher environmental concerns will be more inclined to choose green products. Environmental concern occupies an important position in research on individuals' attitudes towards related issues. Hanson's work pointed out that environmental concern is positively related to consumers' attitudes towards green products. Hartmann and Apaolaza-Ibáñez considered the direct and indirect effects of environmental concern and found that it was positively related to attitudes toward green products and purchase intention. The impact of consumers' environmental concern on their perceived behavioral control also deserves consideration. Bamberg's work shows that consumers' perceived behavioral control can be predicted by environmental concern. The work of Chen and Tung shows that consumers' willingness to consume is indirectly affected by their environmental concern through perceived behavioral control. The increase in consumers' attention to environmental issues has an impact on consumers' own values, and personal values will affect their subjective norms to a certain extent[13]. Therefore, environmental concerns affect consumers' intentions by affecting their own perceptions[7]. Therefore, this study proposes the following hypothesis:

H4: Environmental concern is positively associated with purchasing intention for green home decoration materials.

H5: Environmental concern is positively associated with attitude towards purchasing green home decoration materials.

H6: Environmental concern is positively associated with subjective norm.

H7: Environmental concern is positively associated with perceived behavioral control.

Environmental Knowledge (EK)

Environmental knowledge can be viewed as understanding of the current situation of the environment, the main causes of environmental impacts and personal responsibility for sustainable development. As environmental knowledge increases, consumers will have a better understanding of the interaction between green products and the natural environment, which will increase the probability that consumers have a high willingness to consume green products. The work of Moorman et al. shows that consumers' behavior will be inspired by the knowledge they possess, so subjective knowledge will affect consumers' consumption choices[14]. Harun's work proves that if consumers have sufficient reserves of environmental knowledge, they will often show a more positive consumption attitude when facing green and environmentally friendly products. Kim et al.'s research pointed out that sufficient relevant knowledge will strengthen people's belief in the idea that "the current situation is still controllable", thereby enhancing people's perceived behavioral control[15]. When individuals perceive that others expect them to be knowledgeable about an environmental issue, they are more likely to demonstrate that they have a thorough understanding of the topic. Therefore, those who behave in compliance with social norms may pay more attention to environmental information, and thus in fact establish a greater environmental knowledge base, and this knowledge base may strengthen the requirements for environmental protection in their subjective norm. Therefore, this study proposes the following hypothesis:

H8: Environmental knowledge is positively associated with purchasing intention for green home decoration materials.

H9: Environmental knowledge is positively associated with attitude towards purchasing green home decoration materials.

H10: Environmental knowledge is positively associated with subjective norm.

H11: Environmental knowledge is positively associated with perceived behavioral control.

Perceived usefulness (PU)

Perceived usefulness can be viewed as the subjective assessment made by an individual regarding the value of a technology, product, or service in accomplishing goals and tasks during its use. Irawan et al.'s work pointed out that customers' perceived usefulness is associated with purchasing intention for green products[16]. Considering the actual uses of green home decoration materials, consumers will focus on their practical performance and cost-effectiveness when generating purchasing intention and are more inclined to generate consumption intentions for products with higher subjective evaluations. Therefore, this study proposes the following hypothesis:

H12：Perceived usefulness is positively associated with purchasing intention for green home decoration materials.

Product Image (PIM)

Product Image can be viewed as the overall impression and perception of a product by customers. This usually comes from consumers' perception of product performance, price, and brand reputation. The product image in this study represents consumers' overall impression of green home decoration materials. Therefore, specific brand reputation will be replaced by consumers' overall impression of green home decoration material manufacturers. The work of Hengboriboon et al. pointed out that product image has a direct impact on the purchasing intention of green goods[17]. Aktan and Anjam's research on cross-border trade pointed out that product image will have a positive impact on consumers' attitude towards the product[18]. Therefore, this study proposes the following hypothesis:

H13: Product image is positively associated with purchasing intention for green home decoration materials.

H14: Product image is positively associated with attitude towards purchasing green home decoration materials.

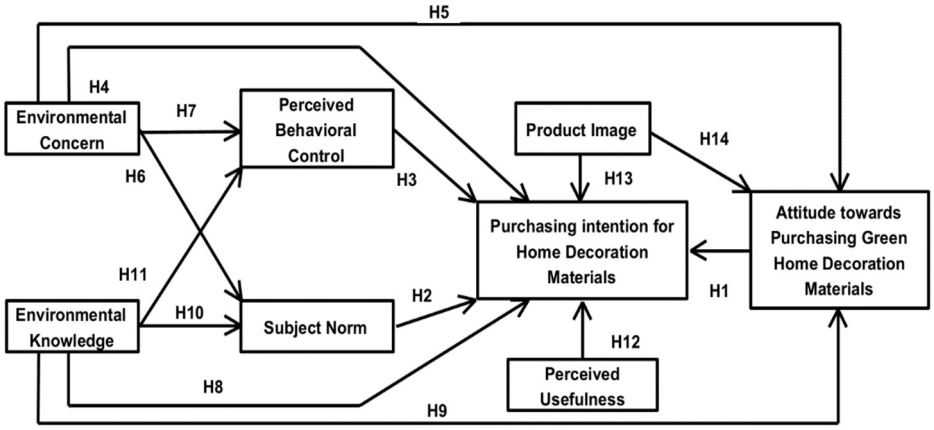

Fig. 1. Proposed research framework

3 Methodology

3.1 Data collection and survey instrument

The data used in this study came from a structured questionnaire. The target group of the study is adults who have the intention to purchase home improvement and building materials or have recent purchase experience. Data was collected through the sales channels of Guangxi Yubang Construction Technology Co., Ltd. from November 20, 2023, to March 25, 2024 (**Table 1**). A total of 611 questionnaires were collected in this survey, and 531 valid samples were obtained (those who clearly stated that they have no intention or experience in purchasing home decoration and building materials are considered invalid samples).

Table 1. Demographics

Items	Classification	Frequency	Percentage
Gender	Male	275	48.2
	Female	256	51.8
Age	18-30	73	13.7
	31-45	268	50.5
	46-55	156	29.4
	56 or over	34	6.4
Education	Elementary or below	63	11.8
	Junior high school	142	26.7
	High school/technical secondary school	135	25.4
	College degree	125	23.5
	Master's degree or over	66	12.4
Personal Income per Year (CNY)	30K or below	57	10.7
	30K to 50K	116	21.8
	50K to 100K	154	29.0
	100K 150K	109	20.5
	150K or over	95	17.9

3.2 Measure

In this study, three social demographic variables were studied using independent measures, namely age, gender, and personal annual income. All remaining scales were developed in Likert format, anchored by "Strongly Agree" (5) and "Strongly. A total of 7 constructs were used in this study. Descriptive results for all items are shown in **Table 2**. Due to the lack of items targeting the perceived usefulness of green home decoration materials, this study designed four items based on the characteristics of home decoration materials. To measure subjects' environmental knowledge level more objectively, this study used a 5-point knowledge test as an item. All other items are modified from previous items.

Table 2. Descriptive statistics of the questionnaire items

	Constructs/Items	Mean	Standard Deviation
Environmental concern			
EC1	I am worried about the condition of the global environment	2.765	0.821
EC2	I would like to reduce my consumption to protect the environment	2.752	0.843
EC3	Social changes are necessary to protect the environment	2.553	0.907
Environmental Knowledge			
EK1	Green home decoration material test questionnaire (5 points)	2.827	1.005
EK2	I would like to check the eco-label and certifications on green home decoration materials before purchase	2.81	1.018
EK3	I would like to have a deeper insight about green home decoration materials before purchase.	2.623	0.955
Attitude towards Purchasing Green Home Decoration Materials			
ATT1	Green home decoration material is favorable	2.784	0.852
ATT2	Green home decoration material is safe and trustworthy	2.756	0.916
ATT3	Green home decoration material is great purchasing choice	2.769	0.889
Perceived Behavioral Control			
PBC1	I have enough resources for me to purchase green home decoration materials	2.915	0.878
PBC2	I have enough opportunities to purchase green home decoration material	2.93	0.862
PBC3	I could choose green home decoration rather than normal material when I want	2.923	0.893
Perceived usefulness			
PU1	I think green home decoration materials can meet my needs for building material performance (such as pressure resistance etc.)	3.006	1.064
PU2	I think green home decoration materials can meet my functional needs for building materials (such as anti-static etc.)	3.01	1.068
PU3	I think green home decoration materials can meet my needs for user-friendliness of building materials (such as no formaldehyde etc.)	3.429	1.04
PU4	I think green home decoration materials can meet my needs for cost-effective building materials.	2.64	0.865
Subjective Norm			

SN1	I believe that purchasing green home decoration materials is in line with the views and expectations of the people around me.	2.874	0.813
SN2	I believe that purchasing green home decoration materials is environmentally friendly consumption.	2.895	0.874
SN3	I believe that purchasing green home decoration is a personal responsibility to promote sustainable development	2.91	0.897
Product Image			
PIM1	I think green home decoration materials are sustainable.	2.911	0.655
PIM2	The performance of green home decoration materials is like normal ones.	3.158	0.903
PIM3	there is no Greenwashing in green home decoration and building materials.	2.013	1.132
Purchase Intention for Green Home Decoration Materials.			
PI1	In my next purchase, I will choose green home decoration materials	2.885	0.717
PI2	I plan to use more green home decoration materials to replace ordinary building materials	2.889	0.759
PI3	For environmental reasons, I would be more inclined to choose green home decoration materials	2.551	0.983

4 Result

4.1 Measurement Model Testing

The most common method to test the internal consistency of each construct in a model is to calculate Cronbach's α coefficients for each construct. When Cronbach's α exceeds 0.700 and there is no significant change in the Cronbach's α of the construct after deleting any item, the scale can be considered to have good internal consistency and robustness. All constructs' Cronbach's α in this study are shown in **Table 3**. And they can be considered internally consistent and reliable.

Table 3. Cronbach's Alpha for each Constructs

Construct	Item	Cronbach's Alpha after Item Deleted	Cronbach's Alpha
Environmental concern (EC)	EC1	0.871	0.852
	EC2	0.869	
	EC3	0.874	
Environmental Knowledge (EK)	EK1	0.852	0.847
	EK2	0.866	
	EK3	0.859	
Perceived usefulness (PU)	PU1	0.883	0.872
	PU2	0.890	
	PU3	0.879	
	PU4	0.906	
Perceived Behavioral Control (PBC)	PBC1	0.914	0.893
	PBC2	0.897	

	PBC3	0.911	
Attitude towards Purchasing Green Home Decoration Materials (ATT)	ATT1	0.892	0.885
	ATT2	0.916	
	ATT3	0.907	
Subjective Norm (SN)	SN1	0.874	0.862
	SN2	0.881	
	SN3	0.877	
Product Image (PIM)	PIM1	0.821	0.783
	PIM2	0.796	
	PIM3	0.810	
Purchase Intention for Green Home Decoration Materials (PI)	PI1	0.902	0.873
	PI2	0.891	
	PI3	0.887	

4.2 Testing of the Structural Equation Model

SEM evaluated the hypothesized conceptual model by Amos 26.0 using a maximum likelihood parameter. Formula (1) is used to measure the relationship between observed variables and latent variables, Formula (2) is used to measures the relationship between variables. As shown in **Table 4**, the model performed satisfactorily on each goodness-of-fit index. All these indices were higher than the recommended fit thresholds.

$$X_i = \lambda_i \xi + \delta_i \quad (1)$$

$$\xi_j = \beta_{ij} \xi_i + \epsilon_j \quad (2)$$

Where X_i is the observed variable, ξ is the latent variable, λ_i is the factor loading, δ_i is the Measurement error of X_i, $\beta_{ij}$is the path coefficient from ξ_i to ξ_j, ϵ_j is the structural error.

Table 4. Fit Indices for conceptual model

Fit Indices	Criteria	Indicators
CMIN/DF	<5.000	3.408
GFI	>0.900	0.928
NFI	>0.900	0.936
RFI	>0.900	0.947
CFI	>0.950	0.952
RMSEA	<0.080	0.067
RMR	<0.050	0.052

Table 5 shows the results with the standardized path coefficients, indicating the effects between constructs in the structural model. This study proposed a total of 14 hypotheses, 10 of which were supported.

Table 5. Hypotheses testing results for the structural model.

Hypothesis	Path	Standardized Path Coefficient	t-Value	Results
H1	ATT→PI	0.631***	12.478	Supported
H2	SN→PI	0.612*	4.752	Supported

H3	PBC→PI	0.748***	7.391	Supported
H4	EC→PI	0.695***	6.723	Supported
H5	EC→ATT	0.748***	6.095	Supported
H6	EC→SN	0.124	1.362	Not supported
H7	EC→PBC	0.613***	5.472	Supported
H8	EK→PI	0.117	1.620	Not supported
H9	EK→ATT	0.659***	7.271	Supported
H10	EK→SN	0.238	1.242	Not supported
H11	EK→PBC	0.693***	7.620	Supported
H12	PU→PI	0.723***	8.931	Supported
H13	PIM→PI	0.152	1.506	Not supported
H14	PIM→ATT	0.607*	4.239	Supported

Note: *p<0.05; ** p<0.01; ***p<0.001.

5 Conclusions

The results of this study indicate that environmental concern, attitude, perceived behavioral control, subjective norm, and perceived usefulness can directly affect the purchasing intention of green home decoration and building materials. Environmental concern and knowledge can also have an indirect impact on purchasing intention of green home decoration materials. This indirect effect operates through the mediating roles of attitude and perceived behavioral control. When consumers are more knowledgeable and concerned about environmental issues, these factors positively shape their attitudes towards green home decoration materials and enhance their perceived control over purchasing these materials, thereby indirectly boosting their purchasing intentions. Therefore, it may be an effective measure to improve purchasing intention by promoting the environmental concern and knowledge of consumers through promoting environmental protection. It is worth noting that perceived usefulness can also have a significant impact on purchasing intention. Therefore, green home decoration material manufacturers can enhance purchasing intention by focusing on improving product performance. Communicating effectively to customers to Demonstrate the practical benefits and superior performance of their products to improve their perceived usefulness may also a useful way. This study indicates that there is no direct significant correlation between product image and purchasing intention. However, product image can positively influence purchase intention indirectly by shaping purchasing attitudes. Based on this, improving consumers' impression of green home decoration materials through measures such as improving performance and avoiding greenwashing may be an effective way to increase consumers' purchasing intention.

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