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Analysis of Consumer Intentions and Behaviors in Purchasing Eco-Friendly Furniture

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Abstract: *This study refines the Theory of Planned Behaviors (TPB) to align with consumer dynamics in China's Suzhou furniture market, focusing on eco-friendly products. It examines factors influencing purchase intentions and behaviors and quantifies their impacts using descriptive statistics, reliability and validity assessments of measurement scales, and hypothesis testing via structural equation modeling (SEM). The findings indicate that subjective norms significantly affect purchase intentions, while perceived behavioral control and purchase intentions strongly predict actual purchasing behavior.*

Keywords: *Eco-friendly furniture, Purchase intentions, Purchase behavior, Structural equation model*

1. Introduction

As we progress into the 21st century, environmental challenges have intensified, catalyzing a significant push towards sustainable development. Issues such as global warming, the depletion of non-renewable resources, and the pollution of air and water threaten to alter the course of human existence. These problems jeopardize natural ecosystems and pose severe risks to human health, economic stability, and social well-being. Consequently, global efforts are increasingly directed toward achieving a green economy and sustainable development. The rising demand for eco-friendly furniture, driven by environmental and health considerations, has prompted governments and organizations to establish relevant certifications and standards. As consumer awareness of environmental issues grows and governmental attention intensifies, the demand for eco-friendly furniture continues to increase. However, public willingness to purchase eco-friendly furniture does not always translate into actual purchase behaviors. Therefore, it is crucial for furniture companies to understand the determinants of consumers' purchase intentions and behaviors regarding eco-friendly furniture[2]. By adopting targeted measures to promote sales, companies can drive market demand. Increased sales can incentivize companies to innovate and develop green technologies, further advancing sustainable practices within the industry.

2. Literature Review

2.1 The relationship between attitude and purchase intention of eco-friendly furniture

In eco-friendly product purchasing, attitude critically shapes consumer behavior. Defined as a person's positive or negative evaluation of a behavior, or as a set of beliefs about a specific object or action, attitude strongly influences purchase intentions [1], thereby impacting consumers' willingness to buy eco-friendly products [12].

This study proposes hypothesis 1 (H1):

H1: There is a positive correlation between consumers' attitudes towards eco-friendly furniture and their purchase intentions for eco-friendly furniture.

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2.2 The relationship between subjective norms and purchase intention of eco-friendly furniture

Subjective norms involve the perceived social pressure experienced when deciding to engage in a behavior or yield to others' opinions. According to the TPB, these norms are positively correlated with the intention to act [1]. This study focuses on purchase intentions and behaviors related to eco-friendly furniture—a high-value, durable product that prompts cautious decision-making. Typically, buyers of such items consult others' opinions and conduct thorough research before purchasing [10]. This social influence is crucial in shaping their intentions to buy eco-friendly furniture.

This study proposes hypothesis 2 (H2):

H2: There is a positive correlation between subjective norms and consumers' purchase intentions for eco-friendly furniture.

2.3 The relationship between perceived behavioral control and purchase intention and behavior of eco-friendly furniture

Perceived behavioral control reflects an individual's assessment of the ease or difficulty of performing a behavior, influenced by both experienced and anticipated obstacles. This concept emphasizes how resources and opportunities can affect one's likelihood of engaging in a behavior. In purchasing contexts, consumers facing external constraints who believe they possess ample resources and opportunities typically experience heightened behavioral control, boosting confidence in their purchasing power and increasing the likelihood of buying [1]. Therefore, assessing one's purchasing power and perceived ability to buy is critical. This perception significantly impacts purchase intentions and behaviors related to eco-friendly furniture[8-10].

This study proposes the hypothesis 3 (H3):

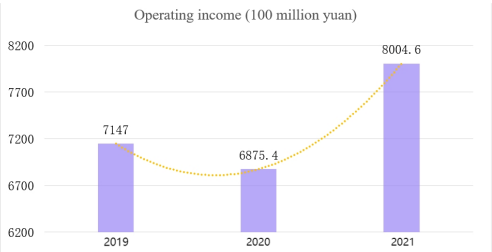
H3: There is a positive correlation between perceived behavioral control and consumers' purchase intentions for eco-friendly furniture.

3.Materials and Methods

3.1 Survey background

3.1.1 Background of the Chinese furniture industry

The furniture industry significantly contributes to societal well-being, possesses international competitiveness, and plays a pivotal role in satisfying consumer needs, enhancing quality of life, and generating employment. According to the China National Furniture Association (2022), in 2021[3], there were 6,647 furniture enterprises of a designated size, generating a total operating income of 800.46 billion RMB—a 13.5% increase from the previous year. The cumulative profit reached 43.37 billion RMB, up 0.9% from the prior year, with a production output of 1.12 billion pieces, marking a 14.01% year-on-year increase. Moreover, the total retail sales by these enterprises reached 166.68 billion RMB, a rise of 14.5%. Fig. 1 depicts the operating income trends of Chinese furniture enterprises from 2019 to 2021.



Source: China National Furniture Association (2022)

Fig. 1. Operating income of furniture companies in China from 2019 to 2021 (100 million yuan)

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3.1.2 Trends in Chinese consumer furniture purchases

According to the 2020 Market Status and Development Trend Analysis of the Home Furnishing and Building Materials Industry in China [7], the evolution of China's economy, alongside rising consumer health consciousness and consumption upgrading, has shifted the focus of Chinese furniture from mere functionality to quality, emotion, health, and environmental protection. Additionally, iiMedia (2022) reveals that 67.8% of Chinese home furnishing consumers prioritize raw materials in their hard furnishings purchasing decisions[6], and 60.5% consider environmental protection. In this era of prioritizing high-quality living, the emphasis on raw materials and environmental impact in home furnishings is increasingly evident, highlighting the escalating importance of eco-friendliness in the furniture industry.

3.1.3 Current status of the Suzhou furniture consumption market

According to the Suzhou Statistics Bureau (2021)[11], the per capita disposable income of Suzhou's permanent residents in 2020 was 62,582 RMB, marking a 4.1% increase from the previous year. Urban residents had a per capita income of 70,966 RMB, up by 3.4%, while rural residents earned 37,563 RMB, a 6.9% increase. In 2021, the overall per capita income rose to 68,191 RMB, a 9.0% growth. Urban and rural incomes reached 76,888 RMB and 41,487 RMB, rising by 8.3% and 10.4% respectively. This steady increase in purchasing power has significantly bolstered the furniture industry in Suzhou, fostering consumption upgrades within the sector.

3.2 Sample and questionnaire design

This study investigates the purchase intentions and behaviors of Suzhou residents towards eco-friendly furniture in 2022. It uses a non-probability convenience sampling approach to collect data. To achieve an adequate sample size, the survey was administered online via the Wenjuanxing platform, resulting in the collection of 554 questionnaires. This substantial dataset allows for detailed analysis of the factors influencing eco-friendly furniture purchasing decisions in Suzhou.

4. Result and Discussion

4.1 Sample description

A well-presented results section coupled with a convincing discussion will prove the novelty and importance of your study. It should provide a concise and precise description of the experimental results, their interpretation, as well as the experimental conclusions that can be drawn.

A total of 554 questionnaires were collected in this survey, with the basic demographic information of respondents presented in Table 1.

Table 1. Demographic characteristics of the sample

Demographic Characteristics	Category	Frequency	Ratio
Gender	Male	344	62.1%
	Female	210	37.9%
Age	18-24 years old	20	3.6%
	25-34 years old	119	21.5%
	35-44 years old	207	37.4%
	45-54 years old	160	28.9%
	55 years old and higher	48	8.7%
Marital status	Single	87	15.7%
	Married	467	84.3%
Number of children under 18 in the family	0	99	21.2%
	1	228	48.8%
	2	127	27.2%
	More than 3	13	2.8%
Education level	Below high school	4	0.7%
	High school or vocational school	25	4.5%
	Junior college	87	15.7%
	Bachelor's degree	170	30.7%
	Graduate degree or above	268	48.4%

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4.1.1 Awareness and purchasing behavior of eco-friendly furniture

a)Consumer awareness and sources of information on eco-friendly furniture

The questionnaire probed into consumer awareness and information sources about eco-friendly furniture with questions such as, "Do you know the concept of eco-friendly furniture?" and "Through which channels did you learn about eco-friendly furniture?" Results indicated that 89.4% of respondents were familiar with the concept. The primary sources of information were television, friends and family, and outdoor advertisements. Additionally, 93.5% of respondents understood eco-friendly furniture as being made from materials safe for human use, highlighting a strong association with material safety and environmental friendliness over brand recognition.

b)Consumer purchase intentions for eco-friendly furniture

The survey revealed that 97.1% of respondents expressed a willingness to buy or continue buying eco-friendly furniture. Key motivators included the environmental benefits, reduced pollution, and the positive impacts on human health.

4.1.2 Variables

Descriptive analysis was performed to describe the overall situation of the data using means, medians, and standard deviation. To understand the distribution of the data, SPSS software was used to conduct descriptive statistical analysis for each variable. The results of the descriptive statistics for some variables are shown in Table 2. The current data did not contain any outliers, exhibited minimal fluctuation, and had a uniform distribution.

Table 2 Descriptive analysis of variables

Variable	Mean	Item	Mean	Median	SD
Attitude	4.4	ATT1	4.6	5	0.7
		ATT2	4.5	5	0.8
Subjective norms	4.3	SN1	4.3	5	0.8
		SN2	4.3	4	0.8
Perceived behavioral control	4.4	PBC1	4.4	5	0.8
		PBC2	4.3	4	0.8

The conceptual model in this study incorporates attitude, subjective norms, and perceived behavioral control as key variables. Table 2 presents the items used to measure each variable, utilizing a 5-point Likert scale, where 1 signifies "strongly disagree" and 5 signifies "strongly agree." Analysis reveals that the mean scores for these variables are above 4, indicating that respondents generally agreed or strongly agreed with the related statements.

4.2 Reliability and validity tests

4.2.1 Reliability Tests

A pilot survey was conducted to revise the questionnaire, followed by a formal survey requiring further reliability testing. Cronbach's alpha coefficient measures the average split-half reliability coefficient for all possible ways of dividing the scale items. An alpha coefficient below 0.6 indicates poor reliability, necessitating a redesign of the questionnaire. An alpha coefficient between 0.6 and 0.7 suggests acceptable but not highly reliable results, possibly requiring minor adjustments. An alpha coefficient between 0.7 and 0.8 indicates acceptable results with good stability and reliability. An alpha coefficient above 0.8 indicates high consistency, stability, and reliability [5]. The reliability test results are shown in Table 3.

Table 3 Reliability analysis of each scale in the formal survey

Variable	Number of Items	Sample size	Cronbach's alpha
ATT	6	554	0.949
SN	3	554	0.934
PBC	3	554	0.868

The results show that the Cronbach's alpha coefficients for the three variables are all above 0.8. This indicates that the research data has a high level of reliability and quality, making it suitable for further analysis without the need for additional optimization of the scale.

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4.2.2 Validity tests

a)Validity tests of the attitude scale

The first step is to analyze the KMO value and the significance level to ensure the data is suitable for factor analysis. As shown in Table 4, the KMO value of the attitude scale is 0.908. A KMO value greater than 0.9 indicates that the research data is very suitable for extracting information, thereby demonstrating good validity. The significance value of Bartlett's test of sphericity is 0.000, which is less than 0.05, indicating that the data is suitable for factor analysis.

Table 4 Validity analysis of attitude scale

KMO and Bartlett's Test of Sphericity for Attitudes						
Sampling adequacy measure (KMO measure)						0.908
Bartlett's test of sphericity			Approximate chi-square			3288.636
			Degrees of Freedom			15
			Significance			0.000
Total variance explained						
Component	Initial Eigenvalues			Extracted Sum of Squared Loadings		
	Total	% of Variance	% of Cumulative	Total	% of Variance	% of Cumulative
1	4.794	79.908	79.908	4.794	79.908	79.908
2	0.433	7.210	87.117			
3	0.249	4.142	91.259			
4	0.215	3.581	94.840			
5	0.188	3.126	97.965			
6	0.122	2.035	100.000			

Note: Extraction method: principal component analysis.

b)Validity test of the subjective norm scale

As shown in Table 5, the KMO value of the subjective norm scale is 0.753, which falls between 0.7 and 0.8, indicating that the research data is suitable for extracting information, thereby demonstrating good validity. The significance value of Bartlett's test of sphericity is 0.000, which is less than 0.05, indicating that the data is suitable for factor analysis.

Table 5 Validity analysis of subjective norm scale

KMO and Bartlett's Test of Sphericity for Subjective Norm						
Sampling adequacy measure (KMO measure)						0.753
Bartlett's test of sphericity			Approximate chi-square			1434.617
			Degrees of Freedom			3
			Significance			0.000
Total variance explained						
Component	Initial Eigenvalues			Extracted Sum of Squared Loadings		
	Total	% of Variance	% of Cumulative	Total	% of Variance	% of Cumulative
1	2.655	88.494	88.494	2.655	88.494	88.494
2	0.216	7.203	95.697			
3	0.129	4.303	100.000			

Note: Extraction method: principal component analysis.

c)Validity test of the perceived behavioral control scale

As shown in Table 6, the KMO value of the perceived behavioral control scale is 0.716, which falls between 0.7 and 0.8, indicating that the research data is suitable for extracting information, thereby demonstrating good validity. The significance value of Bartlett's test of sphericity is 0.000, which is less than 0.05, indicating that the data is suitable for factor analysis.

Table 6 Validity analysis of perceived behavioral control scale

KMO and Bartlett's Test of Sphericity for Perceived Behavioral Control						
Sampling adequacy measure (KMO measure)						0.716
Bartlett's test of sphericity			Approximate chi-square			855.314
			Degrees of Freedom			3
			Significance			0.000
Total variance explained						
Component	Initial Eigenvalues			Extracted Sum of Squared Loadings		
	Total	% of Variance	% of Cumulative	Total	% of Variance	% of Cumulative
1	2.375	79.175	79.175	2.375	79.175	79.175
2	0.404	13.465	92.640			
3	0.221	7.360	100.000			

Note: Extraction method: principal component analysis.

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4.3 Structural equation model and hypotheses testing

The analysis of the measurement model for the first-order reflective constructs shows that all constructs exhibit internal consistency, convergent validity, and item reliability, as shown in Table 7.

Table 7 Loading coefficient, validity, and reliability

Item	Loading	SD	t	p	Reliability
ATT1	0.833	0.033	25.505	0.000	α=0.95, rhoA=0.953 CR=0.96, AVE=0.799
ATT2	0.895	0.022	40.187	0.000	
ATT3	0.913	0.010	87.822	0.000	
PBC1	0.835	0.024	34.598	0.000	α=0.916, rhoA=0.919 CR=0.938, AVE=0.751
PBC2	0.913	0.010	88.365	0.000	
PI1	0.866	0.017	52.245	0.000	α=0.938, rhoA=0.944 CR=0.952, AVE=0.767
PI2	0.749	0.026	29.324	0.000	
SN1	0.927	0,011	82.612	0.000	α=0.935, rhoA=0.936 CR=0.958, AVE=0.885
SN2	0.957	0,006	173.853	0.000	

Then, Partial Least Squares Path Modeling (PLS-PM) was used to test the hypotheses regarding the relationships between the constructs in the model. The evaluation of the structural model includes assessing collinearity issues, the significance and relevance of the structural model relationships, and the level of the coefficient of determination (R^2). Since the variance inflation factor (VIF) values were below the threshold of 5.0, there were no collinearity issues.

Next, the path coefficients of the structural model were analyzed, calculating the t-values and p-values. The results indicated that Hypothesis 2 (H2: There is a positive correlation between subjective norms and consumers' purchase intentions for eco-friendly furniture) was supported, with a beta (β) value of 0.326.

Two hypotheses were not supported at the 5% significance level: H1 (There is a positive correlation between consumers' attitudes towards eco-friendly furniture and their purchase intentions for eco-friendly furniture) and H3 (There is a positive correlation between perceived behavioral control and consumers' purchase intentions for eco-friendly furniture).

4.4 Discussion

This study addresses three research questions. Concerning the first research question, whether the three variables of the TPB (attitude, subjective norms, and perceived behavioral control) are related to consumers' intentions and behaviors in purchasing eco-friendly furniture, three hypotheses (H1, H2, and H3) were proposed.

The model estimation showed that only one of the traditional TPB variables was statistically significant. Thus, H2 was supported, indicating a positive correlation between subjective norms and consumers' purchase intentions for eco-friendly furniture.

H1 and H3 were not supported at the 5% significance level. The lack of significance for the attitude towards green purchase intention might be due to consumers not fully recognizing the benefits of purchasing eco-friendly furniture, resulting in an ambiguous attitude towards purchasing such furniture. It is also possible that perceived behavioral control factors hindered consumers' attitudes towards purchasing eco-friendly furniture, affecting the overall significance of the attitude construct.

5. Conclusion and Recommendations

5.1 Conclusions

5.1.1 Eco-friendly furniture consumption has become mainstream in China

The survey results indicate that out of 554 respondents, 89.35% are aware of the concept of eco-friendly furniture, primarily through social media platforms such as Weibo and WeChat, print media like newspapers, magazines, and books, various websites, television, radio, friends and family, and furniture stores and exhibitions. Additionally, 97.11% of respondents are willing to purchase or continue

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purchasing eco-friendly furniture. They generally believe that eco-friendly furniture is greener, causes less environmental pollution, and is beneficial to human health compared to traditional furniture. This reflects an increase in consumer awareness of health and environmental issues, as well as a tendency to consider the health impacts of furniture when making purchasing decisions.

5.1.2 Significant market potential for eco-friendly furniture in Suzhou

The survey reveals that only 6.32% of respondents are unwilling to pay extra for eco-friendly furniture. Among the respondents, 35.38% are willing to buy eco-friendly furniture if the price is within 10% above that of traditional furniture, and 25.81% are willing to pay if the price is 10%-15% higher. These two price ranges account for a significant proportion of respondents, indicating that most consumers in Suzhou are willing to pay up to 15% more for eco-friendly furniture. This shows a strong preference for eco-friendly furniture among Suzhou consumers. If furniture suppliers can control costs and keep the price difference between eco-friendly and traditional furniture within 15%, the sales volume of eco-friendly furniture is likely to increase significantly.

5.1.3 Diverse factors influencing the purchase of eco-friendly furniture

The hypothesis testing results show that attitude does not have a significant relationship with purchase intention, which contradicts previous research findings. This discrepancy may be due to Suzhou consumers' behavioral attitudes being influenced by various factors, including perceived behavioral control and market information and promotions. Subjective norms have a significant direct impact on consumers' purchase intentions, indicating that consumers are currently heavily influenced by social conformity and the opinions of those around them. Therefore, improving the overall social atmosphere and raising public awareness about environmental protection are the most direct ways to enhance consumers' green purchase intentions.

5.2 Recommendations

5.2.1 Implement strict environmental controls

Furniture suppliers should implement rigorous controls throughout the production process, starting from raw materials. These materials should be naturally derived, free from harmful substances, and should not emit harmful gases. Additionally, they should be easily recyclable and reusable even after their use. The survey indicates that while consumers prefer solid wood furniture, eco-friendly furniture is not limited to solid wood. With strict control over the production process, including the quality of boards and paints, panel furniture can also meet eco-friendly standards. Furniture suppliers should focus on both functional and environmental values. Furniture design should adhere to ergonomic principles, minimizing unnecessary features to ensure comfort and convenience. Manufacturers should use natural, non-polluting materials, increase technological investments, extend the product lifecycle during design and production, and enhance furniture durability.

5.2.2 Control production costs

Consumer income levels and product prices significantly influence the willingness to purchase eco-friendly furniture, directly impacting purchasing behavior. Therefore, green furniture manufacturers should collaborate with raw material suppliers and furniture dealers to reduce unnecessary intermediaries, enhance cooperation, and lower production costs. By maintaining eco-friendly product prices within a consumer-acceptable range, barriers to purchase can be minimized, thereby increasing consumer willingness to buy. In cost control processes, it is essential to balance the interests of production personnel, consumers, society, and nature, while maintaining high product quality standards. The product control framework should be optimized across various dimensions. In design, the initial step of furniture production, maximizing the use of boards and minimizing waste generation should be prioritized without compromising functionality.

5.2.3 Enhance consumer awareness of eco-friendly furniture

The survey revealed that consumers lack sufficient awareness of ecological labels for eco-friendly furniture and struggle to correctly identify eco-friendly products. This gap in knowledge is a significant barrier to purchasing such furniture. Furniture suppliers should provide reliable information through

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various channels to assist consumers in making informed choices and improving their awareness of eco-friendly furniture. Consumers should exercise their own judgment when purchasing eco-friendly furniture and not blindly trust merchants. They can request product quality inspection reports to verify that harmful substances in the furniture comply with national standards. The national mandatory standard GB18584-2001: Indoor Decorating and Refurbishing Materials: Limit of Harmful Substances of Wood-Based Furniture[4] stipulates that formaldehyde emission in wood furniture should not exceed 1.5 mg/L. Additionally, the "E0" level, included in the national standard GB/T 39600-2021 "Formaldehyde Emission Grades for Wood-Based Panels and Finished Products," effective October 1, 2021, mandates that formaldehyde emissions should not exceed 0.050 mg/m³.

Author Contributions

Ruoqiu LU and Yun LU conducted the research; Yun LU collected the data; Ruoqiu LU analyzed the data, Ruoqiu LU wrote the paper; all authors had approved the final version.

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