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The Influence Of Environmental And Eco-Label Knowledge On Pro-Environmental Consumer Behavior: A Mediation Analysis Of Attitude And Green Trust In Eco-Friendly Household Products In Jiangsu Province, China

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Abstract:
The world is grappling with critical environmental issues such as extreme weather events, climate change, waste accumulation, biodiversity loss, and pollution of natural ecosystems. Addressing these challenges, particularly through the frameworks of SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action), is essential not only to protect the planet but also to safeguard human well-being, as environmental degradation can cause physical and mental health problems, limit human potential, and exacerbate vulnerabilities to disasters. In light of increasing environmental challenges and an immediate demand for sustainable practices, it is important to assess how consumers' environmental knowledge and recognition of eco-labels impact their shopping preferences. The aim of this study is to examine the impact of environmental knowledge and eco-label knowledge on Chinese consumers' pro-environmental behavior toward eco-friendly products, with attitude and green trust serving as mediators. A quantitative research design was employed, utilizing an online survey to gather data from 578 consumers in the Jiangsu province of China through purposive sampling. The proposed model was tested using Partial Least Squares Structural Equation Modelling (PLS-SEM). Findings indicate that environmental knowledge, eco-label knowledge, attitude, and green trust are significant predictors of pro-environmental behavior. Additionally, attitude and green trust act as significant but partial mediators. This study offers essential insights for companies seeking to educate consumers on the significance of eco-labels, thereby raising awareness of sustainable practices and encouraging more informed purchasing decisions. It highlights the critical role eco-labels can play in shaping pro-environmental behavior among Chinese consumers, especially when prominently featured on packaging and integrated into broader marketing strategies to enhance brand loyalty and appeal to eco-conscious buyers. Furthermore, the research deepens our understanding of how environmental awareness programs, when coupled with user-generated content and eco-labeling, can collectively influence and potentially amplify pro-environmental behavior in China. However, while these findings are promising, they also suggest that companies must invest more in consumer education and transparent marketing to fully leverage the benefits of eco-labeling.
Keywords: *Environmental knowledge, Eco-labels, Pro-environmental behavior, Green trust, Attitude*

1.0 INTRODUCTION

Since the natural environment supplies resources like water, land, biology, and climate, among other things, it is crucial for human life and progress. **[1]** As ecological problems have become more serious in recent decades; environmental sustainability has emerged as a major worldwide issue. Issues including pollution, waste buildup, biodiversity loss, and climate change endanger both human health and natural ecosystems. Human health is negatively impacted by outdoor air pollution, which is thought to be the cause of five to ten percent of all premature deaths in the contiguous United States each year **[2]**. Despite significant reductions in emissions, the urban population of the EU-28 continued to experience exposure to ambient fine particulate matter (PM2.5) and tropospheric ozone (O3) levels that exceeded the WHO's recommended limit values for protecting human health **[3]**. Similarly, in the Niger Delta region, various pollution sources, including gas flaring, industrial discharges, and agricultural runoff, have had a profound impact on the environment, contributing to the area's significant air and water pollution challenges **[4]**. Due to its heavy reliance on fossil fuels for economic expansion, China has experienced severe air pollution problems **[5].**

As society struggles with these urgent problems, it is evident that solving them calls for coordinated efforts in a variety of areas, such as industry, legislation, and personal conduct. A major danger to ecosystems, biodiversity, and human health is pollution, a widespread environmental problem **[6]**. Global warming is one of the most significant environmental pollution issues. In 2022, the average temperature in China was 10.51°C, marking an increase of 0.62°C compared to the average temperature recorded between 1991 and 2020. This temperature was the second-highest observed since 1951. **[7]**. With two exceptions, February and December, every month had a temperature that was either slightly lower or slightly higher than it was during the same period in the previous year. As hydrologic (weather) extremes rise due to global warming, the effects on both humans and the environment will intensify **[8]**.

Since opening up and reforming its economy in 1978, China has seen rapid economic growth, but it has also had to contend with an increasing number of severe environmental problems. As evidenced by the 2005 Songhua River water pollution disaster, approximately 100 tons of poisonous material entered the Songhua River following the explosion, seriously polluting the river's water and impacting the lives of millions of people living along the shore. An 80-kilometer pollution zone on the Songhua River was created by the explosion **[9]**. Air pollution has been a persistent issue in China since 2011, particularly due to the widespread occurrence of haze in regions such as Beijing-Tianjin-Hebei and the Yangtze River Delta **[10]**. In addition, a significant environmental disaster took place in 2010 when an explosion in the Dalian Xingang oil pipeline led to a major oil leak **[11]**. Meanwhile, the COVID-19 pandemic, caused by the novel SARS-CoV-2 (severe acute respiratory syndrome coronavirus-2), emerged as an extremely contagious respiratory illness in 2019, further exacerbating public health challenges. **[12]**. human activity has a direct impact on the ecosystem. There have been terrible consequences from these instances. serious casualties and damage to property. As a warning to us to put the preservation of the natural world first, the outbreak has also highlighted human shortcomings in ecological and environmental preservation.

Sustainable behaviors are essential for preserving the planet and ensuring that future generations can live in a healthy environment. The United Nations' Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action), emphasize the importance of sustainable development by encouraging responsible resource use and mitigating climate change risks. In this context, consumer behavior plays a critical role, as it directly influences the demand for products and services. This, in turn, impacts resource consumption and shapes production processes, making responsible consumer choices key to advancing sustainability**[13]**. Additionally, environmental monitoring frameworks, such as those used in Europe, offer valuable insights for managing pollution and biodiversity loss, aligning with SDG 13 to support climate action initiatives **[14]**. China has taken significant measures in response to these environmental problems. In 2018, China carried out institutional reforms, establishing the Ministry of Ecology and Environment and merging the responsibilities of the National Development and Reform Commission with the previous Ministry of Environmental Protection, which included addressing climate change and reducing emissions. This policy will assist to build an ecological society, achieve sustainable social and economic progress, and better coordinate and unify environmental protection activities.

The term "pro-environmental consumer behavior" describes consumption habits and purchase choices that reduce adverse environmental effects. Today's consumers are more conscious of the need to embrace environmentally responsible practices, and they are demanding more sustainable, ethically sourced, and ecologically friendly products **[15]**. Individual knowledge, attitudes, and confidence in the environmental claims made by businesses are some of the elements that affect how much of this understanding converts into pro-environmental action. Having a thorough understanding of these elements and how they interact can help designers create methods that encourage sustainable consumption **[16]**.

Environmental knowledge is considered a crucial determinant of pro-environmental behavior. It includes knowledge of sustainable practices, awareness of environmental challenges, and comprehension of the effects of certain acts on the environment. Since knowledgeable customers are better able to make decisions that support sustainability goals, several studies have demonstrated a correlation between increased environmental awareness and more eco-conscious behaviors **[17]**. Environmental knowledge gives customers the ability to assess the environmental impact of the items they choose and look for solutions that are less damaging to the environment when it comes to eco-friendly products. Despite its significance, environmental information by itself does not necessarily result in pro-environmental behavior since knowledge can be translated into action in a variety of ways depending on psychological, social, and economic factors. This

disparity highlights the necessity for a more thorough investigation of mediating factors that may close the knowledge gap between conduct and knowledge, such as attitudes and trust **[18]**.

Eco-labels have emerged as a prominent tool for guiding consumers toward sustainable consumption. They provide information about the environmental attributes of products, such as being organically produced, energy-efficient, or made from recycled materials. By offering a visible and credible assurance of a product's sustainability credentials, eco-labels can enhance consumer trust and encourage environmentally responsible choices. Eco-labels thus serve as an important link between consumer knowledge and behavior, translating complex environmental information into easily understandable cues that facilitate decision-making. In China, eco-labeling has gained attention as part of the country's broader push towards sustainable development. The Chinese government has implemented various initiatives to promote green products and encourage responsible consumption. Yet, the effectiveness of eco-labels in driving pro-environmental behavior remains subject to consumer perceptions, familiarity, and trust in these labels **[17]**.

The literature suggests that consumer attitudes and green trust play a crucial role in shaping the relationship between environmental knowledge, eco-label understanding, and pro-environmental behavior. An individual's attitude refers to their positive or negative evaluation of engaging in particular actions, influencing their decisions and behaviors related to sustainability. Customers who have a favorable attitude toward sustainable consumption may be more inclined to select environmentally friendly items when it comes to eco-friendly goods **[18]**. Conversely, "green trust" refers to how confident customers are in businesses' environmental statements. It entails having faith in the legitimacy and dependability of eco-labels and the businesses that provide them. Customers are more inclined to behave in ways that support the environment when they believe that a product follows sustainable methods. On the other hand, customers may ignore eco-labels if they lack confidence or are worried about greenwashing, which would reduce their impact on buying choices.

To regulate the use of green product labeling, China released the "Measures for the Administration of the Use of Green Product Labeling" on May 5, 2019. This document outlined the pertinent requirements for the labeling's use, style, scope of application, supervision, and management. The east Chinese province of Jiangsu offers a special setting for researching how consumer behavior is impacted by environmental awareness and eco-labels. One of the most populated provinces in China, Jiangsu is known for its fast urbanization and economic growth, which have created serious environmental problems. In order to support China's national objectives for climate action and sustainable development, these issues must be resolved. Gaining knowledge on Jiangsu's consumer behavior might help one better understand how eco-labels and environmental awareness initiatives could affect sustainable consumption trends locally. There is an increasing need to understand how environmental information, eco-labels, attitudes, and trust impact consumer behavior in rising markets like China, even though the majority of the study to date has been on established nations. By investigating the connections between these variables and their effects on the pro-environmental behavior of Chinese consumers in Jiangsu Province, this study seeks to close this gap. The results will have practical ramifications for businesses, legislators, and environmental organizations looking to encourage eco-friendly behaviors in China, in addition to adding to the scholarly conversation on sustainable consumption.

Finding out how Chinese consumers' awareness of environmental concerns and eco-labels influences their pro-environmental behavior is the primary objective of this study, with attitude and green trust serving as mediating factors. In particular, the study seeks to assess how pro-environmental behavior is directly impacted by environmental and eco-label knowledge, explore the mediating functions of attitude and green trust in the relationship between knowledge factors and behavior, and provide recommendations to businesses and policymakers on how to use eco-labels and environmental education to promote sustainable consumption.

This research adds to the body of knowledge by offering a thorough examination of the ways in which pro-environmental conduct is influenced by environmental and eco-label knowledge, with an emphasis on the mediating roles of attitude and green trust. It provides a sophisticated knowledge of the mental processes that motivate environmentally conscious consumption, especially in developing economies. The results will also help create strategies to increase the efficacy of eco-labeling programs, including ideas for fostering consumer confidence and utilizing environmental education to promote sustainable development.

2.0 LITERATURE REVIEW

Pro-environmental behavior refers to actions aimed at minimizing negative environmental impacts, often motivated by factors such as environmental awareness, familiarity with eco-labels, personal attitudes, and trust in green initiatives **[17]**. The Theory of Planned Behavior (TPB) is a widely utilized framework for understanding environmentally conscious behaviors, emphasizing how attitudes, subjective norms, and perceived behavioral control collectively shape individuals' intentions to engage in sustainable actions **[19]**. According to Icek Ajzen's 1985 TPB, human behavior is primarily driven by intentions, which are in turn influenced by three key factors: attitudes, subjective norms, and perceived control over the behavior.

2.1 Environmental knowledge and attitudes

Numerous studies have found that increased environmental knowledge is linked to a higher likelihood of engaging in sustainable behaviors, such as purchasing eco-friendly products. This knowledge helps consumers make informed decisions, reducing uncertainties about the effectiveness of green products and positively influencing their attitudes toward sustainable consumption. Numerous research has looked at how attitudes for green products and practices relate to environmental knowledge. Wang et al. **[20]** did an examination of the elements that determine green purchasing behavior and showed how important environmental awareness is in influencing how consumers see eco-friendly products. Nguyen et al. also looked at the factors that affect Vietnamese consumers' intents to purchase eco-friendly goods, emphasizing how environmental consciousness affects consumer choices. **[21]** Zeng et al. investigated the influence of environmental knowledge and risk perception on environmental concerns and pro-environmental behavior in order to emphasize the role that knowledge plays in encouraging sustainable consumer behavior **[22].** According to the research, attitudes toward green products and actions are often positively influenced by environmental knowledge, highlighting the significance of education and awareness in supporting eco-friendly habits.

This leads to the following hypothesis:

H1: Environmental knowledge positively influences attitudes in environmentally conscious households.

2.2 Environmental knowledge and pro-environmental behavior

Previous research has demonstrated that EK has a significant impact on pro-environmental behavior, and the majority of these investigations have confirmed that EK and PEB are positively correlated **[23] [24] [25].** The propensity of Hungarian university students to pay for eco-friendly products indicates a strong correlation between environmental knowledge and green shopping behavior **[26]**. Research conducted in Korea and Japan has highlighted the critical role of pro-environmental self-identity and attitude in shaping sustainable consumption behaviors, emphasizing that environmental knowledge is a key motivator for pro-environmental actions **[27].** Furthermore, studies in the United States have demonstrated that consumers with strong environmental motivation—referred to as "green customers"—exhibit heightened awareness of eco-friendly products and hold positive views toward pro-environmental advertising, further illustrating the impact of environmental information on consumer behavior **[28].** These findings underscore the importance of environmental knowledge in fostering both awareness and positive attitudes toward sustainable consumption. According to the literature, increasing pro-environmental consumer behavior is mostly dependent on environmental awareness. People are more likely to make ecologically friendly decisions in their everyday activities and purchases when they are more aware of and knowledgeable about environmental concerns. This emphasizes how crucial it is to advance environmental awareness and education in order to create a more sustainable society.

This leads to the following hypothesis:

H2: Environmental knowledge enhances pro-environmental consumer behavior.

2.3 Environmental knowledge and green trust

Consumers' green trust is greatly enhanced by environmental knowledge. The connection between green trust and environmental knowledge has been the subject of several research in a variety of settings. For example, Dhir et al. investigated the factors that influence retail shoppers' decisions to purchase eco-friendly clothing, emphasizing the significance of context, behavior, attitude, and knowledge **[29]**. The impact of consumption values on consumers' intentions to make green purchases was also examined by Amin et al. **[30]**, Numerous researches have emphasized the function of green trust as a mediator in this process. For example, Hossain et al. investigated how customers' pro-environmental behavior is influenced by green trust, eco-label knowledge, and environmental consciousness, particularly in relation to energy-efficient household appliances. **[17].** Their study emphasizes the significant impact that these factors have on shaping consumers'

sustainable purchasing decisions. According to studies, consumer behavior toward sustainable goods and activities may be greatly influenced by both awareness of environmental challenges and confidence in green projects and companies. A greener future may be achieved by companies and politicians encouraging more ecologically responsible behaviors and building green trust by increasing environmental understanding.
This leads to the following hypothesis:
H3: Environmental knowledge fosters green trust in eco-friendly households.

2.4 Eco-label knowledge boosts green trust

Eco-labels, which indicate a product's environmentally friendly attributes, play a significant role in guiding sustainable purchasing choices. Knowledge of eco-labels has been shown to impact consumer behavior by fostering trust in eco-labeled products and reinforcing perceptions of their quality. When consumers understand the standards and certification processes behind eco-labels, they are more likely to trust these products, thereby facilitating sustainable consumption **[31]**. Numerous research has looked at how customer attitudes and knowledge of green products relate to one another. Green trust and environmental and eco-label knowledge have an influence on pro-environmental behavior when it comes purchasing energy-efficient household equipment. In their study, Asif et al. employed structural equation modeling to assess the impact of eco-label knowledge on sustainable consumption practices within Pakistan's energy sector, focusing on variables such as consumer green trust and environmental attitude **[32].** These findings underscore the critical role of eco-label knowledge in shaping consumer attitudes and behaviors toward environmentally friendly products and services. A key focus of the research is the influence of label trust, emphasizing its importance in shaping consumer decision-making. Additionally, the study examines how environmental awareness, eco-label knowledge, and green trust interact to influence consumer behavior, particularly in the context of energy-efficient home appliances. By integrating eco-label knowledge, environmental attitude, and consumer green trust into the theoretical framework of the Theory of Planned Behavior, the research evaluates their combined effect on sustainable consumption behavior in Pakistan's energy industry **[33].** The collective findings from these studies suggest that eco-label knowledge plays a pivotal role in fostering green trust, which in turn encourages pro-environmental behaviors. These insights propose that enhancing eco-label knowledge strengthens consumers' trust in green products, thereby fostering more sustainable consumption patterns.
The following hypothesis stem from this understanding:
H4: Eco-label knowledge boosts green trust in eco-friendly households.

2.5 Eco-label knowledge and pro-environmental behavior

The link between eco-label understanding and pro-environmental consumer behavior has been extensively explored in previous research. In the case of China, Fang examined how factors such as environmental concern, eco-label attitude, eco-label knowledge, and the intent to switch products relate to pro-environmental behavior **[34].** This study delves into the complex interactions between these variables, shedding light on how eco-label comprehension influences consumer behavior in the context of sustainability.
Their goal was to close the knowledge gap about how information about eco-labels affects customer behavior. Pro-environmental conduct in developing economies was also the topic **[35],** which similarly highlighted the factors that encourage such behavior. Research by a number of writers has also highlighted the significance of eco-label trust and awareness in influencing environmentally conscious customer behavior. For instance, an exploration into how eco-label knowledge and trust influence consumer behavior was carried out in the study on the determinants of consumer response to eco-labeled seafood products. This research aimed to understand the factors driving consumer decisions in the context of eco-labels, focusing on how knowledge and trust in these labels shape purchasing behavior.
The following hypothesis stem from this understanding:
H5: Eco-label knowledge enhances pro-environmental consumer behavior.
The association between pro-environmental conduct and eco-label and environmental knowledge is mediated by attitude and green trust. Attitude is a person's positive or negative assessment of adopting sustainable practices, whereas green trust is their belief in the legitimacy of eco-labels. Positive attitudes toward sustainability increase the likelihood of adopting eco-friendly behaviors, while green trust reduces perceived risks and enhances consumer confidence in eco-friendly products. Research suggests that although eco-label

knowledge might not directly result in sustainable purchasing, it can indirectly influence behavior by enhancing attitudes and trust in green products **[36]**.

This leads to the hypotheses:

H6: Attitude mediates the relationship between Environmental Knowledge and Pro-Environmental Behavior.

H7: Green Trust mediates the relationship between Eco-Label Knowledge and Pro-Environmental Behavior.

In this framework（Figure 2.）, knowledge of environmental issues and eco-labels is vital for promoting pro-environmental consumer behaviors, especially when moderated by attitudes and green trust in eco-friendly products.

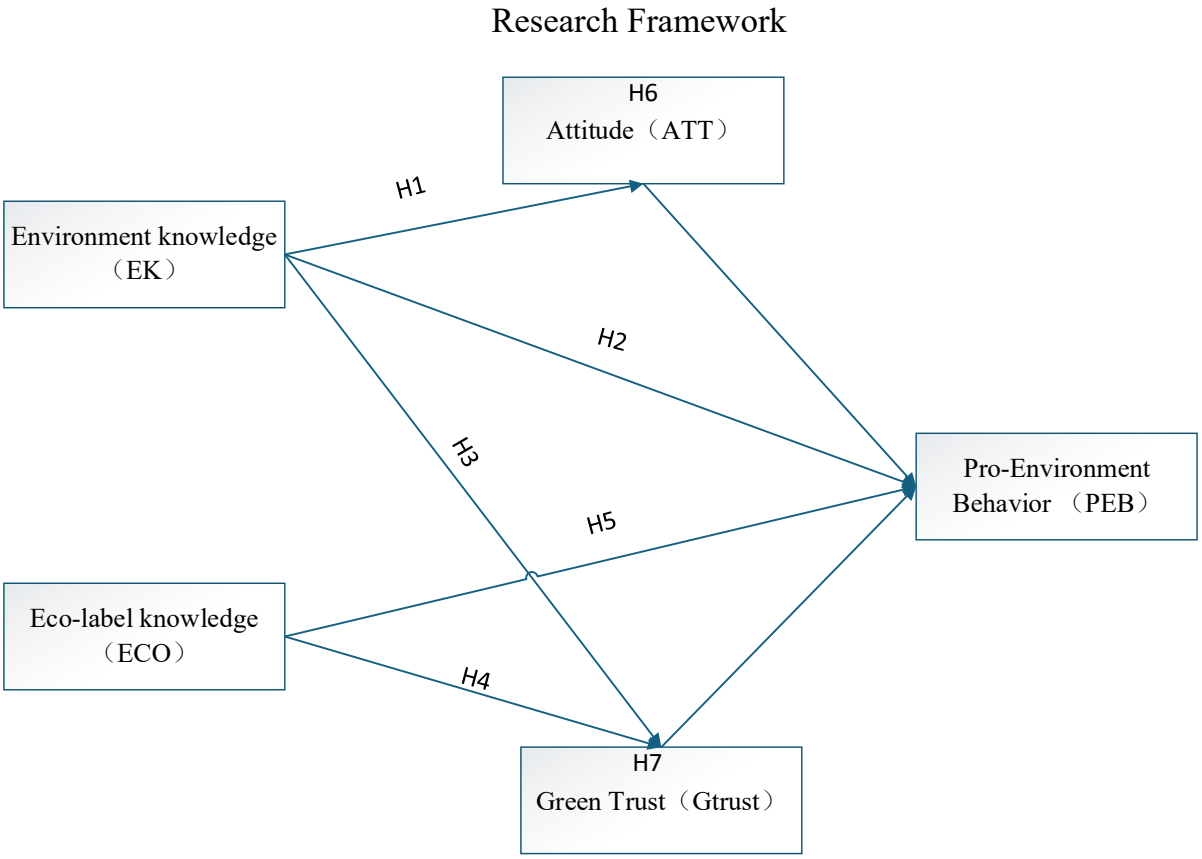

Figure 1. Research Framework

(Source: The corresponding author)

These hypotheses emphasize the significance of cultivating positive attitudes and building trust as pathways through which knowledge can influence sustainable consumer behavior.

In China, there has been a growing emphasis on sustainable consumption and environmental awareness, driven by policy changes and increasing public concern about ecological issues. However, the adoption of eco-friendly products varies across regions due to economic and social disparities. Some areas experience slower uptake of sustainable practices, indicating a need for educational campaigns and transparent marketing strategies to enhance understanding and trust in eco-labels **[37]**. Additionally, cultural factors, such as family influence, significantly shape pro-environmental behaviors in China, particularly in decisions around food consumption, where considerations of health and safety may take precedence over environmental benefits.

The existing literature suggests that environmental and eco-label knowledge significantly impact pro-environmental behaviors, with attitudes and green trust acting as essential mediators. To effectively promote sustainable consumption, efforts should be made to educate consumers about environmental issues and improve the clarity and credibility of eco-labels. Addressing regional and cultural factors is also crucial, especially in diverse markets like China, to adapt strategies to local contexts and enhance the effectiveness of sustainability initiatives.

3.0 METHODOLOGY

3.1 Research Design and Sampling

In this study, a cross-sectional, questionnaire-based research approach was used. Adults were selected by convenience sampling to receive the online self-administered questionnaire. Social media sites like WeChat and QQ in China were used to disseminate the link to the online survey and a synopsis of the study's goals. Participants may reply with computers, tablets, or cellphones. The following requirements had to be met in order for respondents to be included: (1) Chinese individuals between the ages of 18 and 60; (2) having an experience to use household products; and (3) willingness to engage in the study.

For this study, 600 questionnaires were gathered, and 578 responses were verified following a thorough data cleaning procedure. This indicates a good retention rate and excellent quality control. A relatively equal gender distribution was found in the demographic study, with 266 male respondents (46%) and 312 female respondents (54%), guaranteeing a range of viewpoints and improving the findings' generalizability. The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS4 software. This method was chosen due to its ability to handle complex models effectively, even with relatively small sample sizes. The software's flexibility and efficiency in analyzing intricate relationships made it an ideal tool for the research. Becker discussed the significance of guidance in PLS-SEM research, emphasizing the need for systematic analysis in various disciplines **[38]**. Exploring complex interactions between latent variables was made possible by this strong analytical technique, which also yielded insightful information about the goals of the study. The study's dependability and depth in drawing significant results are highlighted by the combination of sophisticated analytical methods and a fair demographic representation.

4.0 RESULT

Table 1 presents the results of the evaluation of the measurement model. Every factor loading exceeds the 0.66 cutoff**,** as recommended by Hair et al. (2019) **[39]**. According to Cronbach's alpha scores (which range from 0.860 to 0.920) and CR values (which range from 0.792 to 0.925), all constructs exhibit good internal consistency and construct validity (Hair et al. (2019) **[39]**. Additional proof of these components 'convergent validity can be seen in AVE values ranging from 0.677 to 0.782. When constructs show an AVE of 0.5 or above and less than its CR, convergent validity is deemed sufficient **[39] [40] [41]**. Convergent validity was empirically supported by the evidence of high Cronbach's alpha values (> 0.7), enormous AVE values (> 0.5), and high CR values (> 0.7) across all constructs.

TABLE 1: Measurement Model Assessment

	Cronbach's alpha	**Composite reliability**	**Average variance extracted (AVE)**	**R-square adjusted**
ATT	0.860	0.861	0.782	0.371
ECO	0.791	0.792	0.705	
EK	0.895	0.897	0.704	
GTRUST	0.906	0.906	0.726	0.430
PEB	0.920	0.925	0.677	0.629

The HTMT and Fornell-Larcker criteria show that the model satisfies discriminant validity, which is confirmed by the analysis. The HTMT criteria (Table 2) indicates that there is enough distinction between the constructs because all construct pair values fall below the 0.85 threshold as recommended by Henseler et al. **[42]**, with the highest value being 0.864. The diagonal values (square root of AVE) for each construct are also higher than their correlations with other constructs, according to the Fornell-Larcker criterion **[40]** as shown in (Table 3) indicating good discriminant validity in the measuring model and conceptual distinction across the constructs. Recent research **[39]** has shown that the HTMT criterion is more effective than older methods like cross-loadings and Fornell-Larcker in identifying discriminant validity issues. An HTMT value below 0.9 suggests adequate discriminant validity between two reflective constructs, indicating that they are sufficiently distinct **[39].**

TABLE 2: HTMT

	ATT	ECO	EK	GTRUST	PEB
ATT					
ECO	0.720				
EK	0.692	0.817			
GTRUST	0.820	0.730	0.651		
PEB	0.712	0.864	0.729	0.682	

TABLE 3: FORNELL-LARCKER

	ATT	ECO	EK	GTRUST	PEB
ATT	0.884				
ECO	0.595	0.840			
EK	0.610	0.691	0.839		
GTRUST	0.724	0.618	0.589	0.852	
PEB	0.636	0.740	0.665	0.623	0.823

The analysis of cross-loadings, collinearity statistics, and model fit, as displayed in Tables 4 and 5, validates the structural model's validity and reliability. As suggested by Hair et al. **[43]**, cross-loadings demonstrate that each indicator loads most on its related concept, hence confirming discriminant validity.
All VIF values fall below the suggested cutoff of 5 **[39],** according to collinearity statistics, with PEB4 having the highest value at 3.717, suggesting no problems with multicollinearity. With an NFI of 0.872 and an SRMR of 0.048 (below the 0.08 criterion) recommended by Henseler et al. **[42],** the model fit indices are also positive, suggesting a respectable and almost ideal model fit. These outcomes confirm the model's applicability and resilience for more research.

TABLE 4: CROSS LOADINGS

	ATT	ECO	EK	GTRUST	PEB
ATT1	0.886	0.530	0.564	0.642	0.580
ATT2	0.889	0.553	0.512	0.655	0.562
ATT3	0.878	0.496	0.540	0.622	0.544
ECO1	0.435	0.807	0.482	0.513	0.598
ECO2	0.498	0.851	0.624	0.510	0.626
ECO3	0.563	0.861	0.630	0.533	0.639
EK1	0.539	0.647	0.827	0.548	0.607
EK2	0.472	0.564	0.834	0.463	0.531
EK3	0.557	0.588	0.865	0.515	0.569
EK4	0.472	0.546	0.827	0.438	0.528
EK5	0.510	0.545	0.842	0.497	0.550
GT1	0.628	0.533	0.513	0.857	0.520
GT2	0.611	0.548	0.490	0.854	0.537
GT3	0.623	0.502	0.485	0.865	0.521
GT4	0.628	0.516	0.518	0.845	0.533
GT5	0.595	0.532	0.503	0.840	0.542
PEB1	0.421	0.481	0.445	0.439	0.699
PEB2	0.479	0.564	0.490	0.486	0.797
PEB3	0.530	0.599	0.532	0.540	0.834
PEB4	0.548	0.659	0.571	0.529	0.877

PEB5	0.542	0.642	0.576	0.522	0.866
PEB6	0.562	0.629	0.602	0.522	0.838
PEB7	0.561	0.664	0.596	0.541	0.835

TABLE 5: COLLINEARITY STATISTICS

	VIF
ATT1	2.136
ATT2	2.290
ATT3	2.131
ECO1	1.507
ECO2	1.781
ECO3	1.819
EK1	2.075
EK2	2.288
EK3	2.548
EK4	2.270
EK5	2.325
GT1	2.553
GT2	2.489
GT3	2.613
GT4	2.341
GT5	2.280
PEB1	2.039
PEB2	2.724
PEB3	2.718
PEB4	3.717
PEB5	3.328
PEB6	3.012
PEB7	3.022

Table 6 reveals that all 7 hypotheses are supported. Significant positive relationships between EK and ATT (β=0.610, t-value=18.634), EK and PEB (β=0.337, t-value=8.192), and EK and GTRUST (β=0.310, t-value=6.471) are indicated by the path coefficient results. These relationships support hypothesis H1. Additionally, ECO and GTRUST have a significant positive link (β=0.404, t-value=8.725), supporting hypothesis H4, while ECO and PEB have a significant positive relationship (β=0.430, t-value=9.672), supporting hypothesis H5.

The bootstrapping findings, shown in Table 6, show that the indirect effects of ECO and EK on PEB through GTRUST and ATT were both positive and statistically significant at the 0.05 level (β = 0.110, t-value = 4.243 as well, and β = 0.046, t-value = 2.533, respectively). H6 and H7 are therefore also supported. Since the direct and indirect effects for both mediators are statistically significant, we conclude that Green Trust (GTRUST) and Attitude (ATT) are partial mediators.

Table 6 Structural Model Assessment

Paths	**Original sample (O)**	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**	**Decision**
Total Effect Model						
ECO -> PEB	0.476	0.474	0.044	10.907	0.000	Supported
EK -> PEB (H2)	0.337	0.339	0.041	8.192	0.000	Supported

Direct Effects						
ATT -> PEB	0.181	0.182	0.041	4.410	0.000	Supported
ECO -> GTRUST (H4)	0.404	0.405	0.046	8.725	0.000	Supported
ECO -> PEB (H5)	0.430	0.429	0.044	9.672	0.000	Supported
EK -> ATT (H1)	0.610	0.611	0.033	18.634	0.000	Supported
EK -> GTRUST (H3)	0.310	0.311	0.048	6.471	0.000	Supported
EK -> PEB	0.191	0.194	0.045	4.287	0.000	Supported
GTRUST -> PEB	0.114	0.111	0.041	2.758	0.006	Supported
Indirect Effects						
ECO -> GTRUST -> PEB (H6)	0.046	0.045	0.018	2.533	0.011	Supported
EK -> GTRUST -> PEB	0.035	0.035	0.014	2.512	0.012	Supported
EK -> ATT -> PEB (H7)	0.110	0.111	0.026	4.243	0.000	Supported

Figure 2 shows the overall path diagram revealing the path coefficients and p-values for all relationships in the structural model.

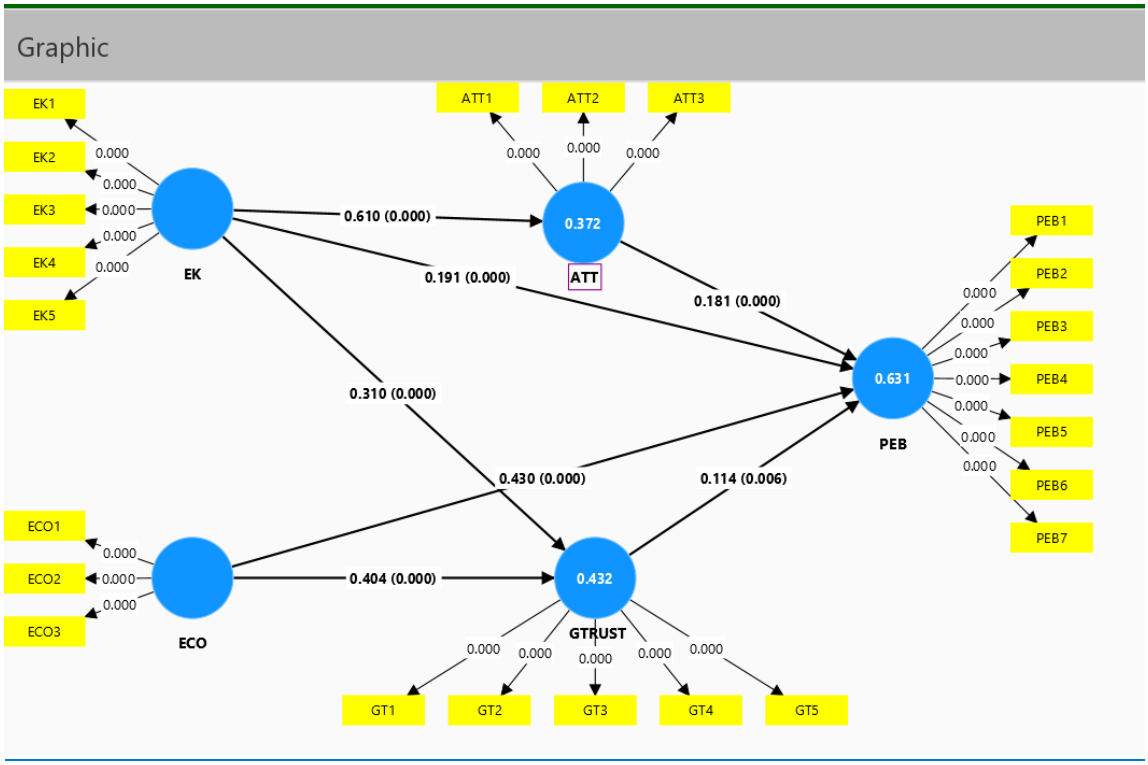

Figure 2: Path Diagram

DISCUSSION

The study looked at how eco-label and environmental knowledge affected pro-environmental consumer behavior among Chinese home product consumers, as well as how attitude and green trust mediated these interactions.In line with the findings of Rasiah et al. **[44]**, Li et al. **[45]**, and Krummeck et al. **[46]**, the results highlight the critical role that environmental knowledge plays in influencing attitudes and actions in environmentally conscious families.

Similarly, Krummeck et al. examined the influence of issue-related knowledge on ecotourism intentions and actual environmental behaviors among tourists, highlighting the significant impact that knowledge has in shaping behavior **[46]**. In line with Hypothesis 1 (H1), the study confirms that environmental knowledge

positively influences pro-environmental attitudes, fostering greater commitment to sustainability and enhancing awareness of environmental challenges.

Supporting this notion, Sun emphasized the need for greater environmental awareness to promote sustainable behaviors, particularly in emerging markets, where he also focused on identifying key catalysts for pro-environmental actions **[47]**. In alignment with Hypothesis 2 (H2), the study found that environmental knowledge promotes pro-environmental consumer behavior, encouraging actions such as purchasing eco-friendly products, reducing waste, and conserving resources. Liu's research, which examined the relationship between brand knowledge, brand attitude, and non-financial brand performance in green restaurants, suggests that consumers' perceptions and behaviors are strongly influenced by their knowledge and attitudes toward green brands **[48]**. Similarly, Sharma's qualitative study on green banking in India emphasized the importance of environmental trust and expertise in promoting sustainable practices within financial institutions **[49]**.

The findings also point to the importance of educational interventions in enhancing environmental knowledge. By integrating environmental consciousness and Sustainable Development Goals (SDGs) into academic curricula, such interventions can help shift individuals' ecological attitudes, values, and ethical considerations. This educational approach can encourage individuals to prioritize eco-friendly products and adopt sustainable consumption practices **[44]**. Supporting Hypothesis 3 (H3), the study reveals that environmental knowledge fosters green trust within eco-friendly households. These results highlight the critical role of education and awareness initiatives in driving sustainable practices. However, while knowledge serves as a crucial foundation, structural support—such as accessible recycling systems, affordable green alternatives, and supportive policies—is also necessary to translate attitudes into consistent behaviors. Future research could further explore how environmental knowledge interacts with external factors and individual values to provide a more nuanced understanding of sustainable behavior.

Overall, the study reaffirms the transformative impact of environmental knowledge in fostering sustainable attitudes and practices in households. Additionally, Damijanić's study demonstrated that consumers' perceptions of eco-labeling and their pro-environmental behavior influence their travel intentions. The study found that eco-labeling perceptions and pro-environmental behavior are positively correlated with general environmental knowledge, with eco-labeling serving as a key influence on consumer behavior **[50]**. The results of Hypothesis 4 (H4) support the idea that eco-labeling knowledge positively influences pro-environmental consumer behavior. Eco-labeling is crucial in bridging the information gap between consumers and the environmental benefits of products, reinforcing the findings of previous research that highlights the role of eco-labels in driving sustainable consumption. Consumers who are more knowledgeable about eco-labels tend to perceive certified products as more trustworthy, thereby fostering a stronger inclination toward environmentally friendly behaviors.

Jus like Amoako examines how green attitudes and knowledge affect young people's green buying habits in Ghana, emphasizing the mediating function of green trust and green value **[51]**. More research by Gorton, who explores the factors that influence consumers' usage of eco-labels, with particular attention to label trust **[52]**. The H5 confirmed that ecolabelling knowledge significantly increased green trust. Consumers who understand the authenticity and reliability of ecolabels are more likely to trust green products and brands. This relationship highlights the key role of transparency and standardization in building consumer confidence in ecolabelling certification. For eco-friendly households already prioritizing environmental concerns, ecolabelling knowledge acts as a catalyst, enhancing their trust in green products and thus their commitment to sustainable choices.

The findings indicate that both eco-label knowledge and environmental knowledge positively influence pro-environmental behavior, with green trust and attitude serving as key mediators in this process. A deeper understanding of eco-labels boosts confidence in green certifications and sustainability programs, thereby encouraging actions such as purchasing eco-friendly products. At the same time, a stronger environmental knowledge base enhances green trust, empowering consumers to better evaluate the credibility of environmental claims. To further promote sustainable practices, it is essential for companies to foster transparency and accountability in their operations. By demonstrating openness about their sustainability efforts, firms can build consumer trust and credibility, particularly among environmentally conscious consumers**[44].** Furthermore, environmental education influences favorable views toward pro-environmental behavior, which encourages sustainable activities even more. According to the idea of planned behavior,

these findings demonstrate the emotional (attitude) and cognitive (green trust) processes that convert information into action. The study highlights the importance of public awareness campaigns and educational programs that promote trust and positive attitudes while also raising knowledge of environmental issues and eco-labels. To create interventions that are more successful in encouraging sustainable habits, future studies might examine these correlations in a variety of cultural and historical situations.

Implications

Through the integration of knowledge, trust, and attitudes, this study has significant implications for researchers, companies, and politicians about the promotion of pro-environmental behavior among customers.

6.1 This study offers improved recommendations to decision-makers about environmental matters.

Green trust (H3), pro-environmental behavior (H2), and attitudes (H1) are all positively impacted by environmental knowledge, which emphasizes the need of planning and carrying out public education initiatives. Through practical information that encourages sustainable living, these campaigns seek to raise public awareness of environmental challenges. Regulations for eco-labeling: The study discovered that pro-environmental behavior (H4) and green trust (H5) were considerably enhanced by eco-labeling knowledge, suggesting the necessity of stringent eco-labeling control and standardization. The broad adoption of green products will be encouraged by customers making better decisions with the aid of clear, trustworthy, and reliable eco-labeling information.

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6.2 This study provides decision-makers with enhanced guidance on environmental issues.

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6.3 This study also building customer trust.

To support sustainable growth, firms that manufacture eco-friendly products can foster green trust through open communication. Green trust's mediating function (H6, H7) demonstrates how important trust is in converting information into action. Trust and loyalty may be increased by offering substantiated information about the product's place of origin, environmental effect, and eco-label certification. Increasing Eco-label Awareness: To improve customer comprehension and adoption, marketing techniques should highlight the advantages of eco-labels. Activities might include thorough explanations of certification procedures, eco-label requirements, and how they relate to environmental sustainability.

6.4 This study increasing the investigation of mediators for Scholars.

In the link between knowledge and conduct, this study emphasizes the mediating function of green trust (H6) and attitude (H7). Future studies might investigate additional possible mediating factors, including perceived behavioral control, social norms, or emotional engagement, to provide a more thorough knowledge of the elements influencing pro-environmental behavior. Intercultural studies: These findings highlight the need for comparative research in various cultural and geographical contexts to investigate the ways in which consumer behavior is impacted by variations in environmental and eco-label knowledge.

6.5 This study empowering families for society.

Societies may encourage more sustainable practices in families by expanding access to environmental and eco-label information. Together, education, eco-label transparency, and green product accessibility will encourage societal changes toward environmental sustainability.

This study concludes by highlighting the interconnected ways that attitudes, trust, and knowledge influence pro-environmental behavior. To achieve long-term sustainable development goals, cooperation between companies, researchers, governments, and the general public is essential.

CONCLUSION

This study underscores the critical influence of eco-label and environmental knowledge on pro-environmental behavior, mediated by attitude and green trust, among Chinese home product consumers. The findings highlight that environmental knowledge not only fosters positive attitudes toward sustainability but also enhances trust in green claims, both of which are essential for translating awareness into actionable behaviors. Similarly, eco-label knowledge bridges the information gap by building consumer trust in certified products, reinforcing environmentally friendly consumption patterns. These results reaffirm the significance of educational initiatives and awareness campaigns in promoting sustainable practices, emphasizing the need for transparency and standardization in eco-label certifications. However, the study also identifies the necessity of structural support, such as accessible recycling systems and affordable green alternatives, to ensure that knowledge and trust translate into consistent pro-environmental behaviors. Future research should further explore the interplay between knowledge, trust, attitudes, and external factors in diverse cultural and socioeconomic contexts to inform policies and strategies aimed at fostering sustainable consumer behavior on a broader scale.

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