Asian Interdisciplinary and Sustainability Review

Original Research Article

Received: 18 August 2025 **Revised:** 1 October 2025 **Accepted:** 1 October 2025

UNLOCKING ORGANIC GREEN CONSUMPTION: A HYBRID SEM-ANN ANALYSIS OF PERCEIVED VALUE AND TRUST MECHANISMS

Jie ZHANG[1] and Chanchai BUNCHAPATTANASAKDA[1]

1 Graduate School, Stamford International University, Thailand;
bunchanchai4@gmail.com (C. B.)

Handling Editor:
Professor Dr.Ismail Suardi WEKKE Universitas Muhammadiyah Barru, Indonesia
(This article belongs to Theme 1: Humanities and Social Sciences for Sustainability)

Reviewers:
1) Associate Professor Dr.Laphassawat SUBPHONKULANAN PSU, Thailand
2) Associate Professor Dr.Piyatida PANYA Sripatum University, Thailand
3) Colonel Dr.Khajornsak THAIPRAYOON Command and General Staff College, Thailand

Abstract

Organic food consumption represents a vital component of sustainable development, yet the complex cognitive mechanisms driving consumer choices remain partially understood. This study investigates the determinants of organic green consumption intentions among Chinese consumers by integrating the Appraisal-Emotional Response-Coping Theory. Employing a robust hybrid methodology, the research combines Structural Equation Modeling (SEM) to assess linear causal relationships with an Artificial Neural Network (ANN) analysis to detect non-linear patterns and prioritize predictor importance. Data were obtained from 425 respondents in Yunnan Province. The SEM analysis reveals that functional, social, and emotional values significantly and directly influence consumption intentions. Conversely, reference group influences—utilitarian, informational, and value-expressive—do not directly drive intentions but exert their impact indirectly through the mediating roles of product trust and chain trust. The complementary ANN analysis uncovers hidden non-linear associations and re-ranks the importance of these drivers, providing a more nuanced predictive model. These findings underscore the pivotal role of trust mechanisms and multidimensional value perceptions. The study concludes with strategic recommendations for marketers and policymakers to foster organic consumption by leveraging trust-building strategies and value-centric communication, effectively bridging the gap between theoretical models and practical strategies for sustainable market expansion.

Keywords: Organic Green Consumption, Hybrid SEM-ANN Approach, Appraisal-Emotional Response-Coping Theory, Perceived Value, Consumer Trust

Citation Information: Zhang, J., & Bunchapattanasakda, C. (2025). Unlocking Organic Green Consumption: A Hybrid SEM-ANN Analysis of Perceived Value and Trust Mechanisms. *Asian Interdisciplinary and Sustainability Review, 14*(2), Article 28. https://doi.org/10.14456/aisr.2025.39

Introduction

Food safety concerns in China drive consumer demand for organic food. By 2018, the organic food market was valued at US10 billion, with strong growth projections (Pitkänen, 2021). However, organic food sales remain proportionally lower than in developed markets, presenting expansion opportunities (Koller et al., 2020). This study examines key factors influencing green consumption intention. Moreover, the Appraisal-Emotional Response-Coping theory remains underexplored in this context. Prior studies have focused on the Theory of Planned Behavior (TPB) and the Stimulus-Organism-Response (SOR) model (Prakash & Pathak, 2017), yet the attitude-behavior gap in sustainable consumption is insufficiently addressed. This study investigates how reference groups and perceived value shape green consumption intention. By integrating these factors, this research advances understanding of consumer decision-making in green consumption.

Literature Review

The Appraisal-Emotional Responses-Coping Behavior Theory is conceptualized as a mediation model to elucidate the dynamic relationship between emotions and behavioral responses (Lages, 2012). The central premise of this theory is that individuals do not respond to external stimuli directly and automatically, but rather through a process of cognitive appraisal. This initial appraisal involves the subjective evaluation of an event or experience in terms of its significance, relevance, or potential consequences for personal goals and well-being. In other words, people first interpret and assess what a situation means for them.

Once the appraisal has taken place, it triggers corresponding emotional responses (Bagozzi, 1992). These emotions may vary in intensity and valence, ranging from positive states such as joy and pride to negative states such as fear, anger, and sadness. Importantly, emotions serve as mediators that link the initial appraisal to subsequent action tendencies. They provide motivational energy and shape the direction of behavioral responses, making emotions not just reactions but functional signals that guide coping strategies. These emotional reactions culminate in coping behaviors or behavioral intentions. Depending on how the situation is appraised and the emotions it evokes, individuals may adopt problem-focused coping (actively addressing the source of stress), emotion-focused coping (managing internal emotional states), or avoidance behaviors (Yuangngoen et al., 2025). Thus, the model underscores the sequential and interconnected nature of appraisal, emotion, and coping. It provides a useful framework for understanding how people translate cognitive evaluations into concrete actions through the mediation of emotions.

Impact of Perceived Value on Consumer Trust

Consumer trust has been widely recognized as a pivotal factor influencing consumer behavior across diverse sectors, significantly affecting consumers' repurchase intentions and their ongoing purchasing decisions. Trust functions as a psychological assurance that reduces consumers' perceptions of risk and uncertainty, particularly in contexts where direct evaluation of product quality or seller reliability is limited. In digital commerce environments, for example, trust not only mitigates information asymmetry but also creates a sense of security that encourages consumers to commit to future transactions.

Concurrently, perceived value also emerges as a fundamental determinant in shaping consumer behavior, directly influencing both trust and repurchase intentions (Bernarto et al., 2024). Perceived value integrates multiple dimensions—such as functional utility, emotional satisfaction, social approval, and monetary worth—that consumers derive from a product or service. When consumers perceive that the benefits they receive outweigh the costs incurred, they are more inclined to build trust in the brand or seller. This trust, in turn, strengthens their willingness to engage in long-term relationships with the business.

Prior research underscores that consumer trust serves as a partial mediator between perceived value and consumers' continued purchase intentions, particularly within the context of e-commerce live streaming (Wu & Huang, 2023). This suggests that while perceived value directly motivates consumers to repurchase, its impact is significantly reinforced when trust is established. In live-streaming scenarios—where immediacy, interactivity, and social proof strongly influence consumer perceptions—the role of trust becomes even more salient in translating value perceptions into actual behavioral commitments.

Additionally, enhancing perceived value in broader e-commerce contexts has been shown to strengthen brand trust and, in turn, foster customer engagement behaviors (Yu et al., 2022). Higher perceived value not only leads to transactional loyalty (i.e., repeat purchases) but also to relational loyalty, manifested in advocacy, word-of-mouth promotion, and active participation in brand communities. These behaviors extend beyond mere repurchase and contribute to the long-term sustainability of customer-brand relationships.

Hence, understanding the nuanced interplay between perceived value and consumer trust is critical for organizations seeking to enhance customer satisfaction, loyalty, and repeat purchasing. Firms that strategically enhance perceived value—through quality improvements, personalized services, transparent communication, and fair pricing—are better positioned to cultivate trust. Once trust is firmly established, it acts as a reinforcing mechanism that sustains consumers' repurchase intentions and promotes deeper engagement, ultimately driving competitive advantage in today's highly dynamic marketplace. Derived from the discussed theoretical insights, the study proposes the following hypotheses:

H1a: Functional value significantly enhances product trust.
H1b: Functional value significantly enhances chain trust.
H2a: Emotional value significantly enhances product trust.
H2b: Emotional value significantly enhances chain trust.
H3a: Social value significantly enhances product trust.
H3b: Social value significantly enhances chain trust.

Influence of Reference Groups on Consumer Trust

The role of reference groups in influencing consumer trust is critical for understanding consumer decision-making and behavior. Reference groups, which can be defined as groups of individuals whose opinions, values, and behaviors provide a standard for others, act as an essential social influence mechanism that guides consumer judgments and purchase intentions. These groups often serve as a lens through which consumers interpret marketing stimuli, evaluate product quality, and assess brand credibility. As such, reference groups significantly shape not only consumers' perceptions of risk and trust but also their loyalty and engagement with a brand.

Existing research highlights the significance of reference groups, including social media and online communities, in shaping consumer perceptions and purchase decisions by providing credible information and reducing uncertainty (Lee & de Fortuny, 2022). In the contemporary digital environment, social media influencers, peer reviews, and online community discussions often function as extensions of traditional reference groups. Their ability to provide firsthand experiences, transparent feedback, and real-time interaction enhances the perceived credibility of the information shared. Consequently, consumers rely heavily on these sources to compensate for the lack of physical inspection or face-to-face interaction in online transactions. Specifically, informational influence from these groups enhances consumers' understanding of products, reduces perceived risk, and, in turn, builds consumer trust, particularly in digital and group-buying environments (Bearden & Etzel, 1982). Informational influence occurs when consumers adopt reference group opinions as credible evidence, especially in contexts characterized by high uncertainty or complexity. For example, on group-buying platforms, consumers are more likely to develop trust not only in the vendor but also in collective

validation from peers who participate in the purchase. This shared reliance on group consensus strengthens consumers' confidence in both the transaction and the seller.

Furthermore, the influence of reference groups extends beyond transactional trust to relational trust as well. That is, consumers not only trust the product information shared but also internalize social norms of reciprocity, solidarity, and shared experience within these communities. This fosters stronger emotional bonds and long-term brand relationships. For marketers, strategically leveraging reference groups—through influencer partnerships, community engagement strategies, and user-generated content—can be an effective way to cultivate trust and sustain consumer loyalty in increasingly digitalized markets. Accordingly, this study posits the following hypotheses:

H4a: Informational influence significantly impacts product trust.
H4b: Informational influence significantly impacts chain trust.
H5a: Utilitarian influence significantly impacts product trust.
H5b: Utilitarian influence significantly impacts chain trust.
H6a: Value-expressive influence significantly impacts product trust.
H6b: Value-expressive influence significantly impacts chain trust.

Relationship between Green Consumption Intention and Perceived Value

The relationship between perceived value and green consumption intention is fundamental to research in sustainability and consumer behavior. Perceived value, which reflects the consumer's overall assessment of a product's utility through a trade-off between benefits and sacrifices, plays a central role in shaping attitudes toward eco-friendly products. In the context of green consumption, these benefits extend beyond functional attributes to include environmental protection, ethical considerations, and social responsibility. As such, consumers who perceive higher value in green products are more likely to translate such evaluations into favorable intentions to purchase and support sustainable consumption.

The existing literature emphasizes perceived value as a significant predictor of consumer decisions regarding sustainable products. Beyond immediate functional benefits, perceived value incorporates emotional satisfaction, symbolic meaning, and alignment with personal values related to sustainability. When consumers believe that adopting green products contributes to broader environmental and societal well-being, their perception of value increases, thereby strengthening their willingness to engage in sustainable behaviors. Importantly, this highlights that green consumption is not merely price-driven but deeply tied to the psychological and ethical evaluations consumers make (Sakdapat et al., 2025).

For instance, Kamboj & Kishor (2022) provided evidence for the mediating role of perceived value in sustainable consumer behaviors across various contexts. Their findings suggest that perceived value bridges the gap between consumers' environmental attitudes and their actual purchase intentions, underscoring its function as both a motivational and cognitive mechanism. Similarly, Bunchapattanasakda et al. (2023) present that green advertising impacts purchase intentions primarily through the mediating role of consumer trust. This indicates that while advertising raises awareness and positive attitudes, its effectiveness ultimately depends on whether consumers perceive the claims as authentic and valuable, thereby fostering trust and encouraging green purchasing behaviors.

Taken together, these findings illustrate that perceived value not only directly influences green consumption intention but also interacts with other psychological constructs such as trust, attitudes, and ethical norms. From a managerial perspective, this suggests that firms aiming to promote sustainable products must strategically enhance consumers' perceived value—by communicating environmental benefits transparently, ensuring product quality, and aligning brand practices with sustainability commitments. By doing so, businesses can reinforce consumer trust and facilitate stronger intentions toward green consumption, ultimately

contributing to long-term environmental and market sustainability. Drawing from these findings, this study proposes the following hypotheses:

H1c: Functional value significantly affects consumers' intentions to purchase organic foods.

H2c: Emotional value significantly affects consumers' intentions to purchase organic foods.

H3c: Social value significantly affects consumers' intentions to purchase organic foods.

Relationship between Green Consumption Intention and Influence of Reference Groups

Consumer behavior, particularly in green purchasing, is significantly influenced by reference groups, which serve as pivotal external sources of guidance and comparison during decision-making. Individuals often leverage these groups to mitigate uncertainties through various forms of influence, namely informational, utilitarian, and value-expressive influences (Zheng et al., 2021). Extant research underscores the profound effect of reference groups on green purchasing intentions, emphasizing the mediating roles of variables such as health consciousness, environmental awareness, regulatory frameworks, and perceived value (Shi & Jiang, 2023; Charviandi, 2023). Drawing on these theoretical insights, this study formulates the following hypotheses:

H4c: Informational influence exerted by reference groups has a significant positive effect on green consumption intention.

H5c: Utilitarian influence exerted by reference groups has a significant positive effect on green consumption intention.

H6c: Value-expressive influence exerted by reference groups has a significant positive effect on green consumption intention.

Relationship between Green Consumption Intention and Chain Trust / Product Trust

Organic food, as a credence good, possesses attributes that consumers cannot directly verify either before or after purchase (Fernqvist & Ekelund, 2014). Trust in green supply chains and products significantly influences consumer decisions, increasing their willingness to purchase sustainable products. Research indicates that consumer trust in certification labels, supply chain transparency, and product eco-friendliness promotes higher-priced eco-friendly purchases, thereby fostering green market growth (Nuttavuthisit & Thøgersen, 2017). Additionally, trust partially mediates the relationship between acceptance of green advertising on social media and purchase intentions (Bunchapattanasakda et al., 2023). Therefore, this study proposes:

H7: Product trust significantly influences consumers' green consumption intentions toward organic foods.

H8: Chain trust significantly influences consumers' green consumption intentions toward organic foods.

Given the above hypotheses, we propose a conceptual model in Figure 1

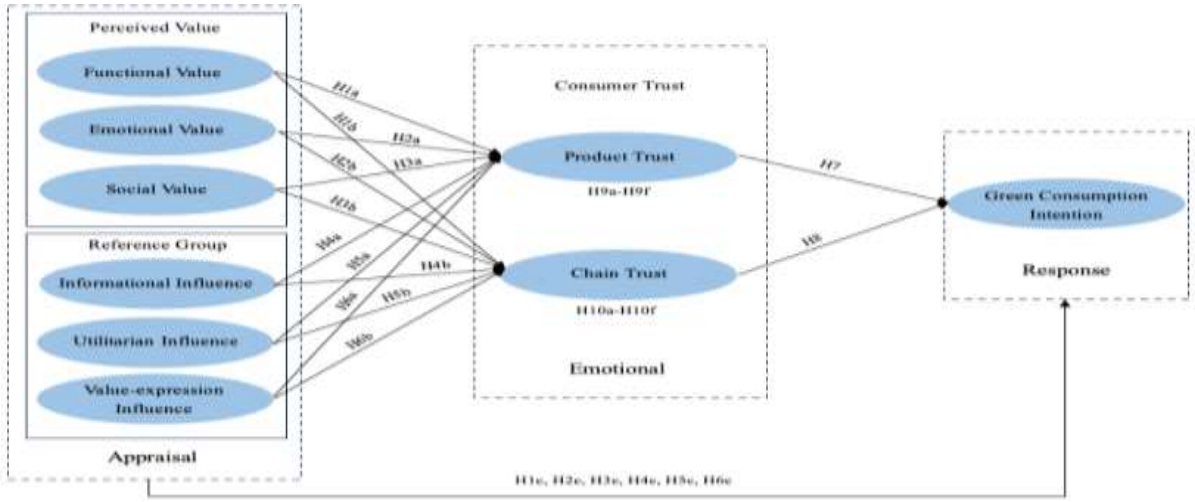

Figure 1 Conceptual Framework

Methodology

Population and Sampling

This study investigates the roles of reference groups' influence and perceived value in shaping green consumption intentions among Yunnan Province residents aged 20 and above with prior experience purchasing green products. This study was conducted in Yunnan Province, China, a region recognized for its agricultural biodiversity and its pivotal role in the organic food sector. Utilizing Cochran's (1977) sample size determination formula, a minimum of 385 respondents is required to achieve a statistically robust confidence level. To enhance the validity and generalizability of the findings, the sample size was increased by 15%, yielding a final dataset comprising 425 respondents.

Data Collection

The research model utilized validated multi-item scales with minor modifications for face validity. A 5-point Likert scale measured responses. Participants were pre-screened for organic food awareness. Data collection was conducted online, with a 30-participant pilot study to refine the instrument. The final survey, distributed via Wenjuanxing (https://www.wjx.cn), yielded 425 valid responses from experienced organic food buyers in Yunnan.

Measurement Instruments

Measurement items were adapted from validated scales in the literature. Perceived value was modeled as a multidimensional construct, including functional, emotional, and social dimensions. Reference group influence was measured through utilitarian, informational, and value-expressive subdimensions. Trust was operationalized at two levels: product trust (confidence in product quality and certification) and chain trust (confidence in supply chain transparency).

Research Findings

Measurement Model

Confirmatory factor analysis (CFA) was conducted to evaluate the fit of the initial measurement model comprising 9 dimensions and 45 indicators. Following the guidelines provided by Harrington (2009), various fit indices were used, including chi-square ($\chi 2$), degrees of freedom (df), $\chi 2/df$ ratio, comparative fit index (CFI), root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), and Tucker-Lewis index (TLI). According to established criteria, a good model fit is indicated by $\chi 2/df < 3.0$, RMSEA ≤ 0.08, TLI and CFI ≥ 0.90 (Hu & Bentler, 1999), and GFI ≥ 0.80 (Chau & Hu, 2001). The results showed that the model fit the data well, with the following fit statistics: $\chi 2 = 973.106$; $df = 910$; $\chi 2/df = 1.069$; CFI = 0.994; GFI = 0.910; TLI = 0.993; RMSEA = 0.013. All indices met the acceptable thresholds.

Convergent Validity

The reliability and validity of the constructs were assessed using confirmatory factor analysis (CFA). Cronbach's alpha and composite reliability (CR) exceeded 0.7, confirming reliability (Nunnally, 1978). Convergent validity was supported by significant factor loadings ($p < 0.001$) (Diamantopoulos et al., 2008) and an average variance extracted (AVE) above 0.5 (Fornell & Larcker, 1981; Bagozzi, 1992). These findings validate the measurement model.

Discriminant Validity

Discriminant validity was assessed using the heterotrait-monotrait (HTMT) ratio method, following Fornell & Larcker (1981) and Henseler et al. (2015). This approach, widely recognized in social science research, compares the average heterotrait-heteromethod correlations (across constructs) to the average monotrait-heteromethod correlations (within constructs). The final HTMT value was derived by computing the geometric mean of the monotrait-heteromethod submatrices, ensuring rigorous validation of construct distinctiveness.

Table 1 confirms that all HTMT values are below the 0.85 threshold, indicating satisfactory discriminant validity.

Table 1 Discriminant validity (HTMT ratios)

	CHI	PRT	GCI	VEI	UTI	INI	EV	SC	FC
CHI									
PRT	0.4903								
GCI	0.5058	0.5077							
VEI	0.4754	0.488	0.4612						
UTI	0.4864	0.4948	0.4299	0.4774					
INI	0.4873	0.4946	0.4315	0.4804	0.4774				
EV	0.4908	0.5028	0.4962	0.4286	0.5135	0.5112			
SC	0.4926	0.5201	0.5106	0.4940	0.4159	0.4792	0.4963		
FC	0.4780	0.4872	0.4952	0.4673	0.4836	0.4203	0.4750	0.4668	

VEI = Value-expression influence; UTI = Utilitarian influence; INI = Informational influence; EV = Emotional value; SC = Social value; FC = Function value; CHT = Chain trust; PRT = Product trust; GCI = Green consumption intention

Structural Equation Model Analysis

AMOS 26.0 was used to analyze the sample data, estimate the structural equation model (SEM), and explore the relationships among the research variables. The model-fitting index is used to assess validity, and the index obtained from the AMOS 26.0 analysis is suitable for each index. The results are as follows: X2/df = 1.063; RMSEA = 0.012; CFI = 0.994; $\chi 2$ = 966.012; TLI =0.994; CFI = 0.994; Thus, the model fitting validity is good. Following their literature review, Hinkin et al. (1997) outline several fit statistics commonly used to evaluate models.

Hypothesis Testing

The structural model was evaluated using AMOS 26.0 to test the proposed hypotheses. Path analysis results and hypothesis significance levels are presented in Table 2. Statistical significance was assessed based on t-values (≥1.96) and p-values (≤0.05). As reported in Table 2, the reported values were statistically significant, while the remaining seven did not meet the established criteria. The standardized beta coefficients quantify the magnitude and direction of relationships, offering critical insights into the model's structural dependencies.

Table 2 presents the structural model results, indicating that FC, EV, and SC exhibited significant effects on PRT, CHT, and GCI (H1a-H1c, H2a-H2c, H3a-H3c), supporting their relevance in shaping green consumption intention. Additionally, INI and UTI significantly influenced PRT and CHT (H4a, H4b, H5a, H5b), while VEI demonstrated similar effects (H6a, H6b). Furthermore, CHT and PRT were significant predictors of GCI (H7, H8). However, INI, UTI, and VEI (H4c, H5c, H6c) did not yield statistically significant relationships with GCI, suggesting these factors do not substantially contribute to green consumption intention in this context.

Table 2 Confirmation of the Hypotheses

Hypothesis	Path	β	S.E.	T Statistics	P-value	Result
H1a Functional value-->Product trust	FC-->PRT	0.147	0.063	2.33	0.02*	Accepted
H1b Functional value-->Chain trust	FC-->CHT	0.127	0.055	2.304	0.021*	Accepted
H1c Functional value-->green consumption intention	FC-->GCI	0.14	0.057	2.435	0.015*	Accepted
H2a Emotional value-->Product trust	EV-->PRT	0.15	0.065	2.328	0.02*	Accepted
H2b Emotional value-->Chain trust	EV-->CHT	0.126	0.056	2.231	0.026*	Accepted
H2c Emotional value-->green consumption intention	EV-->GCI	0.127	0.059	2.169	0.03*	Accepted
H3a Social value-->Product trust	SC-->PRT	0.209	0.063	3.333	0.005**	Accepted
H3b Social value-->Chain trust	SC-->CHT	0.148	0.055	2.718	0.007**	Accepted
H3c Social value-->green consumption intention	SC-->GCI	0.142	0.058	2.46	0.014*	Accepted
H4a Informational influence-->Product trust	INI-->PRT	0.154	0.069	2.232	0.026*	Accepted
H4b Informational influence-->Chain trust	INI-->CHT	0.139	0.061	2.296	0.022*	Accepted
H4c Informational influence -->green consumption intention	INI-->GCI	0.011	0.063	0.175	0.861	Rejected
H5a Utilitarian influence--> Product trust	UTI-->PRT	0.16	0.063	2.545	0.011*	Accepted
H5b Utilitarian influence-->Chain trust	UTI-->CHT	0.137	0.055	2.486	0.013*	Accepted
H5c Utilitarian influence-->green consumption intention	UTI-->GCI	0.017	0.057	0.297	0.766	Rejected

Hypothesis	Path	β	S.E.	T Statistics	P-value	Result
H6a Value expression-->Product trust	VEI-->PRT	0.146	0.064	2.291	0.022*	Accepted
H6b Value expression-->Chain trust	VEI-->CHT	0.122	0.056	2.188	0.029*	Accepted
H6c Value expression-->green consumption intention	VEI-->GCI	0.083	0.058	1.438	0.151	Rejected
H7 Product trust-->green consumption intention	PRT-->GCI	0.139	0.054	2.563	0.01**	Accepted
H8 Chain trust-->green consumption intention.	CHT-->GCI	0.176	0.063	2.77	0.006**	Accepted

Note: (*p < 0.05, **p < 0.01, ***p < 0.001)

Artificial Neural Networking (ANN) Analysis

Artificial neural networks (ANNs) model decision-making while addressing collinearity and linearity constraints (Haykin, 2004; Wilson & Bettis-Outland, 2020).

This study applies a feed-forward back-propagation (FFBP) multilayer perception (MLP) with 10-fold cross-validation, using 90% of the data for training and 10% for testing. The hidden and output layers are configured in SPSS with a sigmoid activation function. Model accuracy is evaluated using RMSE, with lower values indicating higher predictive reliability (Table 3).

Table 3 RMSE value of ANN models.

Model A			**Model B**			**Model C**		
Input: FC, EV, SC, INI, VEI, UTI, PRT, CHT			**Input: FC, EV, SC, INI, VEI, UTI, CHT**			**Input: FC, EV, SC, INI, VEI, UTI,**		
Output: GCI			**Output: PRT**			**Output: CHT**		
Neural network	**Training**	**Testing**	**Neural network**	**Training**	**Testing**	**Neural network**	**Training**	**Testing**
ANN1	0.280	0.228	ANN1	0.333	0.277	ANN1	0.298	0.307
ANN2	0.320	0.475	ANN2	0.307	0.202	ANN2	0.322	0.285
ANN3	0.293	0.268	ANN3	0.323	0.279	ANN3	0.311	0.379
ANN4	0.384	0.321	ANN4	0.307	0.342	ANN4	0.312	0.264
ANN5	0.321	0.223	ANN5	0.282	0.242	ANN5	0.350	0.265
ANN6	0.295	0.267	ANN6	0.287	0.300	ANN6	0.344	0.282
ANN7	0.330	0.177	ANN7	0.292	0.315	ANN7	0.315	0.265

Model A			**Model B**			**Model C**		
Input: FC, EV, SC, INI, VEI, UTI, PRT, CHT			**Input: FC, EV, SC, INI, VEI, UTI, CHT**			**Input: FC, EV, SC, INI, VEI, UTI,**		
Output: GCI			**Output: PRT**			**Output: CHT**		
Neural network	**Training**	**Testing**	**Neural network**	**Training**	**Testing**	**Neural network**	**Training**	**Testing**
ANN8	0.311	0.191	ANN8	0.271	0.265	ANN8	0.316	0.276
ANN9	0.303	0.332	ANN9	0.292	0.202	ANN9	0.304	0.244
ANN10	0.295	0.319	ANN10	0.292	0.336	ANN10	0.308	0.231
Mean	0.313	0.280	Mean	0.299	0.276	Mean	0.318	0.280
SD	0.171	0.296	SD	0.138	0.223	SD	0.129	0.202

Note: VEI = Value-expression influence; UTI = Utilitarian influence; INI = Informational influence; EV = Emotional value; SC = Social value; FC = Function value; CHT = Chain trust; PRT = Product trust; GCI = Green consumption intention

A sensitivity analysis assessed the impact of input variables on GCI; Table 4 presents the ANN model's predictor strengths. Normalized importance was calculated by dividing each predictor's relative importance by the highest observed value (Leong et al., 2020). Results show CHT as the strongest predictor of GCI, followed by PRT. For PRT, CHT was primary, with UTI secondary. INI was the top predictor of CHT, followed by SC and VEI, highlighting varying influences of the predictors. Table 4 compares predictor rankings from SEM and ANN models. SEM rankings rely on path coefficients, while ANN rankings reflect normalized importance. Discrepancies exist across models, with FC, SC, INI, VEI, UTI, and PRT showing variations for GCI in Model A, FC, EV, SC, VEI, and UTI for PRT in Model B, and FC, EV, SC, VEI, UTI, and INI for CHT in Model C. These differences suggest latent attributes influencing relationships, highlighting the limitations of linear models in capturing complex interactions.

Table 4 SEM and ANN results comparison.

SEM path	**Original sample/path coefficient**	**ANN results: normalized relative importance (%)**	**SEM ranking based on the path coefficient**	**ANN ranking based on normalized relative importance (%)**	**Remark**
Model A (output GCI)					
FC→GCI	0.14	50.525	3	4	Not Matched
EV→GCI	0.127	48.906	5	5	Matched
SC→GCI	0.142	67.498	2	3	Not Matched
INI→GCI	0.011	30.927	8	7	Not Matched
VEI→GCI	0.083	29.484	6	8	Not Matched
UTI→GCI	0.017	35.302	7	6	Not Matched

SEM path	Original sample/path coefficient	ANN results: normalized relative importance (%)	SEM ranking based on the path coefficient	ANN ranking based on normalized relative importance (%)	Remark
PRT→GCI	0.139	75.109	4	2	Not Matched
CHT→GCI	0.176	100	1	1	Matched
Model B (output PRT)					
FC→PRT	0.147	41.892	6	5	Not Matched
EV→PRT	0.15	62.695	5	3	Not Matched
SC→PRT	0.209	62.695	2	3	Not Matched
INI→PRT	0.154	42.998	4	4	Matched
VEI→PRT	0.146	36.364	7	6	Not Matched
UTI→PRT	0.16	64.064	3	2	Not Matched
CHT→PRT	0.220	100	1	1	Matched
Model C (output CHT)					
FC→CHT	0.127	58.122	4	5	Not Matched
EV→CHT	0.126	61.208	5	4	Not Matched
SC→CHT	0.148	76.734	1	2	Not Matched
INI→CHT	0.139	100	2	1	Not Matched
VEI→CHT	0.122	71.059	6	3	Not Matched
UTI→CHT	0.137	42.119	3	6	Not Matched

The results show that SEM and ANN align in their rankings of key paths. In Model A, Chain Trust and Emotional Value consistently rank highest for Green Consumption Intention. In contrast, in Model B, Chain Trust ranks highest for Product Trust, confirming the robustness of these relationships. However, most path rankings differ between SEM and ANN, reflecting methodological distinctions. SEM models linear causal relationships using path coefficients, whereas ANNs capture nonlinear interactions through normalized importance values. ANN excels in modeling complex dependencies, whereas SEM provides structured causal pathways for theory validation. Their complementary strengths suggest that integrating both methods can enhance empirical research insights.

Conclusion and Discussion

Recent food safety incidents in China have significantly increased consumer awareness and demand for organic products; however, overall adoption remains limited, especially within developing regions. Employing the Appraisal-Emotional-Response framework, this study investigates the psychological mechanisms underlying consumers' intentions toward green consumption. Specifically, it analyzes the roles of perceived functional, emotional, and social values, as well as informational, utilitarian, and value-expressive influences from reference groups.

Methodologically, Structural Equation Modeling (SEM) and Artificial Neural Networks (ANN) were used to validate the research hypotheses empirically. The findings reveal that consumer-perceived values influence green consumption intentions through trust-based mechanisms. However, the influence of reference groups did not yield statistically significant relationships with green consumption intentions, suggesting these factors do not substantially contribute to green consumption intention in this context. SEM results confirmed the critical effects of CHT and PRT. A comparative analysis demonstrated consistency between SEM and ANN in identifying key paths, notably the influence of CHT on PRT and the influence of emotional value on green consumption intention. Nevertheless, discrepancies in path importance rankings were observed, reflecting SEM's ability to capture linear causal relationships and ANN's proficiency in modeling complex nonlinear interactions. Integrating SEM with ANN methodologies enhances interpretability and predictive accuracy, thereby significantly improving theoretical insights and practical decision-making in complex research environments.

Limitations and Future Research

This study offers meaningful contributions but also has several limitations that suggest directions for future research. First, the focus on China may limit external validity; examining other cultural and geographical contexts could provide deeper insights into cross-cultural differences in green consumption. Second, reliance on surveys raises concerns about self-selection bias. Future research could employ experimental designs or longitudinal analyses using actual purchase data to test causal relationships and intention-behavior gaps more rigorously. Lastly, this study emphasized functional and emotional dimensions of perceived value. Exploring other dimensions—such as conditional, epistemic, and social values—would yield a more comprehensive framework for understanding green consumption and enhance both theoretical and practical implications.

References

Bagozzi, R. (1992). The Self-Regulation of Attitudes, Intentions, and Behavior. *Social Psychology Quarterly, 55*(2), 178-204.

Bearden, W., & Etzel, M. (1982). Reference Group Influence on Product and Brand Purchase Decisions. *Journal of Consumer Research, 9*(2), 183-194.

Bernarto, I., Purwanto, A., Tulung, J., & Pramono, R. (2024). The Influence of Perceived Value, And Trust on Wom and Its Impact on Repurchase Intention. *Revista de Gestão Social e Ambiental, 18*(4), e04983.

Bunchapattanasakda, C., Huang, Y., Bunchapattanasakda, P., Boonmek, B., & Lertjanyakit, H. (2023). Impact of Green Advertising on Green Product Purchase Intention: Mediating Role of Consumer Trust. *The Journal of Pacific Institute of Management Science (Humanities and Social Science), 9*(3), 82-98.

Charviandi, A. (2023). Application of Shopping Bag to Consumer Green Purchase Behavior through Green Trust, and Green Perceived Value. *Journal of Artificial Intelligence and Digital Business (RIGGS), 1*(2), 19-24.

Chau, P., & Hu, P. (2001). Information Technology Acceptance by Individual Professional: A Model Comparison Approach. *Decision Sciences, 32*(4), 699-719.

Cochran, W. (1977). *Sampling Techniques* (3rd ed.). New York: John Wiley & Sons.

Diamantopoulos, A., Riefler, P., & Roth, K. (2008). Advancing formative measurement models. *Journal of Business Research, 61*(12), 1203-1218.

Fernqvist, F., & Ekelund, L. (2014). Credence and the effect on consumer liking of food – A review. *Food Quality and Preference, 32*(C), 340-353.

Fornell, C., & Larcker, D. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research, 18*(3), 382-388.

Harrington, D. (2009). *Confirmatory factor analysis*. New York: Oxford University Press.

Haykin, S. (2004). *Neural Networks A Comprehensive Foundation*. Singapore: Pearson Educartion Pte. Ltd.

Henseler, J., Ringle, C., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*, 115-135.

Hinkin, T., Tracey, J., & Enz, C. (1997). Scale Construction: Developing Reliable and Valid Measurement Instruments. *Journal of Hospitality & Tourism Research, 21*(1), 100-120.

Hu, L., & Bentler, P. (1999). Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Kamboj, K., & Kishor, N. (2022). Influence of Customer Perceived Values on Organic Food Consumption Behaviour: Mediating Role of Green Purchase Intention. *FIIB Business Review, 0*(0). https://doi.org/10.1177/23197145221125283.

Koller, T., Goedhart, M., & Wessels, D. (2020). *Valuation: Measuring and Managing the Value of Companies* (7th ed.). New Jersey: John Wiley & Sons.

Lages, C. (2012). Employees' external representation of their workplace: Key antecedents. *Journal of Business Research, 65*(9), 1264-1272.

Lee, J., & de Fortuny, E. (2022). Influencer-Generated Reference Groups. *Journal of Consumer Research, 49*(1), 25-45.

Leong, L., Hew, T., Ooi, K., & Wei, J. (2020). Predicting mobile wallet resistance: A two-staged structural equation modeling-artificial neural network approach—International *Journal of Information Management, 51*, 102047.

Nunnally, J. (1978). An overview of psychological measurement. In B. Wolman. (ed.). *Clinical Diagnosis of Mental Disorders* (pp. 97-146). Massachusetts: Springer.

Nuttavuthisit, K., & Thøgersen, J. (2017). The Importance of Consumer Trust for the Emergence of a Market for Green Products: The Case of Organic Food. *Journal of Business Ethics, 140*, 323-337.

Pitkänen, J. (2021). *Mobile payments: Finland compared to China*. Bachelor of Business Administration Thesis, Seinäjoki University of Applied Sciences.

Prakash, G., & Pathak, P. (2017). Intention to buy eco-friendly packaged products among young consumers of India: A study on developing nation. *Journal of Cleaner Production, 141*, 385-393.

Sakdapat, N., Yuangngoen, P., & Ngamcharoen, P. (2025). Communication for Promoting Healthy Behaviors and Well-Being among the Elderly in Thailand: A Mixed Methods Study. *American Journal of Health Behavior, 49*(3), 284-301.

Shi, J., & Jiang, Z. (2023). Willingness to pay a premium price for green products: does a reference group matter?. *Environment, Development and Sustainability, 25*, 8699-8727.

Wilson, R., & Bettis-Outland, H. (2020). Can artificial neural network models be used to improve the analysis of B2B marketing research data?. *Journal of Business & Industrial Marketing, 35*(3), 495-507.

Wu, Y., & Huang, H. (2023). Influence of Perceived Value on Consumers' Continuous Purchase Intention in Live-Streaming E-Commerce—Mediated by Consumer Trust. *Sustainability, 15*(5), 4432.

Yu, W., He, M., Han, X., & Zhou, J. (2022). Value acquisition, value co-creation: The impact of perceived organic grocerant value on customer engagement behavior through brand trust. *Frontiers in Psychology, 13*, 990545.

Yuangngoen, P., Sakdapat, N., & Ngamcharoen, P. (2025). Analysis on Factors Influencing Medical Health Tourism Behaviour of Generation X. *The Journal of Mind and Behavior, 46*(2), 45-72.

Zheng, X., Li, C., Fang, X., & Zhang, N. (2021). Price sensitivity and consumers' support for renewable energy in China. *Energy, 222*, 119862.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.