



Original Article

The impact of media publicity and online product reviews on consumers' purchase intentions of energy-efficient appliances

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Abstract: In the changing global economy, energy security has become a central concern for the sustainable development of nations. The limited energy supply in developing countries has led governments and enterprises to explore efficient energy resources. The consumption of energy-efficient appliances is a crucial way to address energy scarcity. This study aims to predict consumer purchase intention for energy-efficient household appliances. The study extends the Stimulus - Organism - Response model by incorporating green perceived value and customer trust as mediators between external stimuli and consumers' behavioral responses. Data was collected from 287 household heads in Vietnam and analyzed by applying partial least squares structural equation modeling. Results show that media publicity, online product reviews, green perceived value, and customer trust all significantly correlate with consumers' purchase intention. Results further indicate that green perceived value mediates the relationship between media publicity, online product reviews and consumers' purchase intention. Moreover, customer trust in energy-efficiency labels is a significant mediator between media publicity, online product reviews and consumers' purchase intention. The research offers theoretical and practical insights into green consumption and the promotion of energy efficiency in emerging markets.

Keywords: Customer behavior, energy-efficient, media, online product reviews, trust.

1. Introduction

Consumer purchase of household energy-efficient appliances has received paramount

attention from marketing researchers. Energy-efficient appliances are products that reduce carbon emissions through technological

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innovation and often include innovative but lesser-known features. Energy-efficient appliances use less energy to provide the same service. Therefore, acquiring energy-efficient appliances yields financial savings for households and benefits the environment and society by reducing greenhouse gas emissions (Hossain et al., 2022). Households contribute significantly to greenhouse gas emissions, and a growing body of literature recognizes the importance of households' purchase of energy-efficient appliances (Jamil et al., 2022). From 1970 to 1990, scholars primarily relied on socio-demographic criteria, such as gender, age, and income, to profile green consumers (Straughan & Roberts, 1999). However, Diamantopoulos et al. (2003) argued that demographic factors have a lower power in predicting green consumer behavior than psychological criteria. Upon entering the 2000s, researchers have switched to using theories such as the Theory of Planned behavior, the Value - Belief - Norm theory, or the Knowledge - Attitude - Behavior model as theoretical foundations to explain consumer purchase of energy-efficient appliances (Hossain et al., 2022; Jamil et al., 2022). These theories mainly focus on psychological factors, while the impact of situational factors on consumers' purchase behavior toward energy-efficient appliances has received little attention. Moreover, despite the high worldwide Internet penetration rate and mobile phone usage, there is little published work on the influence of digital environment contexts, such as e-commerce and social media, on consumer purchase of energy-efficient appliances. Ma et al. (2022) reported that online product reviews on e-commerce platforms positively affect consumers' decision to purchase energy-efficient refrigerators. Furthermore, although previous studies have shown perceived value as a determinant of consumers' purchase intention towards energy-efficient appliances, the mediating role of perceived value is not well understood. In addition, the antecedents of consumer perceived value remain unclear. Tanrikulu (2021) suggested that the influence of situational factors on perceived value should be investigated.

To address these gaps, based on an extension of the Stimulus - Organism - Response (SOR)

framework, the first objective of this study is to examine the influence mechanism of external factors, including media publicity and online product reviews, on consumers' purchase intention of energy-efficient appliances. The second research objective was to assess the mediating role of green perceived value and consumer trust.

This study contributes to the current body of knowledge of energy consumption in several ways. First, by incorporating online product reviews into situational factors, this study will provide fresh insights into the power of the SOR model in explaining the influence of environmental stimuli on the individual's affective and cognitive states, which translate into behavioral intention. Second, this study provides evidence on the mediating role of green perceived value and trust in energy-efficiency labels between media publicity, online product reviews and consumers' purchase intention of energy-efficient appliances. This result is a fresh contribution in the current body of knowledge and one of the first attempts to explore these relationships with mediators. Third, the study's findings will help marketing managers and energy-efficient appliance sellers design effective communication strategies to encourage consumer purchase of such products.

Furthermore, this study enriches the understanding of consumer purchase of energy-efficient appliances in emerging markets, a topic that has received scarce attention (Trotta, 2018). Given their economic significance and fast-growing energy demand, more attention should be paid to emerging markets. This study focuses on Vietnam and adds to the literature on consumers' pro-environmental behavior in emerging countries. Vietnam is a typical emerging market, where household energy consumption is a major contributor to the total energy consumption. At the household level, energy consumption accounts for approximately 33% of the total energy consumption, ranking second to the manufacturing industry (Tran et al., 2022). Therefore, it is crucial to encourage households in Vietnam to use energy-efficient appliances to ensure national energy security, fulfill environmental commitments, and achieve the United Nation's Sustainable

Development Goals. Existing research about consumer purchase of energy-efficient appliances in Vietnam has primarily focused on the impact of psychological and socio-demographic factors on consumer choice (Nguyen et al., 2019; Nguyen et al., 2016), neglecting the role of situational factors.

Hanoi was selected as the specific research context for two reasons. First, consumers in this city have higher income and tend to pursue a sustainable lifestyle (Nguyen et al., 2021). Second, Hanoi has the highest number of retailers of energy-saving products (Statista, 2022), making it easier to approach target research participants.

2. Literature review and hypotheses development

2.1. Theoretical background

The current study is anchored on the SOR theory, which postulates that environmental stimuli can provoke people's cognitive and affective processes, which lead to certain behavioral outcomes (Mehrabian & Russell, 1974; Tang et al., 2019). The SOR comprises three main components: stimulus, organism, and response. The first component, "stimulus", pertains to the triggers that elicit individual responses. The "organism" component refers to the affective and cognitive states experienced by individuals when they interact with stimuli. The final component is the "response", which denotes individuals' reactions and behaviors in response to stimuli and their internal states. The SOR model was chosen for this study for several reasons. Firstly, previous consumer energy behavior studies have used the SOR model to predict consumers' perceptions, emotional responses and behaviors (Tang et al., 2019). Secondly, the SOR model provides a suitable theoretical lens to understand how consumers' circumstances impact their internal psychological states, and consequently, their intention to purchase energy-efficient household appliances.

In accordance with the SOR framework, this study proposes that media publicity and online product reviews, which represent environmental stimuli, exert influence on both consumer

perception (green perceived value) and customer emotion (trust in energy efficiency labels), and their behavioral responses, specifically reflected in purchase intention. Green perceived value and trust in energy efficiency labels are chosen to represent consumers' cognitive and affective states, respectively, as energy-efficient appliances are associated with environmental benefits (Issock et al., 2020). Previous studies have indicated a lack of credibility in energy rating labels among consumers in Vietnam (Nguyen et al., 2018). However, considering the implementation of the Energy Efficiency Standards and Labeling program for 10 years, this research expects that extensive media publicity and online product reviews may impact consumers' green perception and trust in energy efficiency labels.

2.2. The influence of media publicity on purchase intention, green perceived value, and customer trust

Media publicity depicts the extent to which consumers are exposed to energy-saving information in the surrounding environment (Zhang et al., 2020). Previous studies have demonstrated that media publicity can promote energy-saving behavior among employees in the workplace (Zhang et al., 2013).

Consumer perceived value refers to the overall evaluation that consumers make about the utility of a product or service based on their perception of what is received and what is given (Zeithaml, 1988). Green perceived value pertains to the customer's judgment about a product's overall environmental excellence and superiority (Zhang et al., 2020). Given that consumers in Vietnam generally have limited knowledge about environmental issues (Nguyen et al., 2017), this study anticipates that providing more information about energy-efficient appliances through various media channels will lead to consumers perceiving these products as having higher environmental value.

Purchase intention is the optimal proxy of pro-environmental purchase behavior (Ajzen, 1991). The intention of consumers to purchase energy-efficient household appliances has been of interest to many researchers because it reflects consumers' willingness to buy such products.

Media publicity positively influences consumers' intention to recycle electronic products by shaping their perception and attitude (Wang et al., 2018). Based on these discussions, this research expects that when consumers are exposed to information highlighting the environmental friendliness of energy-efficient appliances, it will enhance their perception of the green value associated with such products and motivate them to purchase. The following hypotheses are formulated:

H1: Media publicity positively influences consumers' intention to purchase energy-efficient appliances.

H2: Media publicity positively influences green perceived value.

Morgan and Hunt (1994) defined trust as the confidence that one party has in the reliability and integrity of their exchange partner. Trust represents the intention to accept vulnerability based on the positive expectations of the intentions or behaviors of another. Trust in energy efficiency labels refers to a psychological state organized by positive expectations about the product's environmental performance (Issock et al., 2020). Trust plays a crucial role in forming and maintaining buyers' and sellers' relationships. Spence (1973) proposed the signaling theory to explain the process by which individuals convey information to each other when there is uncertainty. The theory suggests that signals can convey product quality information in asymmetric scenarios where the seller possesses more information than the buyer. These signals, in turn, help establish credibility and gain the buyer's trust. Trust has positively influenced consumers' purchase intention (Hossain et al., 2022). When deciding to purchase energy-efficient appliances, consumers often lack information regarding the environmental benefits of such products (Issock et al., 2020). In such a case, knowledge and information about energy-saving appliances promoted through the television, newspaper, and other media could act as signals to ensure product quality. Wang and Li (2022) emphasized that information quality disseminated by green advertisement can affect customer trust in

energy-saving smart home products. Hence, the following hypothesis is developed:

H3: Media publicity positively influences customer trust.

2.3. The influence of online product reviews on purchase intention, green perceived value, and customer trust

Word of mouth (WOM) refers to communication about products and services between consumers who are perceived as independent of commercial influence and, therefore, have no incentive to distort the truth in favor of the product or service (Huete-Alcocer, 2017). WOM is one of the most influential factors affecting consumer behavior. With the global proliferation of the Internet, a new form of WOM, known as online WOM or eWOM, has emerged. Digital platforms, such as virtual communities, websites, product review sites, and social media, provide individuals with the means to share their feedback with a larger audience through texts, videos, or posts on discussion boards. Such eWOM forms carry higher credibility than information marketers provide online (Huete-Alcocer, 2017). Luo et al. (2023) highlighted that consumers' purchase of energy-efficient products is influenced by information shared by social media influencers. Similarly, in the context of energy-efficiency purchases, where it may be difficult to assess the environmental attributes of products, online product reviews can improve consumers' perception of the product's environmental friendliness. Furthermore, in their research on influencer marketing, Lou and Yuan (2019) confirmed the positive effect of social media product reviews on consumers' brand trust. Based on the above discussion, we propose the following hypotheses:

H4: Online product reviews positively influence consumers' intention to purchase energy-efficient appliances.

H5: Online product reviews positively influence green perceived value.

H6: Online product reviews positively influence customer trust.

2.4. The influence of green perceived value and customer trust on purchase intention

A study conducted by Gil and Jacob (2018) revealed the significant influence of green perceived value and green trust on consumers' intention to purchase energy-efficient products with environmentally friendly attributes. It can be assumed that as consumers develop a better perception of the green value associated with energy-efficient appliances and place growing trust on environmental claims attached to these products, their motivation to make such purchases amplifies. Therefore, the following hypothesis is proposed:

H7: Green perceived value has a positive impact on consumers' intention to purchase energy-efficient appliances.

H8: Customer trust has a positive impact on consumers' intention to purchase energy-efficient appliances.

2.5. The mediating role of green perceived value and customer trust

Based on the arguments presented, media publicity and online product reviews are

expected to improve consumers' perception of value and trust in energy-efficiency labels, thereby increasing their intention to purchase such products. This expectation is consistent with the SOR theory, which suggests that the organism phase mediates the impact of stimuli on behavioral responses. Hence, the following hypotheses are proposed:

H9a: Green perceived value mediates the relationship between media publicity and purchase intention.

H9b: Green perceived value mediates the relationship between online product reviews and purchase intention.

H10a: Customer trust mediates the relationship between media publicity and purchase intention.

H10b: Customer trust mediates the relationship between online product reviews and purchase intention.

Figure 1 shows the research model of this study.

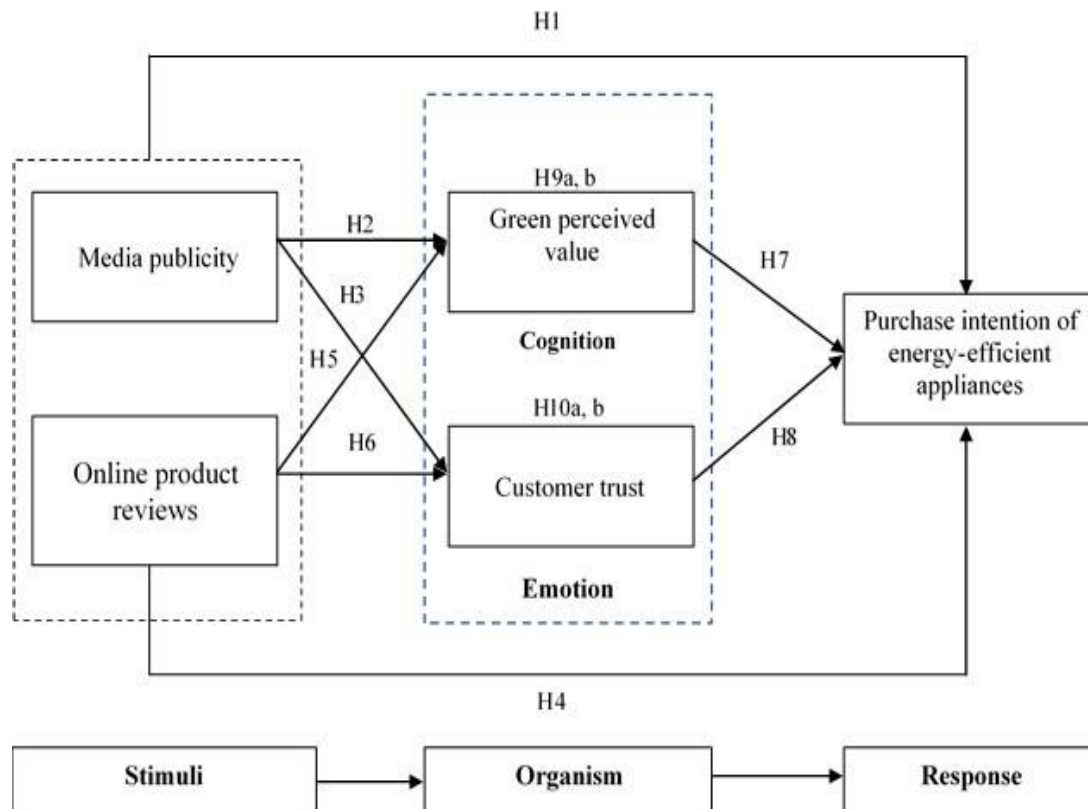


Figure 1: The proposed research framework
 Source: Author's suggestion.

3. Research methodology

3.1. Sampling and data collection

All measurement constructs and items were adapted from existing validated scales. Media publicity and green perceived value were each measured using three items from Zhang et al. (2020). Online product reviews were measured with four items from Reza Jalilvand and Samiei (2012). Customer trust was measured with five items from Isock et al. (2020). All measurement items were assessed using a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Due to the absence of a sampling frame and the population size unable to be estimated, this study adopted a non-probability convenience sampling approach, which was used in previous research on consumer purchases of energy-saving products (Nguyen et al., 2016). Also, a convenience sampling method is a cost-effective and time-efficient sampling method. The external validity of convenience sampling is limited because the findings cannot be generalized to the target population. However, this research aims to examine relationships that have not been studied previously. Therefore, weak external validity is not a major concern.

A questionnaire was developed by forward and back translation of items from English to Vietnamese and vice versa. To ensure the representativeness and suitability of the survey items, the authors conducted in-depth interviews with six professors specializing in green marketing and two focus groups consisting of consumers of energy-efficient appliances to detect possible issues associated with the items and the questionnaire.

Since this study utilized PLS-SEM for data analysis, a sample size of 100-200 is recommended (Hoyle, 1995). Before the main study, we conducted a pilot test with five heads of households in Hanoi to identify potential problems with administration and completion of the questionnaire. A total of 287 respondents participated in the main study, satisfying the minimum required sample size. The survey was conducted using both direct and indirect approaches. The questionnaire was distributed to friends, colleagues, and acquaintances of the

research team members from May to July 2023. Specifically, 70 responses were collected through direct distribution using paper-based questionnaires, while 217 responses were collected through indirect distribution via an online link. The respondents were household heads over the age of 18 and had either purchased energy-efficient appliances or expressed an interest in them.

3.2. Data analysis

The program Smart PLS4 was employed in this study to assess both the measurement and structural models. PLS-SEM was chosen because it is the most suitable approach for testing complex models with various path analyses and multiple mediators (Hair Jr et al., 2021). Also, PLS-SEM does not require a large sample size (Hair Jr. et al., 2021). The bootstrapping procedure was used to evaluate path coefficients and assess the quality of the structural model equation.

4. Results

4.1. Measurement model

Internal consistency

All the outer loading values were above the cutoff value of 0.708 (Hair et al., 2019), except for item TR4. Therefore, this item was eliminated.

Composite reliability (CR) and Cronbach's Alpha (CA) were used to test the constructs' internal consistency. CR values ranged from 0.854 to 0.898, above the cutoff value of 0.7 and CA values of all constructs exceeded the threshold of 0.70 (Hair et al., 2019), so the measurement model has a good internal consistency.

Convergent validity

For convergent validity to be considered acceptable, the latent constructs' average variance extracted (AVE) values were above 0.50, which means the latent constructs explain 50% or more of the variance of the items forming the constructs.

Discriminant validity

Discriminant validity measures the extent to which each construct is separate from other constructs within the model. Ringle et al. (2015)

propose that both the Fornell and Larcker (1981) criteria and the Heterotrait Monotrait Ratio methods should be used to determine the discriminant validity of latent variables. The

square root of the AVE should exceed the construct correlations with any other construct in the model.

Table 1: Assessment of the measurement model

Constructs	Items	Outer loadings	Cronbach's Alpha	CR	AVE	R ²
Green perceived value (GPV)	GPV1	0.860	0.809	0.887	0.724	0.222
	GPV2	0.883				
	GPV3	0.807				
Purchase intention of energy-efficient appliances (INT)	INT1	0.807	0.770	0.867	0.685	0.599
	INT2	0.814				
	INT3	0.830				
	INT4	0.771				
Media publicity (MED)	MED1	0.810	0.772	0.854	0.594	0.311
	MED2	0.838				
	MED3	0.836				
Online product reviews (REV)	REV1	0.737	0.820	0.881	0.649	
	REV2	0.739				
	REV3	0.789				
	REV4	0.815				
Customer trust (TR)	TRU1	0.853	0.849	0.898	0.687	
	TRU2	0.839				
	TRU3	0.827				
	TRU4					
	TRU5	0.797				

Source: Results from data analysis.

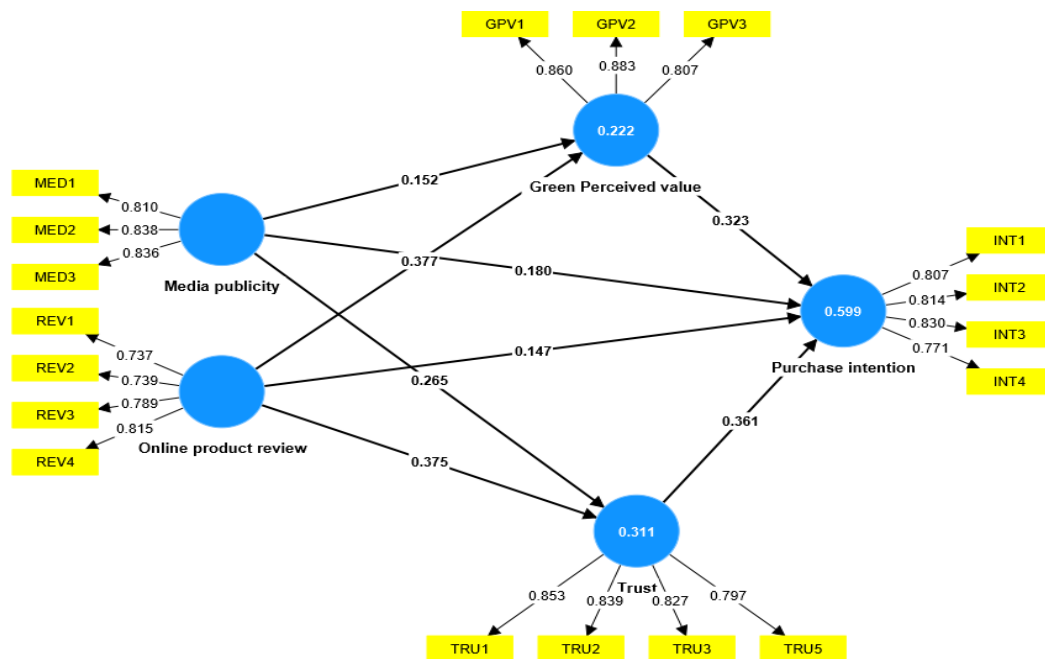


Figure 2: The results of the measurement model assessment

Source: Results from data analysis.

Table 2: Fornell-Larcker criterion

Constructs	Green perceived value	Media publicity	Online product review	Purchase intention	Customer trust
Green perceived value	0.851				
Media publicity	0.341	0.828			
Online product review	0.453	0.504	0.771		
Purchase intention	0.587	0.528	0.568	0.806	
Trust	0.377	0.454	0.509	0.640	0.829

Source: Results from data analysis.

Table 2 shows the diagonal of a square matrix (in bold) that represented the square root of the AVE for each construct and correlations among the constructs. The figures indicated that all latent constructs exhibit satisfactory discriminant validity. Henseler et al. (2015) introduced an additional approach, the Heterotrait-Monotrait ratio of correlations, to

evaluate discriminant validity. A threshold value of HTMT is proposed smaller than 0.85, meaning the discriminant validity is present (Henseler et al., 2015). In conclusion, based on the results, the reflective measurement model could be said to have met internal consistency, convergent and discriminant validity.

Table 3: Heterotrait-Monotrait Ratio (HTMT)

	Green perceived value	Media publicity	Online product review	Purchase intention	Trust
Green perceived value					
Media publicity	0.432				
Online product review	0.574	0.646			
Purchase intention	0.716	0.666	0.708		
Trust	0.450	0.562	0.615	0.758	

Source: Results from data analysis.

4.2. Structural model

When the measurement model assessment is satisfactory, the next step in evaluating PLS-SEM results is assessing the structural model. Collinearity must be examined before assessing the structural model to ensure it does not bias the regression results. Ideally, the VIF values should be close to 3 and lower.

To evaluate the structural model, bootstrapping was conducted with re-sampling of 5,000. The results of the path coefficients and hypotheses are presented in Table 4 and Figure 3. Our findings indicate that all hypotheses are supported at a 95% confidence level. Media publicity ($\beta = 0.152$, $p < 0.05$) and online product reviews ($\beta = 0.377$, $p < 0.01$) both

positively affect consumers' green perceived value. They explained 22.2% of the variance in consumers' green perceived value. Therefore, hypotheses H2 and H5 are supported. Findings also indicate that media publicity ($\beta = 0.265$, $p < 0.01$) and online product reviews ($\beta = 0.375$, $p < 0.01$) both have significant positive impact on customer trust. Media publicity and online product reviews explain 31.1% of the variance of purchase intention. Hypotheses H3 and H6 are also accepted. Moreover, the results highlighted that media publicity ($\beta = 0.180$, $0 < 0.01$), online product reviews ($\beta = 0.147$, $p < 0.05$), green perceived value ($\beta = 0.323$, $p < 0.01$), and trust ($\beta = 0.361$, $p < 0.01$) positively influence purchase intention, supporting H1, H4, H7, and H8. Furthermore, media publicity, online

product reviews, green perceived value, and customer trust collectively account for 59.9% of the variance in purchase intention. Overall, the

results have supported all the direct hypothesized relationships between the media publicity, online product reviews and purchase intention.

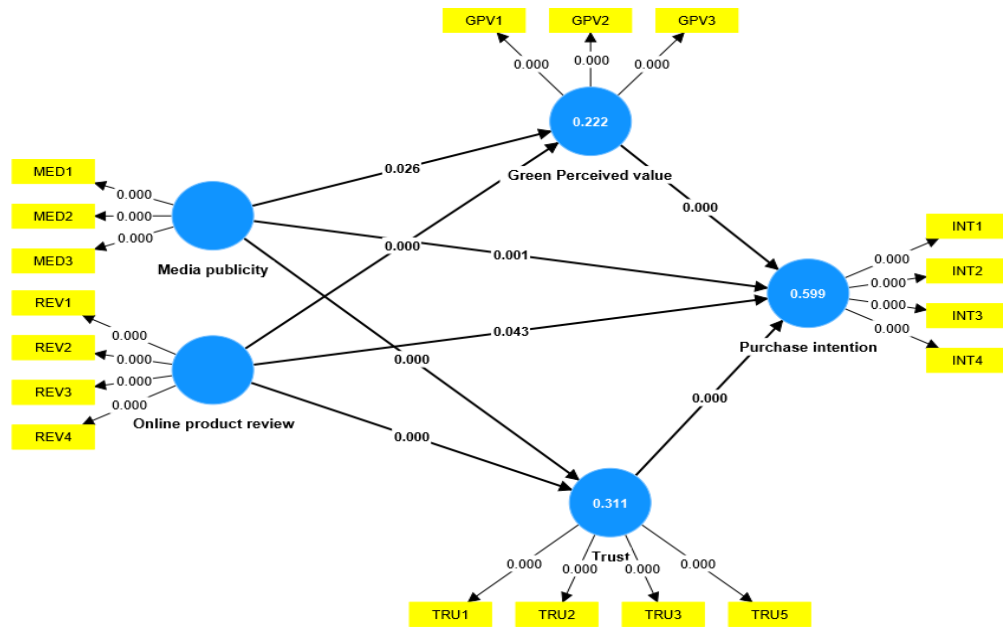


Figure 3: PLS Path Model
 Source: Results from data analysis.

Table 4: Structural path estimates

Hypothesis	Relationship	Path Coefficient	Std.	p values	Results	f-square	Effect sizes
Direct effects							
H1	Media publicity → Purchase intention	0.180	0.053	0.001	Supported	0.056	Small
H2	Media publicity → Green Perceived value	0.152	0.068	0.026	Supported	0.022	Small
H3	Media publicity → Trust	0.265	0.065	0.000	Supported	0.076	Small
H4	Online product review → Purchase intention	0.147	0.073	0.043	Supported	0.032	Small
H5	Online product review → Green Perceived value	0.377	0.095	0.000	Supported	0.136	Small
H6	Online product review → Trust	0.375	0.067	0.000	Supported	0.152	Medium
H7	Green Perceived value → Purchase intention	0.323	0.058	0.000	Supported	0.197	Medium
H8	Trust → Purchase intention	0.361	0.060	0.000	Supported	0.219	Medium
Indirect effects							
H9a	Media publicity → Green perceived value	0.049	0.022	0.028	Supported		Partial mediation

	→ Purchase intention					
H9b	Online product review → Green perceived value → Purchase intention	0.122	0.038	0.001	Supported	Partial mediation
H10a	Media publicity → Trust → Purchase intention	0.096	0.030	0.001	Supported	Partial mediation
H10b	Online product review → Trust → Purchase intention	0.135	0.028	0.000	Supported	Partial mediation

Source: Results from data analysis.

The f^2 effect size is used to rank the order of the predictor construct's relevance in explaining a dependent construct in the SEM. Values higher than 0.02, 0.15, and 0.35 depict small, medium, and large f^2 effect sizes (Cohen et al., 2013). Therefore, the impact of online product reviews ($f^2 = 0.152$) on customer trust was medium. Also, both green perceived value ($f^2 = 0.197$) and customer trust ($f^2 = 0.219$) have a medium impact on consumers' intention to purchase energy-efficient appliances.

4.3. The mediating effects analysis

This study regards green perceived value and customer green trust as mediators. As can be seen from Table 4, green trust significantly mediates the relationship between media publicity and purchase intention ($\beta = 0.049$, p-value < 0.05), and the relationship between online product reviews and purchase intention ($\beta = 0.122$, p-value < 0.01). Similarly, customer trust was working as a significant mediating effect on media publicity and purchase intention ($\beta = 0.096$, p-value < 0.01) and online product reviews and purchase intention ($\beta = 0.135$, p-value < 0.01). Thus, H9a, H9b, H10a and H10b were supported.

According to Hair et al. (2014), a VAF value greater than 0.8 indicates full mediation, a value between 0.2 and 0.8 indicates partial mediation, and a value less than 0.2 suggests no mediation. Table 4 shows that the VAF values for green perceived value and customer trust fall within the range of 0.2 to 0.8, indicating their partial mediation effect on the relationship between environmental stimuli

and consumers' purchase intention of energy-efficient appliances. In addition, compared to green perceived value, customer trust exhibits a stronger mediating effect on the relationship between media publicity, online product reviews, and purchase intention.

5. Discussion of findings

5.1. Theoretical implications

This study investigates the role of media publicity and online product reviews in influencing consumers' intention to purchase energy-efficient household appliances. In addition, it explores how green perceived value and customer trust act as mediators in the relationship between media publicity, online product reviews, and consumers' purchase intention. This study has several theoretical contributions. First, by integrating online product reviews into the SOR model and forming a more comprehensive framework for understanding consumers' purchase decisions, this research advances the extant knowledge of digital environment influences on consumer choices. Second, this study examines the mediating role of green perceived value and customer trust in the relationship between media publicity, online product reviews and consumers' purchase intention, which have not been studied in previous research. Prior studies on green consumption have primarily focused on internal factors such as perceived behavioral control and attitude (Hoang, 2023; Vu et al., 2013). The findings from this study offer some important insights into the relationship between

internal and external factors, shedding light on how they collectively influence consumers' decision to purchase energy-efficient household appliances.

This study corroborates the ideas of Gil and Jacob (2018) and Hossain et al. (2022), who suggested that green perceived value and customer trust have a positive relationship with consumers' intention to purchase energy-efficient household appliances. Also, media publicity positively affects consumers' purchase intention of energy-efficient appliances. This finding was also reported by Li et al. (2023). Furthermore, this study seems consistent with Jalilvand and Samiei (2012) who found the impact of online product reviews on consumers' purchase intention. Moreover, one interesting finding is that media publicity and online product reviews positively influence green perceived value and customer trust in energy-efficiency labels. Another notable finding is the mediating mechanism of green perceived value and customer trust in the relationship between media publicity-purchase intention and online product reviews-purchase intention.

The path analysis results indicate that, compared to media publicity, online product reviews have a stronger positive effect on both green perceived value and customer trust towards energy-efficiency labels. These relationships may partly be explained by the nature of online reviews, where feedback and opinions shared by previous consumers on digital platforms reflect their personal experiences with the product rather than being controlled by marketing efforts. As a result, these online reviews are perceived as much more reliable than traditional media (Huete-Alcocer, 2017). Online reviews provided by other consumers are trusted more by potential consumers than company-generated information disseminated through conventional media channels (Lou & Yuan, 2019).

Finally, the results show that trust is the strongest predictor of consumers' purchase intention for energy-efficient appliances, followed by green perceived value. A possible explanation for this is that despite the implementation of the Energy Efficiency Standards and Labeling program in Vietnam since 2013, there is a proliferation of appliances in the market making claim about reducing

household energy consumption, but their effectiveness remains questionable. This situation erodes consumer trust, making trust the primary determinant of consumers' purchase decisions.

5.2. Practical implications

The research findings have validated the importance of online product reviews and media publicity in shaping green perceived value, customer trust and consumers' purchase intention of energy-efficient appliances. In today's digital era, many consumers rely on online platforms to gather product information and make informed purchasing decisions. Consequently, many manufacturers and retailers of energy-saving products have been trying to evoke and heighten green perception and trust in customers, which can enhance their purchase behavior. The findings suggest that manufacturers and online retailers of electrical appliances should encourage consumers to leave feedback about their purchase. They could prepare questions or suggest keywords related to energy efficiency and environmental friendliness of such products in the online review sections. The opinions and reviews of previous consumers can nurture the trust of potential buyers, motivating them to make purchases. An implication of this finding is the possibility that information about the green value of energy-saving products should be actively communicated through various media channels, including mass media, such as television and print, and social media platforms. This would ensure that all customers have a clear understanding of the benefits of these products. Additionally, given that trust is the strongest predictor of consumer purchase intention in this study, governments should increase consumers' awareness of energy rating labels by ensuring transparency in the labeling process for energy-saving appliances. Manufacturers and retailers should be given incentives to produce and sell energy-efficient products.

6. Limitations and future research

Several limitations of this study should be acknowledged. First, the use of cross-sectional data in this study may limit the ability to establish causal relationships between variables,

which is a natural problem of cross-sectional data. Future research should consider collecting data at different periods. One possible avenue for future research is to conduct a longitudinal study, allowing for a better observation of causal relationships between variables over time. Second, while not within the scope of this paper, the dataset lends itself to exploring the impact of different socio-demographic variables on pro-environmental purchase behavior. For example, as this study collected data from urban households in Hanoi, future research could investigate potential differences in influencing factors and purchase behavior between household consumers in urban and rural areas. Third, this study is confined to energy-saving products. Future research could test whether the proposed model stands up to scrutiny in other pro-environmental behaviors, such as the consumption of electric cars. Furthermore, the relatively low R-squared values for green perceived value (22.2%) and customer trust (31.1%) suggest that additional variables should be added to the research model. Future studies should incorporate other environmental stimuli, such as electricity prices, to improve the model's predictive power.

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