



Original Article

Understanding green purchase intention under health concerns and environmental concerns: The impact of the COVID-19 pandemic

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Received: February 22, 2024

Revised: April 4, 2024; Accepted: April 25, 2024

Abstract: The COVID-19 epidemic has raised concerns about the environment and individual health, which has contributed to the market's strong growth for green products. This study evaluates the factors impacting Vietnamese consumers' intentions to make green purchases during the COVID-19 pandemic. A sample of 312 collected responses was analyzed using structural equation modeling (SEM). The results show that fear of the COVID-19 pandemic has a positive influence on health concerns and environmental concerns, thereby enhancing consumers' trust in green products and forming their intention to purchase green products. Besides, green word-of-mouth mediates the relationship between green trust and green purchase intention. The findings suggest that companies should consider these factors to market their green products to consumers in Vietnam effectively.

Keywords: COVID-19, green purchase intention, green consumption, green trust, green word-of-mouth, health concerns, environmental concerns.

1. INTRODUCTION

In the face of the exploitation and destruction of the natural environment, the concept of “green consumerism” has always been a hot topic, which has attracted much attention worldwide (Moisander, 2007). Consumers believe their consumption choices can jointly contribute to protecting the environment and improving the quality of social life or help reduce

environmental degradation. This belief affects how they perceive and interact with marketed goods and services. Similarly, consumers are willing to pay more and seek information about the green characteristics of a product when intending to purchase an environmentally friendly product or brand (Oliver & Lee, 2010).

COVID-19 has increased awareness among consumers about the connection between people

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<https://doi.org/10.57110/vnujeb.v2i6.260>

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and nature, leading to a rise in environmentally conscious purchasing behavior and a stronger emphasis on green and sustainable consumption. In 2021, a survey conducted by the IBM Institute for Business Value involving over 14,000 adults from 9 countries showed that COVID-19 has significantly impacted people's perspectives on environmental sustainability (Orrell et al., 2021). Specifically, 93% of respondents stated that the pandemic had influenced their views on environmental sustainability. Moreover, 55% of global consumers consider ecological sustainability an essential factor when choosing a brand. Additionally, the study found that 62% of respondents are willing to alter their purchasing behavior to minimize the negative environmental impact. Green consumption is becoming more important in Vietnam, and there is a need for continuous efforts to promote sustainable consumption and production practices among both businesses and consumers. Also, the Vietnamese government has promoted sustainable production and consumption through policies and campaigns. Despite that, many consumers are unaware of the environmental impact of their consumption choices; in other words, the factors that drive their decision to buy green products are still not identified, especially in developing countries such as Vietnam.

There have been many studies on green purchase intention (Jian et al., 2020; Chi et al., 2021; Ekawati et al., 2023; Hu et al., 2022). Hu et al. (2022) and Jian et al. (2020), for example, conducted research to measure the impact of health and environmental concerns. Meanwhile, Guerreiro and Pacheco (2021) and Román-Augusto et al. (2022) added “Green Trust” and “Green Word-of-Mouth” to conclude the importance of these factors in forming consumer intentions. While the direct influence of fear related to COVID-19 on health and environmental concerns is evident, the connection between COVID-19 fear and concepts like “Green Trust” and “Green Word-of-Mouth” has not been thoroughly explored. Additionally, establishing a research framework that combines these factors to understand why Vietnamese people choose green products in the post-COVID-19 context has remained a worthwhile motivation for this research. Therefore, this paper will fill the gap by demonstrating how the fear of COVID-19

affects health concerns, environmental concerns, green trust, and green word-of-mouth to predict customers' intentions in Vietnam after the COVID-19 period.

This article is presented in the following order. The second part is the literature review and hypothesis development. The third part describes the research method. Following this, we present the research results and discuss the evaluation of the hypothesis and structure's model. The final section provides the conclusion and some implications.

2. Literature review

2.1. Underpinning theory

In this study, we relied on the Theory of Planned Behavior, and the Pathogen-Stress Theory as a foundation for assessing how fear of COVID-19 impacts consumers' green purchasing intention. The Theory of Planned Behavior (Ajzen, 1991) is an extension of the Theory of Reasoned Action that has proposed determinants for forming consumer purchasing intentions. In the study by Hu et al. (2022), the Theory of Planned Behavior is used to measure consumers' intention to purchase green products in the context of the COVID-19 pandemic. In addition, Qi and Ploeger (2021) also applied the above theory to investigate Chinese consumers' green product purchase intentions during the pandemic.

Besides, by applying the Pathogen-Stress Theory, Hu et al. (2022) also evaluate the impact of the COVID-19 pandemic on health concerns, and the ability to adapt to the unpredictability of the COVID-19 pandemic. This theory emphasizes that human behaviors in unhealthy and unsafe environments, such as the high incidence rate of parasites, will have a significant impact on solving social problems and choosing consumer goods. Meleady et al. (2021) also discussed the impact of pathogen threat in the COVID-19 situation.

2.2. Green purchase intention

Ali and Ahmad (2012) stated that green purchase intention means consumers' willingness to pay for environmentally friendly products rather than traditional ones. Similarly,

Chen and Chang (2012) and Thi Tuyet Mai (2019) also suggested that intention is formed when consumers' purchasing ability is oriented towards environmental standards, and can express health concerns and social responsibility.

Besides, during the COVID-19 pandemic, the Pathogen-Stress Theory (Zeigler-Hill & Shackelford, 2020) and the Theory of Planned Behavior (Ajzen, 1991) are used to evaluate consumers' behavioral intention to buy green products. In particular, the fear of the COVID-19 pandemic is one of the essential factors affecting consumers' behavioral intentions. It is shown when people tend to pay more attention to environmental aspects such as climate change or product origin, such factors can influence their consumption habits (Doszhanov & Ahmad, 2015). Therefore, consumers will likely prefer green products as they have the requirements for goods' safety, quality, and eco-friendliness (Nguyen et al., 2020).

2.3. The fear of COVID-19

According to the World Health Organization (2020), the fear of COVID-19 is an emotional response that arises from the perceived threat, shaped by an individual's assessment of the situation and their ability to cope with it. This fear is often related to concerns about the virus's transmission, the disease's severity, and the potential risk to one's health, leading to detrimental mental health effects, including heightened stress levels, feelings of anxiety, and depression (Pakpour et al., 2021). Following the gradual recovery of the world from the COVID-19 pandemic, the fear of the virus continues to affect human vaccine hesitancy, with those higher levels of fear leading to less vaccination against COVID-19 (Freeman et al., 2022). In certain individuals, this fear can also result in symptoms associated with post-traumatic stress disorder after the COVID-19 pandemic (Asmundson & Taylor, 2020). Overall, the fear of COVID-19 alters consumer behavior and their perspective on health and environmental matters, leading to a more environmentally conscious approach (Sun et al., 2021).

2.4. Health concerns

Health concerns are related to an individual's awareness or anticipation of their

physical and mental health. The COVID-19 pandemic poses serious threats to people worldwide and has various degrees of impact on public health (Bou-Hamad et al., 2021). This fear formed due to the lack of effective preventive treatment. COVID-19 has become a widespread fear (Schimmenti et al., 2020), which led to numerous physical and mental health concerns. Many people mistakenly believe this disease is similar to the flu; however, it has different symptoms and is highly mutable, severely affecting the lungs and leaving behind severe post-COVID sequelae. These effects have put increased pressure on healthcare concerns and have affected people's lifestyles in the long term. Consequently, this study proposes the following:

H1: Fear of COVID-19 positively influences health concerns.

Health concerns also have affected various aspects of life, including customers' shopping intentions (Savarese, 2020). There is a growing interest in green goods such as recycled items or items made from organic produce, which are perceived as healthier and safer than other non-organic items. Furthermore, Hu et al. (2022) have shown a positive correlation between health concerns and green purchase intentions. The more people care about their health, the more they intend to buy green products. Accordingly, green product use may continuously develop even after the pandemic. In this study, we proposed that:

H2: Health concerns positively influence green purchase intention.

Environmental concerns

Environmental concerns can drive consumers to seek green products because they advocate for living in harmony with nature and protecting the natural environment (Chen & Chang, 2013b). Alibeli and Johnson (2009) defined environmental concerns as the degree to which consumers are aware of and participate in solving environmental problems.

In addition, the fear of COVID-19 is considered to have a close relationship with environmental concerns. Many hypotheses have been that "COVID-19 results from excessive resource exploitation negatively impacts the environment and society" (Platto et al., 2021). As stated above, the COVID-19 pandemic shows that people's activities significantly impact the

natural environment. The pandemic also indicates that humans and nature affect each other through a sustainable relationship. Therefore, consumers highly concerned about COVID-19 can increase their environmental concerns by reducing pollution levels to create a better living environment (Fritsche & Häfner, 2012). Based on these discussions, we have formed this hypothesis:

H3: Fear of COVID-19 positively influences environmental concerns.

Green trust

In the prevalence of environmental concerns, trust becomes essential to encourage customers to form a purchase intention. Consumers may reduce their hesitation and risk when purchasing something (Ekawati et al., 2023), which builds a strong relationship with sellers. Therefore, Chen and Chang (2013a) and Chen (2010) claim that green trust is the belief and expectation of a product, service, or brand to have credibility, good deeds, and concern for environmental benefits. Meanwhile, environmental concerns are an essential determinant in deciding consumers' long-term trust and intentions (Lee et al., 2011). Customers will actively seek information about more environmentally friendly products and trust them more (Li et al., 2021). Thus, it can be hypothesized that:

H4: Environmental concerns positively influence green trust.

Many researchers have studied the relationship between green trust and green purchase intention. As pointed out by Chen and Chang (2012), Lee et al. (2011), and Wang (2015), this is a positive relationship that reflects the consequences of human activities, leading to a strong consumer interest in the environment. This has led consumers to establish trust in environmentally friendly products and tend to consider buying them (Ekawati et al., 2023); Lu et al., 2007; and Li et al., 2021). Hence, the following hypothesis is postulated:

H5: Green trust positively influences green purchase intention.

2.5. Green word-of-mouth

According to Söderlund (1998), "Green Word-of-mouth" describes how customers spread a brand's or product's favorable environmental messaging to their friends,

family, and coworkers. Since customers are more inclined to trust and recommend green products when they receive positive feedback from their peers, green trust has a substantial impact on green word-of-mouth (Wang et al., 2018). In addition, positive word-of-mouth is more likely to propagate among customers who believe in a product's eco-friendliness (Chen et al., 2014). Hence, companies should build and maintain green trust through transparency, certifications, and sustainability commitments, leading to increased brand engagement and loyalty (Abbas et al., 2018). According to the study, "green trust" and "green word-of-mouth" are directly related to the current environmental context. As a result, the following hypothesis is proposed:

H6: Green trust positively influences green word-of-mouth.

Green word-of-mouth is a valuable tool for companies to attract environmentally conscious consumers, as it significantly influences their attitudes and behaviors towards green products. Chen and Chang (2013a) stated that positive word-of-mouth increased purchase intention. Another study by Chen et al. (2014) found that when consumers are unsure about green features, they are more likely to believe in and purchase green products from outstanding green word-of-mouth. Companies can encourage customers to share positive experiences about their environmentally friendly products and practices, leveraging social media platforms as an effective way of promoting green word-of-mouth (Du et al., 2010). Hence, the following hypotheses are postulated:

H7: Green word-of-mouth positively influences green purchase intention.

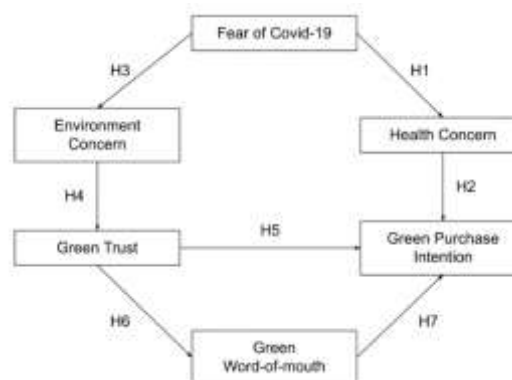


Figure 1: The proposed research model
Source: Authors.

3. Methodology

3.1. Data collection and sampling

The primary data for this research was gathered through convenience sampling conducted in Vietnam from March to May 2023. There are six major constructs and 21 scale items in the questionnaire. The survey was formed through 2 main steps. In the first step, 50 individuals were reviewed to test the accuracy of the content and question ambiguity. In the second step, after adjusting the questionnaire, we distributed the official survey online using Google Forms via social media. Using this sampling method restricts how widely the findings can be applied. However, its limitations were reduced by sharing the survey across different social media groups including various socio-economic demographics.

Data were gathered via an online survey administered in Vietnam, with a total of 312 questionnaires received. Following meticulous screening aimed at excluding low-quality surveys, only 249 responses deemed acceptable were utilized for subsequent data analysis. The determination of an appropriate sample size for this study employed an *a priori* sample size calculator tailored for Structural Equation Modeling (SEM), as outlined by Soper (2021). By considering parameters such as statistical

power levels (0.95), desired probability (0.05), anticipated effect size (0.3), the number of latent constructs (6), and the number of observed variables (15 items), the calculated total sample size necessary to achieve the minimum effect size was established at 236. Consequently, our sample size of 249 is deemed sufficient for the application of structural equation models.

The study presents the demographic characteristics of respondents regarding their consumer behavior. The study included 312 respondents, of which 50.3% are male, 44.8% are female, and 4.9% identified as other. Regarding age, most respondents are 18 to 24, with 53.1% of the total sample. The under-18 group accounts for only 9.8%, while the 25 to 30 and over 30 age groups constitute 24.5% and 12.6%, respectively. Regarding occupation, the most significant proportion of respondents (54.5%) are students. In terms of purchasing behavior, people who often shop online account for the highest rate, with 63.6%, while 36.4% are offline purchases.

3.2. Measurement

The measurement items have been adjusted based on previous studies (As shown in Table 1). The Five-Point Likert Scale is a reliable method for evaluating responses on a scale from 1 - strongly disagree to 5 - strongly agree.

Table 1. Questionnaire

Constructs	Measurement items	Sources
The fear of COVID-19 (C)	C1: "When watching news and stories about the coronavirus on social media, I become nervous or anxious." C2: "I am afraid of losing my life because of the coronavirus." C3: "It makes me uncomfortable to think about the coronavirus"	Jian et al. (2020)
Health Concern (HC)	HC1: "I'm concerned about my well-being." HC2: "I'm scared of getting infected by the virus and dying as a result." HC3: "I'm constantly conscious of aches and pains in my body."	Hu et al. (2022)
Environment Concern (EC)	EC1: "It makes me sad to see natural environments destroyed." EC2: "Nature is important because it can contribute to the pleasure and welfare of humans." EC3: "We need to preserve resources to maintain a high quality of life."	Jian et al. (2020)
Green Trust (GT)	GT1: "I believe green products have a good reputation because they help our health and the environment" GT2: "I believe that green products live up to their promises to care for our health and the environment." GT3: "Green products' environmental concern meets your expectations."	Román-Augusto et al. (2022); Chen (2010)

Constructs	Measurement items	Sources
Green Word-of-mouth (GWOM)	GWOM1: "Due to their eco-friendly and healthy image, green products are recommended by other people."	Román-Augusto et al (2022)
	GWOM2: "Due to being environmentally friendly and healthy, green products have a good reputation."	
	GWOM3: "Due to their environmental and health benefits, green products receive positive feedback from people."	
Green Purchase Intention (GC)	GPI1: "I plan to spend more on green products rather than conventional products"	Ur Rehman et al. (2023); Al-Kumaim et al. (2021)
	GPI2: "I will consider purchasing green products because they are less polluting"	
	GPI3: "I will consider switching to environmentally friendly brands for ecological reasons"	
	GPI4: "I expect to purchase green products in the future because of their positive environmental contribution"	
	GPI5: "I would like to consider purchasing green products first."	
	GPI6: "I intend to purchase green products in near future."	

Source: Author's compilation.

3.3. Data analysis

We utilize partial least squares structural equation modeling (PLS-SEM) as a tool to analyze our proposed model. Chin & Newted (1999) stated that a minimum sample size of 30 to 100 is appropriate for PLS-SEM as it is a nonparametric technique that does not assume a

normal distribution of data, contrasting with maximum probability-based CB-SEM. For our analysis, we use SmartPLS 4.0 with the two-step method. Firstly, we assess the accuracy and consistency of the measurements. Secondly, we evaluate the structural model to analyze our hypotheses to gain meaningful insights comprehensively.

Table 2. Reliability and validity tests

Constructs	Measurement	Outer loadings	Cronbach's Alpha	CR	AVE
The fear of COVID 19 (C)	C1	0.835	0.797	0.819	0.708
	C2	0.828			
	C3	0.861			
Environment Concerns (EC)	EC1	0.849	0.856	0.856	0.776
	EC2	0.895			
	EC3	0.898			
Green Purchase Intention (GPI)	GPI1	0.822	0.893	0.896	0.653
	GPI2	0.854			
	GPI3	0.835			
	GPI4	0.808			
	GPI5	0.792			
	GPI6	0.822			
Green Trust (GT)	GT1	0.837	0.838	0.839	0.755
	GT2	0.893			
	GT3	0.877			
Green Word-of-mouth (GWOM)	GWOM1	0.846	0.835	0.835	0.752
	GWOM2	0.892			
	GWOM3	0.863			
Health Concerns (HC)	HC1	0.826	0.760	0.760	0.676
	HC2	0.814			
	HC3	0.827			

Source: Authors.

4. Result

4.1. Measurement model assessment

The reliability and validity of the scale are assessed using several criteria, including convergent validity, internal consistency reliability, and discriminant validity, as recommended by Hair et al. (2017). First, we evaluate the internal consistency reliability by examining the outer loadings of the indicators, Composite Reliability (CR), and Cronbach's Alpha (CA). As seen in Table 2, all the values

for Outer Loadings, Composite Reliability (CR), and Cronbach's Alpha (CA) surpass the threshold value of 0.7, affirming the reliability of the constructs. Second, the average variance extracted (AVE) is used to determine convergent validity. A construct is considered to attain convergent validity when its AVE surpasses the threshold of 0.5. In this analysis, factors ranging from 0.653 to 0.776 are higher than the minimum requirement of 0.5. Third, HTMT (Heterotrait-Monotrait) values in Table 3 are below the threshold of 0.85, so discriminant validity between constructs is established.

Table 3: HTMT

	C	EC	GPI	GT	GWOM	HC
C						
EC	0.568					
GPI	0.564	0.665				
GT	0.633	0.639	0.630			
GWOM	0.619	0.655	0.679	0.773		
HC	0.757	0.794	0.760	0.724	0.734	

Source: Author's proposal.

Table 4: Estimation results of the structural equation model

	Coefficients (β)	P values	f – Square	Support
H1: C → HC	0.601	0.000	0.565	Accepted
H2: HC → GPI	0.382	0.000	0.166	Accepted
H3: C → EC	0.483	0.000	0.304	Accepted
H4: EC → GT	0.541	0.000	0.415	Accepted
H5: GT → GPI	0.151	0.030	0.023	Accepted
H6: GT → GWOM	0.647	0.000	0.719	Accepted
H7: GWOM → GPI	0.269	0.001	0.072	Accepted

Source: Author's proposal.

4.2. The structural model assessment

We checked for construct collinearity before testing hypotheses. Since all VIF values are below 4, there is no evidence of collinearity among the components. We bootstrapped 312 samples to determine the Path coefficient and P-values for our hypothesis. Table 4 shows a direct link between COVID-19 fear and health problems ($\beta = 0.601$, $P = 0.000$) and a positive influence of health concerns on green purchase intention ($\beta = 0.382$, $P = 0.000$), supporting H1 and H2. These results support the viewpoint of Tzur Bitan et al. (2020) that individuals become increasingly concerned about their health as they become more informed about the potential consequences of COVID-19 illness. Consumers

are more likely to alter their consumption behaviors if they link environmentally conscious choices to favorable health effects.

Besides, COVID-19 significantly affects environmental concerns ($\beta = 0.483$, P -value = 0.000), supporting H3. Individuals who experienced fear related to the COVID-19 pandemic tend to exhibit heightened concern toward the environment. As COVID-19 spread, people's concern for the environment increased, particularly regarding climate change, environmental degradation, and global warming. It shows the sustainable relationship between humans and the environment. Jian et al. (2020) also have a similar statement, highlighting that those who fear COVID-19 tend to prioritize and

reinforce their environmental values and behaviors.

As for H4, green trust positively correlates with environmental concern ($\beta = 0.541$, $P = 0.000$). This suggests that the more people value the environment, the more they believe in eco-friendly products. Because of climate change, people are becoming increasingly conscious of how their behavior affects the environment. This increased awareness has led to a growing interest in green products. Chen & Chang (2013a) and Chen (2010) also confirm that customers who trust eco-friendly products value reputable brands that prioritize environmental benefits and engage in socially responsible actions.

Furthermore, green trust influence positively affects green purchase intention ($\beta = 0.151$, P -value = 0.030) and green word of mouth ($\beta = 0.269$, P -value = 0.000). These findings show that the more consumers trust in green products, the higher the intention to purchase, which is consistent with Lu et al. (2007). The environmentally beneficial effects will improve consumer trust in green products and their purchasing intention. Besides, customers' trust plays a crucial role in driving green word-of-mouth. If the customers clearly understand the product information, they will have more confidence and give positive recommendations to others. Green trust has a noticeable and favorable impact on spreading positive recommendations about environmentally conscious behavior.

Finally, word of mouth about eco-friendly products influences buying decisions ($\beta = 0.151$, P -value = 0.030), supporting Hypothesis 7. Consumers frequently believe that recommendations from friends and family are more trustworthy information sources than official information from manufacturers. Walia et al. (2019) also point out that word-of-mouth is an effective marketing tool.

Table 4 also shows that the f-square values for all exogenous latent variables were more significant than 0.02, meaning that they had small to large effects (Cohen, 2013). Besides, R-square values range from 0.233 to 0.481, indicating a moderate to substantial impact of independent factors on the dependent factor, and Q2 values of more than 0 indicate exogenous constructs can predict endogenous constructs.

4. Conclusion

4.1. Summary findings and implications

Our research aims to determine factors affecting Vietnamese green purchase intention after the COVID-19 pandemic. We combined environment-related factors, green trust, and green word-of-mouth with the fear of COVID-19, based on the Theory of Planned Behavior and the Pathogen-Stress Theory. Results from a survey of 312 participants indicate that the fear of the COVID-19 pandemic has a positive impact on health concerns and environmental concerns, thereby enhancing consumers' trust in green products and forming their intention to purchase green products. Besides, green word-of-mouth plays a mediating role in the relationship between green trust and green purchase intention. Therefore, our research has theoretically contributed to completing a research framework on green consumption intentions more comprehensively through a model using the fear of COVID-19 as an antecedent.

This paper also provides some practical implications for the role of managerial decisions in evaluating consumer intention. The findings give valuable insight into understanding and satisfying consumers' needs better. As stated above, health and environmental concerns are vital to green purchase intention under the fear of a pandemic. In this sense, the article suggests that businesses should integrate health and environmental aspects into their products. Accordingly, consumers who are affected by fear of the disease will form an intention to buy eco-friendly products when firms design effective promotions about health and environmental benefits. To help people make eco-friendly choices, businesses should use clear green labels to guide buyers and inspire them to join health and environmental programs. Besides, to build long-term green trust with customers, firms need to ensure the truthfulness of product information. Due to increasing greenwashing knowledge, consumers raise doubts about green advertising. Therefore, green-based goods clarified in origin will add economic value to businesses and encourage consumers to drive positive word-of-mouth recommendations. Policymakers can also

encourage energy-conserving consumption and environmentally friendly shopping behaviors through social networks.

4.2. Limitations and future research

The study has some limitations that should be taken into consideration in future research. First, using the convenience sampling method to gather data may restrict the generalizability of the research findings. Future studies could enhance the credibility of the model by employing various research methods, ensuring broader and more universally applicable results. Second, while studies have shown a positive correlation between green purchase intention and actual green purchasing behavior, there is still a gap in understanding how intentions translate into actual behavior. Further research is required to understand the mechanisms behind this intention-behavior gap and explore ways to bridge it. Third, to improve the knowledge of the field, we recommend that future studies combine different factors to measure intensely green consumers' intentions. Researchers can consider adding "greenwashing" and "green consumption behavior" to identify the relation between green purchase intention and actual behavior.

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