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Article

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MARKETING | RESEARCH ARTICLE

The formation of attitudes and intention towards green purchase: An analysis of internal and external mechanisms

Nguyen Thi Hoang Yen¹ and Dung Phuong Hoang^{2*}

Abstract: Nowadays, since green consumption is widely accepted and affordable, obtaining favourable attitudes of consumers toward green purchases becomes paramount to accelerating the market penetration of ecological items. Under the planned behaviour theory and other theoretical backgrounds of attitude formation, this study examines its determinants and the relevant underlying mechanisms. Specifically, based on the quantitative data collected from 535 Vietnamese consumers, we estimate the direct, indirect, and total effects of health consciousness, environmental concern, and online product review on attitudes toward green purchases and their interrelationships in influencing green purchase intention. Our results indicate that health consciousness and environmental concern represent an internal mechanism that significantly influences the formation of green purchase attitudes and intentions. Interestingly, health consciousness totally mediates the impact of environmental concern on attitudes towards green choices. Meanwhile, online product review functions as social stimuli that directly affect green purchase intention but do not significantly influence attitude. Overall, environmental concern and health consciousness together not only influence customers' engagement with online product reviews but also play a more important role in forming attitudes toward green purchases and consequently, the intention to buy green products. Our findings provide insightful implications for designing communication strategies for green consumption.

Subjects: Consumer Psychology; Cognitive Psychology; Psychological Science

Keywords: Green purchase; health consciousness; environmental concern; online product review; sustainable consumption

JEL Classifications: M31; M37

1. Introduction

The social progress and changing environment of the world have led to the emergence of various purchasing patterns in customers' minds. Green consumption represents one of the crucial trends in marketing (Semprebon et al., 2019). Green products are commonly perceived as healthy, high-quality and providing a route to sustainable development (Charter & Tischner, 2017). The acceleration of green purchase behaviour is, hence, believed to bring change in people's life and livelihood. Understanding the motives for green purchases is crucial for practitioners and governments in formulating and carrying out effective green marketing strategies (Huang et al., 2014; Narula & Desore, 2016).

Over decades, green consumption has grasped wide interest among citizens, governments and business communities given their increasing environmental concerns and public health consciousness (Göçer & Sevil Oflaç, 2017; Narula & Desore, 2016; Y. Liu et al., 2017). As the consumer becomes increasingly knowledgeable, an understanding of why consumers purchase green products is required to appreciate green consumption. Although the motives for green purchases are diverse, complex, and context-dependent, most research in this field is systematically built upon the attitude-behavioural intention/behaviour perspective (Abrar et al., 2021; Y. Liu et al., 2017). Based on that, green purchase intention and behaviour are driven by attitude toward the green purchase, social norms and perceived behaviour control or self-efficacy regarding the purchase of green products (Dilotsotlhe, 2021; Nguyen Thi Tuyet et al., 2017; T. N. Nguyen et al., 2018; Taufique & Vaithianathan, 2018; Verma & Chandra, 2018; Vu et al., 2022; Y. T. H. Nguyen & Nguyen, 2020). Nowadays, it is evident that green consumption has become a popular lifestyle that is widely accepted and appreciated by societies and governments. Thanks to global trade liberation and technological progress, green products are becoming increasingly available at lower costs. This makes the green purchase more accessible and affordable. The green purchase decision, therefore, would rely more on consumer attitudes towards the consumption of ecological products. Recent empirical studies also reveal the stronger impact of consumer attitude toward green purchases as a robust predictor of the intention to buy ecological products (Biswas & Roy, 2015; Paul et al., 2016; Taufique & Vaithianathan, 2018; Verma & Chandra, 2018; Y. T. H. Nguyen & Nguyen, 2020). This research, therefore, gives a primary focus on the path from attitudes towards green purchases and green buying intention.

Despite that the role of attitudes in influencing green purchase intention and behaviour has been frequently highlighted in previous studies, there is limited knowledge about how attitudes towards green choices are formed. Theoretically, an attitude could be formed either internally through one's existing values and beliefs or externally through cognitive learning from social stimuli (Chairy & Syahrivar, 2020; Jalees et al., 2021). Previous works reveal that health consciousness and environmental concerns that are internally formed in customers' minds could affect attitudes towards green purchases and hence, intention to buy ecological products (Iqbal et al., 2021; Kim & Chung, 2011; Lestari et al., 2021; Li & Jaharuddin, 2021; Mohd Suki, 2016; Moslehpour et al., 2022; Xu et al., 2020). While health consciousness indicates the level of willingness or readiness of undertaking healthy behaviours (Becker et al., 1977), environmental concern reflects the extent to which one cares and tends to engage in pro-environmental actions (Nabilla, 2019; Zelezny & Schultz, 2000). Both health consciousness and environmental concern are rooted in one's self-consciousness and awareness of health-related or environmental issues as well as their desperation for human well-being (Michaelidou & Hassan, 2008; Nabilla, 2019; Newsom et al., 2005; Schifferstein & Oude Ophuis, 1998). On the other hand, peer review could be regarded as a social stimulus as it provides a source of unbiased product information from the community of consumers (Chen & Xie, 2008). In today's digital age, searching and reading online reviews become integral phases of the purchase decision-making process (Goldsmith & Horowitz, 2006; Hennig-Thurau et al., 2004; Q. B. Liu et al., 2011). In this study, we use the concept of "online product review" to indicate the extent to which an individual is exposed to online reviews of green products and hence, represent the level of social stimuli that they engage in during their decision-making for green purchase (Bambauer-Sachse & Mangold, 2011). In sum, environmental concerns and health consciousness could be treated as internal values and beliefs while online product review reflects social stimuli that consumers may "learn" from during their process of forming attitudes towards green purchases and in turn, motivating the intention to buy green products. It is also suggested that the knowledge and information that consumers attain from various communication sources may interact with their inherent values and beliefs to derive changes in attitudes and consequently, intention and behaviour towards a purchase (Jalees et al., 2021). However, previous works only examine the impacts of environmental concern and health consciousness as two separate independent determinants while neglecting the effect of online product reviews on attitudes towards green choices.

In response to the above research gaps, this study aims to answer three key questions, (1) Are there any relationships between each environmental concern, health consciousness, and online product review on attitudes towards green purchases and the intention to buy green products?, (2) Among factors including environmental concern, health consciousness, and online product review, which one demonstrate a more influential impact on attitudes towards green purchases and the intention to buy green products?, and (3) How environmental concern, health consciousness, and online product review interact with each other in their influences on attitudes towards green purchases and the intention to buy green products?

Our research contributes to the existing literature on green purchase behaviour in at least three ways. First, this paper presents the first study which compares the internal and external mechanisms of the formation of attitudes toward green purchases by examining and contrasting the impacts of environmental concern, health consciousness, and online product review on attitudes and intention to buy green products. Second, we also give insights into green purchase behaviour by further testing the interactions between environmental concern, health consciousness, and online product review in their influences on attitudes and green purchase intention. Third, from the purchase decision-making perspective, while health consciousness and environmental concern may induce the recognition of the need for green products, online product reviews support the middle phases: information search and evaluation of alternatives. By examining the paths from environmental concern and health consciousness to online product review and green purchase intention, this study sheds more light on the decision-making process of green purchase.

The rest of the paper will be organized as follows. After the introduction section, we provide a literature review on the attitudinal-behaviour perspective in examining green consumption behaviour and the theoretical framework that supports the hypothesis development. Next, we describe our research methodology and measurement properties for the quantitative survey. The section on research findings then provides the estimation results for our model. In the conclusion, we further discuss the findings to explain our contributions to the field and provide some relevant managerial implications.

2. Literature review and theoretical framework

2.1. Attitudes and green purchase intention

The Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB) (Ajzen & Fishbein, 1980; Ajzen, 1991) have been frequently utilized to explain green purchase behaviours (Dilotsotlhe, 2021; Nair & Little, 2016; Nguyen Thi Tuyet et al., 2017; T. N. Nguyen et al., 2018; Taufique & Vaithianathan, 2018; Verma & Chandra, 2018; Vu et al., 2022; Y. T. H. Nguyen & Nguyen, 2020). The common idea of these theories features the central role of intention in predicting a specific behaviour. Despite that green purchase intention and behaviour are driven by attitude toward the green purchase, social norms and perceived behaviour control or self-efficacy regarding the purchase of green products, green attitudes demonstrate the most influential impact on the intention to buy ecological products (Biswas & Roy, 2015; Paul et al., 2016; Taufique & Vaithianathan, 2018; Verma & Chandra, 2018; Y. T. H. Nguyen & Nguyen, 2020). This may be because, green consumption has increasingly become a popular and desirable lifestyle while barriers to green purchases are significantly reduced thanks to more favourable government policies, global trade liberation and technological progress. The probability of green behaviour, hence, relies more on personal attitudes or favourable/unfavourable evaluations of an individual towards green purchases (Ajzen, 1991). This is also the reason underlying our partial application of the theory of planned behaviour in this research where the path from green attitudes to green purchase intention is the main focus.

Theoretically, attitudes take a function of behavioural beliefs (Ajzen & Fishbein, 1980) that if an individual believes in the positive outcome resulting from the performance of specific behaviour, they will form a favourable attitude towards that behaviour. In turn, the more favourable the

attitude is, the stronger the intention to execute the behaviour will be (Ajzen, 1991). In this regard, attitudes are predictors of purchase intentions and consequently purchase behaviour (Ajzen, 1991). In the context of green purchasing behaviour, attitudes are critically important as consumers who are the focal point of the purchasing decision process may face uncertainty and other purchasing barriers while bombarded with much product information (Amoako et al., 2020; M. T. Liu et al., 2020). Empirical studies have supported the attitude-green purchase intention relationship across various cultural and demographic segments (Dilotsotlhe, 2021; Kim & Chung, 2011; Marvi et al., 2020; Tarkiainen & Sundqvist, 2005; Taufique & Vaithianathan, 2018; Wu & Chen, 2014). In this research, we expect a similar relationship between attitudes and green product purchase intention and retest the relationship based on the following hypothesis:

H1. *Attitude toward green product purchase has a positive impact on green product purchase intention.*

2.2. Health consciousness and environmental concern as an internal mechanism of green attitude formation

In a broader sense, attitudes reflect a psychological tendency expressed by the evaluation of a particular behaviour or entity (objects, people, views, institutions, norms, and others). An attitude is then accompanied by a certain extent of favour or disfavour that guides the tendency to act (Eagly & Chaiken, 1995). The literature suggests that such a psychological state could be formed by various factors, including both internal and external motives.

First, values and beliefs that are embedded in an individual's perception could function as the internal building blocks of attitudes and hence, behaviours (Eagly & Chaiken, 1995; Verplanken & Holland, 2002). "Value", as indicated in one's important life goals, standards, or guiding principles in life (Rokeach, 1973), is the most fundamental dimension of an individual's belief system (Vaske & Donnelly, 1999). Specifically, an individual's values will form their belief about whether their desired end states are attained (Feather, 1990; Rokeach, 1973; Schwartz & Bilsky, 1987). This psychological aspect, in turn, may impact the formation of an individual's favourable or unfavourable evaluation by guiding them to judge whether an entity or behaviour satisfies their values (Grunert & Juhl, 1995; Poortinga et al., 2004). It appears that values concerned with health and the environment are the two most common factors that shape attitudes toward green purchases in recent literature (Abdulsahib et al., 2019; Jonathan & Tjokrosaputro, 2021; Mishal et al., 2017; Vassan, 2018; Xu et al., 2020).

Health consciousness indicates the extent to which an individual is ready to undertake healthy actions (Becker et al., 1977). This readiness is rooted in their awareness, self-consciousness and concern for the prevention of illness (Michaelidou & Hassan, 2008; Newsom et al., 2005; Schifferstein & Oude Ophuis, 1998). Health-conscious customers, hence, are more likely to engage in healthy behaviours to attain the desired state of well-being (Newsom et al., 2005). Consumers with high health consciousness may consider whether a product is safe for their health. Therefore, they may be more seriously concerned with the product's sources and ingredients that are used to make the product as compared to those with low health consciousness (Alam et al., 2022). Green products are commonly seen as having better quality, giving nutritious and produced sustainable development principles (Charter & Tischner, 2017). The "green" category may form their belief that green product purchase would support their healthy actions, hence, helping them to maintain a healthy life as desired (Abdulsahib et al., 2019; Kumar et al., 2017; Xu et al., 2020). This belief would then nurture favourable attitudes toward green products and the tendency to undertake green purchases. Empirical studies have affirmed the relationship between health consciousness and the purchase of organic goods (Smith & Paladino, 2010) and especially those that directly influence one's health such as organic foods (Cheung et al., 2015; Iqbal et al., 2021; Li & Jaharuddin, 2021), green furniture (Xu et al., 2020), and personal care products (Kim & Chung, 2011). Formally, we hypothesize the following:

H2a. *Health consciousness has a positive impact on attitude toward green product purchase*

H2b. *Health consciousness has a positive impact on green product purchase intention*

The concern for environmental protection is another value that is commonly attributed to their pro-environmental behavioural intentions and green consumption behaviour (Taufique & Vaithianathan, 2018). Environmental concern is rooted in one's perception of themselves as an integral part of the natural environment and hence, demonstrates the environmental consideration embedded in their mind (Nabilla, 2019; Zelezny & Schultz, 2000). Ecologically concerned people believe that the ecological conditions are deteriorating and that must be resolved through environmentally friendly behaviours. In recent decades, customers have been increasingly aware of the negative impacts of their consumption on the environmental quality that may threaten the survival of human beings (Junior et al., 2015). Green products are commonly believed to be the viable solution for environmental issues due to their ability to recycle and reduce carbon footprint in both the production and consumption process (Fontes et al., 2021). Customers who have higher environmental concerns, therefore, may be more interested in green products because they believe that green purchases and consumption would help sustain the environment for future generations. This belief would form a favourable attitude toward green purchases and guide their purchasing decision toward ecological products. Previous works show empirical evidence about the linkage between environmental concerns and either attitude toward green purchases or intention towards green choices (Cheung et al., 2015; Duong et al., 2022; Lestari et al., 2021; Mohd Suki, 2016; Moslehpour et al., 2022; None & Kumar Datta, 2011; Paul & Rana, 2012). We, therefore, hypothesize that:

H3a. *Environmental concern has a positive impact on attitude toward green product purchase*

H3b. *Environmental concern has a positive impact on green product purchase intention*

2.3. Online product review as the external mechanism of green attitude formation

Not only is the internal perception embedded in values and beliefs, but attitudes are also formed by social stimuli through cognitive learning. Cognitive learning refers to the process in which a person observes others' attitudes or behaviour and is uniform with their previous attitudes, beliefs, and thoughts to either form or reshape the attitudes toward an entity or a behaviour (Solomon et al., 2010). Under this mechanism, an attitude could be both externally influenced by what the individual could learn from the reference group, WOM and opinion leaders and internally shaped within oneself through their "black box" with existing values and beliefs.

Online product review has become increasingly a common and crucial source of product knowledge (Chen & Xie, 2008). Modern consumers, especially tech-savvy ones tend to use this communication channel when they want to seek independent and hence, unbiased product information (Chen & Xie, 2008). This would help them reduce uncertainty, searching costs and cognitive dissonance issues during the purchase decision-making process (Goldsmith & Horowitz, 2006; Hennig-Thurau et al., 2004; Q. B. Liu et al., 2011). Online reviews are reported to actively contribute to their final purchase decision (Tuten & Solomon, 2018). Different from other traditional communication channels from which consumers passively receive product information, online product review requires active participation and initiative from the consumers in searching and selecting peers' reviews to read. According to Burton and Khammash (2010), consumers engage more in online product reviews for products of higher perceived involvement. Theoretically, product involvement may result from consumers' psychological attachment to the products (Te'eni-harari & Hornik, 2010). Y. T. H. Nguyen and Nguyen (2020) also find that if a consumer has a favourable evaluation of the green product purchase, he or she tends to engage with online product reviews. In this regard, consumers who seek online product reviews are more likely to have already formed

a positive attitude towards the products. According to the balance theory, people tend to form balanced or harmonious states in their interactions with either objects or people by aligning their attitudes more towards others whom they like, as compared to those they do not like (Chaiken & Eagly, 1983; Sampson & Insko, 1964). This helps them avoid the sense of uncertainty and instability that can lead to feelings of tension and physiological arousal (Tsai & Levenson, 1997). In the context of online product reviews, consumers were more prone to posting positive than negative reviews (Mangold & Smith, 2012). The reason may be that once they seek online reviews of a specific product, they have a certain level of interest in that product and tend to use online product reviews to reinforce their choice. In this sense, we believe that online product reviews could enhance consumers' existing positive attitudes, and consequently purchase intention. The literature also suggests empirical evidence about the positive impacts of online product reviews on purchase intention in a variety of contexts (Chatterjee, 2001; Chen & Xie, 2008; Jalilvand & Samiei, 2012) and green product purchase decisions in particular (Y. T. H. Nguyen & Nguyen, 2020).

H4a. *Online product review has a positive impact on attitude toward green product purchase*

H4b. *Online product review has a positive impact on green product purchase intention*

2.4. The interrelationships between environmental concern, health consciousness, and online product review

Despite numerous pieces of evidence highlighting environmental concern and health consciousness independently as determinants of green purchase behaviour, we posit that environmental concern relates to health consciousness for two primary reasons. First, human health is closely linked to the state of the environment. Good environmental quality serves basic physiological needs, with clean air and water, and favourable natural conditions for food products that support healthy lives (EEA European Environment Agency, 2022). The concept of environmental concern, therefore, expresses self-interest (Takala, 1991). The reason is that people care about environmental quality mainly because they are afraid that environmental degradation could pose a threat to their health and human well-being. This forms the central concern when they evaluate facts, one's behaviour, or others' behaviour with consequences for the environment (Hopper & Nielsen, 1991). Accordingly, highly environmentally concerned individuals develop high levels of awareness about what could harm or promote health. Second, health consciousness is a multi-dimensional concept which indicates self-awareness about one's health, and the willingness to seek and use health information and engage in health-promoting behaviours (Michaelidou & Hassan, 2008). Previous works suggest that people who are better informed of risk factors have a higher tendency to adopt healthier lifestyles (Iversen, 2006). In this regard, those who are concerned about the environment may obtain information about the state of the environment and their dangers to health and well-being, therefore, being motivated to exert health promotion behaviours as a self-protection response. In sum, environmental concern may be a potential precursor of awareness and actions taken to improve one's health.

H5. *Environmental concern has a positive impact on health consciousness*

Information search and evaluation of alternatives are the two middle phases following the need recognition and just before customers make a purchase decision (Kotler & Armstrong, 2017). In the first phase, consumers who are concerned about either their health or the environment may recognize their need for green products as viable solutions for both environmental protection and health promotion (Fontes et al., 2021). They, therefore, would highly likely proceed to the next steps: searching for more information about green products and evaluating different green choices. Online reviews about green products not only provide a source of information about green offerings but also contains reviewing content that enables evaluation of alternatives. Previous

studies have affirmed a direct linkage between either health consciousness or environmental concern and green product purchases (Cheung et al., 2015; Iqbal et al., 2021; Lestari et al., 2021; Moslehpour et al., 2022). In an attempt to give insights into green purchase decision-making, we add the following hypotheses:

H6a. *Health consciousness has a positive impact on online product review*

H6b. *Environmental concern has a positive impact on online product review*

3. Research method

3.1. Data collection

This study employed a quantitative approach by using a survey method to test the hypotheses. Due to the lack of a sampling frame, data was collected through an online survey conducted in early 2018 by applying the convenient snowball sampling technique. Facebook was used to reach and recruit participants because this social network has already established the strongest presence in Vietnam- a country listed among countries with the highest number of Internet users in Asia, which had 64 million Internet users as of June 2017, accounting for 67 per cent of the population (UNICEF, 2017). In 2018, there are approximately 51.9 million users (Statista, 2021) in Vietnam which is equivalent to 54.3% of the total population which was about 95.5 million in the same year (World Bank, 2021). As a referral technique, snowball sampling allows the collection of data through the existing social structures by leveraging initial respondents' suggestions of their friends and acquaintances (Bhutta, 2012; Y. T. H. Nguyen et al., 2022). In fact, by subscribing to social networks, users can build public profiles and establish explicit connections with others in their social network (Chu, 2011). Thus, by applying the virtual snowball sampling technique, the researchers can have access to potential respondents by connecting through interpersonal relationships with Facebook users (Y. T. H. Nguyen et al., 2022).

However, the phenomenon of sample bias can occur when applying the snowball sampling technique (Bhutta, 2012). To avoid this phenomenon, we began the survey with a small sample of 30 consumers in different age groups and occupations from our Facebook friend list. Then, we extended the sample by encouraging these respondents to recommend others on their Facebook networks to participate in our survey. Moreover, in following the suggestion of Podsakoff et al. (2012), we provided clear instructions on how to answer the questions in the questionnaire for respondents to minimize the effect of social desirability bias. In addition, respondents were informed not only about the research purposes but also about the importance of their answers' objectivity and honesty. Overall, we received responses from 535 Vietnamese consumers aged from 15 to 65 who fully answered all the questions in the two months of March and April 2018. The sample description can be seen in Table 1.

3.2. Measures

Measures for this study were adapted from the ones used in previous research related to green purchase intention, TPB's variables, online product review and self-image congruence. In particular, the measure of green product purchase intention, attitude toward green purchases and environmental concern were adapted from those of Paul et al. (2016). The construct "online green product review" was measured using the scale adapted from Bambauer-Sachse and Mangold (2011). The measure of health consciousness was adapted from Tarkiainen and Sundqvist (2005). All of these measure items were evaluated on a seven-point Likert scale, ranging from strongly disagree (1) to strongly agree (7).

To adapt measurement scales to the research context and to ensure the content validity of the measures, we conducted qualitative research via two traditional focus group interviews. The

Table 1. Demographic profile of respondents

Consumer profile	Frequency	Percentage
Gender		
Male	193	36.1
Female	342	63.9
Occupation		
Student	94	17.6
Functionaries/employees in state enterprises/organizations	212	39.6
Managers/employees in private/foreign companies	161	30.1
Others	68	12.7
Place of residence		
Hanoi City	449	83.9
Other provinces	86	16.1
Age		
15–20	8	1.5
21–34	293	54.8
35–49	228	42.6
50–65	6	1.1

Note: $n=535$

measurement instrument was tested with several consumers to check the clarity of the concepts and related items, the language as well as the clarity of instructions and the response format of the instrument. Based on the feedback, some minor modifications were made to the items and the questionnaire before officially conducting the survey. The details of measurement properties used in this study are provided in Table 2.

4. Data analysis and result

4.1. 4.1. Reliability and validity of measurement scales

In following the suggestions by Anderson and Gerbing (1988), we tested the measurement model to ensure the acceptable reliabilities and validities of the measures by conducting two phases of factor analyses. First, an exploratory factor analysis (EFA) using SPSS 23.0 on all items was conducted to initially identify underlying factors and to assess the degree of unidimensionality of measures. In the second phase, a confirmatory factor analysis (CFA) for the overall measurement model was performed. The result of CFA showed that all the fit indices of the measurement model are acceptable with $p = 0.000$ (Chi-square = 432.274, $df = 159$, Chi-square/ $df = 2.719 < 3$, TLI = 0.954, CFI = 0.962, IFI = 0.962 were all greater than 0.95, RMSEA = 0.057 < 0.07). Then, we evaluated the reliability and validity of measurement as suggested by Hair et al. (2019) and Fornell and Larcker (1981)

As recommended by Hair et al (2018), convergent validity was evaluated by checking the item loadings, the composite reliability (CR) and the average variance extraction (AVE). The items used and the results of the reliability and convergent validity tests are shown in Table 3 below. Factor loadings of items (λ) are all higher than 0.7 while the composite reliability of all constructs in our research is greater than 0.8. Besides, the AVE of all constructs is also higher than 0.5. These numbers establish adequate convergent validity for the measure (Hair et al, 2018; Kline, 2015).

Discriminant validity which measures whether separate factors are unrelated is tested and shown in Table 4. According to the discriminant validity test, all the squared roots of the AVEs

Table 2. Measurement scales

Code	Constructs/Items	Source of reference
Green Purchase Intention (INT)		
INT1	I will consider buying products because they are less polluting in the coming times.	Paul et al. (2016)
INT2	I will consider switching to environmentally friendly brands for ecological reasons.	
INT3	I plan to spend more on environmentally friendly products rather than conventional products.	
INT4	I expect to purchase environmentally friendly products in the future because of their positive environmental contribution.	
INT5	I definitely want to purchase green products in the near future	
Attitude toward green purchase (ATT)		
ATT1	I like the idea of purchasing green	Paul et al. (2016)
ATT2	Purchasing green is a good idea	
ATT3	I have a favourable attitude toward purchasing the green version of a product	
Online product review (OPR)		
OPR1	I often read other consumers' online product reviews to know what products/brands make good impressions on others	Bambauer-Sachse and Mangold (2011)
OPR2	To make sure I buy the right product/brand, I often read other consumers' online product reviews	
OPR3	I often consult other consumers' online product reviews to help choose the right product/brand	
OPR4	I frequently gather information from online consumer product reviews before I buy a certain product/brand	
Health consciousness (HEA)		
HEA1	I choose food carefully to ensure good health	Tarkiainen and Sundqvist (2005)
HEA2	I think of myself as a health-conscious consumer	
HEA3	I think often about health issues	
Environmental concern (ENV)		
ENV1	I am very concerned about the environment	Paul et al. (2016)
ENV2	I would be willing to reduce my consumption to help protect the environment	
ENV3	Major political change is necessary to protect the natural environment	
ENV4	Major social changes are necessary to protect the natural environment	
ENV5	Anti-pollution laws should be enforced more strongly	

Table 3. Reliability and convergent validity of measurement scales

Constructs/Items	Factor loading (λ)	Composite Reliability (ρ)	AVE
INT1	0.767	0.901	0.646
INT2	0.798		
INT3	0.784		
INT4	0.818		
INT5	0.848		
ATT1	0.823	0.836	0.631
ATT2	0.831		
ATT3	0.724		
OPR1	0.827	0.913	0.726
OPR2	0.928		
OPR3	0.884		
OPR4	0.76		
HEA1	0.878	0.837	0.633
HEA2	0.761		
HEA3	0.741		
ENV1	0.762	0.892	0.625
ENV2	0.73		
ENV3	0.851		
ENV4	0.83		
ENV5	0.772		

Table 4. Descriptive statistics, correlation matrix and discriminant validity

	Mean	S.D.	INT	ATT	OPR	HEA	ENV
INT	5.850	0.943	0.803*	0.570	0.482	0.739	0.619
ATT	6.441	0.787		0.794*	0.305	0.552	0.496
OPR	5.396	1.161			0.852*	0.479	0.364
HEA	6.216	0.885				0.796*	0.786
ENV	6.029	0.762					0.790*

Note: * square root of AVE of each construct

are greater than the factor correlation coefficients, demonstrating the discriminant validities of the measures used (Fornell & Larcker, 1981).

4.2. Hypotheses test

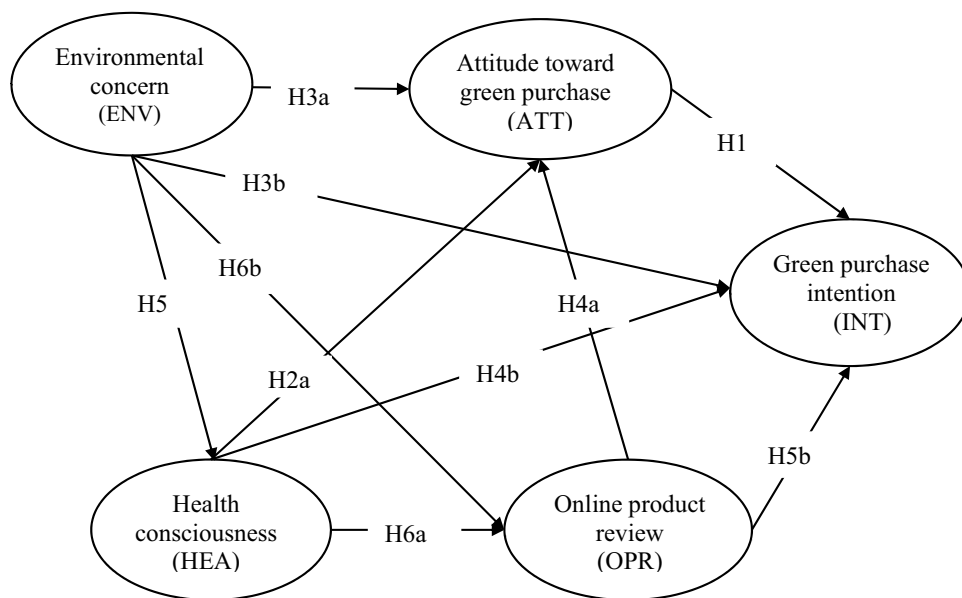
After assessing the reliability and validity of the measures used, a structural model was specified by applying covariance-based structural equation modelling (SEM) using maximum likelihood estimation to test the research hypothesis. Bootstrapping with 1000 samples was used. The overall fit measures of the structural model indicate an adequate fit of the model to the data with $p = 0.000$ (Chi-square = 432.274, $df = 159$, Chi-square/ $df = 2.719$, TLI = 0.954, CFI = 0.962, IFI = 0.962, RMSEA = 0.057). The results of the hypotheses test are summarized in Table 5 and Figure 1.

4.3. Direct, indirect and total effects

As seen in Figure 1, green purchase intention is not only directly influenced by attitude toward green purchases and online product review but also indirectly by health consciousness. In addition,

Table 5. Results of structural model and hypotheses tests							
Hypotheses	Relationships			Std. Beta	Critical ratio	p-value	Supported or not
H1	ATT	→	INT	0.218	4.702	***	Supported
H2a	HEA	→	ATT	0.397	4.132	***	Supported
H2b	HEA	→	INT	0.489	5.839	***	Supported
H3a	ENV	→	ATT	0.165	1.926	0.054	Not Supported
H3b	ENV	→	INT	0.070	1.022	0.307	Not Supported
H4a	OPR	→	ATT	0.055	1.078	0.281	Not Supported
H4b	OPR	→	INT	0.155	3.816	***	Supported
H5	ENV	→	HEA	0.786	16.244	***	Supported
H6a	HEA	→	OPR	0.505	5.560	***	Supported
H6b	ENV	→	OPR	-0.032	-0.374	0.709	Not Supported

Figure 1. Results of the structural model.



health consciousness can indirectly influence green purchase intention through the mediating role of attitude and online product review. Similarly, environmental concern can have an indirect influence on green purchase intention, attitude and online product review via the mediating paths. Thus, to provide a more complete picture of the mechanism through which environmental concern and health consciousness affect green purchase intention, we test all the related mediation effects even though we did not formally hypothesize indirect effects. Given recent recommendations in quasi-similar examination models by previous works on green consumption such as Kabaday et al. (2015), Wang et al. (2018), Zhang et al. (2018), we analyzed direct, indirect and total effects in a structural equation modelling (SEM) framework with bootstrapping with 1000 replications. Table 6 below shows the significant direct, indirect, and composite impacts of the four independent factors in the research model. The result shows that the most influential factor is

Table 6. Direct, indirect, and total effects of the construct on intention to buy green products

Dependent variables	Effect	ATT	OPR	HEA	ENV
ATT	Direct			0.397	
	Indirect				
	Total			0.397	
OPR	Direct			0.505	
	Indirect				
	Total			0.505	
HEA	Direct				0.786
	Indirect				
	Total				0.786
INT	Direct	0.218	0.155	0.489	
	Indirect			0.165*	0.514*
	Total	0.218	0.155	0.654	0.514

Note: The strikethrough values mean the values of the nonsignificant paths, * The nonsignificant paths are excluded

health consciousness, followed by environmental concern while the lowest impact comes from online product review.

5. Discussion and implication

5.1. Discussion

In consistent with previous works that take the common attitude–behaviour perspective of green consumption, this research partially affirmed the validity of the theory of planned behaviour which assumes that green purchase intention/behaviour could be explained by customers’ attitudes towards buying ecological products (Dilotsotlhe, 2021; Nair & Little, 2016; T. N. Nguyen et al., 2018; Taufique & Vaithianathan, 2018; Verma & Chandra, 2018; Vu et al., 2022; Y. T. H. Nguyen & Nguyen, 2020). In other words, attitudes remain a crucial determinant of green consumption behaviour across various demographic customer segments. Our research further expands the theory of planned behaviour and existing knowledge about the determinants of attitudes towards green purchases by exploring how the attitude towards green purchase is formed and their interactions in influencing green purchase intention.

First, our empirical results suggest that environmental concern and health consciousness together form attitudes and intentions to purchase green products. However, their roles in such an internal mechanism are different. In line with previous studies (Cheung et al., 2015; Iqbal et al., 2021; Kim & Chung, 2011; Li & Jaharuddin, 2021; Xu et al., 2020), our empirical results indicate the significant role of health consciousness in green purchase decisions. Specifically, health consciousness not only has the most influential positive impact but also mediates the influence of environmental concern on green product purchase intention. Meanwhile, contradicting previous works (Cheung et al., 2015; Duong et al., 2022; None & Kumar Datta, 2011; Lestari et al., 2021; Moslehpour et al., 2022; Mohd Suki, 2016; Paul & Rana, 2012), environmental concern demonstrates no significant direct effect on attitudes and green product purchase intention. Instead, its impacts are totally mediated by health consciousness. This novel finding further affirms the perspective that environmental concern is, indeed, self-interest (Takala, 1991). In other words, the worry about the bad consequences of environmental degradation on their health and human well-being forms the core of environmental concern (Hopper & Nielsen, 1991). Therefore, the impact of environmental concern on green purchase intention could be entirely explained by health consciousness. While previous studies mostly treat environmental concern and health

consciousness as two independent determinants of green purchase behaviour, our findings give insights into their interactions in influencing the decision to buy ecological products.

Second, contradicting to our expectation, online product review, which represents social stimuli that may shape attitudes from theoretical perspectives, does not necessarily form a favourable attitude towards green choices. The reason may be that online product review only implies a high involvement that a customer form towards green products, in other words, “they really care” while exposure to contradicting feedback could reshape their attitudes in different ways. However, interestingly, those who demonstrate the behaviour of searching and reading reviews about green products (as proxied by online product reviews) inform a significantly high tendency of green purchase intention. The finding is similar to Y. T. H. Nguyen and Nguyen (2020) which also affirm the linkage between online product review and green purchase intention. However, we challenge the explanation of Y. T. H. Nguyen and Nguyen (2020) that when a customer engages with online product reviews, he or she either has a favourable evaluation of the green product purchase by testing the impact of online product review on attitudes.

Thirdly, in expanding the existing knowledge about the mechanisms underlying green purchase intention, we test the direct, indirect, and composite impacts of health consciousness, environmental concern, and online product review on attitudes and green purchase intention and find some novel findings. From the attitude formation perspective, there are two mechanisms of green purchase attitude, including (1) the internal mechanism through the effects of consumers’ existing values and beliefs (health consciousness and environmental concern) and (2) the external mechanism through the cognitive learning that activates the interaction between online product review and the consumers’ inherent values and beliefs. Our findings indicate that the internal mechanism plays a more important role in forming attitudes toward green purchases and consequently, the intention to buy green products. Interestingly, the probability that the external mechanism is activated (i.e. whether customers engage with online product reviews) is significantly driven by consumers’ internal motives (i.e. health consciousness and environmental concern). From the purchase decision-making process perspective, we find the sequences in the purchase decision of ecological products in accordance with Kotler and Armstrong (2017). Specifically, while health consciousness indicates the recognition of the need for ecological products, it becomes the precursor of online product reviews that represent the phases of information search and evaluation of alternatives before making a purchase decision.

5.2. Practical implications

This research provides a complementary view of the TPB framework that has usually been used in studying green consumption behaviours. In line with other studies on green consumption behaviours, our recommendations also refer to the communication or educational campaigns to enhance attitudes toward green purchases and the market penetration of green products (H. V. Nguyen et al., 2019; Wu & Chen, 2014). However, in addition to traditional recommendations, our novel findings suggest more detailed tactics aiming at the desired formation of green purchase attitudes and intentions for both marketing managers and government agencies.

From the business perspective, as the key concern of customers is their health, the foremost communication strategies should be promoting health in which the role of environmental protection in sustaining human well-being is highlighted. Those “hooks” are then linked to green products so that green consumption appears viable for them in the long run. These motives could be applied as the common theme for advertising storyboards aiming at forming favourable attitudes towards green purchases and driving consumers towards further steps of the purchase decision-making process. Once consumers recognize their need for green products to protect their health and the environment, theoretically, they would seek different alternatives and evaluate their choices. At this stage, online social channels should be more effectively used to make green products more desirable in consumers’ evoked sets. Despite that online product reviews are uncontrollable communication sources to firms, they could either provide opportunities for

customers to talk about their green items or eliminate the bad effects of negative reviews. For example, firms could introduce functions on their websites for customers to vote and share reviews while managing social media pages in a way that encourages customers' responses rather than merely introducing their products. In addition, firms should also actively interact with customers' reviews, especially negative ones to reduce the uncertainty among other customers.

On the policy front, encouraging green consumption is also a sustainable solution for the whole society to protect the environment and ensure public health. Government agencies should understand their citizens' insights to tailor suitable and relevant messages that help educate people about the benefits of green products. As individuals are mostly self-interest, communication campaigns that aim to either environmental protection or public health should first focus on the citizens' health. This would be the key pain point that drives the pro-environmental and health-promoting actions that benefit themselves and the society at large. Green consumption, in turn, is introduced as an effective and simple way that every citizen could do for their health and the planet. In addition, government agencies can also contribute to the sources of online reviews for green products by facilitating and regulating online forums and social media where reviews on green products, especially their benefits to individuals' health and positive externalities to the environment could be shared among citizens. Similar to firms, government agencies could not control online product reviews. However, they could inspire citizens' shares and enhance engagement with online reviews among citizens through viral public marketing campaigns or calls for support from influencers and celebrities.

6. Conclusion

Along with economic development and improved living standards across the world, increased production and consumption are the facts of life. In response to threats of environmental degradation to the survival of human beings, encouraging green purchase behaviour is a viable solution for policymakers and societies. Our research responds to the research gaps regarding the formation of attitudes towards green purchases while providing more insights into the impacts of environmental concern and health consciousness on attitudes and intention to purchase green products as found in previous works. Specifically, given the central role of attitudes in guiding intention to buy environmentally friendly products, this study explores how attitudes and green purchase intention are formed from both the attitude formation and purchase decision-making process perspectives. Based on the attitude formation perspective, the empirical results indicate that environmental concern and health consciousness, as rooted in one's self-consciousness and awareness, constitute the internal mechanism while online product review, a type of social stimuli, represents the external mechanism that shapes the green attitudes and drives green purchase intention. Those relationships could also be viewed from the purchase decision-making perspective. While environmental concern and health concerns induce the first phase: recognition of the need for green products, online product reviews support information search and evaluation of alternatives as the middle phase. Our findings shed more light on the decision-making process of green purchases and hence, provide valuable and insightful implications for academia, practitioners, and policymakers.

This study has some limitations. First, this study only examines the purchase intention while both theories and empirical evidence acknowledge the gap between the purchase intention and the actual behaviour (H. V. Nguyen et al., 2019). Second, we did not examine the validity of the research model among various demographic segments. Third, consumers may form different levels of health or environmental concern when purchasing various types of green products. For example, healthcare products or organic foods are directly linked to health consciousness while the use of electric products or household appliances is more attributed to environmental issues. However, we only examine the purchase intention of green products in general. Finally, this research only takes the sample of Vietnam whereas the levels of socio-economic development may influence the extent to which public health and the environment are concerned.

This study with its findings and limitations provides some interesting directions for further research. Specifically, future research should incorporate the behaviour and mind the intention-behaviour gap to enhance the validity and practicability of this study. In order to support segmentation and targeting strategies, future studies should compare and contrast the findings among different customer segments. This would provide more insightful implications for tailor-made communication strategies. Our research could also be revisited with specific green products so that the potential differences in the mechanisms of attitude formation and consumption behaviour of various green product lines are revealed. Revisiting this study as cross-national comparative research for a more comprehensive view of green consumption behaviour is also a crucial direction. In addition, future studies could further expand the application of the theory of planned behaviour in explaining green behaviour by conducting either in-depth interviews or focus groups aiming at exploring other determinants of attitudes, social norms, perceived behavioural control or even other environmental stimuli that influence green purchase intention and behaviour. The findings from such exploratory research could help build more insightful conceptual models, followed by quantitative research for validation.

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No potential conflict of interest was reported by the authors.

Data availability statement

All data analysed during this study are available upon request.

Correction

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

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