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**Article**

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## MARKETING | RESEARCH ARTICLE

# Factors influencing continuance intention of online shopping of generation Y and Z during the new normal in Vietnam

Binh Nguyen Thi<sup>1</sup>, Thi Lan Anh Tran<sup>2</sup>, Thi Thu Hien Tran<sup>2,3</sup>, Thanh Thao Le<sup>2</sup>, Phan Nhat Hang Tran<sup>2</sup> and Minh Hieu Nguyen<sup>3\*</sup>

**Abstract:** This study investigated the determinants of online shopping continuance intention of Generation Y and Z during the new normal. A conceptual framework, which was an extension of the Technology Acceptance Model, was empirically tested using partial least squares structural equation modelling, multi-group analysis technique, and the data collected from 847 Gen Y-ers and Gen Z-ers in Hanoi, Vietnam during March 2022. The results revealed that facilitators of repurchase intention included perceived usefulness, perceived ease of use, satisfaction, and environmental awareness while perceived risks of online shopping served as a barrier. Notably, the barrier was found to affect Gen Y's repurchase intention more severely. Personalization was not directly associated with the intention but had strong indirect effects through perceived usefulness, perceived ease of use, and satisfaction. The risk of COVID-19 was not a predictor of online repurchase intention. Understanding of the continuance intention of online shopping among consumers from different generations in an emerging country during the new normal may aid to enhance the quality of decision-making. Specifically, platforms and sellers should adopt customized marketing programs towards Gen Y and Gen Z. Additionally, a user-friendly and informative purchasing process with personalized features should be formulated. Demonstrating online shopping as a green behavior would be useful. This study differs from earlier research by considering and comparing factors influencing the intention to keep shopping online of Gen Y and Gen Z in a developing country when the COVID-19 is well controlled.

**Subjects:** Psychological Science; Multidisciplinary Psychology; Consumer Psychology

**Keywords:** COVID-19; Generation; Personalization; Hanoi; TAM; Online shopping; PLS-SEM

## 1. Introduction

Online shopping refers to the act of purchasing goods or services through the internet. In the mid-1990s, the increasing popularity of the World Wide Web and the development of information and communications technologies led to the considerable emergence of online shopping (Andreev et al., 2010). According to Statista (2022a), retail e-commerce sales worldwide increased from 1,336 billion US dollars in 2014 to 4,938 billion US dollars in 2021. Online shopping has become popular in the developed countries, whereas the developing countries, particularly nations in the Southeast Asia, have experienced a lower prevalence of shopping online despite its great potential of growth (Alyoubi, 2015; Kshetri, 2007). The limited scales of e-commerce in emerging countries result from various obstacle types, including economic barriers (e.g., poor information technology

infrastructure, low rate of payment by credit card or e-wallet), socio-political barriers (e.g., lack of government regulations, high taxes), and cognitive barriers (e.g., uncertain awareness of the benefits and consequences, changes of consumers' choice architecture; (Alyoubi, 2015; Babenko et al., 2019; Lawrence & Tar, 2010).

The rapid outbreak of the COVID-19 pandemic has upended life and accelerated online shopping further since online shopping reduces physical interactions, thus preventing the coronavirus's dissemination (Al-Hattami, 2021; Koch et al., 2020; Nguyen et al., 2021a). A remarkable shift from going to brick-and-mortar stores to one-click shopping has been recorded with an average growth of 10% in the online customer base of 45 countries across the world (McKinsey & Company, 2020). A report by Verdon (2021) shows that the purchase volume of e-commerce for the first quarter of 2021 increased by 38%, compared to that of 2020. The presence of COVID-19 is a tremendous shock, marking a turning point in the growth of e-commerce in developing countries (UNCTAD, 2021). Taking Thailand as an example, its e-commerce grew 19% in 2020 with an expected steady compound annual growth rate of 7.4% to 2024, pushing shopping online as a persistent habit (J.P. Morgan, 2021). So far, the large percentages of adults (over three-quarters) in many emerging countries are fully vaccinated, enabling citizens' daily lives to return to their pre-COVID-19 status (Ritchie et al., 2020). Currently, purchasing in online channels, despite being at a larger scale than that before the COVID-19's occurrence, is falling owing to the lessened infection fear and more access to physical stores (Han et al., 2022). In contrast to the ample knowledge on the determinants of virtual shopping during the COVID-19, understanding the factors influencing the intention to continue shopping online when inhabitants are familiar with and ready to live with the coronavirus, to the best of our knowledge, is limited.

A focus of research on online shopping behaviors is on intergenerational comparison, whose findings would be informative for formulating the strategy of the segment market (Lissitsa & Kol, 2016). A generation includes a cohort of persons who are born within a particular period and have distinct personality traits and consumer behaviors (Lissitsa & Kol, 2021). Persons born from 1981 to 1996 are known as Generation Y (Gen Y); meanwhile, members of Generation Z (Gen Z) were born between 1997 and 2012 (Dimock, 2019). Both generations are technological and media savvy and have a high rate of exposure to the Internet (compared to the older cohorts); however, their differences in experiences, attitudes, and preferences for online shopping significantly influence their choice of shopping types (Dabija & Lung, 2019). Before COVID 19, Gen Y was perceived as consumption-driven with greater purchasing power while Gen Z was associated with "online store disloyalty" and pragmatism in purchasing due to their extensive value comparison among e-stores (Lissitsa & Kol, 2016). Notably, Koch et al. (2020) found that Gen Z consumers reveal higher hedonic motivations in e-shopping than Gen Y consumers, highlighting the certain discrepancies between these generations in the health crisis era. Notwithstanding, little, so far, is known about the factors associated with continuance intention to shop online of Gen Y and Gen Z.

This study investigates the determinants of the continuance intention to shop online during the new normal using the data collected from 847 Gen Y and Gen Z respondents in Hanoi, Vietnam during March 2022 and a conceptual framework formulated based on the Technology Acceptance Model (TAM). The specific research questions are as follows:

**Q1:** *What are the driving factors of continuance intention of online shopping?*

**Q2:** *What are the barriers to continuance intention of online shopping?*

**Q3:** *What are the differences in the effects of factors on continuance intention of online shopping among generational cohorts (i.e., Y and Z)?*

This study has made both theoretical and practical contributions. First, it provides novel insights into facilitators and deterrents to the continuance intention of online shopping in the new normal.

Second, the research reports large positively significant mediating effects of personalization on repurchase intention. Third, the impact of the perceived risk of COVID-19 on the continuance intention is found to be insignificant, demonstrating online shopping as a consistent action in the new normal rather than a response to the infection danger. Fourth, the perceptions of online shopping risks have a greater negative effect on the continuance intention of Gen Y in comparison to Gen Z. The fifth contribution is business implications proposed based on the findings of influential factors for marketing managers and e-commerce platforms to promote the loyalty of online shopping users from different generational cohorts.

The remainder of this paper is divided into five sections. Section 2 synthesizes the existing literature to adopt the theoretical framework of this research. Subsequently, Section 3 describes the process of data collection and methods used to analyze the data. In the fourth section, the results are presented before Section 5 discusses and interprets the findings in detail. Conclusions and future research directions are drawn in the final section.

## 2. Conceptual framework foundation

### 2.1. Repurchase intention (RI)

Repurchase intention is defined as an individual's judgment regarding purchasing a specific service again from the same firm, considering his or her existing condition and expected circumstances (Hellier et al., 2003). In the online shopping context, repurchase intention refers to the subjective likelihood that customers will continue to purchase products from an online seller or use a previous online channel to shop at a certain vendor (Khalifa & Liu, 2007). Acquiring new customers usually takes much more time, expense, and effort than retaining existing ones; therefore, promoting the repurchase intention of customers could help maintain and improve any company's profitability (Spreng et al., 1995, Nguyen et al., 2022). In addition, for enterprises, customer retention is a means of creating competitive advantages and achieving sustainable development goals (Tsai & Huang, 2007). It is, hence, essential to investigate the determinants of customer repurchase intention.

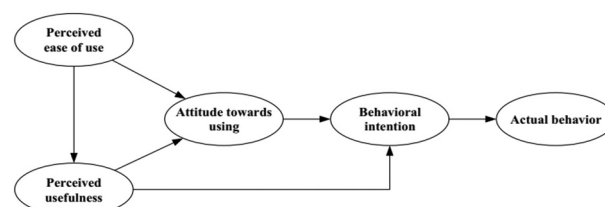
### 2.2. Technology Acceptance Model (TAM)

TAM, developed by Davis (1985), explains an individual's acceptance of a particular innovative technology through four fundamental predictors: Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitude (ATT), and Behavioral Intention (Figure 1).

As a result of appreciating TAM as a robust theoretical foundation to parsimoniously link beliefs to behavior, scholars have deployed TAM to analyze (the potential of) technological adoptions in a variety of contexts (Hubert et al., 2017). Because online shopping behaviors use the internet as the technological environment for making purchase decisions, TAM has been intensively utilized to predict the repurchase intention of consumers (Trivedi & Yadav, 2018; Wen et al., 2011).

Among three antecedents of the behavioral intention (see, Figure 1), ATT has frequently been claimed to be eliminated from the original model (Brown et al., 2002; Gefen et al., 2003; S. Wang et al., 2016). This results from the fact that ATT does not take a significant role in the overall variance in technological usage (Teo & Noyes, 2011; Zacharis, 2012). Besides, behavioral intention

Figure 1. The classic TAM.



is demonstrated to be an effective predictor of actual use (Davis, 1989; Venkatesh et al., 2003) and directly affected by perceived usefulness and perceived ease of use (Wu & Wang, 2005). Having considered the better explanatory power of the model, this paper adopts a parsimonious TAM version with a removal of ATT.

According to Davis (1989), PU is defined as the extent to which use of the technology will increase an individual's productivity. The positive relationship between behavioral intention and PU is widely demonstrated (Venkatesh & Davis, 2000). In online purchasing, PU refers to the extent to which consumers believe that using the Internet will improve their performance, thereby enhancing the shopping experience (Perea et al., 2004). As reported by Chiu et al. (2009), the consumers' repurchase intention will be higher if they are fully aware of the usefulness of the experience.

PEU is known as the degree to which the use of the technology is supposed to be effortless and easy (Venkatesh & Davis, 2000). PEU is a significant predictor of behavioral intention (Abdullah et al., 2016; Amin et al., 2014b). Hamid et al. (2016) indicate that when a consumer believes it is easy to purchase a product, his/her intention to repurchase it will increase. PEU is found to have a positive effect on PU as the easier a technology is to use, the more useful it can be (Davis, 1989; Venkatesh & Davis, 2000). Based on the abovementioned discussions, the following hypotheses are proposed:

*H1: Perceived usefulness positively influences the repurchase intention.*

*H2a: Perceived ease of use positively influences the repurchase intention.*

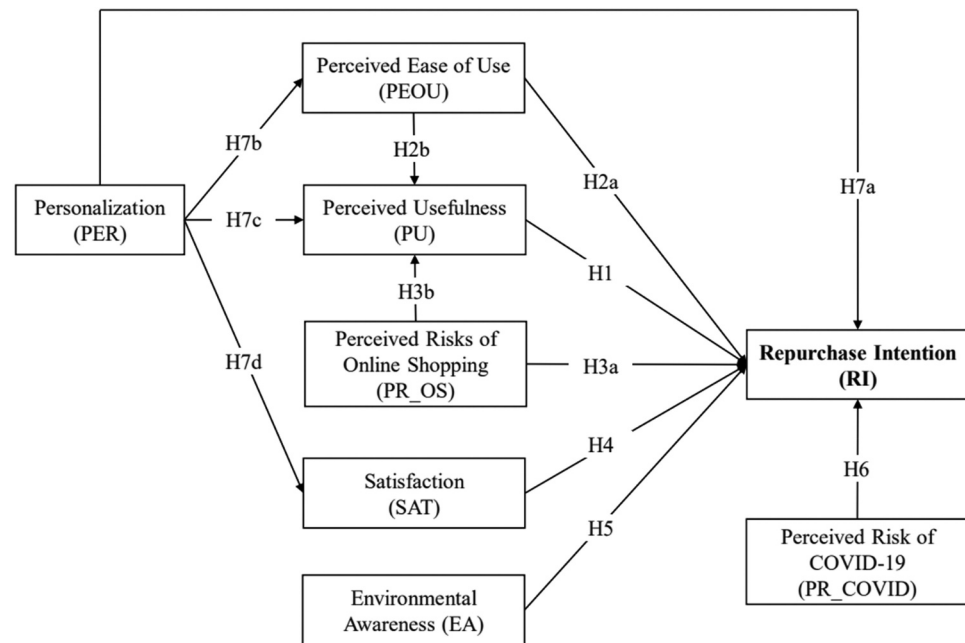
*H2b: Perceived ease of use positively influences perceived usefulness.*

TAM is typically a technology-oriented model whose fundamental constructs do not comprehensively drive the variety of user task environments; thus, it needs to be extended to better explain the adoption behavior of innovative technology (Lu et al., 2005; Schepers & Wetzels, 2007). This research enhances the TAM model by adding five constructs: personalization, perceived risks of online shopping, perceived risk of COVID-19, environmental awareness, and satisfaction (Figure 2).

### **2.3. Perceived risks of online shopping (PR\_OS)**

Cunningham (1967) suggests that risk comprises two dimensions: uncertainty and consequences. Peter and Ryan (1976) in the effort to understand consumer's behavior categorize the risk into the probability of consequences occurring and adverse effects of poor consumer's choice. Facing risks is a part of using a (new) technology and perceived risk is consistently found to be an impediment to behavioral intention (G.S. Kim et al., 2008; Luo et al., 2010). Unfortunately, TAM lacks constructs related to risks and loss (Lu et al., 2005; Natarajan et al., 2018). It is, therefore, necessary to integrate the consumers' perceived risks into TAM (Shukla et al., 2021). However, risks may vary across industries or sectors. When purchasing online, customers may confront various types (e.g., financial, product, time, delivery, privacy) of risks. Perceived risks of online shopping is defined as the likelihood of experiencing loss when buying goods in online stores (Ko et al., 2004). This study focuses on the two most common kinds—financial risk and product risk. The former is the possibility of losing money, or the consumer's sense of insecurity when utilizing payment online (Masoud, 2013). The latter is the perception that a purchased product may not be as expected (Masoud, 2013). A large number of researchers have agreed that perceived risks of online shopping have adverse effects on the adoption of purchasing virtually (Kok Wai, Dastane et al., 2019; Lingying Zhang et al., 2012) and perceived usefulness in online shopping and online transactions

**Figure 2. The theoretical framework of the study.**



(Featherman & Pavlou, 2003; Kalinic & Marinkovic, 2016). Therefore, the following hypotheses are proposed:

*H3a: Perceived risks of online shopping negatively influence the repurchase intention.*

*H3b: Perceived risks of online shopping negatively influence perceived usefulness.*

#### 2.4. Satisfaction

As defined by Anderson and Srinivasan (2003), e-satisfaction is a customer's contentment regarding his or her previous purchasing experience with a particular e-commerce company. Ha (2012) defines satisfaction as a consumer's emotional reaction to a specific experience with a website. When purchasers are satisfied with online purchasing based on their previous experiences, they are more likely to buy again from the channel(s); Wen et al., 2011; Yoon, 2002), even with a higher frequency (C. Kim et al., 2012). For those reasons, the following hypothesis is formulated:

*H4: Satisfaction positively influences the repurchase intention.*

#### 2.5. Environmental awareness (EA)

Environmental awareness can be defined as the knowledge of, and concerns about the influences of human activities on climate and environment together with thoughts and attitudes towards measures to solve environmental problems and improve environmental conditions (Hopwood et al., 2005; Schuitema et al., 2013). Many researches highlight that individuals with higher environmental awareness are more inclined to take (more) environmentally friendly actions (S.-C. Chen & Hung, 2016).

According to Siikavirta et al. (2008), online shopping using home delivery services can significantly reduce the number of deliveries compared to customers picking up the goods by themselves. Depending on the door-to-door delivery methods used, greenhouse gas emissions can be mitigated by 18–87% while travel distance can reduce by just 54% to 93%, leading to decreases



in NO<sub>x</sub>, and PM<sub>10</sub> (Buldeo Rai, 2021; Jaller & Pahwa, 2020; Wygonik & Goodchild, 2018). In this sense, online shopping can be considered an act of fostering environmental sustainability. Therefore, it can be predicted that individuals with a greater degree of environmental awareness might have a higher intention to shop online. Based on the above, the following hypothesis is proposed:

*H5: Environmental awareness positively influences the repurchase intention.*

## **2.6. Perceived risk of COVID-19 (PR\_COVID)**

According to Xie et al. (2019), “COVID-19 risk perception” is measured as an index, including affection and awareness to provide an overall measure of perceived risk. The rise of COVID-19 cases and the fear of infection coupled with health consequences affect the decision on various activities, such as shopping channels (Hieu, 2021; Loxton et al., 2020; Nguyen, 2021; Nguyen & Pojani, 2021, 2022a; Nguyen et al., 2021b; Nguyen-Phuoc et al., 2022a, 2022b; Tran et al., 2022). Most studies conducted in the COVID-19 era highlight that perceived risk of the pandemic is responsible for a shift from conventional shopping to online shopping (Eger et al., 2021; Nguyen et al., 2021a). A report by UNCTAD (2020a) shows that online purchases have increased by 6% to 10% across most product categories. Thus, the following hypothesis is preferred:

*H6: Perceived risk of COVID-19 positively influences the repurchase intention.*

## **2.7. Personalization (PER)**

Consumers, especially Gen Z and Gen Y, not only enjoy more personalized products but are also willing to pay a premium for products that highlight their individuality (Francis & Hoefel, 2018). Personalization is defined as a customer’s perception of the extent to which an online store offers differentiated services to satisfy specific individual needs (Parasuraman et al., 1988; Yang & Jun, 2002). Previous research indicates that increased personalization of websites will promote customer loyalty to web-based services (T. (Catherine) Zhang et al., 2011). As for e-commerce, business’ personalization of services to suit customers’ needs, values, habits and lifestyles can help foster the relationships with customers and promote their loyalty, which originates from their repurchase intention (Harris & Goode, 2004).

According to T.-P. Liang et al. (2009), personalized services have a higher positive impact on perceived usefulness than non-personalized services. A process tailored to the specific needs of an individual can enable them to be familiar with it, thus using it straightforwardly. As demonstrated by Kang and Namkung (2019), personalization which tailors technology environments for alignment with individual needs would increase consumers’ perceived ease of use. In addition, customers’ experience personalization is found to foster a higher customer satisfaction than standardized encounters (Bettencourt & Gwinner, 1996). Accordingly, the following hypotheses are proposed:

*H7a: Personalization positively influences the repurchase intention.*

*H7b: Personalization positively influences perceived ease of use.*

*H7c: Personalization positively influences perceived usefulness.*

*H7d: Personalization positively influences satisfaction.*



### 3. Data collection and analytical methods

#### 3.1. Research context

Hanoi, the capital of Vietnam, is in North Vietnam and plays the role of a major center for economic development and international transactions, as well as a development engine of the Red River Delta and the whole country. With a population density of more than 2,455 inhabitants per square kilometer (Statista, 2021), Hanoi is the second most crowded and motorcycle-oriented city of Vietnam (H.N. Nguyen et al., 2020; Nguyen & Armoogum, 2020; Thanh Chuong & Minh Hieu, 2022). Before the COVID-19 pandemic, according to Vietnam E-Commerce Association (Vietnam E-Commerce Association, 2020), Hanoi ranked second after Ho Chi Minh City in terms of e-commerce index ranking. During the pandemic, online shopping was one of the most important shopping channels when the city applied social distancing periods, such as in April 2020 (Nguyen et al., 2021a). According to VietnamPlus (2021), citizens in the capital increased their use of online channels by 30% to 50%.

#### 3.2. Survey design

Based on a rigorous synthesis of the literature, a three-part self-administered questionnaire was designed.

- Its first component was a brief introduction that explained the survey's goals and scope.
- The second section requested demographic information of the participants (e.g., gender, generation, income, educational level, living area).
- The last part encompassed 33 items to measure eight latent constructs. For “repurchase intention”, 4 items were adopted based on the studies of Wen et al. (2011) and Mohamed et al. (2014) while “perceived usefulness” was assessed using 4 items adapted from Pandey and Parmar (2019), p. 1 item modified from Davis (1989), and 1 item developed by the authors. “Perceived ease of use” was obtained through 3 items introduced by Gefen (2003). As for “perceived risks of online shopping”, 4 items were utilized based on Masoud (2013), Ariff et al. (2014). 4 items of “satisfaction” were accessed from Janda et al. (2002), Seiders et al. (2005) and simultaneously, 4 items of “environmental awareness” were derived from Y. Wang et al. (2018). “Perceived risk of COVID-19” was measured using 3 items of Dryhurst et al. (2020) and Brewer and Sebbby (2021), and 2 items developed by the authors. “Personalization” was assessed using 2 items based on Wolfenbarger and Gilly (2003) and 1 item derived from D.N. Su et al. (2022). All measurement scales were evaluated on a five-point Likert scale ranging from 1 (= “strongly disagree”) to 5 (= “strongly agree”).

First, a paper-based questionnaire in English was developed. Subsequently, the questions and scales were converted into Vietnamese. Based on the suggestions of two researchers with relevant expertise, the precise translation and wording of items in the local context were completed. Next, it was tested on a sample of 20 respondents (10 for each generation), who pointed out any unclear words or probable survey difficulties, allowing for an additional questionnaire development. Finally, the questionnaire was eligible for the official survey after two rounds of testing to enhance both of its validity and reliability.

#### 3.3. Data collection and sample

To collect data for this research, a survey was carried out within three weeks, from 28<sup>th</sup> February to 20 March 2022 in Hanoi. During this period, the daily number of COVID-19 infections was relatively high at around 2,000. However, there were no mobility restrictions imposed by the government. Working and studying activities took place normally as pre-COVID-19. Since the number of online shopping users in Hanoi remained unknown, we applied a convenience sampling technique. Specifically, twelve surveyors, after being trained carefully, were divided into six groups, each of which took responsibility for two urban and three non-urban districts. In each district, surveyors worked 5 shifts in different public locations (e.g., department stores, supermarkets, universities, restaurants, apartments, and walking streets). Each shift lasted two hours, one of which was for surveying Gen Y while another was for surveying Gen Z. At a survey location, each surveyor randomly asked a person to participate in the survey. In case of achieving a participation approval

**Table 1. Descriptive statistics (n = 847)**

Variable	Value	All (N = 847)		Gen Z (N = 404)		Gen Y (N = 443)	
		Freq	%	Freq	%	Freq	%
Gender	Male	420	49.6	202	50.0	218	49.2
	Female	427	50.4	202	50.0	225	50.8
Generation (age)	Gen Z (10–25)	404	47.7	404	100		
	Gen Y (26–41)	443	52.3			443	100
Living area	Urban districts	605	71.4	321	79.5	284	64.1
	Non-urban districts	242	28.6	83	20.5	159	35.9
Education level	Under-graduate	461	54.4	331	81.9	130	29.3
	Graduate	304	35.9	68	16.8	236	53.3
	Post-graduate	82	9.7	5	1.3	77	17.4
Monthly personal income	<5 million VND	338	39.9	285	70.5	53	12.0
	5–10 million VND	251	29.6	84	20.8	167	37.7
	10–20 million VND	161	19.0	23	5.7	138	31.1
	>20 million VND	97	11.5	12	3.0	85	19.2

from a respondent who was over 17 years old and had already shopped online within 2 years, a face-to-face paper-and-pen interview was implemented. At the end of the survey, the participant received 20,000 VND (~1 USD) as a reward for his/her support.

In total, of 1,150 invited attendants, 875 provided their answers. After the data cleaning process, 28 were eliminated due to the lack of reliability, leading the final sample to encompass 847 responses useful for further analyses.

Table 1 presents demographic information of the respondents, including gender, age, living area, educational degree, and monthly personal income. Nearly half (49.6%) of the participants were male while 47.7% of participants belonged to Gen Z. Besides, the majority of the respondents lived in urban districts (71.4%). More than half of those interviewed were undergraduates (54.4%), followed by graduates (35.9%), and post-graduates (9.7%). Respondents with monthly personal income below 5 million VND made up the highest percentage of 39.9%, while the monthly personal income brackets of 5–10 million, 10–20 million, and above 20 million constituted 29.6%, 19.0%, and 11.5%, respectively. The main differences between the two samples of Gen Z and Gen Y were related to educational level and personal income. Most Gen Z respondents could not attain a graduate degree and earned less than 5 million VND per month.

### 3.4. Analytical method

While covariance-based structural equation modeling (CB-SEM) was the dominant approach for examining interrelationships between latent variables included in conceptual frameworks, partial least squares structural equation modeling (PLS-SEM) has recently been increasingly used as an effective alternative (Astrachan et al., 2014; Fauzi & Sheng, 2020; F. Hair et al., 2014). The attractiveness of PLS-SEM for researchers stems from the method's ability to estimate complex models including many constructs, items, and paths with no distributional and/or size requirements for the data (Hair, 2017; Khan et al., 2019). The approach is highly recommended for the research based on extensions of well-established theories (Hair et al., 2019). For these reasons, the PLS-SEM was chosen for this study. The SEM analyses were undertaken using SmartPLS 3.3.8, which is the most common statistical package for estimating PLS-SEM with all necessary measures to

implement multi-group analysis and evaluate model fit, measurement models, and structural model.

## 4. Results

### 4.1. Measurement model evaluation

To assess the measurement models, this study followed the four steps suggested by Hair et al. (2019), as follows:

- Firstly, the individual item's reliability was tested by outer loadings to ensure that at least half of the indicator's variance was explained by the construct (Sarstedt et al., 2017). Table 2 reveals that all of the indicators's outer loading values satisfied the suggested level of 0.708 (Hair et al., 2019), thus implying that item reliability was acceptable.
- Secondly, the Cronbach's Alpha (CA) and composite reliability (CR) values were utilized to assess the internal consistency reliability. Since the CA and CR values, which ranged from 0.848 to 0.918, and from 0.902 to 0.938 respectively (Table 2), exceeded the recommended cut-off value of 0.7 (Hair et al., 2019), all of the constructs were measured satisfactorily by the assigned items.
- Thirdly, to evaluate the convergent validity, the average variance extracted (AVE) was considered. The AVE values of eight latent constructs ranging between 0.686 and 0.789 (Table 2), met the minimum required value of 0.5 (Fornell & Larcker, 1981); therefore, a satisfactory degree of convergent validity was attained.
- Finally, the discriminant validity, which relates to the level of statistical difference between two constructs (F. Hair et al., 2014) was evaluated utilizing the Fornell-Larcker criterion along with the Heterotrait-Monotrait Ratio (HTMT) of the correlations. As shown in Table 3, the square root of each latent construct's AVE is greater than the inter-construct correlation values of that same construct and other measured constructs, confirming a good discriminant validity (Hair et al., 2019). Table 4 reveals that all of the HTMT values were lower than the threshold value of 0.85 suggested by Voorhees et al. (2016). Again, this finding demonstrated the discriminant validity of the proposed model.

Accordingly, the reliability and validity of the suggested measurement models were ascertained. In the next stage, this paper would evaluate the structural model.

### 4.2. Structural model evaluation

The developed structural model was assessed through four major steps as follows:

#### 4.2.1. Model fit

According to Hu and Bentler (1999), standardized root mean square residual (SRMR) is an absolute criterion for evaluating the model fit. In this study, the SRMR value was 0.041, which was clearly lower than the cut-off value of 0.08 recommended by Hu and Bentler (1999). Hence, the proposed theoretical model fitted the data well.

#### 4.2.2. Predictive capacity evaluation

This step was to measure the predictive power of the structural model through assessing the coefficient of determination ( $R^2$ ) value and the cross-validated redundancy ( $Q^2$ ) value, which represent the model's predictive accuracy and predictive relevance, respectively. As can be seen from Table 5,  $R^2$  values ranged from 0.343 to 0.540, implying a moderate level of predictive accuracy (Hair et al., 2019).  $Q^2$  values, which were determined employing the blindfolding procedure, ranged from 0.260 to 0.388, greater than 0—the required minimum level. Thus, the developed model had medium predictive relevance for all endogenous variables (Hair et al., 2019). Among constructs, repurchase intention had the highest levels of both  $R^2$  and  $Q^2$ .

**Table 2. Evaluation of measurement model**

Latent Constructs/Items		Outer Loadings	CA	CR	AVE
<b>Perceived Usefulness (PU)</b>			0.908	0.929	0.686
PU1	Online shopping provides a wide selection of products.	0.854			
PU2	Online shopping provides special offers/discounts for purchase.	0.851			
PU3	I find the product tracking process helpful.	0.804			
PU4	I find the purchase process simple.	0.843			
PU5	Online shopping saves time	0.799			
PU6	Online shopping provides a variety of convenient methods of payment	0.815			
<b>Perceived Ease of Use (PEOU)</b>			0.848	0.908	0.766
PEOU1	I find it clear and understandable to go online shopping	0.881			
PEOU2	I am able to interact flexibly with online shopping channels	0.875			
PEOU3	It is easy to become skillful at using online shopping channels	0.87			
<b>Perceived Risks of Online Shopping (PR_OS)</b>			0.872	0.902	0.7
PR_OS1	I am concerned that my billing information might be misused on online platforms	0.709			
PR_OS2	I am concerned that I might be overcharged when shopping online.	0.87			
PR_OS3	I might not get what I ordered through online shopping	0.895			
PR_OS4	I find it difficult to judge the quality of the product on online shopping platforms	0.859			
<b>Satisfaction (SAT)</b>			0.897	0.928	0.764
SAT1	Online shopping is a delightful experience	0.854			
SAT2	I am completely satisfied with online shopping experience	0.886			
SAT3	My choice to shop online was a wise one	0.892			
SAT4	Overall, I am satisfied with the decision to shop online	0.865			
<b>Environmental Awareness (EA)</b>			0.901	0.931	0.77
EA1	I would like to describe myself as an environmentally responsible person	0.877			
EA2	I am concerned about environmental problems such as air pollution, noise pollution, plastic waste reduction, reuse-recycle, etc.	0.889			
EA3	I consider the potential environmental impacts of my actions when making any decision	0.866			
EA4	I would feel comfortable when taking actions that are more environmentally friendly	0.879			
<b>Perceived Risk of COVID-19 (PR_COVID)</b>			0.918	0.938	0.752
PR_COVID1	Getting sick with the coronavirus/COVID-19 can be serious	0.876			
PR_COVID2	I am worried about being infected with COVID-19	0.891			
PR_COVID3	I am affected by the COVID-19 pandemic	0.861			
PR_COVID4	I am worried about the consequences of COVID-19	0.872			
PR_COVID5	Going out and being in contact with people increases the risk of COVID-19 infection	0.835			

(Continued)

Latent Constructs/Items		Outer Loadings	CA	CR	AVE
<b>Personalization (PER)</b>			0.866	0.918	0.789
PER1	Online shopping platforms understand my needs	0.904			
PER2	Online shopping platforms offer me services/goods recommendations based on my preferences	0.889			
PER3	Online shopping platforms provide promotion information suitable for me	0.87			
<b>Repurchase Intention (RI)</b>			0.877	0.916	0.731
RI1	My intention is to continue using online shopping rather than use conventional shopping	0.841			
RI2	If I could, I would like to continue shopping online as much as possible	0.87			
RI3	I will continue shopping online in the future	0.865			
RI4	I will shop online more regularly in the future	0.844			

#### 4.2.3. Path evaluation

The bootstrapping algorithm with 5,000 resamples was utilized to estimate the direct, indirect, and total effects among the proposed constructs (Table 6). The results of path evaluation are the answers to the 1<sup>st</sup> and 2<sup>nd</sup> research questions set in Section 1.

**4.2.3.1. Direct effects.** The results showed that the hypotheses H1, H2a, and H2b, which were based on the original TAM model, were supported (Figure 3). Specifically, repurchase intention of online consumers was positively impacted by perceived ease of use ( $\beta_{PEOU \rightarrow RI} = 0.216$ ,  $p = 0.000$ ) and perceived usefulness ( $\beta_{PU \rightarrow RI} = 0.268$ ,  $p = 0.000$ ). In addition, perceived ease of use had a significant positive influence on PU ( $\beta_{PEOU \rightarrow PU} = 0.299$ ,  $p = 0.000$ ). Perceived risks of online shopping negatively and significantly affected both repurchase intention and perceived usefulness ( $\beta_{PR\_OS \rightarrow RI} = -0.100$ ,  $p = 0.005$ ;  $\beta_{PR\_OS \rightarrow PU} = -0.083$ ,  $p = 0.004$ ), supporting H3a and H3b. H4 and H5 were also confirmed as satisfaction and environmental awareness had significant positive effects on repurchase intention ( $\beta_{SAT \rightarrow RI} = 0.358$ ,  $p = 0.000$ ;  $\beta_{EA \rightarrow RI} = 0.075$ ,  $p = 0.038$ ). Surprisingly, repurchase intention appeared to be unaffected by perceived risk of COVID-19 ( $\beta_{PR\_COVID \rightarrow RI} = -0.005$ ,  $p = 0.876$ ), thereby rejecting H6. H7a was supported since there was no direct linkage of personalization found on repurchase intention ( $\beta_{PER \rightarrow RI} = -0.047$ ,  $p = 0.251$ ). However, personalization was a significant driving factor of perceived ease of use, perceived usefulness, and satisfaction ( $\beta_{PER \rightarrow PEOU} = 0.586$ ,  $p = 0.000$ ;  $\beta_{PER \rightarrow PU} = 0.491$ ,  $p = 0.000$ ;  $\beta_{PER \rightarrow SAT} = 0.589$ ,  $p = 0.000$ ), supporting H7b, H7c, H7d. To sum up, ten out of twelve proposed hypotheses were statistically supported at the significance level of 5%.

**4.2.3.2. Indirect effects.** Perceived ease of use and perceived risks of online shopping had partial mediating influences on repurchase intention via perceived usefulness, while perceived ease of use, perceived usefulness, and satisfaction fully mediated the relationship between personalization and repurchase intention (Tables 6 and 7). Personalization indirectly facilitated perceived usefulness. Notably, the impact of personalization on repurchase intention was the strongest of all observed indirect relationships.

**4.2.3.3. Total effects.** The total effects are equal to the sum of the direct and indirect effects. In particular, Table 6 indicates that personalization had the greatest positive total effects on the intention with the coefficient value of 0.468, followed by satisfaction (0.358), perceived ease of use (0.296), and perceived usefulness (0.268). In addition, environmental awareness had the positive but lowest influence on repurchase intention (0.075). Meanwhile, perceived risks of online shopping were the only deterrent of the intention since the negative effect of the perceived risk of COVID-19 was insignificant.

Table 3. Fornell-Larcker criterion for discriminant validity

	AVE	EA	PEOU	PER	PR_COVID	PR_OS	PU	RI	SAT
EA	<b>0.770</b>	<b>0.878</b>							
PEOU	<b>0.766</b>	0.482	<b>0.875</b>						
PER	<b>0.789</b>	0.492	0.585	<b>0.888</b>					
PR_COVID	<b>0.752</b>	0.555	0.454	0.419	<b>0.867</b>				
PR_OS	<b>0.700</b>	0.122	0.099	0.136	0.138	<b>0.837</b>			
PU	<b>0.686</b>	0.512	0.578	0.654	0.399	0.007	<b>0.828</b>		
RI	<b>0.731</b>	0.465	0.583	0.485	0.362	-0.063	0.612	<b>0.855</b>	
SAT	<b>0.764</b>	0.524	0.606	0.588	0.432	0.048	0.599	0.653	<b>0.874</b>

**Table 4. Results of Heterotrait-Monotrait ratio (HTMT)**

	EA	PEOU	PER	PR_COVID	PR_OS	PU	RI
EA							
PEOU	0.551						
PER	0.556	0.683					
PR_COVID	0.609	0.513	0.469				
PR_OS	0.151	0.127	0.172	0.159			
PU	0.567	0.658	0.737	0.434	0.052		
RI	0.522	0.675	0.557	0.400	0.069	0.683	
SAT	0.582	0.694	0.666	0.474	0.068	0.663	0.736



**Table 5. Evaluation of predictive accuracy and predictive relevance**

Factors	R <sup>2</sup>	Predictive capability level	Q <sup>2</sup>	Predictive relevance level
PEOU	0.343	Moderate	0.260	Medium
PU	0.494	Moderate	0.336	Medium
RI	0.540	Moderate	0.388	Medium
SAT	0.346	Moderate	0.262	Medium

#### 4.2.4. Moderating effect

In PLS-SEM, the multigroup analysis (MGA), known as PLS-MGA, is a technique for assessing whether hypothesized relationships vary significantly across groups (Sarstedt et al., 2011). This study applied PLS-MGA analysis using the bootstrapping method to investigate the moderating effects of generations on the relationships between the predictors and repurchase intention of online consumers (i.e., answering the third research question set in Section 1). Before conducting the PLS-MGA, the measurement invariance test was performed (Matthews, 2017). A p-value greater than 0.95 or less than 0.05 in Henseler's PLS-MGA approach reveals the significant differences between specific PLS path coefficients across two groups at the 5% level of significance. As reported in Table 8, only the relationships between perceived risks of online shopping and repurchase intention was significantly different between Gen Y and Gen Z groups. Notably, the negative impact of perceived risks of online shopping on repurchase intention is significantly larger for Gen Y ( $\beta = -0.155$ ,  $p = 0.000$ ) compared to Gen Z.

## 5. Discussions

### 5.1. Theoretical implications

Sharing the same view with Alalwan et al. (2018), Bhattacharjee (2001), Lee and Chang (2011), the results of this study confirmed that when customers assume that a technology-based service is more useful, they are more likely to have a higher level of repurchase intention. This study corroborated previous findings that perceived ease of use had an indirect effect on the behavioral intention via perceived usefulness (L. Chen & Aklikokou, 2020). However, in contradiction with Chuan-Chuan Lin and Lu (2000), we also found that perceived ease of use had a direct positive effect on the behavioral intention. Notably, Amin et al. (2014b) and Liu et al. (2016) supported our findings that an effortless e-shopping system leads to not only a greater intention to repurchase but also a higher perception of usefulness. Since both Gen Y and Z were born into the digital era, they are well aware of using technologies for online purchasing and its benefits (Nicholas, 2009), resulting in no generational differences in the effects of perceived usefulness and perceived ease of use on continuance intention.

Initially, supported by the study of Pappas et al. (2012), we supposed that personalization would directly affect repurchase intention. Nevertheless, this study was unsuccessful in proving this. A possible explanation would be that personalization may coincide with the concern about privacy invasion (Arpaci, 2016), which is a significant problem in developing countries due to the lack of resources to enforce legislation meant to protect e-users (UNCTAD, 2020b). The concern would prevent the respondents from considering personalization as a direct facilitator of repurchase intention. Meanwhile, consistent with Kwon and Kim (2012) and T.-P. Liang et al. (2009), personalization was found to have substantial positive mediating impacts on repurchase intention via perceived ease of use, perceived usefulness, and satisfaction. These results demonstrated that customers highly appreciated the outcomes generated by personalization when shaping their repurchase intention.

This research affirmed the negative effect of perceived risks of online shopping on repurchase intention as also proposed by H.-F. Chen and Chen (2019), L.J. Liang et al. (2018). Moreover, it

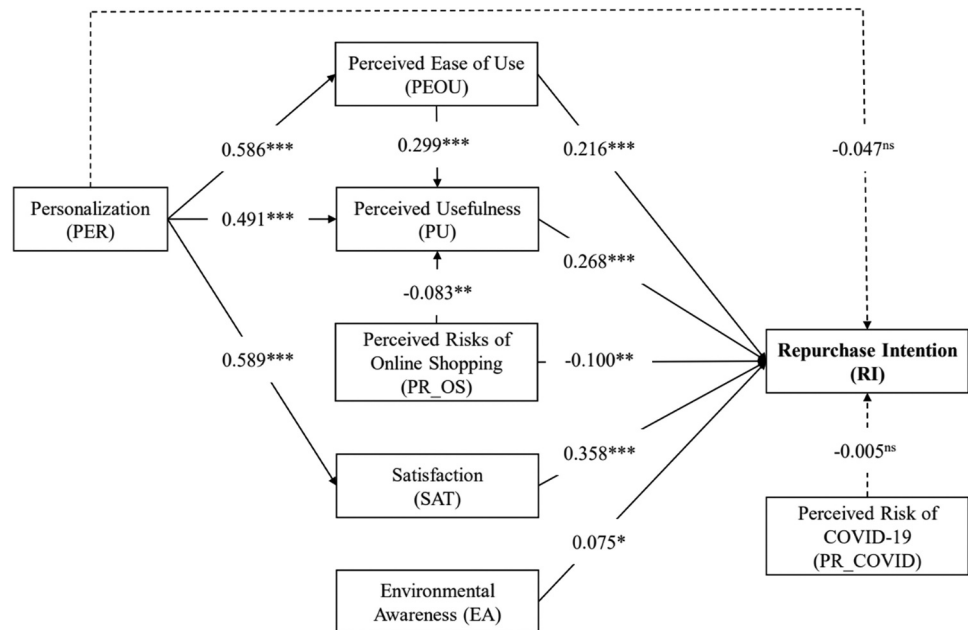
**Table 6. Direct, indirect, and total effects**

Paths	Direct effects				Result	Total indirect effects			Total effects		
	$\beta$	Std.	p	H		$\beta$	Std.	p	$\beta$	Std.	p
PU $\rightarrow$ RI	0.268***	0.049	0.000	H1	Support				0.268***	0.049	0.000
PEOU $\rightarrow$ RI	0.216***	0.041	0.000	H2a	Support	0.080***	0.018	0.000	0.296***	0.039	0.000
PEOU $\rightarrow$ PU	0.299***	0.041	0.000	H2b	Support				0.299***	0.041	0.000
PR_OS $\rightarrow$ RI	-0.100**	0.038	0.005	H3a	Support	-0.022*	0.009	0.011	-0.122**	0.041	0.002
PR_OS $\rightarrow$ PU	-0.083**	0.031	0.004	H3b	Support				-0.083**	0.031	0.004
SAT $\rightarrow$ RI	0.358***	0.040	0.000	H4	Support				0.358***	0.040	0.000
EA $\rightarrow$ RI	0.075*	0.036	0.038	H5	Support				0.075*	0.036	0.038
PR_COVID $\rightarrow$ RI	-0.005 <sup>ns</sup>	0.032	0.876	H6	<b>Reject</b>				-0.005 <sup>ns</sup>	0.032	0.876
PER $\rightarrow$ RI	-0.047 <sup>ns</sup>	0.041	0.251	H7a	<b>Reject</b>	0.516***	0.033	0.000	0.468***	0.037	0.000
PER $\rightarrow$ PEOU	0.586***	0.028	0.000	H7b	Support				0.586***	0.028	0.000
PER $\rightarrow$ PU	0.491***	0.038	0.000	H7c	Support	0.175***	0.026	0.000	0.666***	0.027	0.000
PER $\rightarrow$ SAT	0.589***	0.030	0.000	H7d	Support				0.589***	0.030	0.000

Note: \*\*\*p < 0.001; \*\*p < 0.01; \*p < 0.05; ns: non-significant.

**Figure 3. The path analysis results.**

Note: \*\*\*p < 0.001; \*\*p < 0.01; \*p < 0.05; ns: non-significant; dotted line represents insignificant path.



furthered the literature by illustrating the greater negative impact of perceived risks on Gen Y's repurchase intention than on Gen Z's. Our finding was a response to the limitation of TAM claimed by Venkatesh et al. (2003) that investigating more representative moderator variables beyond demographics is essential. Indeed, generations refer to not only age but also distinct traits and lifestyles (Dahlberg et al., 2015; Lissitsa & Kol, 2021). Gen Y pays more attention to the risks possibly because of their greater purchasing power and higher frequency of placing big orders, making them more sensitive to risks (Hoffower, 2021). As reported by Merriman (2015), Gen Y has a strong desire for financial safety since they experienced significant uncertainty in their life as a result of the financial crisis and subsequent recessions. In contrast, Gen Z consumers, who are studying or just entering the labor market, usually have a limited financial budget, leading to their wide-ranging comparison among e-stores. This group of consumers may even be willing to choose e-stores offering low prices and accept high(er) risks in parallel.

As expected, satisfaction was found to be a driving factor of repurchase intention; whereas, surprisingly, this study failed to find any significant correlation between perceived COVID-19-related risk and repurchase intention. This contradictory result could be explained that respondents were familiar with and ready to live in the new normal with the presence of the coronavirus. By February 2022, the time of this research survey, over 75% of Vietnamese were fully vaccinated (Statista, 2022b) and the rate was even higher in Hanoi (WHO Viet Nam, 2022). Previous

**Table 7. Specific indirect effect**

Paths	$\beta$	Std.	p
PEOU → PU → RI	0.080***	0.018	0.000
PR_OS → PU → RI	-0.022*	0.009	0.011
PER → PEOU → RI	0.127***	0.025	0.000
PER → PEOU → PU	0.175***	0.026	0.000
PER → PEOU → PU → RI	0.047***	0.011	0.000
PER → PU → RI	0.131***	0.026	0.000
PER → SAT → RI	0.211***	0.026	0.000

\*\*\*p < 0.001; \*p < 0.05

Table 8. Multigroup analysis results

Relationship	Gen Z		Gen Y		$\beta$ Difference ( $\beta_1 - \beta_2$ )	p-value Difference (One-Tailed)	Supported
	$\beta_1$	p-value	$\beta_2$	p-value			
PU $\rightarrow$ RI	0.209	0.002	0.287	0.000	-0.078	0.788	No
PEOU $\rightarrow$ RI	0.203	0.000	0.221	0.000	-0.018	0.591	No
<b>PR_OS <math>\rightarrow</math> RI</b>	<b>-0.029</b>	<b>0.583</b>	<b>-0.155</b>	<b>0.000</b>	<b>0.126</b>	<b>0.021</b>	<b>Yes</b>
SAT $\rightarrow$ RI	0.391	0.000	0.334	0.000	0.057	0.238	No
EA $\rightarrow$ RI	0.058	0.347	0.087	0.071	-0.029	0.645	No
PR_COVID $\rightarrow$ RI	0.031	0.497	-0.027	0.532	0.059	0.178	No
PER $\rightarrow$ RI	-0.022	0.737	-0.071	0.197	0.049	0.287	No

researchers, such as Lee et al. (2012), Nguyen and Pojani (2022b), report the insignificant effects of the perceived risk of the pandemics (i.e., H1N1 and COVID-19) on the use or the usage intention of tourism and transportation modes when the diseases were well-controlled.

This research showed that when online shoppers comprehended environmentally friendly characteristics of e-commerce platforms, they tended to repurchase items on online platforms. It is noticeable that the technology adoption literature only records the moderation effect of environmental awareness between attitude and intention to use e-services (e.g., Chauhan et al., 2021; Shah et al., 2021), whereas, the direct association of environmental perception with e-purchasing intention has not been explored yet. Therefore, the finding of this current research has broadened the related literature of eco-friendly virtual shopping. The insignificant moderating effect of generations on the relationship between environmental awareness and repurchase intention would be more or less surprising because Gen Z tends to have a strong concentration on environmental matters (C.-H. (Joan) Su et al., 2019). However, it is understandable since both Gen Y and Gen Z are recognized to be environmentally conscious (McCrindle & Wolfinger, 2009). Recent empirical comparative evidence, such as (Casalegno et al., 2022), highlights that environmental concern is a strong antecedent of sustainable purchase behaviors for both Gen Y and Z. In addition, environmental perception is well demonstrated to have positive impacts on Gen Y's and Gen Z's green behaviors in emerging countries (Ogiemwonyi, 2022; Saut & Saing, 2021). Another possible interpretation is involved in the shared and increasing concerns about the poor air quality and pollutions in Hanoi (VnExpress, 2019). This could result in similar effects of environmental awareness on the intention to keep purchasing virtually between the two generations.

## **5.2. Managerial implications**

The findings of this study are essential for marketing managers and e-commerce platforms. The insignificant role of the perceived pandemic-related risk demonstrated that the e-commerce sector is actually in the new normal wherein consumers are no longer concerned about COVID-19 when choosing shopping channels. Therefore, marketing programs and initiatives should focus on factors that have been consistently proved as the influential factors of e-shopping intentions before the presence of COVID-19 pandemic (e.g., perceived usefulness, satisfaction, perceived risks of online shopping). Specifically, it is crucial for website planners and e-commerce sellers to keep a user-friendly and informative purchasing process through clear explanations, exciting and pleasant interface to foster positive feelings in users. The promotion of personalization, hence, would contribute to this goal. For sellers, it could be gained through the adoption of personalized marketing, promotion, and communication strategy. For online shopping platforms, enhanced personalization features may be obtained through investment in customer data and analytics foundation, as well as the acquisition of technology talents. However, possible threats of personalization should also be considered to enhance customer's sense of safety when experiencing online shopping and providing their personal information. Demonstrating online shopping as a green activity through using electric bikes or motorcycles in the last-mile delivery procedure or showing the environmental responsibility of stakeholders can be a wise way to retain e-shoppers. Designing and operating customer services effectively to gather customers' response regarding their online shopping experience are critical to evaluate customers' satisfaction and implement improvements.

Online shopping is a process attributable to both online and offline procedures. The quality of products and offline processes, which involve good delivery to customers, should be controlled strictly to maintain a superior service. Specifically, complete and accurate product information, along with trustworthy and authentic reviews from previous buyers should be readily available in order that customers can easily visualize the actual quality of the product and avoid misunderstandings or unrealistic expectations. In addition, the return and refund policy should be concisely and clearly designed to provide consumers with a feeling of security against product-related risks or financial loss. Moreover, since Gen Y users pay more attention to the online shopping risks,

companies' solutions and policies of risk management should be informed more intensively for this subject.

## 6. Conclusions

Our study has enhanced the understanding of the determinants of the continuance intention to shop online of Generation Y and Z when COVID-19 is well controlled. The present research found that facilitators of repurchase intention included perceived usefulness, perceived ease of use, satisfaction, and environmental awareness while perceived risks of online shopping served as a barrier. Notably, the barrier was found to be significantly larger to the repurchase intention of Gen Y. Personalization was not directly associated with the intention but had strong indirect effects through perceived usefulness, perceived ease of use, and satisfaction. The risk of COVID-19 was not a predictor of repurchase intention of online shopping during the new normal. Based on the findings of influential factors, a series of managerial implications were proposed.

Although this research was designed and carried out rigorously, its findings need to be clarified with attention to some following limitations. First, the convenience sampling approach would result in biases. Although it is understandable that users living in urban areas are more inclined to online purchase (Shao et al., 2022; Zhou & Wang, 2014), they seemed overrepresented in this study. Although the data used were not representative perfectly, we nevertheless believe that a large sample of nearly 850 responses collected in accordance with a carefully designed recruitment strategy (see, subsection 3.3) could enable to attain useful results. Second, online shopping is a complex behavior possibly affected by a wide range of factors, some of which were disregarded in this study. Therefore, the combination with other well-known models, such as the Theory of Planned Behavior and Risk Theory, to extend our proposed theoretical framework is necessary to better model the continuance intention. Third, due to regional differences in the growth of e-commerce, the COVID-19 progression, and strategies in response to the pandemic, our results need to be validated and extended by replicating this study in other geographical areas.

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## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Author contributions

The authors confirm contribution to the paper as follows: Study conception and design, B.N.T., M.H.N.; data collection, T.L.A.T., T.T.H.T., T.T.L., P.N.H.T.; analysis and interpretation of results: B.N.T., M.H.N., T.T.H.T.; draft manuscript

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