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# Shift of Vietnamese Consumer E-purchasing Behavior During and After Covid-19 Pandemic

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## Abstract

**Purposes:** The study aimed at examining the impact of the COVID-19 pandemic on the shift of online consumer purchasing behavior and whether the new behaviors would be maintained after the epidemic season. The study also aims to investigate how online customers change based on perceived risks. **Research design and Methodology:** The study investigated purchasing behavior of the same 377 online Vietnamese consumers during two periods: (1) during the period of social distancing and (2) one and half year after that, allowing data to be collected in real time, so that consumers do not have to recall their behavior. **Results:** Purchasing behavior appeared to be more influenced by gender, age and household size. Aged consumers are more concerned about risks than those in the younger group, who only worry about the risks during the pandemic. Consumers in households with two or more people are more concerned about the risks than those living alone. Female appeared to be more influential in both during and after pandemic than male. **Conclusions**: The findings contribute to clarify shift of online consumer purchasing behavior, which helps business to develop effective marketing strategies and enhance their presence in the e-commerce sector.

**Keywords:** COVID-19, Distribution, Normal context, Online consumer, Purchasing behavior

**JEL Classification Code**: D12, D15, E21

## 1. Introduction

Right before COVID-19 changed our world, Vietnam has already experienced the growth of online shopping. Vietnam's e-commerce and online retail sectors are expanding rapidly due to the country's Internet connectivity (Bui et al., 2022). The extraordinary penetration and growth of the Internet has contributed to the emergence of online shopping as a modern and popular channel for Vietnamese customers. Client demographic variables such as age,

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gender, marital status, family size and income are the factors influencing online buying behaviors (Qazzafi, 2020). Besides, convenience, information, products and services, cost and time efficiency are also acknowledged (Bhatt et al., 2021; M. Faris Uddin et al., 2020; Duarte et al., 2018).

Then, in 2020, faced with a frightening biological enemy that spread across the world, people withdrew indoors. As the pandemic progressed, banning public gatherings, social isolation, and travel restrictions limited all human activities and movements. Therefore, it is inevitable that the way consumers live and spend has changed, for example, increasing online purchasing.

Since the last peak of middle 2021 while vaccines have been available for everyone, virus cases have declined sharply. Like other countries, Vietnam has inch closer to the normal context. However, the future of consumer purchasing behavior depends on the nature of post-pandemic life, which is not exactly the same as it was before the pandemic. Remote and hybrid work and online purchasing habits, for example, may permanently shift the nature of consumer living and spending.

Prior to the occurrence of the COVID-19 pandemic, research was undertaken on customer behavior focused on the advantages of internet shopping. The devastating ramifications of the COVID-19 pandemic seems alter the course of human history. Therefore, it is necessary to investigate in depth how this pandemic influences the society's online shopping behavior and whether or not the behavior change after the pandemic's demise. The study seeks to identify the priorities of Vietnamese online consumers for different sorts of items as the pandemic spread and in the new normal context based on multi-stage surveys.

The remainder of this paper includes four sections. Literature review section synthesizes the existing literature of online shopping trends and factors influencing consumer online purchasing behavior. Methodology section describes the adopted conceptual framework, the process of data collection and methods used to analyze the data. Result section presents and interprets the findings in detail. The Discussion and Conclusion sections discuss the main findings and the research limitations, and conclude the paper with implications for the e-commerce platforms.

## 2. Literature Review

Behavior was understood as the observable actions of a person to carry out intentions in the context of that preconditions are stable and individuals are assumed to be rational (Fishbein & Ajzen, 1975; Ajzen, 1991; Ajzen, 2015). Consumer buying behaviors refer to an implementation of five steps which respectively are seeking,

purchasing, using, assessing and disposing products and services (Schiffman et al., 1993). The cultural, social, and economic facets of the consumer environment are proven to have an influence on consumer behaviors (Vázquez-Martínez et al., 2021; Ayalew & Zewdie, 2022).

Ever since the emergence and growing penetration of Internet and mobile phones, consumers buying behaviors at brick-and-mortar stores has gradually been shifted to online shopping, which draws attention of scholars to the consumers' online shopping behaviors. Online shopping is defined to be a behavior of buying and selling products and services through the Internet, including going online, visiting a store's website, choosing favorite items, and arranging to process the payment and delivery (Daroch et al., 2021).

Consumers purchasing behaviors during the crisis were judged to be more rational and (Theodoridou et al., 2019). According to research by Cai and Leung (2020), consumers prefer to opt for basic and economical products over luxury products as a result of a decreased in income. Consumers also stock up items those have low substitution of brands, supply disruptions due to events such as adverse weather, natural disaster, new policies with the purpose of future consumption (Gupta et al., 2020; Tsao et al., 2019). Moreover, products with high quality and value are not selected for purchase, even when they fit the consumer's budget (Gu et al., 2021). Besides, consumer behaviors tend not to go back to old patterns in the pre-crisis but develop into a habit over the hard time and even becomes predictable for businesses (Köksal & Zgül, 2007; Sheth, 2020). For example, the financial crisis in 2008 changed consumer behaviors drastically, which persisted as trends afterwards. These trends include a desire for simplicity, discretionary thrift, mercurial spending, green consumerism, and ethical consumerism (Sarmento et al., 2019; Vázquez-Martínez et al., 2021). The reasons of the changes stem from the knowledge and experiences customers have during crises such as an unclear future, harsh conditions, rising unemployment, declining earnings, a rise in the number of persons dying, all may cause great change to consumers buying behaviors (Amalia & Ionut, 2009).

COVID-19 is seen as a crisis that has caused changes in consumers' behaviors in general and online shopping behaviors in particular (Jones, 2020). Consumers shopping patterns have changed since the pandemic with more emphasis on e-commerce. This is aligned with the previous findings on consumers' behavior changes whenever a crisis occurs (Antonetti et al., 2019; Wansink, 2004). One of the apparent changes in consumers' behaviors is a shift towards healthier product categories such as healthy foods (Romeo-Arroyo et al., 2020), sports equipment and health-related supplements (Gu et al., 2021). The lockdown and other

stringent regulations are also an opportunity for consumers to familiarize themselves with the platforms and speed up online decision making, explained by an increase in consumer awareness and experience (Gu et al., 2021). Besides, while some behavioral changes permanently stay over time, some might be temporary. For example, some consumers reported that when the pandemic occurred they shopped online more often during weekdays than pre-pandemic period, but they tend to go back to the old patterns when the lockdown and social distancing are lifted (Pollák et al., 2022). Therefore, it is an interesting field to observe which changes in consumer behavior disappear and which persist in the future.

It has been reported that consumers pay more attention to reducing risks than to increasing benefits of online shopping (Mou et al., 2017; Koistinen & Jˇarvinen, 2016). Perceived risks such as psychological risk, physical risk, privacy risk, delivery risk, social risk, time-related risk have been reported to discourage online shopping behaviors (Balogh & Mészáros, 2020; Amirtha et al., 2020; Ariffin et al., 2018). During the COVID-19, consumers choose to shop online because of government-imposed restrictions and consumers' anxiety over the health risks associated with brick-and-mortar store shopping (Shaw et al., 2022; Nguyen et al., 2020). However, in the new normal context, perceived risks have been reported to bring consumer purchasing behaviors going back to old patterns (Dabrynin & Zhang, 2019; Mortimer et al., 2016; Amirtha et al., 2020, Pham et al., 2020, Iriani & Andjarwati, 2020, Fihartini et al., 2021; Nguyen et al., 2022).

This study aims to investigate the shift of online consumer buying behavior and how perceived risks influence the frequency of online shopping behaviors from the COVID-19 pandemic to new normal situation using the data collected from 377 Vietnamese respondents. Respondents are consumers younger than 45 years old, who are believed to be more familiar to online shopping. The studies were firstly performed when the pandemic was at its forth peak in May 2021 and secondly performed in October 2022 in the normal situation. With the aim of the study, the specific research questions are as follows:

Question 1: How has online shopping behavior of consumer changed during the COVID-19 pandemic and in the new normal context?

Question 2: How have perceived risks affected the frequency of online shopping behavior of Vietnamese during the COVID-19 pandemic and in the new normal context?

This study has made theoretical and practical contributions. First, it investigates the shift of online consumer buying behaviors from the COVID-19 pandemic to new normal situation. Second, it provides insights into the impacts of the perceived risks of online shopping and mediating effects of personalization on the frequency of online shopping during and after the pandemic. Third, the study provides business suggestions for e-commerce platforms to improve the shopping behavior of online consumers.

## 3. Methodology

### 3.1. Data Collection

Based on a synthesis of the literature about shifts on online consumers purchasing behavior and factors affecting the behavior, a self-administered questionnaire was designed. In-depth interview and focus group were conducted for questionnaire finalization. The questionnaires cover contents about demographic characteristics, changes in consumer behavior, and perceived risks influencing consumers' shopping behaviors. Pilot study was carried out to point out any unclear words or answering difficulties, allowing for any necessary questionnaire development to enhance both validity and reliability.

In order to get real-time insights into online customer purchasing habits, the authors collect data two times: during the COVID-19 outbreak and after the period of social distancing, thus consumers do not have to recall their behaviors. The studies were firstly performed when the pandemic was at its forth peak in May 2021 and secondly performed in October 2022 since the normal situation.

The first official survey was disseminated to consumers through social media platforms since there were restrictions imposed by the government. The participants were asked to provide personal information to recontact for participation in the second-round survey. The second questionnaire, which was taken place during normal context, was sent to respondents who already participated in the first-round survey. After first questionnaire were closed, in total, 478 responses were collected. After second questionnaire were closed, 403 of first-round participants responded. After data cleaning process, 26 were eliminated due to lack of reliability, resulting in 377 valid replies. The sample size would be considered large enough for further analysis (Faul et al., 2009; Roldan & Sanchez-Franco, 2012).

### 3.2. Analytical Method

To analyze the perceived risks affecting the frequency of consumers' online purchases, the authors used the Structural Equation Modeling (SEM) model. The SEM path-modeling estimates are anticipated to be both consistent and impartial, in keeping with previous investigations (Vázquez-Martíneza et al., 2021).

Inheriting and developing the research model of previous research papers, the author proposes the following conceptual model:
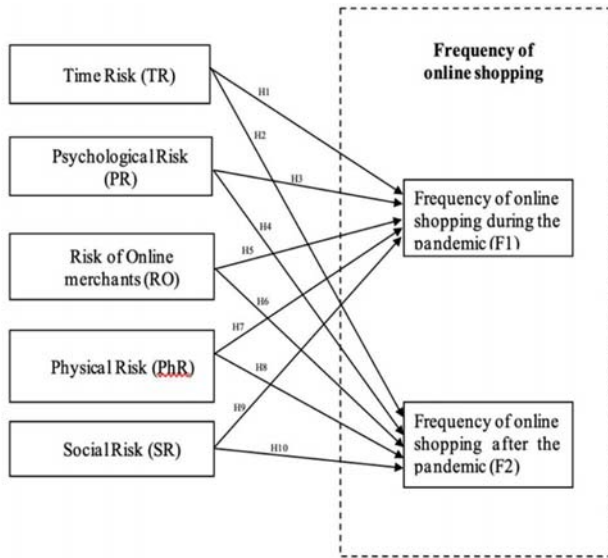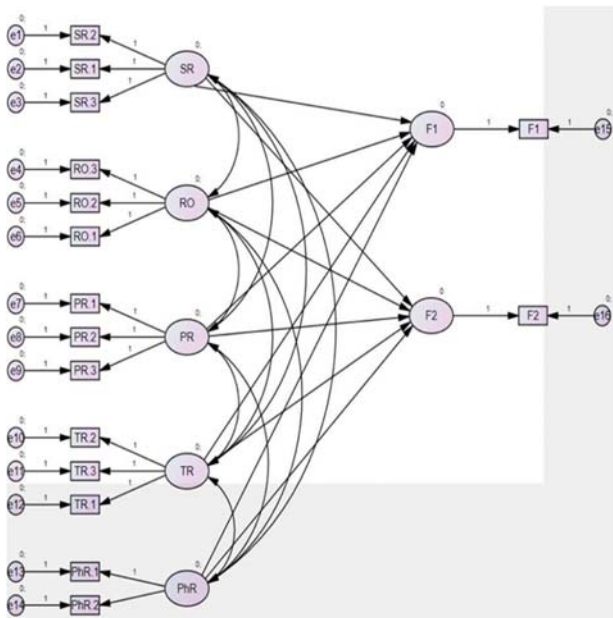


**Figure 1:** Conceptual Model



**Figure 2:** Research Model

We hypothesize the risks affecting the frequency of consumers' online shopping during and after the COVID-19 crisis scenario:

**H1:** The higher consumer rate the Time Risk, the more frequency of consumers' online shopping during the COVID-19 pandemic.

**H2:** The higher consumer rate the Psychological Risk, the more frequency of consumers' online shopping during the COVID-19 pandemic.

**H3:** The higher consumer rate the Risk of Online merchants, the more frequency of consumers' online shopping during the COVID-19 pandemic.

**H4:** The higher consumer rate the Physical Risk, the more frequency of consumers' online shopping during the COVID-19 pandemic.

**H5:** The higher consumer rate the Social Risk, the more frequency of consumers' online shopping during the COVID-19 pandemic.

**H6:** The higher consumer rate the Time Risk, the more frequency of consumers' online shopping after the COVID-19 pandemic.

**H7:** The higher consumer rate the Psychological Risk, the more frequency of consumers' online shopping after the COVID-19 pandemic.

**H8:** The higher consumer rate the Risk of Online merchants, the more frequency of consumers' online shopping after the COVID-19 pandemic.

**H9:** The higher consumer rate the Physical Risk, the more frequency of consumers' online shopping after the COVID-19 pandemic.

**H10:** The higher consumer rate the Social Risk, the more frequency of consumers' online shopping after the COVID-19 pandemic.

## 4. Research Result

### 4.1. Sample Description

Table 1 presents demographic information of the research participants. 74.27% of participants were female. The age range is spread from 18 to 45 years old with nearly 70% belong to Gen Z. More than half of those interviewed live in households with 3-5 people (66.31%), followed by participants live in households with more than 5 members (14.32%), participants living alone accounts for approximately 10%, and the rest are participants living in households with 2 members (9.29%).

**Table 1:** Descriptive Statistics

|  | Frequency | Percent |
|---|---|---|
| *Gender* | | |
| Female | 280 | 74.27 |
| Male | 97 | 25.73 |
| *Age* | | |
| 18-22 | 258 | 68.43 |
| 23-30 | 59 | 15.65 |
| 31-45 | 60 | 15.92 |
| *Household size* | | |
| 1 person | 38 | 10.08 |
| 2 people | 35 | 9.29 |
| 3-5 people | 250 | 66.31 |
| >5 people | 54 | 14.32 |

## 4.2. Shift of Online Consumer Purchasing Behavior

### 4.2.1. Age & Gender

The frequency of online shopping does not differ considerably among female age groups, but males between the ages of 31 and 45 prefer not to purchase online unless compelled to do so. Moreover, there are differing tendencies amongst genders. Males almost bought online more frequently during the epidemic, but returned to pre-epidemic online purchasing behaviors in the new normal setting; in contrast, females increased their frequency of internet buying during the COVID-19 epidemic and maintained the trend afterward, especially women who belong to Gen Y.
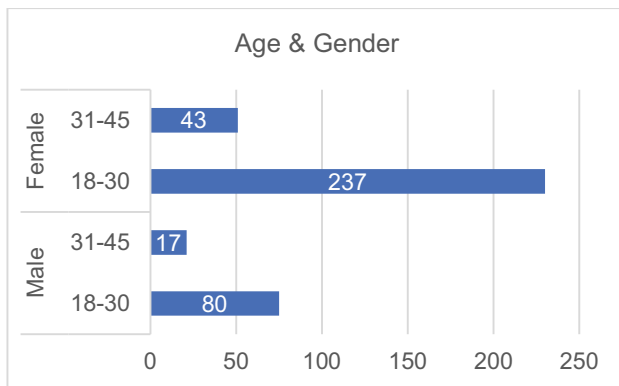


**Figure 3:** Frequency of Online Shopping Grouped by Age and Gender

### 4.2.2. Family Size

During the COVID-19 pandemic, customers increased their frequency of online buying regardless of family size. Once the pandemic has passed, consumers return to their normal pattern. The data indicates that people who live alone or in a large family (more than 5 people) consume the least online, while the group living in a couple has a tendency to buy online the most (18% of increase after the pandemic, and 31% of increase both during and after the pandemic).
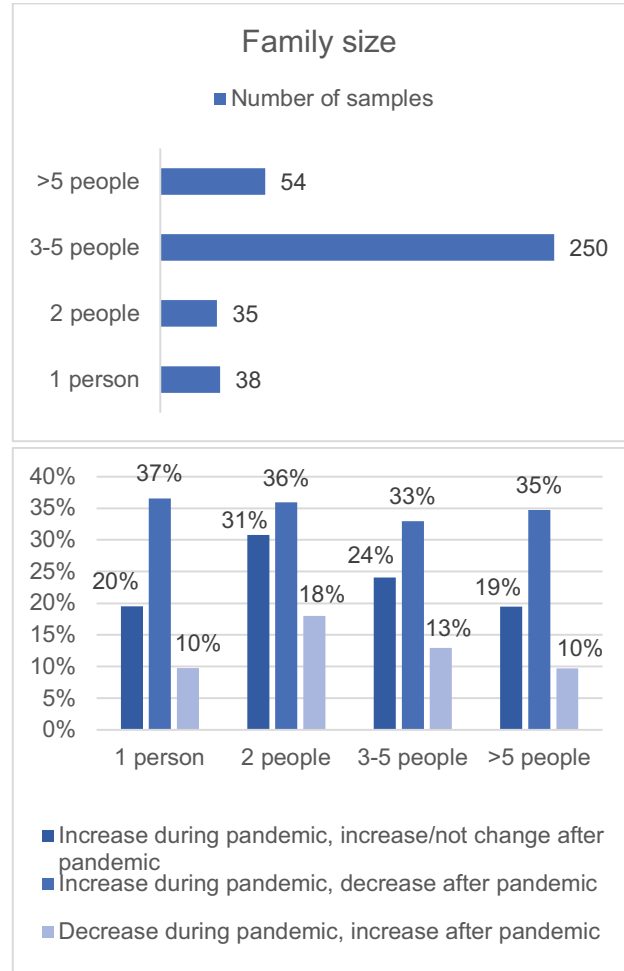




**Figure 4:** Frequency of Online Shopping Grouped by Family Size

### 4.2.3. Categories of Online Shopping

For female, during the pandemic, the product categories with the most increase in spending were Health Care and Toiletries (39%) and Cosmetics and Beauty Care (29%). In the new normal context, the product categories with the most spending increases were Health Care and Toiletries (31%), Clothes and Shoes (30%), and Cosmetics and Beauty care (24%). There has been a significant increase in spending for Leisure and Travel. Interestingly, Gen Z women increase spending for Sport after pandemic while Gen Y women decide not to spend for those activities.

**Table 2:** Categories that Saw an Increase in Expenditure

| | During Covid-19 | | | | After Covid-19 | | | |
|---|---|---|---|---|---|---|---|---|
| | Female | | Male | | Female | | Male | |
| | 18-30 | 31-45 | 18-30 | 31-45 | 18-30 | 31-45 | 18-30 | 31-45 |
| Food (readily made) | 13 | 18 | 15 | 17 | 7 | 10 | 7 | 11 |
| Food (fresh) | 8 | 16 | 12 | 21 | 7 | 8 | 7 | 0 |
| Healthcare products; Toiletries; Household Cleaners | 19 | 20 | 17 | 17 | 12 | 19 | 13 | 5 |
| Education | 6 | 7 | 8 | 13 | 7 | 4 | 7 | 11 |
| Internet and technological equipment | 8 | 5 | 12 | 17 | 5 | 2 | 6 | 11 |
| Cosmetics and beauty care | 18 | 11 | 7 | 0 | 16 | 8 | 8 | 0 |
| Transportation expenses | 2 | 0 | 3 | 4 | 13 | 10 | 13 | 16 |
| Clothes and shoes | 12 | 5 | 12 | 4 | 15 | 15 | 13 | 11 |
| Sports | 2 | 2 | 3 | 4 | 4 | 0 | 6 | 5 |
| Leisure and travel | 3 | 2 | 3 | 4 | 10 | 15 | 12 | 21 |
| Household appliances | 9 | 9 | 7 | 0 | 5 | 6 | 5 | 11 |
| None | 1 | 4 | 1 | 0 | 1 | 4 | 4 | 0 |

(Legend: 0-10, 11-15, 16-20, 21-25)

For male, during the pandemic, the products with the most increased spending are both readily made (32%) and fresh (33%) Food, Health Care (34%), and Technological equipment (29%). In the new normal period, the product groups with the most spending increases were Travel (33%), Transportation (29%), and Clothing and footwear (24%). Both Gen Y and Gen Z men spend more for Sport activities after pandemic.

### 4.2.4. Locality

By locality, the authors want to examine whether the consumers shop within their residential area or not. It can be seen that only young female group witnessed an increase in local purchase after the pandemic. Meanwhile, this shopping pattern decreases over time for other groups.
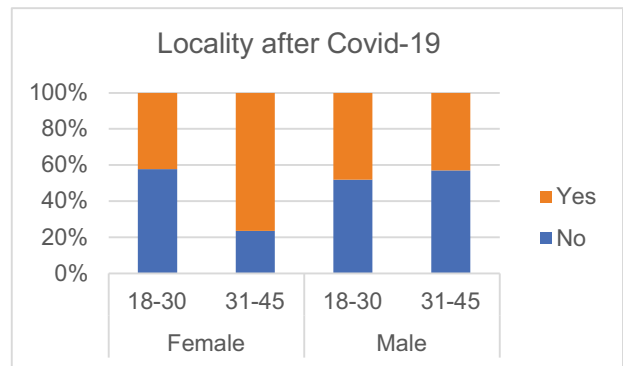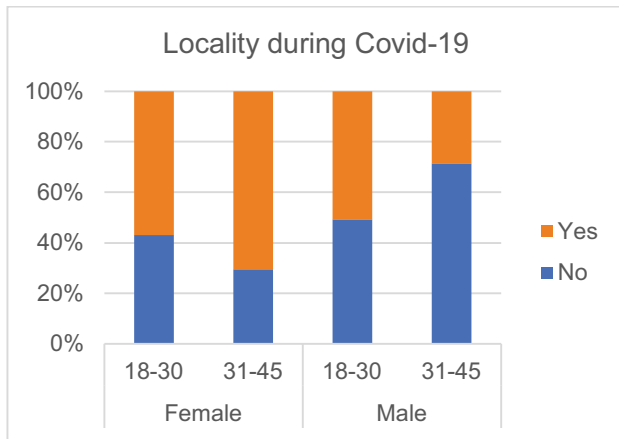


Locality during Covid-19
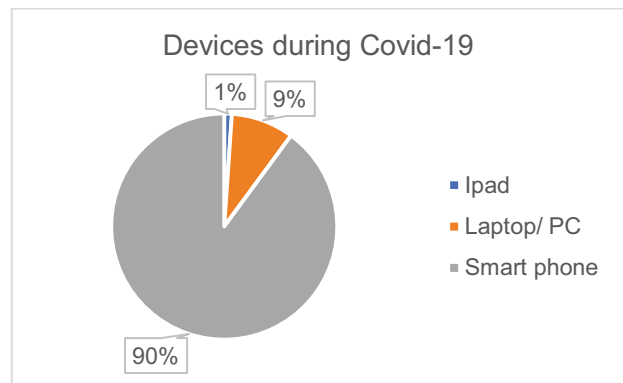


Locality after Covid-19

**Figure 5:** Locality During and after COVID-19

### 4.2.5. Devices

Regardless of the crisis, smartphones continue to be the most popular choice for online shopping. These findings are aligned with those of previous studies which point out that smartphones were mostly used for online shopping (Bacik et al., 2020; Gu et al., 2021).
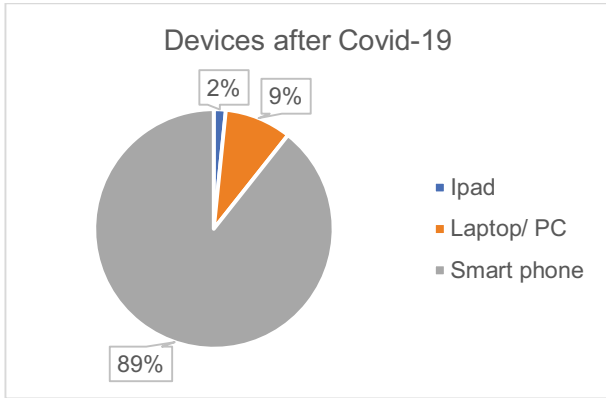


Devices during Covid-19

**Figure 6**: Devices During and after COVID-19

### 4.2.6. Shopping Time

Respondents prefer to make purchases online during their free time, such as in the evenings or on the weekends, regardless of the outbreak of COVID-19. Consumers shop online more often during weekdays when the pandemic occurred, but when the lockdown and social distancing are lifted, they tend to shop less.
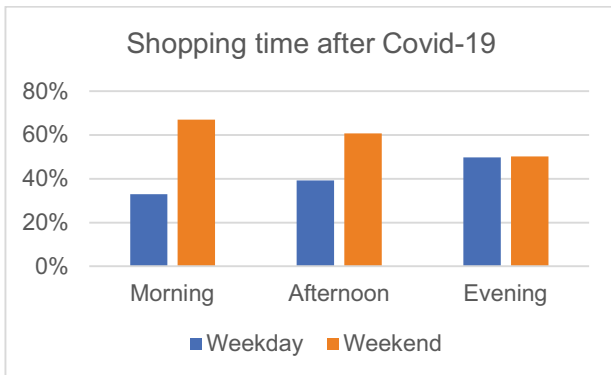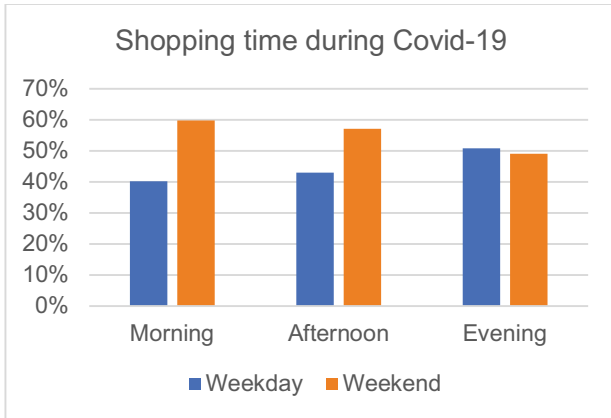




**Figure 7:** Shopping Time During and after COVID-19

### 4.2.7. Speed

Participants were asked whether they increased their speed of online shopping or not during the pandemic, compared to before, an after the pandemic, compared to during. The result shows that consumers tend to make faster online shopping decisions during the pandemic than before the pandemic. The most visible change is seen within the gen Z. This speed, however, did not show any further increase after the pandemic. It indicates that the speed stays the same as during the pandemic or even decreases.





**Figure 8:** Shopping Speed During and after COVID-19

The follow-up questions are about why this phenomenon occurred. The participants were asked if the increase in speed during the pandemic was attributable to previous experience in online shopping before the pandemic. The result shows that majority of participants of all ages and genders answered "yes".

**Previous experience before Covid-19**



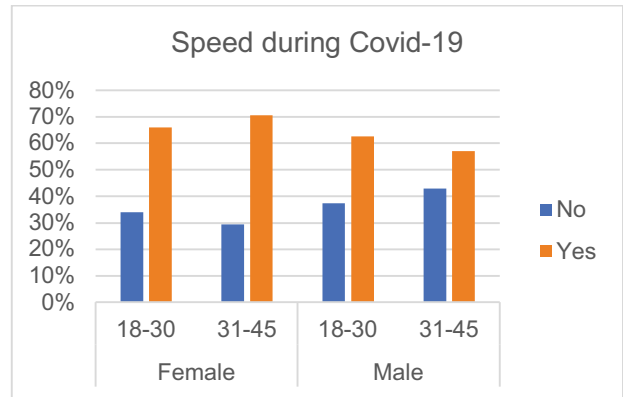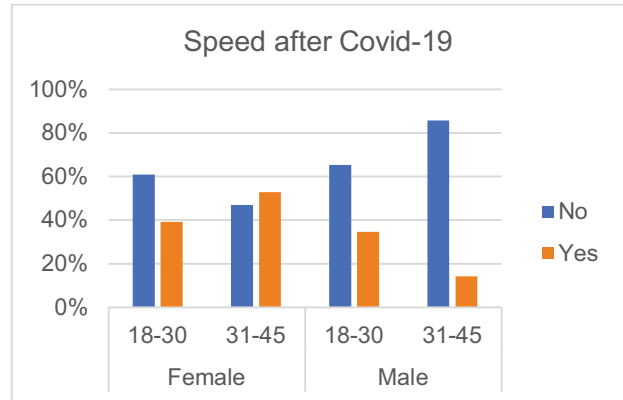**Previous experience after Covid-19**



**Figure 9:** Previous Experience During and after Covid-19

### 4.2.8. Sufficient Information

The authors want to investigate if consumers have been provided sufficient information for online buying decision, therefore the question is formulated as follows: "Do you feel that you have been provided enough information when shopping online". After the pandemic, respondents find an increase in the sufficiency of information of online products, which increases their buying decision.

**Sufficient information during Covid-19**



**Sufficient information after Covid-19**



**Figure 10**: Information Sufficiency During and after COVID-19

### 4.2.9. Needs

The authors want to investigate if consumers buy online items out of spontaneity or have a prior plan, therefore the question is formulated as follows: "Do you feel that you really need the items after the purchase". The answer is mainly yes, especially male consumers after COVID-19 pandemic, showing that consumers are well aware of what they want to shop online and barely "regret" after making buying decision.

**Needs during Covid-19**



**Needs after Covid-19**



**Figure 11**: Needs During and after Covid-19

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## 4.3. Perceived Risks

### 4.3.1. Structural Equation Model (SEM)

The authors used SEM to identify the impact of perceived risks on the frequency of consumers' online shopping during and after the COVID-19.

Before analyzing the structural model, the overall model fit was accessed to ensure that the model adequately represents the entire set of causal relationship.

### 4.3.2. Model Fit Evaluation

A 5-point scale was used in the Likert scale data statistics, which is reliable for the applicability of the model (cmin/df = 2.05, RMSEA = 0.0494), and structural coefficients were statistically persuasive ($p < 0.01$). Therefore, the path coefficients of the structural model can be proceeded to examine. The percent of variance explained by the predictor variables are relatively high, which shows that these variables explain more than 60% of the model.

**Table 3:** Model Fit Evaluation

| RMSEA 90% CI | RMSEA | 0.0494 |
|---|---|---|
| | Lower | 0.0319 |
| | Upper | 0.0669 |
| | TLI | 0.965 |
| | BIC | -124 |
| Model test | $X^2$ | 63.6 |
| | df | 31 |
| | p | < .001 |

**Table 4:** Exploratory Factor Analysis

| | Factor | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Uniqueness |
| D1.1 | | | | | | 0.79969 |
| D1.2 | | | | | 0.887 | 0.21932 |
| D1.3 | | | | | 0.554 | 0.63442 |
| D2.1 | | | 0.881 | | | 0.25860 |
| D2.2 | | | 0.843 | | | 0.20397 |
| D2.3 | 0.404 | | 0.470 | | | 0.39349 |
| D3.1 | | 0.877 | | | | 0.24690 |
| D3.2 | | 0.722 | | | | 0.47536 |
| D3.3 | | 0.761 | | | | 0.37354 |
| D4.1 | | | | 1.015 | | 0.00500 |
| D4.2 | | | | 0.650 | | 0.40091 |
| D5.1 | 0.865 | | | | | 0.22356 |
| D5.2 | 0.929 | | | | | 0.12258 |
| D5.3 | 0.561 | | | | | 0.63374 |

Note. 'Maximum likelihood' extraction method was used in combination with a 'oblimin' rotation.

### 4.3.3. Regression Subgroup Analysis

**Age**

**Table 5:** Path Coefficient and Hypothesis Test Result (Group age < 31 years old)

| | | | Estimate | P |
|---|---|---|---|---|
| F1 | <--- | RO | -,482 | ,043 |
| F1 | <--- | PR | ,411 | ,111 |
| F1 | <--- | TR | ,069 | ,772 |
| F1 | <--- | PhR | ,243 | ,321 |
| F2 | <--- | SR | -,253 | ,198 |
| F2 | <--- | RO | -,140 | ,440 |
| F2 | <--- | PR | ,180 | ,361 |
| F2 | <--- | TR | ,107 | ,558 |
| F2 | <--- | PhR | ,007 | ,972 |
| F1 | <--- | SR | -,316 | ,220 |

There were 317 people aged 18-30 years old who surveyed. The results are statistically significant at 5% during the epidemic at Risk of Online Merchant. Accordingly, people in this age group are aware of the impact of risks due to the COVID-19 pandemic brings to their online shopping frequency, during the epidemic period. However, after the epidemic, they are no longer affected by these risks.

When consumers rated Risk of Online merchants 1 level higher, the frequency of consumers' online shopping during the COVID-19 epidemic increased by 0,482 level.

**Table 6:** Path Coefficient and Hypothesis Test Result (Group age 31 – 45 years old)

| | | | Estimate | P |
|---|---|---|---|---|
| F1 | <--- | RO | -1,527 | ,045 |
| F1 | <--- | PR | -2,023 | ,044 |
| F1 | <--- | TR | 4,671 | ,044 |
| F1 | <--- | PhR | -,821 | ,073 |
| F2 | <--- | SR | 1,485 | ,030 |
| F2 | <--- | RO | -1,518 | ,044 |
| F2 | <--- | PR | -1,986 | ,047 |
| F2 | <--- | TR | 4,514 | ,049 |
| F2 | <--- | PhR | -,714 | ,111 |
| F1 | <--- | SR | 1,381 | ,044 |

The survey results showed that 60 people aged 31-45. Most of the results show statistical significance at 1%, 5% and 10% during and after the pandemic, except for the variable Physical Risk which is not significant at any level of significance after the epidemic. Accordingly, people in this age group are aware of the impact of risks posed by COVID-19 on their online shopping frequency, however, they are not affected by Physical Risk.

When consumers rated Time Risk 1 level higher, the frequency of consumers' online shopping during and after the COVID-19 epidemic increased by 4,671 and 4,514 level respectively.

When consumers rated Psychological Risk 1 level higher, the frequency of consumers' online shopping during and after the COVID-19 epidemic decreased by 2,023 and 1,986 level respectively.

When consumers rated Risk of Online merchants 1 level higher, the frequency of consumers' online shopping during and after the COVID-19 epidemic decreased by 1,527 and 1,518 level respectively.

When consumers rated Physical Risk 1 level higher, the frequency of consumers' online shopping during the COVID-19 epidemic decreased by 0,821 level.

When consumers rated Social Risk 1 level higher, the frequency of consumers' online shopping during and after the COVID-19 epidemic increased by 1,381 and 1,485 level respectively.

**Gender**

**Table 7:** Path Coefficient and Hypothesis Test Result (Group Male)

| | | | Estimate | P |
|---|---|---|---|---|
| F1 | <--- | RO | -,089 | ,431 |
| F1 | <--- | PR | -,077 | ,437 |
| F1 | <--- | TR | -,004 | ,980 |
| F1 | <--- | PhR | -,142 | ,175 |
| **F2** | **<---** | **SR** | **,269** | **,008** |
| F2 | <--- | RO | -,064 | ,562 |
| **F2** | **<---** | **PR** | **-,186** | **,054** |
| F2 | <--- | TR | -,049 | ,762 |
| F2 | <--- | PhR | ,076 | ,451 |
| F1 | <--- | SR | ,144 | ,164 |

There were 97 men who surveyed. The results show statistical significance at 5%, 10% for the variable Social Risk and Psychological Risk after the pandemic; no statistical significance during the epidemic, Accordingly, men during the epidemic have not been affected by the risks brought by COVID-19, but after the epidemic, they were more aware of these risks, thereby affecting their online shopping frequency.

When men rated Psychologicald Risk 1 level higher, the frequency of consumers' online shopping after the COVID-19 epidemic increased by 0.269 level.

When men rated Social Risk 1 level higher, the frequency of consumers' online shopping after the COVID-19 epidemic decreased by 0.186 level.

**Table 8:** Path Coefficient and Hypothesis Test Result (Group Female)

| | | | Estimate | P |
|---|---|---|---|---|
| F1 | <--- | RO | ,028 | ,834 |
| F1 | <--- | PR | -,078 | ,506 |
| F1 | <--- | TR | -,032 | ,886 |
| F1 | <--- | PhR | -,203 | ,157 |
| **F2** | **<---** | **SR** | **,205** | **,048** |
| F2 | <--- | RO | ,001 | ,993 |
| **F2** | **<---** | **PR** | **-,218** | **,026** |
| F2 | <--- | TR | -,104 | ,569 |
| F2 | <--- | PhR | ,021 | ,860 |
| **F1** | **<---** | **SR** | **,243** | **,054** |

The results show statistical significance at the 10% and 5% level for the Social Risk merchants during and after the epidemic; The level of 5% for the variable Psychological Risk after the epidemic. Accordingly, women during the epidemic are only affected by the risks brought by Social Risk, and after the epidemic, they have more awareness of Psychological Risk, thereby influencing their online shopping frequency.

When women rated Psychological Risk 1 level higher, the frequency of consumers' online shopping after the COVID-19 epidemic decreased by 0,218 level.

When women rated Social Risk 1 level higher, the frequency of consumers' online shopping during and after the COVID-19 epidemic increased by 0,243 and 0,205 level respectively.

**Household size**

**Table 9:** Path Coefficient and Hypothesis Test Result (Group Household with 1 person)

| | | | Estimate | P |
|---|---|---|---|---|
| F1 | <--- | RO | 7,051 | ,930 |
| F1 | <--- | PR | 28,650 | ,933 |
| F1 | <--- | TR | -38,202 | ,932 |
| F1 | <--- | PhR | 10,864 | ,932 |
| F2 | <--- | SR | -2,086 | ,500 |
| F2 | <--- | RO | ,645 | ,513 |
| F2 | <--- | PR | 2,165 | ,553 |
| F2 | <--- | TR | -3,370 | ,467 |
| F2 | <--- | PhR | ,973 | ,485 |
| F1 | <--- | SR | -24,350 | ,933 |

There were 38 people living alone surveyed. The results show that there is no statistical significance for all variables, both during and after the pandemic. Accordingly, people who live alone are not affected by the risks brought by COVID-19, thereby not affecting their online purchase frequency.

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**Table 10**: Path Coefficient and Hypothesis Test Result (Group Household with 2 or more)

|  |  |  | **Estimate** | **P** |
|---|---|---|---|---|
| **F1** | **<---** | **RO** | **-,250** | **,001** |
| F1 | <--- | PR | -,096 | ,286 |
| **F1** | **<---** | **TR** | **,259** | **,023** |
| F1 | <--- | PhR | -,033 | ,613 |
| **F2** | **<---** | **SR** | **,240** | ***** |
| **F2** | **<---** | **RO** | **-,233** | ***** |
| F2 | <--- | PR | -,136 | ,103 |
| **F2** | **<---** | **TR** | **,248** | **,018** |
| F2 | <--- | PhR | ,013 | ,827 |
| **F1** | **<---** | **SR** | **,143** | **,063** |

There are 339 people who live in the household with 2 or more than 2 people. The results show that during and after the pandemic, there are 3 risks including Time Risk, Risk of Online merchants and Social Risk is significant at 5%, 1% and 10%. Accordingly, people living in households with 2 or more members are more affected by post-epidemic risks than during the epidemic.

When consumers rated Time Risk 1 level higher, the frequency of consumers' online shopping during and after the COVID-19 epidemic increased by 0,259 and 0,248 level respectively.

When consumers rated Risk of Online merchants 1 level higher, the frequency of consumers' online shopping during and after the COVID-19 epidemic decreased by 0,250 and 0,233 level respectively.

When consumers rated Social Risk 1 level higher, the frequency of consumers' online shopping during and after the COVID-19 epidemic increased by 0,143 and 0,240 level respectively.

## 5. Discussion and Conclusion

The perceived risks affect the shopping frequency of consumer groups both during and after the COVID-19 epidemic. During the COVID-19 pandemic, the results of this study are consistent with previous studies such as Nitchhote and Nuangjamnong (2022), Mehrolia et al. (2020), Pham et al. (2020), and Li J et al. (2020). The research results also show the influence of social and physical risks when households with 2 or more people are more concerned about the risks affecting their online shopping frequency than those living alone, both during and after the pandemic. This shows that households have awareness of risks to avoid spreading to the community and surrounding relatives. The authors further study the impact of these risks at the post-pandemic time in Vietnam, this is a new point compared to previous studies, showing that

after the epidemic, the risks have a stronger impact for consumers' online shopping frequency.

Moreover, perceived risks have different impact on the groups of consumers of age and gender, which is also mentioned in the findings of Lewis and Duch (2021). However, other research shows the opposite, that age and gender do not affect perception of risks during the pandemic, thereby affecting the frequency of shopping (Mehrolia et al., 2020; Nambiar & Rajesh, 2020). The reality in Vietnam shows that each consumer group has different reactions to online shopping, for example consumers aged 31-45, the age group of most married people, their concern about risks is higher and more profound than those in the younger group of 31 years old, who only worry about the risks during the pandemic. Besides, in Vietnam, there has been a deeper change in men's awareness after the pandemic, along with that, women are concerned about risks both during and after the epidemic, specifically, after the epidemic they are affected more than during the epidemic. This suggests that this study has similarities with studies showing effects across age and gender.

The study provides empirical evidence from Vietnam about the shift of online consumer purchasing behavior and whether or not the new behaviors would maintain after the epidemic on a diverse sample of Vietnamese consumers and which perceived risks affect the frequency of consumers during and after the COVID-19 outbreak.

This study aims to test the proposed approach to assessing the purchasing behavior of online consumers, which can contribute to the identification of trends and patterns of online shopping. Therefore, it can be a component of a comprehensive toolkit in the design of e-commerce distribution strategy. These outcomes will be utilized as a basis for businesses to develop realistic distribution strategies to approach and stimulate the shopping demands of consumers. Specially applicable to e-commerce enterprises when it is required to build ways to persuade consumers to purchase, given that consumers have acclimated to a new lifestyle and developed a preference for the correlation between brands. The product is appropriate for this way of life. It is important for shopping websites and e-commerce suppliers to maintain the purchasing process, create a user-friendly feel, and provide information through clear explanations, interesting interfaces and pleasant to promote positive emotions in users. Designing and operating effective customer services to collect customer feedback on their online shopping experience is critical to assessing customer satisfaction and implementing improve. Besides, because Gen Y users are more concerned about the risks when shopping online, companies' risk management policies and solutions need to be provided with more in-depth information to this audience, which

provides a sense of security against the risks or financial losses associated with the product..

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