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Continuance Usage Intention toward E-Payment during the COVID-19 Pandemic from the Financial Sustainable Development Perspective Using Perceived Usefulness and Electronic Word of Mouth as Mediators

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Abstract: Digital transformation is essential to financial sustainable development. Since the beginning of 2020, the whole world has been under the influence of the COVID-19 pandemic, which has accelerated the pace of financial digitization. According to the perceived usefulness of the technology acceptance model (TAM) and the perceived seriousness of the health belief model (HBM), this study developed and explored the theoretical framework of consumers' continuance usage intention toward e-payment. A questionnaire survey was conducted to explore this continuance usage intention among consumers who have used e-payment in Taiwan during the COVID-19 pandemic, with a total of 387 valid samples. The overall model was analyzed by structural equation modeling (SEM). The empirical results showed that the security, perceived seriousness, and perceived usefulness of e-payment significantly affect electronic word of mouth (eWOM), while the security and perceived seriousness of e-payment have a significant effect on continuance usage intention through perceived usefulness and eWOM. During the COVID-19 pandemic, e-payment providers should encourage consumers to use e-payment via eWOM, perceived usefulness, and consumers' perceived health seriousness and should improve the use efficiency of e-payment through e-payment financial services, thus encouraging consumers' continuance usage intention toward e-payment.

Keywords: e-payment; continuance usage intention; perceived usefulness; COVID-19; health belief model; technology acceptance model; electronic word of mouth; security; structural equation modeling; financial sustainable development

1. Introduction

Banks are financial intermediaries between enterprises and society, and they have the responsibility and obligation to lead enterprises and consumers into a sustainable business model by using the flow of money. On 22 September 2019, the United Nations announced the Principles for Responsible Banking (PRB), which were jointly and voluntarily initiated by more than 30 banks from 49 countries. The PRB establish the banking model for green finance, provide a consistent framework for banks to integrate elements of financial sustainable development into their business, and assist relevant banks to make positive contributions to sustainable finance. For example, Alipay uses the PRB to plan carbon reduction and encourages customers to use electronic payments to reduce carbon emissions. In 2020, the world was affected by COVID-19 and banks encouraged consumers to switch from traditional payment to e-payment, thus accelerating the pace of financial digitization. Digital transformation is the key to the implementation of financial sustainable development.

E-payment is an online behavior of consumers in the digital world. The financial industry is in an unprecedented dynamic and innovative stage. In [1,2], the authors have

pointed out that financial innovation affects financial services, including e-payment, remittance, crowdfunding, and e-commerce. Consumer behavior and the expected operation and development of the financial industry continually generate new business models that have a profound impact on the financial industry, particularly in regard to e-payment. According to a digital payment report in 2020 [3], the global transaction volume via e-payment hit USD 5.204 trillion in 2020, ranking first in the field of FinTech. At the same time, the report [3] found that the number of independent internet users around the world in 2020 was 4.28 billion, as mobile technology became more economical and practical.

It is estimated that the use of the internet will continue to increase gradually in the future, and the connection between mobile networks and the internet will be particularly obvious in the e-payment market under the development of financial technology (FinTech). E-payment is an emerging payment method. The World Economic Forum (WEF) in 2015 officially divided FinTech into six categories, with payment as one of the six important indicators. With the rise of the internet and support for FinTech in various countries, payment has shifted from the general payment methods of the past to the electronic era. According to the report of [4], the e-payment usage rate in Sweden and Denmark is 94%, while that in Singapore and Hong Kong, which are in the same region as Taiwan, is 53% and 65%, respectively. In Taiwan, the automated teller machine (ATM) penetration rate is high and convenience stores in remote areas also have ATMs available all year round. Taiwan has faced initial challenges in promoting e-payment.

With the popularization of the internet, significant changes have taken place in daily financial transactions [5]. In recent years, e-payment has become widely used in all walks of life. The World Health Organization (WHO) declared COVID-19 a pandemic on 11 March 2020. This pandemic has changed the world, with consumers shifting from offline purchases to online purchases and payments, and this directly has affected the use of e-payment. FinTech has created new commercial digital behaviors in work, entertainment, and daily life. COVID-19 has created a consumer demand for non-contact FinTech that allows users to greatly influence the world economy while avoiding physical contact with others. Therefore, the demand for e-payment has increased.

According to the findings of this study, the usage rate of e-payment in Taiwan increased to 76% after the outbreak of COVID-19, wherein the usage rate of e-payment for people aged 45 to 64 with an average monthly income of between TWD 90,000 and TWD 120,000 increased to 84.6%, i.e., 8.6% higher than the average. This phenomenon indicates that the middle class has a certain degree of awareness of health hazards and is willing to change their payment pattern. According to statistics of the Financial Supervisory Commission (Taiwan) on electronic data in June 2021, the number of people using e-payment reached 13.15 million, or 4.86 million (+58.62%) more than that in June 2020 [6].

Changes in consumer behavior due to the health rules and living restrictions caused by the COVID-19 pandemic have affected the growth of online sales and led to a rapid increase in e-payment. Reducing human contact is necessary to avoid the risk and transmission of infectious diseases [7]. Although there have been rapid changes in the field of e-payment during the COVID-19 pandemic, a literature review found only a small number of studies on the continuance usage intention toward e-payment during the severely infectious period, such as [8], who explained the adoption and continuance intention to use contactless payment technologies during the COVID-19 pandemic, as well as how the pandemic facilitates mobile payment. Refs. [5,9] integrated the health belief model (HBM) and technology continuous theory (TCT) to investigate consumers' continued use of e-payment. This study provided a combined framework of the TAM and the HBM, in which electronic word of mouth was added as the mediating variable, to observe the intention of consumers to use e-payment through electronic word of mouth during the pandemic. However, this study indicated that during the pandemic, even though consumers have a strong intention to use e-payment through electronic word of mouth, they do not have marked continuance usage intention toward e-payment through perceived usefulness. This is interesting because COVID-19 is a rare pandemic, described as once in a century, but if consumers do not make

e-payment through electronic word of mouth, they do not have strong continuance usage intention toward e-payment.

The present study aimed to fill in the gaps in the results of previous studies, which are similar to those discussed above, by focusing on the combination of the extension of the TAM and the HBM together with electronic word of mouth (eWOM) for a survey of the use of e-payment during the COVID-19 pandemic. However, unlike previous studies, this study added eWOM as a mediator and perceived usefulness as a difference, which have not yet been fully tested by academics and researchers.

By taking security, which is an exogenous variable of the TAM, and the perceived seriousness of the HBM as independent variables, this study used the perceived usefulness of the TAM, the continuance usage intention, and eWOM as variables to establish potential mediating variables and discuss consumers' reuse intention toward e-payment. These analyses have helped identify trends in mobile commerce and e-payment during the COVID-19 pandemic. During this period, e-payment providers have taken security as a priority, which affects consumers' continuance usage intention toward e-payment through perceived usefulness and eWOM in order to protect their lives from COVID-19. The purpose of this paper was to determine the effects of consumers' continuance usage intention toward e-payment through the mediation of perceived usefulness and eWOM using structural equation modeling (SEM). This study addressed the gap in this area to explain the continuance usage intention toward e-payment during the COVID-19 pandemic.

This study aimed to use the HBM to examine the perceptions of people in Taiwan to avoid contact during the COVID-19 pandemic period when they are faced with threats to health caused by health risks. It also targeted the use of the TAM to safely test the mediating effect of electronic word of mouth and the perceived usefulness on the continuance usage intention toward e-payment. The important goals of this study included carrying out an investigation of the continuance usage intention toward e-payment via electronic word of mouth through the perceived usefulness in the technology acceptance model (TAM), in combination with perceived seriousness of the health belief model (HBM). This study also looked to clarify the effect of perceived usefulness and electronic word of mouth on improving continuance usage intention and the mediating effect of electronic word of mouth in particular. It is expected to prove direct and indirect relations among perceived usefulness, electronic word of mouth, and continuance usage intention. For e-payment providers, this study aimed to determine whether consumers consider e-payment to be useful due to a secure transaction environment or the risks of the pandemic, and whether the introduction of electronic word of mouth gives consumers stronger continuance usage intention.

2. Literature Review and Hypotheses Development

As countries around the world are experiencing the COVID-19 pandemic, it is important to act accordingly to prevent its spread.

2.1. Technology Acceptance Model

The technology acceptance model (TAM) was proposed by Fred Davis in 1986 [10]. The TAM was developed from the theory of reasoned action and is composed of five constructs: perceived ease of use (PEOU), perceived usefulness (PU), attitude (ATT), behavioral intention (BI), and actual use (AU). Among them, PU is the most important factor in the acceptance of new IT because PU has direct effects and produces indirect effects on continuance usage through mediation. This study defines PU as follows: "a person perceives that the use of a specialized system can improve his/her benefit". It is used to evaluate consumers' acceptance of information systems, technologies, or new products. Ref. [11] pointed out that the TAM aims to explain the general determinants of technology acceptance, thereby expounding upon consumer behavior in a wide range of end-user computing technologies and user groups. Refs. [12,13] indicated that TAM should be integrated with other acceptance theories to incorporate relevant human and social factors and to promote its predictive and explanatory abilities. In addition to employing security, which is

an exogenous variable of the extended TAM, perceived usefulness, and continuance usage intention, this study expanded the TAM by combining it with eWOM to explain consumers' continuance usage intention toward e-payment during the COVID-19 pandemic.

2.2. Health Belief Model

The health belief model (HBM) [14] explains the positive health behaviors induced by beliefs during communication activities. For example, when an individual perceives a negative health outcome as serious and that they are vulnerable, the behavioral benefit of reducing the likelihood of such an outcome will be emphasized. Ref. [15] pointed out that the core concept of the HBM is people's perception of disease threat and behavior evaluation, including the evaluation of the behavior's effectiveness, the input and results of behavior change, and the implementation barriers. Ref. [16] emphasized that the HBM provides an understanding of how health risks are cultivated and can be dealt with while explaining the control of health behaviors. The HBM identifies perceived seriousness, perceived benefits, perceived barriers, self-efficacy, and action as determinants of intention to take action based on health status. This study used perceived seriousness as a dimension to explore health threats during the COVID-19 pandemic.

The HBM is a widely used framework to explain how to make decisions over whether a special behavior is displayed based on the assessment of the risks to health and the benefit of changing behavior; the TAM is a kind of behavior model that makes an assessment, based on perceived usefulness, of the continuance usage intention of science and technology, to which the description is applicable for consumers to accept the factors of new science and technology. The literature integrating the TAM and the HBM includes a study on the health-related internet usage of Malaysian women by [17] and a study on health searches by [18]. However, there is a lack of studies on special infectious diseases. Therefore, under the pre-condition of taking security, an exogenous variable of the TAM, and the perceived seriousness of the HBM as independent variables, this study adopted two variables, i.e., perceived usefulness and eWOM, to establish potential mediating variables and explore consumers' continuance usage intention toward e-payment. These analyses helped identify the development trend of e-payment related to FinTech during the COVID-19 pandemic.

2.3. Security and Perceived Usefulness

Information security is always at the forefront in e-transactions, and therefore security is indispensable for the use of scientific and technological products. Ref. [19] found that perceived usefulness has a direct effect on behavioral intention and then established a technology acceptance model. Consumers' belief in a system can be affected by other factors, which are called external variables in the TAM. In this study, security was added as an external variable. Perceived usefulness in the TAM means that the easier it is to use e-payment, the higher will be the users' perceived usefulness of e-payment systems. Empirical studies on the TAM have included such correlation and found a significant relationship between these two factors [20–23]. The security requirements of e-payment technology solutions are designed to address various issues, such as increasing consumers' usage intention toward e-payment systems. In [23–25], the authors found that security and perceived usefulness are important factors affecting consumers' usage intention toward e-payment systems. During the COVID-19 pandemic, consumers have been concerned about the risk of infection. If e-payment providers can improve the level of information security and provide consumers with a secure information environment to use e-payment for transactions, consumers can avoid the risk of infection caused by cash without the suspicion of information leakage. Such security measures can enable consumers to perceive the convenience and usefulness of e-payment and improve their usage intention toward e-payment. Thus, we proposed our first hypothesis:

Hypothesis 1. *Security has a positive effect on perceived usefulness.*

2.4. Perceived Seriousness, Perceived Usefulness, and Continuance Usage Intention

The effects of the perceived seriousness of the COVID-19 pandemic on consumers, e.g., on jobs, family life, and social relations, are detailed in this section. Ref. [26] pointed out that consumers care about their health status and that health belief has a strong impact on behavioral intention toward use through perceived seriousness and perceived usefulness. Ref. [27] showed that the comparison between the TAM and the HBM indicates they are complementary in some aspects. Therefore, if they are combined to explore the interpretation of special diseases and the prediction over the use of technological products, other variables can be better explained for the reference of researchers. In the aggregation model of the HBM and the TAM, [17] pointed out that perceived seriousness toward health information has an indirect effect on individuals' continuance usage intention via perceived usefulness.

The HBM assumes that consumers are more willing to engage in specific health behaviors when their health is expected to be threatened. In [28,29], the authors pointed out the perceived seriousness of perceived health threats and showed that specific actions, such as reducing the risk of physical contact, are more likely to be taken in the expectation that they will reduce the incidence of serious diseases. Ref. [17] showed that the health-related factor of the perceived seriousness of health risks and the technology-related factor of perceived usefulness have a positive effect on the use of technology. During the continuous spread of the pandemic, consumers have become concerned about the threat of infection to their lives and discovered that e-payment can effectively reduce the risk of exposure to infection, which has enhanced consumers' perceived usefulness of e-payment and increased their continuance usage intention toward e-payment. Therefore, this study assumed that consumers with higher perceived seriousness toward diseases will have perceived usefulness and continuance usage intention toward e-payment and developed H2 and H3 as follows:

Hypothesis 2. *Perceived seriousness has a positive effect on perceived usefulness.*

Hypothesis 3. *Perceived seriousness has a positive effect on continuance usage intention.*

2.5. Perceived Seriousness and Electronic Word of Mouth

During the COVID-19 pandemic, consumers were unable to have face-to-face contact with others due to being quarantined or under lockdown. As a result, they searched online for electronic word of mouth and applied it as a reference for their use of e-payments. Ref. [30] noted in their study that individuals are susceptible to specific negative health outcomes that are serious or threatening. Refs. [31,32] pointed out that the more health problems people perceive, the more their choice for health problems will be affected by the information disseminated by eWOM. Ref. [33] showed in their study that most of their respondents trusted all online information. Studies have confirmed that the perceived seriousness of the HBM has a substantial impact on the intention to adopt information and this process affects subsequent health behaviors [34]. In the age of network information, it is easy for consumers to obtain the information they need from the internet, and eWOM is an important reference for consumers to judge the quality of products or services. When consumers feel that their health is seriously threatened, the characteristics of e-payment without physical contact will have a significant effect on eWOM. Therefore, this study proposed H4 as follows:

Hypothesis 4. *Perceived seriousness has a positive effect on eWOM.*

2.6. Perceived Usefulness and Electronic Word of Mouth

During the COVID-19 pandemic, consumers are unable to have face-to-face contact with others due to being quarantined or under a lockdown. However, they can still make procurements for daily necessities through the internet. As a result, they search online for electronic word of mouth and use it as a reference for their using e-payments. According to the theory of reasoned action (TRA) and because perceived usefulness in the TAM is the key factor affecting the acceptance of certain technologies or behaviors, this study was based on taking eWOM as the affecting factor to interpret e-payment. Ref. [35] emphasized that information adoption is regarded as a process of information conversion and internalization. Ref. [36] focused their research on perceived usefulness and extended it to the use of eWOM, with perceived usefulness regarded as a key factor in interpreting eWOM. Ref. [36] provided the assessment of perceived usefulness as a mediator of the eWOM adoption process. As [37,38] stated, perceived usefulness has a significant effect on eWOM adoption. Ref. [39] mentioned that the perceived usefulness of eWOM is affected by its relevance, timeliness, accuracy, and completeness. Consumers make decisions based on eWOM because of its informative and persuasive nature [40]. Ref. [41] noted that the information consistency, number of words, and proportion of negative content also affect the usefulness of eWOM.

As emphasized by [42], the perceived usefulness of e-comments is a type of heuristic processing that drives cognitive cues and emotional responses. E-comments can reduce the perceived risk to consumers [43,44] and improve their satisfaction [45] and decision-making efficiency [37]. Several studies have shown that the amount of eWOM is significantly correlated with sales volume and the number of positive and negative comments will affect consumer decisions [43,46–48]. When consumers perceive the convenience and usefulness of e-payment, such information will be regarded as useful information through comprehensive use experience to be passed to non-specific consumers through the network, resulting in eWOM. The perceived usefulness of e-payment will also significantly affect eWOM. Therefore, this study proposed H5 as follows:

Hypothesis 5. *Perceived usefulness has a positive effect on eWOM.*

2.7. Security, Electronic Word of Mouth, and Continuance Usage Intention

Security is crucial for consumers to decide whether to use e-payment. Generally, it is important to ensure the security of e-payment user information [49]. The internet is increasingly used in sales, purchases, and payments. Therefore, different vulnerabilities and security issues are appearing and are increasing in number. In order to ensure the safe implementation of online transactions, it is essential that people are able to choose reliable e-payment methods [50]. E-payment security is a part of the information security framework, which also includes data security and information security. E-payment security protects electronic transactions from unauthorized access, use, alteration, or sabotage. The security of e-payment users is the core of the rapid development of e-payment [51]. Ref. [23] discussed that security and perceived usefulness are important factors affecting consumers' continuance usage intention toward e-payment. Many studies have emphasized that the demand for security in e-payment can increase consumers' continuance usage intention toward e-payment systems [24,25,52]. The focus on near-field communication (NFC) and radio frequency identification (RFID) has dominated the e-payment market (such as point of sale) in many aspects, including security, convenience, and reliability [53–57]. Consumers can use security-related e-payment, including those with positive eWOM recommendations [58]. To meet consumers' demands, e-payment providers will improve the level of information security. After consumers use e-payment, their sense of security will be passed to non-specific consumers through the network, resulting in eWOM. When consumers attach importance to the information security of electronic transactions, they will have a strong usage intention toward e-payment with security and eWOM. Therefore, this study proposed H6 and H7 as follows:

Hypothesis 6. *Security has a positive effect on eWOM.*

Hypothesis 7. *Security has a positive effect on continuance usage intention.*

2.8. Perceived Usefulness and Continuance Usage Intention

Perceived usefulness is defined as the degree to which individuals believe that using a specific system will improve their job performance. People who purchase items via the internet and find that a specific system is useful for transactions provide evidence that perceived usefulness has a significant effect on continuance usage intention [12,13,59,60]. Previous studies have shown that perceived usefulness has a significant effect on the intention to use a specific system. In [61], the author confirmed the positive correlation between perceived usefulness and the intention to use mobile library services. Similarly, [62] pointed out that perceived usefulness has a constructive effect on continuance usage intention. However, according to [63], perceived usefulness has no significant correlation with behavioral control. Moreover, [64] found that the effect of perceived usefulness on continuance usage intention is not significant. During the pandemic, when consumers perceive the convenience and usefulness of e-payment for online shopping, they will have a strong continuance usage intention toward e-payment shopping. Therefore, this study proposed H8 as follows:

Hypothesis 8. *Perceived usefulness has a positive effect on continuance usage intention.*

2.9. Electronic Word of Mouth and Continuance Usage Intention

During the pandemic, e-commerce development has increased rapidly and the academic research topics have changed. For example, in electronic commerce research (ECR), there was an early focus on telecommunications and electronic commerce and recently, the emphasis is on the innovation and development of e-commerce in Asia, with a research focus expanding to include emerging tools, business models. and applications in e-commerce [65]. In addition, consumers have changed their shopping patterns [66]; furthermore, e-commerce models have introduced various ways of transaction. E-payment seems to have become the favored e-commerce [67]. Among the formal and informal information sources of health, mass media play a vital role in information transmission as the main source of online information. Consumers pass information to other consumers through electronic mode after consumption and form consumers' evaluation of electronic payment providers [68].

Word of mouth (WOM) is the interpersonal communication between consumers about products and services and has been identified as a persuasive source of information by researchers [65]. Consumers believe in the product WOM more than the product information given by salespersons [66]. Ref. [67] emphasized that eWOM refers to any positive or negative statement on the internet made by potential, actual, or former consumers about a product or a company, which provides information to a large number of people and organizations. In addition, [68] showed that eWOM refers to online comments, such as product information forums, social networking websites, and e-mails.

Studies on eWOM mainly focus on exploring the multi-faceted nature of sales and consumer behavior, including consumers' information adoption and providing evidence for effects on product preferences and effects on continuance usage intention [69–74]. In addition, e-commerce in the business model has become the norm [75] and eWOM has a broad effect on consumer attitudes and behaviors, including consumers' continuance usage intention [76–78]. Ref. [79] emphasized that more and more consumers trust and use eWOM caused by online consumer comments to evaluate their continuance usage intention toward products and services. Consumers use e-payment to complete transactions in a useful and safe environment and transmit their usage feelings to other consumers through the network, and other consumers will search and organize the network information before

using e-payment and will decide on their use behaviors according to eWOM. Therefore, this study proposed H9 as follows:

Hypothesis 9. *eWOM has a positive effect on continuance usage intention.*

Based on the above literature review, the structure of this study was constructed as shown in Figure 1.
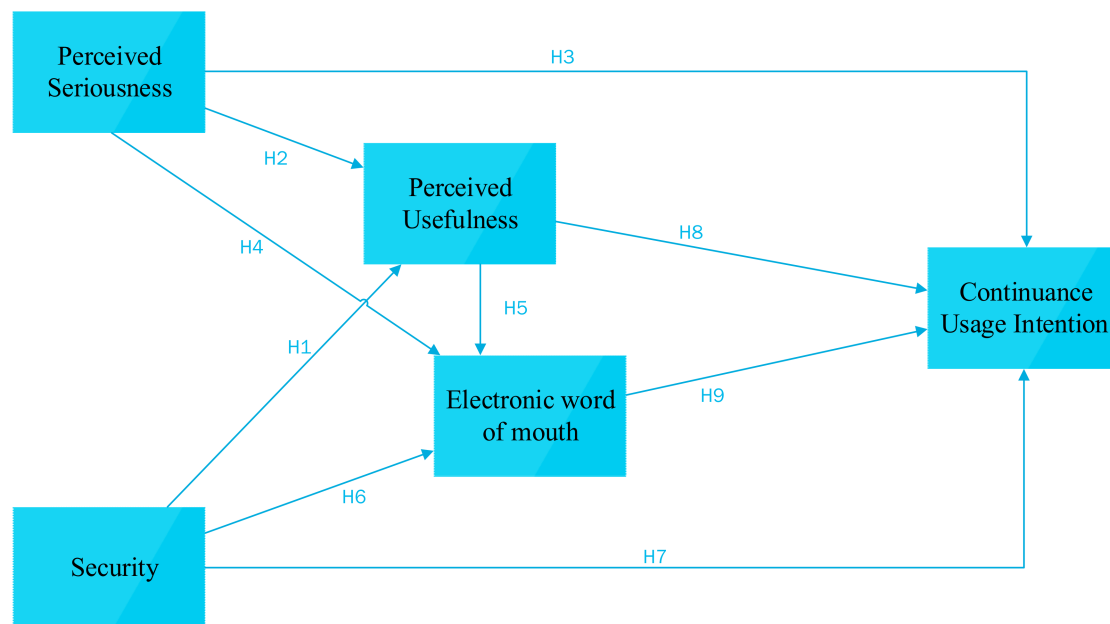
Figure 1. Integrated model based on the technology acceptance model and the health belief model.

3. Research Method

3.1. Questionnaire Design

The research of [8,9,80,81] illustrates the effects of the TAM, the HBM, e-payment usefulness, security, and eWOM on continuance usage intention toward e-payment. Subsequently, the research structure of this study was constructed to explore whether consumers would replace traditional cash payment methods with e-payment to avoid contact during the COVID-19 pandemic. This study also explored whether eWOM affects consumers' long-term continuance usage intention toward e-payment before they use e-payment and when consumers make purchases in their daily life under the influence of eWOM and its perceived usefulness.

The construct of the security dimension was from the scale of [82]. The construct of the perceived usefulness dimension was from the scale of [11]. The construct of the eWOM dimension was from the scale of [83]. The construct of the perceived seriousness dimension was from the scale of [8]. The construct of the continuance usage intention dimension employed the scale of [84]. In addition to referring to the scales mentioned above, the questionnaire was appropriately modified into a design suitable for e-payment without changing the original meaning. The questionnaire was examined by two e-payment providers and two scholars, and the reliability of the questionnaire was pre-tested to ensure the content was consistent and reliable, in line with the current situation of the e-payment industry, and could effectively measure the substantial psychological feelings of consumers.

The questionnaire was based on a seven-point Likert scale, and the responses of the participants were obtained through an online survey. The questionnaire was distributed to consumers over 18 years of age who were living in Taiwan. The questionnaire was distributed by the exclusion method—that is, the respondents who answered the questionnaire were consumers who had used e-payment, so as to obtain responses from the

participants and avoid sampling error. The sampling period of this paper was from 15 August to 14 September 2021.

Ref. [85] pointed out that for SEM, the sample size should be at least 10–20 times that of the model variables. Under the method of maximum likelihood estimation (MLE), the minimum sample size requirement is 10 times that of the model variables [86]. In this study, a total of 47 questions were selected for model variables. In order to prevent the model from becoming too complex to converge and affecting the model fit, this study adopted modified indices to filter questions and adjust the model fit. After question modification and filtration, the total number of questions was 29 and the number of valid samples was 387, which met the requirements of SEM proposed by the above scholars.

3.2. Sample Characteristics

This study took consumers with experience in making e-payments as the study objects, and the subjects used methods such as LINE, e-mail, LinkedIn, Facebook, and Instagram to return their questionnaires by forwarding the link. Moreover, through financial institutions, this study was able to forward the links of questionnaires to the customers with experience in making e-payments. After they had filled out and submitted the questionnaire, the data of these people were collected. The collection period of the questionnaires was from 15 August to 14 September 2021. In total, 451 users took part in the survey. After eliminating 64 responses with incomplete or invalid data, 387 valid responses were retained for data analysis.

The researchers conducted a pre-test of 51 participants through the questionnaire to measure the reliability and consistency of the items. The results showed that the reliability standard was acceptable. Cronbach's α values were constructed after deleting items with a reliability lower than 0.7—namely, items 9, 10, and 18 in the dimension of eWOM, which were all higher than 0.70. The results also supported the consistency of the structure, indicating there was no correlation between items. In total, 451 valid questionnaires were collected from the research questionnaire samples. The collected questionnaires were coded and processed using the SPSS 21 software package. After screening invalid questionnaires and those from respondents who did not use e-payment, 387 questionnaires were sorted out for statistical analysis.

The demographic statistics showed that 55.3% of the respondents were male and 44.7% were female; 76.5% of the respondents were professionals, service workers, soldiers, civil servants, and teachers; and 74.9% of the respondents were aged between 35 and 64. The education level of the respondents varied, with bachelor's and master's degrees accounting for 92.3% of the total, while doctoral degrees accounted for 4.4%. With regard to the use of e-payment in the post-epidemic period, 73.2% of the respondents indicated that they used electronic purses an average of 27 times a month, and 76% of the respondents indicated that they used e-payment as their main payment tool. A summary analysis showed that during the COVID-19 pandemic period, consumers' perceived seriousness of the pandemic has affected their perceived usefulness and had a significant effect on continuance usage intention toward e-payment. the demographic survey data are shown in Table 1.

Table 1. Summary of the demographic statistics of samples.

	N	%
Gender		
Male	214	55.3
Female	173	44.7
Total	387	100.0

Table 1. *Cont.*

	N	**%**
Age		
18–24 y	48	12.4
25–34 y	44	11.4
35–44 y	95	24.5
45–54 y	108	27.9
55–64 y	87	22.5
Over 65 y	5	1.3
Total	387	100.0
Education		
General and vocational high school or below	13	3.4
Bachelor	195	50.4
Master	162	41.9
PhD	17	4.4
Total	387	100.0
Occupation		
Student	42	10.9
Professionals	58	15.0
Business services	168	43.4
Soldiers, civil servants, and teachers	70	18.1
Manufacturing	35	9.0
Administrative associate	14	3.6
Total	387	100.0
E-payment usage frequency during the COVID-19 pandemic		
10 times or less	145	37.5
11–20 times	92	23.8
21–30 times	46	11.9
31–40 times	41	10.6
41–50 times	16	4.1
51 times or more	47	12.1
Total	387	100.0
Increase in usage after COVID-19		
Yes	294	76
No	93	24
Total	387	100

3.3. Reliability and Validity Analysis

This study used composite reliability (CR) to measure the internal consistency of the items. Reliability would indicate a higher consistency of the dimension indicators. In this study, the composite reliability of the five dimensions was 0.929 for security, 0.936 for perceived usefulness, 0.87 for perceived seriousness, 0.943 for eWOM, and 0.897 for continuance usage intention. The average variance extracted (AVE) measured the variation explanation ability of variables to potential variables. The higher the AVE value, the more likely the observed variables could reflect the potential characteristics between the common dimension factors. The average variance extracted (AVE) of the five dimensions was 0.687 for security, 0.746 for perceived usefulness, 0.577 for perceived seriousness, 0.625 for eWOM, and 0.745 for continuance usage intention, all consistent with the standard of convergent validity proposed by [87]. Ref. [88] stated that the CR value should be greater than 0.7 and the AVE should be greater than 0.5. Except for the factor load (λ) of the item "If I get sick from COVID-19, I will die," which was 0.596, the factor loads of all items were greater

than 0.6. Therefore, all five dimensions of this model had convergent validity, as shown in Table 2.

Table 2. Analysis of confirmatory factors.

Construct	Item	Model Parameter Estimates					Item Reliability	Residuals	Convergent Validity	
		Unstd.	S.E.	t-Value	*p*	Std.	SMC	1-SMC	CR	AVE
SECU [2]	SECU1	1		16.366	*** [1]	0.705	0.497	0.503	0.929	0.687
	SECU3	1.371	0.084	16.366	***	0.863	0.745	0.255		
	SECU4	1.161	0.081	14.278	***	0.751	0.564	0.436		
	SECU5	1.523	0.093	16.335	***	0.873	0.762	0.238		
	SECU6	1.54	0.093	16.536	***	0.89	0.792	0.208		
	SECU7	1.447	0.089	16.243	***	0.872	0.760	0.240		
PU [2]	PU2	1				0.795	0.632	0.368	0.936	0.746
	PU3	1.249	0.062	20.256	***	0.88	0.774	0.226		
	PU4	1.221	0.062	19.858	***	0.871	0.759	0.241		
	PU5	1.228	0.06	20.616	***	0.902	0.814	0.186		
	PU6	1.184	0.06	19.616	***	0.866	0.750	0.250		
PER [2]	PER1	1				0.707	0.500	0.500	0.870	0.577
	PER2	1.259	0.079	15.853	***	0.859	0.738	0.262		
	PER3	1.095	0.083	13.215	***	0.757	0.573	0.427		
	PER4	1.227	0.085	14.364	***	0.847	0.717	0.283		
	PER5	1.059	0.099	10.694	***	0.596	0.355	0.645		
eWOM [2]	eWOM2	1				0.754	0.569	0.431	0.943	0.625
	eWOM 4	1.097	0.059	18.595	***	0.875	0.766	0.234		
	eWOM 5	1.107	0.068	16.233	***	0.786	0.618	0.382		
	eWOM 6	1.018	0.062	16.438	***	0.793	0.629	0.371		
	eWOM 7	0.699	0.05	14.02	***	0.692	0.479	0.521		
	eWOM 11	1.084	0.059	18.253	***	0.869	0.755	0.245		
	eWOM 12	0.955	0.064	14.966	***	0.736	0.542	0.458		
	eWOM 13	0.945	0.065	14.623	***	0.718	0.516	0.484		
	eWOM 14	1.143	0.064	17.754	***	0.848	0.719	0.281		
	eWOM 16	0.926	0.055	16.869	***	0.813	0.661	0.339		
CI [2]	CI1	1				0.891	0.794	0.206	0.897	0.745
	CI2	0.991	0.037	26.46	***	0.918	0.843	0.157		
	CI3	0.915	0.05	18.367	***	0.774	0.599	0.401		

[1]. *** *p* < 0.001; [2]. SECU = security; PU = perceived usefulness; PER = perceived seriousness; eWOM = electronic word of mouth; CI = continuance usage intention.

This study used the average variance extracted (AVE) to verify whether there was discriminant validity between different dimensions. The square roots of the AVE were 0.791, 0.829, 0.864, 0.759, and 0.863, respectively, which were greater than the Pearson correlation between dimensions, proving that there was discriminant validity between the dimensions [87], as shown in Table 3 in detail.

Table 3. Reliability and discriminant validity.

	Cronbach's Alpha	CR	AVE	eWOM	SECU	PU	PER	CI
eWOM [3]	0.948	0.943	0.625	**0.791** [1]				
SECU [3]	0.928	0.929	0.687	0.488 [2]	**0.829** [1]			
PU [3]	0.935	0.936	0.746	0.529 [2]	0.420 [2]	**0.864** [1]		
PER [3]	0.858	0.870	0.577	0.233 [2]	0.043 [2]	0.158 [2]	**0.759** [1]	
CI [3]	0.886	0.897	0.745	0.727 [2]	0.393 [2]	0.426 [2]	0.165 [2]	**0.863** [1]

[1]. Square root of AVE in board on diagonals. [2]. Off diagonals are Pearson correlations of constructs. [3]. SECU = security, PU = perceived usefulness, PER = perceived seriousness, eWOM = electronic word of mouth, and CI = continuance usage intention.

4. Research Results

4.1. Structural Equation Modeling

Structural equation modeling (SEM) analysis provided the goodness of fit between the hypothesis model and the collected data [89]. This study took the opinions of [90–92] to

verify the model fit indices. The chi-square value (model fit test statistic, χ^2) is the difference between the sample covariance matrix and the model expectation matrix and is the basis for calculating the goodness-of-fit indices of SEM, including the goodness-of-fit index (GFI), adjusted-goodness-of-fit index (AGFI), root mean square error of approximation (RMSEA), comparative-fit index (CFI), non-normed-fit index (NNFI), incremental-fit indices (IFI), and standardized root mean square residual (SRMR).

The chi-square value is calculated by the function of the ML estimation method $[(N-1)F_{ML}]$ and is sensitive to the sample and susceptible to model complexity. In [93], the authors suggested that the ratio (χ^2/df) of the chi-square value (χ^2) to the degrees of freedom (df) can be used as the overall fitness index, and a χ^2/df ratio less than 5 is acceptable [94]. GFI and AGFI values between 0.8 and 0.89 indicate a reasonable fit [95–97], an RMSEA value between 0.05 and 0.08 indicates a fair fit of the model [94], an NNFI value greater than 0.90 indicates a good fit of the model, and a greater value is better [97,98].

In this study, the model goodness-of-fit indices were: χ^2 (chi-square) = 367; χ^2/df = 3.061; GFI = 0.831; AGFI = 0.80; RMSEA = 0.073; CFI = 0.916; and SRMR = 0.0569. The results were all in line with the index values recommended by the above scholars, indicating that the model in this paper had an acceptable goodness of fit. The goodness-of-fit indices of the model are shown in Table 4.

Table 4. Results of the final model.

R^2 (PU) = 0.196, R^2 (eWOM) = 0.391, R^2 (CI) = 0.531								
Regression Path			β	B	S.E.	C.R.	*p* Value	Hypothesis	Confirmed (Y/N)
PU [2]	←	SECU [2]	0.414	0.457	0.062	7.379	0.000 *** [1]	H1	Y
PU	←	PER [2]	0.140	0.119	0.044	2.724	0.006 ** [1]	H2	Y
CI [2]	←	PER	−0.003	−0.003	0.048	−0.071	0.943	H3	N
eWOM [2]	←	PER	0.161	0.167	0.048	3.444	0.000 *** [1]	H4	Y
eWOM	←	PU	0.366	0.45	0.066	6.854	0.000 *** [1]	H5	Y
eWOM	←	SECU	0.328	0.444	0.072	6.172	0.00 0 *** [1]	H6	Y
CI	←	SECU	0.040	0.058	0.070	0.825	0.409	H7	N
CI	←	PU	0.048	0.063	0.065	0.965	0.334	H8	N
CI	←	eWOM	0.682	0.727	0.067	10.862	0.000 *** [1]	H9	Y

Goodness-of-fit statistic
χ^2 (chi-square) = 367, χ^2/df = 3.061, GFI = 0.831, AGFI = 0.80,
RMSEA = 0.073, and CFI = 0.916 SRMR = 0.0569

[1]. *** $p < 0.001$; ** $p < 0.01$; [2] SECU = security; PU = perceived usefulness; PER = perceived seriousness; eWOM = electronic word of mouth; CI = continuance usage intention.

4.2. Verification of the Hypothesis Results

According to the analysis results of the structural model, R^2 was 0.531 for the continuance usage intention dimension of this model, 0.391 for the eWOM dimension, and 0.196 for the perceived usefulness dimension, indicating a certain explanatory power of the model. The results of the path analysis showed that security had a significantly positive effect on perceived usefulness and eWOM, thus supporting H1 and H6 and indicating that when the respondents used e-payment safely, they would think e-payment was useful and would be willing to convey positive comments to non-specific consumers through messages. Subsequently, they would have a sense of identity and a positive attitude toward the use of e-payment. There was a significantly positive effect on the perceived usefulness of non-contact e-payment for the respondents who believed that COVID-19 poses a serious threat to life, thus supporting H2. The online eWOM generated by the respondents regarding the safety and convenience of e-payment caused a significantly positive effect on the perceived usefulness of e-payment on eWOM, thus supporting H5. The positive effect from the respondents' use of non-contact e-payment was transmitted to non-specific consumers through messages to form eWOM, which in turn had a positive and significant effect on

continuance usage intention, thus supporting H9. As security, perceived usefulness, and perceived seriousness had no significant positive effect on continuance usage intention, H3, H7, and H8 were not supported. In contrast, when the respondents felt that the epidemic was serious and life-threatening, they used e-payment and strengthened their continuance usage intention through eWOM directed at non-specific consumers, hence supporting H4.

By comparing the path coefficients of each variable, it could be seen that the standardized regression coefficient of eWOM for continuance usage intention was 0.68, indicating that consumers' perceived value of eWOM has the largest effect on their continuance usage intention, followed by the standardized regression coefficient of security for perceived usefulness of 0.414, the standardized regression coefficient of security for eWOM of 0.328, and the standardized regression coefficient of perceived seriousness for eWOM of 0.161. According to the results of the path coefficient analyses, eWOM is an important factor affecting consumers' perceived seriousness of diseases, perceived usefulness of e-payment, and continuance usage intention.

Hypothesis 1. *Security has a positive effect on perceived usefulness. It indicates the significant correlation between security and perceived usefulness, with a significance of p = 0.000 and β = 0.414, and so H1 is sufficiently supported.*

Hypothesis 2. *Perceived seriousness has a positive effect on perceived usefulness. It indicates there is a correlation between perceived seriousness and perceived usefulness, with a difference of p = 0.006 and β = 0.140, and so H2 is supported.*

Hypothesis 3. *Perceived seriousness has a positive effect on continuance usage intention. It indicates there is a correlation between perceived seriousness and continuance usage intention, with a significant difference of p = 0.943 and β = -0.003, and so H3 is not supported.*

Hypothesis 4. *Perceived seriousness has a positive effect on eWOM. It indicates there is a significant correlation between perceived seriousness and electronic word of mouth, with a significance of p = 0.000 and β = 0.161, and so H4 is fully supported.*

Hypothesis 5. *Perceived usefulness has a positive effect on eWOM. It indicates there is a significant correlation between perceived usefulness and electronic word of mouth, with p = 0.000 significance and β = 0.366, so H5 is fully supported.*

Hypothesis 6. *Security has a positive effect on eWOM. It indicates there is a significant correlation between security and electronic word of mouth, with a significance of p = 0.000 and β = 0.328, and so H6 is fully supported.*

Hypothesis 7. *Security has a positive effect on continuance usage intention. It indicates there is a significant correlation between security and continuance usage intention, with a significance of p = 0.409 and β = 0.040, and so H7 is not supported.*

Hypothesis 8. *Perceived usefulness has a positive effect on continuance usage intention. It indicates there is a significant correlation between perceived usefulness and continuance usage intention, with a significant difference of p = 0.334 and β = 0.048, and so H8 is not supported.*

Hypothesis 9. *eWOM has a positive effect on continuance usage intention. It indicates there is a significant correlation between electronic word of mouth and continuance usage intention, with a significance of p = 0.000 and β = 0.682, and so H9 is fully supported.*

The path analysis results of each hypothesis are shown in Table 4.

4.3. Mediation Effect Analysis

The mediation effects were tested by using the suggestions of [99]. First, the independent variable must be related to the dependent variable; second, the independent variable must be related to the mediating variable; and third, the mediating variable must be related to the dependent variable. Finally, after controlling the mediating variable, there is partial mediation if the predictive power of the independent variable for the dependent variable decreases but still reaches a statistically significant level; there is complete mediation if the predictive power of the independent variable for the dependent variable decreases and does not reach a statistically significant level. PROCESS software for path analysis based on regression was used to analyze the mediation model effects, as it is a calculation tool for estimating and detecting the interaction and conditional indirect effects in regulatory mediation models [100]. This study conducted analyses using the [101] PROCESS Macroset version (Model 6). Bootstrapping, as suggested by [102], was used to test for indirect effects and was conducted using the PROCESS [101] statistical software. Bootstrapping was performed 5000 times according to [102] to verify the mediation effects.

The upper and lower bounds of the *Bias-Corrected* 95% confidence interval do not contain a zero, indicating that the mediation variable had an indirect effect [102]. The test results of PROCESS Model 6 are shown in Table 5.

Table 5. Indirect effect.

Path	Bootstrap 5000 Confidence Interval [2]			
	Effect	BootSE	LLCI	ULCI
Total indirect effect				
PER [1] → CI [1]	0.153	0.039	0.078	0.230
Indirect effects				
Path 1 [3]	0.008	0.006	0.000	0.027
Path 2 [3]	0.041	0.017	0.009	0.078
Path 3 [3]	0.103	0.031	0.045	0.167
Direct effect				
PER → CI	−0.011	0.033	−0.077	0.054
Path	Bootstrap 5000 Confidence Interval			
	Effect	BootSE	LLCI	ULCI
Total indirect effect				
SECU [1] → CI	0.357	0.043	0.276	0.448
Indirect effects				
Path 4 [3]	0.024	0.017	−0.008	0.062
Path 5 [3]	0.109	0.023	0.070	0.160
Path 6 [3]	0.224	0.041	0.146	0.310
Direct effect				
SECU→CI	0.068	0.0430	−0.016	0.152

[1]. SECU = security; PU = perceived usefulness; PER = perceived seriousness; eWOM = electronic word of mouth. [2]. Number of bootstrap samples for bias-corrected bootstrap confidence intervals: 5000. [3]. Path 1: PER → PU → CI; Path 2: PER → PU → eWOM → CI; Path 3: PER → eWOM → CI; Path 4: SECU → PU → CI; Path 5: SECU → PU → eWOM → CI; Path 6: SECU → eWOM → CI.

Regarding Path 1, the bootstrap effect of PER on CI through PU was non-significant at β = 0.008, (0.000, 0.027). It indicates that the mediating effect of perceived usefulness between PER and C1 is important, and so H2 and H4 are supported but H3 is rejected.

For Path 2, the bootstrap effect of PER through PU to eWOM to CI was significant at β = 0.041, (0.009, 0.078). It indicates that the mediating effect of perceived seriousness via

electronic word of mouth to continuance usage intention is significant, and so H2, H5, and H9 are fully supported.

For Path 3, the bootstrap effect of PER on CI through eWOM was significant at $\beta = 0.103$, (0.046, 0.167). EWOM had an indirect effect on perceived seriousness and consumers' continuance usage intention, and perceived seriousness was found to affect consumers' continuance usage intention through eWOM. By further examining the mediation effect of perceived usefulness on perceived seriousness and consumers' continuance usage intention, it could be seen that perceived usefulness had no mediation effect on perceived seriousness and consumers' continuance usage intention. Perceived seriousness had no direct effect on consumers' continuance usage intention, indicating that eWOM had a complete mediation effect on perceived seriousness and consumers' continuance usage intention—that is, perceived seriousness affects consumers' continuance usage intention through eWOM. These results indicated that eWOM, in turn, mediated the relationship between PER and CI.

Regarding Path 4, the bootstrap effect of security (SECU) on continuance usage intention (CI) through perceived usefulness (PU) was non-significant at $\beta = 0.024$, (-0.089, 0.062). It indicates that the mediating effect of perceived usefulness between security and continuance usage intention is not important, and so H1 is supported but H7 and H8 are rejected.

For Path 5, the bootstrap effect of SECU through PU to eWOM to CI was significant at $\beta = 0.109$, (0.070, 0.160). It indicates that the mediating effect of security through perceived usefulness and via electronic word of mouth to continuance usage intention is significant, and so H5, H6, and H9 are fully supported.

For Path 6, the bootstrap effect of SECU on CI through eWOM was significant at $\beta = 0.224$, (0.146, 0.310). EWOM had an indirect effect on security and consumers' continuance usage intention. By further examining the mediation effect of perceived usefulness on security and consumers' continuance usage intention, it can be seen that perceived usefulness had no mediation effect on security and consumers' continuance usage intention. Security had no direct effect on consumers' continuance usage intention, indicating that eWOM had a complete mediation effect on security and consumers' continuance usage intention—that is, security affects consumers' continuance usage intention through eWOM. These results indicated that PU and eWOM, in turn, mediated the relationship between SECU and CI.

5. Conclusions

The investigation results of this study indicated the effects of the mediating variables such as perceived usefulness and electronic word of mouth in improving continuance usage intention; in particular, the mediating effect of electronic word of mouth was significant. Therefore, the investigation results also showed the direct and indirect relations between the electronic word of mouth and continuance usage intention.

5.1. Theoretical and Practical Implications

This study examined with solid evidence if security and perceived seriousness improve the mediating effect of e-payment continuance usage intention through perceived usefulness and electronic word of mouth. This study tested its model with solid evidence to indicate the correlation between perceived usefulness and continuance usage intention and between the electronic word of mouth and continuance usage intention in security and perceived seriousness. As mentioned above, the correlation between the five variables in the integration model may fill the gaps in the literature on e-payment during the COVID-19 period.

First, the data related to the consumers in Taiwan indicate that the six hypotheticals have a significant positive effect and security has significant positive effects on the perceived usefulness of the Taiwan consumers. This indicates that consumers can make safe transactions based on e-payment and enable consumers to feel perceived usefulness;

therefore, security has a positive effect on perceived usefulness, as assumed by this study. The result is in line with that of past studies [20–25] and highlights the effects of security and perceived usefulness in predicting the continuance usage intention of consumers. Therefore, understanding the views of consumers on security can help e-payment providers to formulate strategies for improving the continuance usage intention of consumers. In addition, in regard to electronic word of mouth affected by perceived seriousness, the investigation results of the consumers in Taiwan support these views. Therefore, the positive views of consumers on perceived seriousness can bring about continuance usage intention. This study showed that during COVID-19, the perceived seriousness of consumers to pandemic has significantly affected electronic word of mouth, which is in line with previous references [30–34]. So, in a severe pandemic situation, if e-payment providers formulate strategies to enable consumers to produce a good feeling of use and further send electronic word of mouth out, it may attract other consumers to make e-payment transactions.

This study also predicted that perceived usefulness may affect electronic word of mouth, and the results of the investigation into the consumers in Taiwan also support the prediction. Therefore, if consumers perceive useful and positive views, it may bring about the continuance usage intention of consumers. As a result, the positive and significant effect of perceived usefulness on electronic word of mouth obtains support, which is in line with previous references [35–48]. For this reason, in a severe pandemic situation, if consumers perceive e-payment to be useful, they may share the user experience on the internet (electronic word of mouth) and influence other consumers to improve continuance usage intention. The effects of electronic word of mouth are essential for e-payment providers. In terms of predicting the effects of security on electronic word of mouth, the results support this hypothesis. If consumers have positive views on the security of e-transactions, it may bring about continuance usage intention. Therefore, security has significant effects on electronic word of mouth. This study result is in line with previous references [23–25,51–58]. It is necessary to stress the establishment of the security of e-transactions and electronic word of mouth. In this regard, e-payment providers need to establish electronic word of mouth by fulfilling their commitment to consumers by providing security, services, and high quality. In terms of the effects of electronic word of mouth on continuance usage intention, the results showed significant effects. If consumers have positive views on electronic word of mouth, it may spur consumers to willingly use e-payment. Therefore, the continuance usage intention of consumers can grow accordingly. This result is in line with previous references [65–79]. The necessity of electronic word of mouth was stressed, and it is suggested that e-payment providers should maintain consumers' confidence of use by providing consumers with secure and quality technologies of perceived usefulness to lay the foundation of establishing electronic word of mouth and improving continuance usage intention.

The data related to Taiwanese consumers supported mediating examination, in which, security was taken as an independent variable and perceived usefulness as the mediation of the model. Thus, security through perceived usefulness has indirect effects on continuance usage intention, which indicates the mediation of perceived usefulness between security and continuance usage is significant. The results support H1 but reject H7 and H8, which are in line with previous references H7 [49,50] and H8 [63,64]. When the investigation was conducted in Taiwan, it was during the panic period of COVID-19, so the considerations of information security and perceived usefulness of consumers were not the sole factors, but the priority was the avoidance of contact, so the indirect effect of security through perceived usefulness on continuance usage intention was insignificant due to the panic mentality during COVID-19. When perceived usefulness and electronic word of mouth are taken as the mediation of the model, the effect of security through perceived usefulness on electronic word of mouth and continuance usage intention is marked. The results showed that the mediating effect of security through perceived usefulness between electronic word of mouth and continuance usage intention was significant. It shows the mediation of electronic word of mouth between security and continuance usage intention is marked. It

also indicates that perceived usefulness and electronic word of mouth successively mediate the relations between security and continuance usage intention. The mediating effect of perceived usefulness for the correlation between security and continuance usage intention is put forward for mediating examination. This study showed that perceived usefulness has no indirect effect on security and continuance usage intention during COVID-19, a finding that is the same as that of [63,64]. Our study showed that during this COVID-19 crisis, perceived usefulness is not the direct factor affecting continuance usage intention of consumers but security through perceived usefulness and electronic word of mouth has positive effects on continuance usage intention. This study identified that apart from secure transactions, e-payment providers must enable consumers to produce perceived usefulness and willingly upload their user experience onto the internet to become electronic word of mouth so that consumers increase their use of e-payment to form continuance usage intention.

This study made testing with perceived seriousness an independent variable, and when perceived usefulness was taken as the medication of the model, perceived seriousness through perceived usefulness had a significant effect on continuance usage intention. This indicates that it is important to have perceived usefulness as the mediation of perceived seriousness and continuance usage intention. The result is in line with previous references [26–34]. When perceived usefulness and electronic word of mouth are taken as the mediation of the model, perceived seriousness through perceived usefulness has a significant effect on electronic word of mouth and continuance usage intention. This study indicated that perceived seriousness through perceived usefulness and via electronic word of mouth has a significant mediating effect on continuance usage intention. The result of this study is in line with previous literature [26–28,35–48,65–79]. This study indicated that during these COVID-19 times, perceived seriousness of consumers through perceived usefulness and via electronic word of mouth has a significant mediating effect on continuance usage intention. When electronic word of mouth and perceived usefulness are taken as the mediation of the model, perceived seriousness through electronic word of mouth has a marked effect on continuance usage intention. It also indicates that perceived usefulness and electronic word of mouth successively mediate the relations between perceived seriousness and continuance usage intention. In this study, the mediating effect of perceived usefulness for the correlation between perceived seriousness and continuance usage intention was put forward for mediating examination. This study also indicated that perceived usefulness could not completely mediate the correlation between perceived seriousness and continuance usage intention. During this COVID-19 pandemic, perceived usefulness is not the direct factor affecting continuance usage intention of consumers but the perceived seriousness of consumers, through perceived usefulness and electronic word of mouth, has positive effects on continuance usage intention. Therefore, during COVID-19, e-payment providers must have secure transactions, and if consumers are under the perceived seriousness of the external environment, the providers must enable consumers to produce perceived usefulness and further willingly transmit electronic word of mouth on the internet. Consumers, therefore, increase their use of e-payment to increase the significance of continuance usage intention.

During the COVID-19 pandemic, personal safe contact behaviors have been of great concern and resulted in changes in people's behaviors. Due to border blockades and flow control for shopping, people have used non-contact e-payment to not only maintain social distance and avoid contact but also prevent the spread of COVID-19. This study found that when consumers switched from cash to e-payment during the COVID-19 pandemic, the key factor for their continuance usage was the protection of their own health. With the perceived seriousness of health risks, consumers' perceived usefulness and eWOM has a positive effect on the use of e-payment. The conclusion of this study confirms that the perceived seriousness of health risks has a significant effect on consumers using e-payment and passing eWOM to other consumers for health-related purposes [103]. At the same time, the results of this study are consistent with those of [104], who found that the behavioral

intention to use health information technology is affected by perceived health risks, which is consistent with H2, H4, and H5 of this study.

The results of this study showed a significant relationship between security or perceived seriousness and perceived usefulness during the COVID-19 pandemic. Due to the perceived seriousness of health risks, consumers' perceived usefulness of e-payment has a mediating role and affects consumers' continuance usage intention. The results of this paper showed a significantly positive correlation between security and perceived usefulness. As consumers' intention to use e-payment during the COVID-19 pandemic due to the security factor is supported by the studies of [23–25,47], H1 was hence verified. There is a significant relationship between security and consumers' continuance usage intention through perceived usefulness and eWOM. This result is consistent with the studies of [48–52], hence verifying H6 and H9. According to [63], perceived usefulness has no significant correlation with behavioral control. Moreover, [64] found that the effect of perceived usefulness on continuance usage intention is not significant, hence verifying H8.

This paper also found a significant relationship between security or perceived seriousness and perceived usefulness in the COVID-19 pandemic period. In this study, the PROCESS test results of the mediation effects revealed that security has a significant partial mediation effect on consumers' continuance usage intention through perceived usefulness and eWOM and that perceived seriousness has a complete mediation effect on consumers' continuance usage intention through perceived usefulness and eWOM. In addition, the mediation effect test showed that consumers' perceived seriousness during the COVID-19 pandemic has a complete mediation effect on consumers' continuance usage intention toward e-payment through the improvement of the perceived usefulness of e-payment. The results indicated that security and perceived seriousness are important factors affecting consumers' continuance usage intention toward e-payment through perceived usefulness and eWOM.

5.2. Managerial Implications

COVID-19 has accelerated the global digital transformation and brought changes and innovations to human lifestyles and working modes. At the same time, under the PRB promoted by the United Nations, the use of e-payment in FinTech can effectively reduce carbon emissions, which is in line with sustainable financial development. The development and application of digital payment have become key areas of international attention in recent years. During the COVID-19 pandemic, e-payment has played a key role in strengthening the ability to prevent future crises. In the face of uncertainty over whether COVID-19 will continue to affect people's lives, making e-payments in FinTech a financial sustainable development is an integral part of supporting people through the pandemic and sustaining economic development. By adding to the relevant literature in the field of technology use in theory and practice, this study made a number of theoretical contributions to the introduction and use of e-payment during the COVID-19 pandemic.

This study attempted to fill in the gaps in the results of previous studies. Different from previous studies, this was an empirical study that combined consumers' perceived seriousness of health in the HBM with security, which is an exogenous variable of the TAM, perceived usefulness, continuance usage intention, and eWOM. This study extended the results of previous studies and explored topics that had not yet been discussed. Through the extended model of the TAM, the variable of perceived seriousness in the HBM, and eWOM, this study was able to understand the factors affecting consumers' continuance usage intention toward e-payment through perceived usefulness and eWOM during the COVID-19 pandemic, thus filling a theoretical gap. This study confirmed the role of the perceived seriousness of health threats in enabling consumers to use e-payment during the COVID-19 pandemic. At the same time, this study regarded the current use of non-contact payment (e-payment) methods as a health protection behavior that must be implemented. This study emphasized that the use of e-payment in FinTech could help establish resilience during the COVID-19 pandemic. Enhancing consumers' cognitive ability and confidence

in using e-payment is the key to ensuring the continuity of such actions and the continuity of consumers' continuance usage intention toward e-payment, thus supporting the validity of the model proposed in this paper.

6. Limitations and Future Research Directions

This study has some limitations. First, the researcher carried out the questionnaire survey in Taiwan during the period of COVID-19, the interviewees were mainly from the public in Taiwan, and the data were from the consumers in Taiwan. Strictly speaking, the results only apply to Taiwan. Second, this was a cross-sectional study and investigation. Consumers may consider being affected by different factors of social atmosphere during the COVID-19 pandemic, and it was difficult to predict the continuance usage intention of consumers during this period. In addition, as the data of this study were collected during the COVID-19 pandemic, they cannot represent studies at a normal time, nor can they represent the long-term causal inference. Future studies are suggested to be longitudinal to provide more reliable results. Last, this study did not consider all potential factors possibly affecting the continuance usage intention of consumers. In the future, this study can be made through or in combination with other factors (i.e., exogenous and/or mediating variables), such as perceived ease of use, quality of service, privacy, and customer satisfaction, to study the differences in the continuance usage intention of consumers and expand the application scope of the framework.

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