"Toward the digital economy: Mobile payment affecting sustainable consumption behavior"

| AUTHORS | Jing Yuan (iD)<br>Songyu Jiang (iD)<br>Bethzaida Mary Joy Dela Cruz |
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**BUSINESS PERSPECTIVES**

Jing Yuan, Ph.D. Candidate, Graduate School, Lyceum of the Philippines University, Philippines.

Songyu Jiang, Dr., Lecturer, Rattanakosin International College of Creative Entrepreneurship, Rajamangala University of Technology Rattanakosin, Thailand. (Corresponding author)

Bethzaida Mary Joy Dela Cruz, Dr., Lecturer, Graduate School, Lyceum of the Philippines University, Philippines.

Jing Yuan (Philippines), Songyu Jiang (Thailand),
Bethzaida Mary Joy Dela Cruz (Philippines)

# TOWARD THE DIGITAL ECONOMY: MOBILE PAYMENT AFFECTING SUSTAINABLE CONSUMPTION BEHAVIOR

## Abstract

Mobile payment has a pronounced impact on the consumption mode of various industries and provides new clues for sustainable consumption. This study aims to explore the role of perceived risk and perceived technology on sustainable consumption intention and behavior. Moreover, it proposes the structural equation model of mobile payment for sustainable consumption behavior. 574 participants from Chinese higher education institutions filled in the questionnaire. The bootstrapping method was used to solve the problem of mediating factors. Amos 26.0 helped to construct structural equation models. The study determined the negative effect of the perceived mobile payment risk on the perceived mobile payment usefulness, perceived mobile payment ease of use, and sustainable consumption intention. Moreover, the three variables have a particular buffer in the relationship between perceived mobile payment risk and sustainable consumption behavior. Furthermore, perceived mobile payment usefulness positively impacts sustainable consumption intention, and they have a chain-mediated effect on the relationship between perceived mobile payment risk and sustainable consumption behavior. The same effect also occurs in the relationship between perceived mobile payment ease of use and sustainable consumption intention.

| **Keywords** | Chinese college students, digital payment, sustainable development goals, perceived risk, technological psychology, Chinese consumer |
|---|---|
| **JEL Classification** | O33, G14, F47 |

## INTRODUCTION

The digital economy brought many opportunities for economic and social development. It is a significant turning point for the sustainable development of the world economy, providing many technologies for economic development (Jiang, 2020). The digital economy has become a vital driving force for transforming and upgrading the traditional economy (Pu et al., 2022). Mobile or electronic payment is at the commanding height of a new round of global industrial competition with critical competitiveness in the digital economy. Therefore, stakeholders need to explore ways to adapt to mobile payment for the digital economy (Shkarlet et al., 2020). Therefore, as the frontier regions of the leading mobile payment developers, the United States and China have made outstanding contributions to driving the world economy, solving the employment and social problems, and achieving sustainable development (Niu, 2022).

The digital economy has changed the traditional payment operation mode. Consumers are convenient in the digital environment, which may also be full of threats (Sturgeon, 2021). Mobile payment is standard in many countries (Khanra et al., 2021). The 5G and Industry 4.0 have made e-commerce popular worldwide (Tsaramirsis et al., 2022).

Its convenience and fast advantages have gradually become the main driving force to promote global economic development (Liu et al., 2022).

As an essential enabler of sustainable development, mobile payment is challenging to value the potential of the digital economy to shape sustainable consumption behavior (Dabbous & Tarhini, 2019). Data-driven cloud computing, big data, blockchain, and other cutting-edge technologies are necessary to promote sustainable development in the face of the digital economy effect on different industries, including tourism, real estate, food, media, and energy (Shkarlet et al., 2020). However, as a virtual channel to achieve sustainable development, research on sustainable consumption behavior in the context of a digital economy is rare.

Mobile payment has changed people's consumption patterns, and the impact of mobile payment on consumer behavior is almost indisputable (Cao, 2021). However, present achievements need to explore the impact of mobile payment on sustainable consumption behavior.

In recent years, social media, big data, and AI have been essential factors affecting sustainable consumption behavior (Jiang et al., 2022). The technology acceptance model (TAM) and perceived risk theory (PRT) are prominent in predicting sustainable consumption behavior (Granić & Marangunić, 2019). However, while mobile payments are taking the world by storm, linking them to sustainable consumption behavior is a new attempt. Therefore, this study tries to provide new evidence on this topic and explore how PRT and TAM explain the impact of mobile payments on the sustainable consumption behavior of higher education students.

# 1. LITERATURE REVIEW AND HYPOTHESES

The technology acceptance model (TAM) strives to explain the determinants of widespread computer acceptance (Gbongli et al., 2019). The technology acceptance model explains the impact of mobile payment on consumer behavior in Uber, Alipay, and online shopping, of which the ease of use and usefulness of mobile payment are essential predictors (Putra et al., 2022).

The perceived risk theory (PRT) holds that consumers face uncertainty and consequences in purchasing decisions (Wei et al., 2018). Since this outcome is difficult to predict, it will likely pose consumer risks (Wei et al., 2018). Furthermore, users' perceived risk of a specific technology product will directly affect their attitude and willingness to use it (Wang et al., 2018).

Perceived risk refers to the uncertainty of consumers in the purchase decision; during mobile payment in the network environment, consumers will face much uncertainty, so the risk has also become the crucial factor for consumers (Wong & Mo, 2019). When consumers intend to make online purchases, perceived risks have a significant negative impact on consumers' online purchase intentions (Moureaud et al., 2021; Kamalul Ariffin et al., 2018).

The research model combining PRT and TAM suggests the negative impact of perceived risk on technical perception. Surveys on users' willingness to accept electronic services reflect that the lower the perceived risk of users, the lower their perceived usefulness (Wei et al., 2018). Perceived usefulness is the most important determinant of consumers' behavioral intention to use mobile payments, followed by perceived ease of use (Wong & Mo, 2019). Perceived risk is a significant barrier to mobile payment adoption (Wong & Mo, 2019).

The TAM states that perceived usefulness is a crucial factor affecting consumers' willingness to shop online (Wang et al., 2020). Sensing the usefulness of mobile payments can drive customer behavior without considering economic benefits (Li et al., 2019). Perceived mobile payment usefulness positively affects Chinese consumers' willingness to use mobile payments, including the user's perceived convenience and coupon-related content (Li et al., 2019). Behavioral factors and TAM are gaining traction in the digital age (Gbongli et al., 2019). However, the

switching behavior of payment methods has received little attention, especially when consuming sustainable products (Gbongli et al., 2019).

Perceived usefulness refers to the degree to which consumers feel helpful when using the system, and consumer behavior refers to consumers' actual purchasing behavior under the influence of multiple factors (Li et al., 2019). There is increasing evidence that college students pay attention to mobile payments, and survey evidence from college students in the United States and China has emphasized the usefulness of mobile payments in forming payment behavior (Gbongli et al., 2019). In sustainable research, sustainable consumption in the food and tourism industries identify the positive impact of technology on consumers' use of sustainable products (Wei et al., 2018).

Sustainable consumption intention refers to the probability that a consumer will use or purchase a product in compliance with human health and environmental protection (Saari et al., 2021). Sustainable consumption behavior refers to consumers' actual use and purchase of products for human health and environmental protection (Lazaroiu et al., 2019). However, Saari et al. (2021) demonstrated that college students are almost unlikely to buy and use if they are not willing to consume sustainably. Therefore, sustainable consumption intentions influence sustainable consumption behavior to a large extent (do Paço et al., 2019).

Based on the PRT, perceived asymmetric information, perceived uncertain technology, and perceived regulation affect consumers' willingness to adopt mobile payments (Sasongko et al., 2022). The extended TAM emphasizes that users' perceived risk, ease of use, usefulness, and attitude positively impact the willingness to use Alipay (Li et al., 2019). The conclusion that perceived risk harms perceived ease of use and usefulness is still proper in mobile payment research (Li et al., 2019). Furthermore, Chinese college students believe that the mobile payment transaction environment is insecure, and transaction security is the biggest obstacle to the development of mobile payment (Lin et al., 2019).

Perceived ease of use is crucial in online shopping intentions and mobile payments under the domination of the technology acceptance model (Pertiwi

et al., 2020). In the context of the development of fast reading in the digital economy, perceived ease of use is positively correlated with online shopping and intention in P2P, and even the ease of use makes students more willing to use online banking (Yuan et al., 2019).

It can also significantly influence shopping behavior. The more convenient the product, the more conducive the digital platform is for consumers to form consumption habits (Naruetharadhol et al., 2022). Moreover, this role also exists in educational and P2P platforms (Yuan et al., 2019). As an essential product of the digital economy, consumer perception of ease of use has significantly predicted their behavior of using mobile payment. However, research has yet to predict mobile payment ease perception of sustainable consumption behavior (Ma et al., 2021).

PRT and TAM are combined to discuss the impact of digital technology on behavior, especially the current mobile payment technology, which is of great significance for the construction of the digital technology use model (Hu et al., 2019). Perceived usefulness refers to the degree to which users subjectively feel the improvement in their work performance after using a specific software program, such as mobile payment changing the payment method, and bringing convenience to consumers' life and work (Khanra et al., 2021). Many studies have shown that perceived usefulness and ease of use have a significant positive relationship with consumption intention (Lin et al., 2019).

As noted above, the shaping of perceived risk on behavioral intent may be influenced by the ease of use of perception techniques (Kamalul Ariffin et al., 2018). The survey of smart tourism proves the negative effect of sensing the wind direction of tourism technology on tourism behavior intention, among which the ease of use of intelligent tourism technology may reduce the perception of risks, thereby forming tourism intention (Huang & Lau, 2020). Wang et al. (2022) surveyed Chinese and American college students and clarified that the perceived usefulness of mobile payment might mediate the path of perceived risk and consumption intention.

Concerning college students' mobile payment willingness, perceived usefulness can positively affect college students' consumption behavior,

among which only mobile payment behavior intentions are more likely to occur (Hu et al., 2022). TAM provides strong evidence in the education industry, and college students are more likely to promote the intention to use when they perceive the ease of use of online education technology to continue to use it.

The positive effect of perceived ease of use on behavior is the extension of the TAM. The mediating effect of behavioral intention is more significant in the survey of college students (Hu et al., 2022). There needs to be more discussion among university students. However, as an essential research direction of the current transformation of college students' consumption patterns, sustainable consumption pays attention to the ease of use of digital technology products in green consumption and sustainable consumption to promote sustainable consumption behavior (Hernandez et al., 2020).

Behavioral intention has long been an essential indicator of predictive behavior, and PRT suggests that risk perception may negatively affect behavioral intention and specific behavior (Kamalul Ariffin et al., 2018). As the primary payment method of Chinese and American college students, their perception of payment risk negatively affects their willingness to make mobile payments in an unfamiliar environment, and their payment behavior will be affected (Wang et al., 2022). In sustainable consumption research, the willingness to consume sustainably also often plays a mediating role in influencing the significance of external variables on sustainable consumption behavior (Jiang et al., 2022). Therefore, this study proposes the following hypotheses:

H1: *Perceived mobile payment risk (PMPR) negatively affects sustainable consumption intention (SCBI).*

H2: *Perceived mobile payment risk (PMPR) negatively affects perceived mobile payment usefulness (PMPU).*

H3: *Perceived mobile payment usefulness (PMPU) positively affects sustainable consumption intention (SCBI).*

H4: *Perceived mobile payment usefulness (PMPU) positively affects sustainable consumption behavior (SCB).*

H5: *Sustainable consumption intention (SCBI) positively affects sustainable consumption behavior (SCB).*

H6: *Perceived mobile payment risk (PMPR) negatively affects perceived mobile payment ease of use (PMPEU).*

H7: *Perceived mobile payment ease of use (PMPEU) positively affects sustainable consumption intention (SCBI).*

H8: *Perceived mobile payment ease of use (PMPEU) positively affects sustainable consumption behavior (SCB).*

H9: *Perceived mobile payment usefulness (PMPU) mediates the relationship between the perceived mobile payment risk (PMPR) and sustainable consumption intention (SCB).*

H10: *Perceived mobile payment ease of use (PMPEU) mediates the relationship between the perceived mobile payment risk (PMPR) and sustainable consumption intention (SCBI).*

H11: *Sustainable consumption intention (SCBI) mediates the relationship between perceived mobile payment usefulness (PMPU) and sustainable consumption behavior (SCB).*

H12: *Perceived mobile payment ease of use (PMPEU) and sustainable consumption intention (SCBI) mediates the relationship between the perceived mobile payment risk (PMPR) and sustainable consumption behavior (SCB).*

H13: *Perceived mobile payment usefulness (PMPU) and sustainable consumption intention (SCBI) mediates the relationship between the perceived mobile payment risk (PMPR) and sustainable consumption behavior (SCB).*

## 2. METHODS

This study empirically examines mobile payment's impact on the sustainable consumption behavior of Chinese higher education students. It also seeks to demonstrate the perceived payment risk, the impact of perceived mobile payment usefulness and ease of use on sustainable consumption behavior intention, and its impact on sustainable consumption behavior, constructing a structural equation model. In order to achieve this goal, the study used an online questionnaire to help the study obtain 574 valid questionnaires. Table 1 illustrates the respondents' demographics.

**Table 1.** Respondents' demographics

| Characteristic | | Frequency | Percent |
| --- | --- | --- | --- |
| Gender | Male | 304 | 53.0 |
| | Female | 270 | 47.0 |
| Age | <18 | 27 | 4.7 |
| | 18-25 | 442 | 77.0 |
| | 25-30 | 87 | 15.2 |
| | >30 | 18 | 3.1 |
| Location | Rural area | 344 | 59.9 |
| | City area | 230 | 40.1 |
| Grade | Freshman | 60 | 10.5 |
| | Sophomore | 86 | 15.0 |
| | Junior | 189 | 32.9 |
| | Senior | 155 | 27.0 |
| | Master | 49 | 8.5 |
| | Doctor | 35 | 6.1 |

The questionnaire design originates from discussions on related topics, including six parts. Firstly, the study surveys the respondent's basic demographic information, including gender, age, grade, and regional surveys. The second part refers to a survey of the perceived mobile payment usefulness, consisting of four questions adopted from Khanra et al. (2021). Then, the study investigated the perceived mobile payment ease of use using four questions, which were also derived from Khanra et al. (2021). The fourth part aims to measure the sustainable consumption intention based on Lazaroiu et al. (2019), with five questions. Perceived mobile payment risk is described in part five, based on Wong and Mo (2019), consisting of four questions. Finally, five questions measure the sustainable consumption behavior from Jiang et al. (2022) study on sustainable consumption behavior in online education. The study was adapted and modified based on the original scale to adapt

to the study of mobile payment on sustainable consumption behavior. The questions are all on a 5-point Likert scale, from 1-5, expressing different levels of agreement, which means "strongly disagree – strongly agree."

After the data collection, SPSS 26 and Amos 26 were the main tools for statistical data analysis. Firstly, SPSS was used to complete the descriptive statistical analysis and the questionnaire's overall reliability and validity analysis. Then Amos 26 helps to complete the validation factor analysis, model fit analysis, aggregation validity and discrimination validity analysis, path analysis, and finally, build a model diagram of the structural equation of mobile payment for sustainable consumption behavior for college students.

## 3. RESULTS AND DISCUSSION

Table 2 introduces the KMO = 0.908 (> 0.9) and indicates that the overall validity of the scale is close to perfect. Sig = 0.000 (< 0.05) in Bartlett's Test of Sphericity indicates a strong correlation between variables. The variables are not independent, and factor analysis can be continued (Yetter & Foutch, 2014).

**Table 2.** Validity test

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | .908 |
| --- | --- | --- |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 5912.537 |
| | df | 231 |
| | Sig. | .000 |

Reliability analysis aims to show that the data are credible, reliable, and authentic. Cronbach reliability analysis is the most common and widely used measurement method, directly using an indicator, the Cronbach reliability coefficient value, to describe the reliability level (Hair et al., 2010). If the Cronbach reliability coefficient value is more than 0.6, it generally means that the reliability is acceptable, and the larger the reliability coefficient value, the better (Hair et al., 2010). From the measurement results of reliability statistics, Cronbach's alpha value is 0.808, and the normalized term based on Cronbach's alpha value is 0.832. Both coefficients are 90%, so the analyzed data have high internal consistency and reliability.
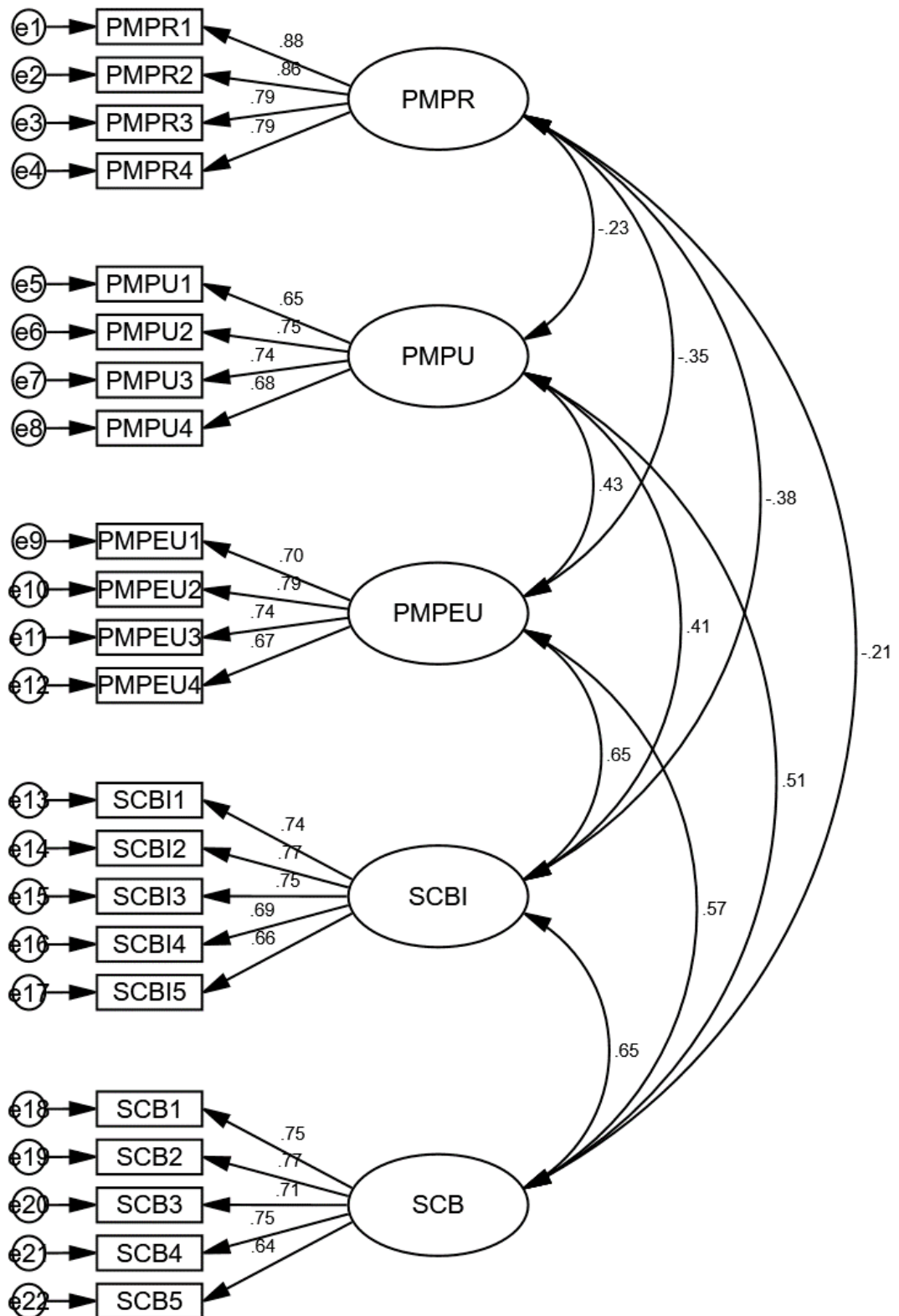
*Note:* PMPR – Perceived mobile payment risk; PMPU – Perceived mobile payment usefulness; PMPEU – Perceived mobile payment ease of use; SCBI – Sustainable consumption intention; SCB – Sustainable consumption behavior.

**Figure 1.** Confirmatory factor analysis

**Table 3.** Reliability statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | No. of Items |
|---|---|---|
| .808 | .832 | 22 |

**Table 4.** Model fitting results

| Index | χ2/df | RMSEA | GFI | AGFI | NFI | IFI | TLI | CFI |
|---|---|---|---|---|---|---|---|---|
| Standard | <3 | <0.08 | >0.9 | >0.9 | >0.9 | >0.9 | >0.9 | >0.9 |
| Results | 2.086 | 0.044 | 0.939 | 0.923 | 0.930 | 0.962 | 0.957 | 0.962 |

Figure 1 is the CFA diagram; the paper conducts the covariances between the variables. Perceived mobile payment risk is almost negatively correlated with other variables, and other variables can also be interpreted with each other, indicating that the relationship between factors is analyzable. In addition, the factor load of each latent variable is higher than 0.6, which means that the observed variable can explain the shallow variable well. In addition to Figure 1, Table 5 further organizes and summarizes the results.

To assess CFA, the study measured the fitting of the SEM model. Table 4 shows the model adaptation results and indicators: $X^2/df$ = 2.086 (< 3), GFI = 0.939 (≥ 0.90), AGFI = 0.923(≥ 0.80), NFI = 0.930(≥ 0.90), CFI = 0.962(≥ 0.90), and RMSEA = 0.044 (< 0.08). Therefore, the research model fit fully meet the statistical requirements, which means that the analysis can continue.

Convergent validity means a question or test that measures the same latent trait that falls on the same factor and a high correlation between the measured values between the questions or tests (Mueller & Hancock, 2018). Amos calculates average variation extraction (AVE) and combination reliability (CR) according to the standardized factor loads of each item of the latent variable. When the standardized factor loads in the study are greater than 0.5, AVE is more significant than 0.6. The CR has good convergence validity if it is greater than 0.7 (Mueller & Hancock, 2018). Table 5 indicates that the NFI value of all CFA models is equal to or greater than 0.90. In addition, all factor loads are significant, and the scale exhibits a high internal consistency level, indicating that the measurement is convergent. In addition, Table 5 reveals that the composite reliability and mean-variance (AVE) values for each construct are > 0.60 (PMPR = 0.692, PMPU = 0.501, PMPEU = 0.526, SCBI = 0.525, SCB = 0.530). CR is also higher than 0.7

(PMPR = 0.900, PMPU = 0.800, PMPEU = 0.8166, SCBI = 0.846, SCB = 0.849). Therefore, the convergence validity of the study meets the requirements.

**Table 5.** Convergence validity

| Latent Variable | Items | Factor load | CR | AVE |
|---|---|---|---|---|
| PMPR | PMPR1 | 0.884 | 0.900 | 0.692 |
| | PMPR2 | 0.858 | | |
| | PMPR3 | 0.794 | | |
| | PMPR4 | 0.787 | | |
| PMPU | PMPU1 | 0.649 | 0.800 | 0.501 |
| | PMPU2 | 0.752 | | |
| | PMPU3 | 0.740 | | |
| | PMPU4 | 0.683 | | |
| PMPEU | PMPEU1 | 0.697 | 0.816 | 0.526 |
| | PMPEU2 | 0.791 | | |
| | PMPEU3 | 0.739 | | |
| | PMPEU4 | 0.668 | | |
| SCBI | SCBI1 | 0.743 | 0.846 | 0.525 |
| | SCBI2 | 0.772 | | |
| | SCBI3 | 0.754 | | |
| | SCBI4 | 0.688 | | |
| | SCBI5 | 0.658 | | |
| SCB | SCB1 | 0.755 | 0.849 | 0.530 |
| | SCB2 | 0.766 | | |
| | SCB3 | 0.715 | | |
| | SCB4 | 0.755 | | |
| | SCB5 | 0.643 | | |

*Note*: PMPR – Perceived mobile payment risk; PMPU – Perceived mobile payment usefulness; PMPEU – Perceived mobile payment ease of use; SCBI – Sustainable consumption intention; SCB – Sustainable consumption behavior.

Table 6 suggests that the absolute value of the correlation coefficient between any two factors is less than the square root of the corresponding factor AVE, indicating a certain degree of distinction between the four factors studied. Hence, the distinguishing validity of the scale is reliable.

Thus, the study uses CR and AVE as the evaluation criteria for convergence validity. The convergence validity is better when the CR value of each factor is greater than 0.7 and the AVE value is more significant than 0.50. The criterion for distinguishing

**Table 6.** Discriminant validity test

| Latent variable | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| PMPR | 0.832 | | | | |
| PMPU | −0.225 | 0.708 | | | |
| PMPEU | −0.354 | 0.425 | 0.725 | | |
| SCBI | −0.382 | 0.410 | 0.646 | 0.725 | |
| SCB | −0.209 | 0.510 | 0.565 | 0.651 | 0.728 |

*Note*: The diagonal is the square root of the corresponding dimension AVE. PMPR – Perceived mobile payment risk; PMPU – Perceived mobile payment usefulness; PMPEU – Perceived mobile payment ease of use; SCBI – Sustainable consumption intention; SCB – Sustainable consumption behavior.

validity is that the square root value of each factor AVE is greater than the correlation coefficient of the factor with other factors (Hair et al., 2010). Table 5 demonstrates that the standardized factor load of the latent variable to which each item belongs is above 0.7. In addition, the average variance of each variable extracted AVE values was between 0.501-0.692, greater than the standard of 0.5. The combined reliability CR exceeded 0.800-0.900 (> 0.7), indicating that the convergence validity is reliable.

After establishing the SEM, the estimated value, standardized path coefficient, standard error, CR, and p-value are obtained by the Amos 26.0 version. If the CR is more significant than 1.96, the p-value

is less than 0.05. The path coefficient can pass the significance test within the 95% confidence interval. It indicates that the corresponding path of the preset model is hypothetical. Otherwise, the assumption is not valid (Mueller & Hancock, 2018). Table 7 and Figure 2 show the test results.

Table 7 uncovers the following results. PMPR has a significant negative effect on SCBI ($\beta = -0.149$, $p < 0.05$). PMPR significantly negatively affects PMPU ($\beta = -0.23$, $p < 0.001$). PMPU has a significant positive influence on SCBI ($\beta = 0.192$, $p < 0.001$). PMPU positively affects SCB ($\beta = 0.272$, $p < 0.001$). SCBI positively affects SCB ($\beta = 0.429$, $p < 0.001$). PMPR significantly negatively affects PMPEU ($\beta = -0.357$, $p < 0.001$). PMPEU positively
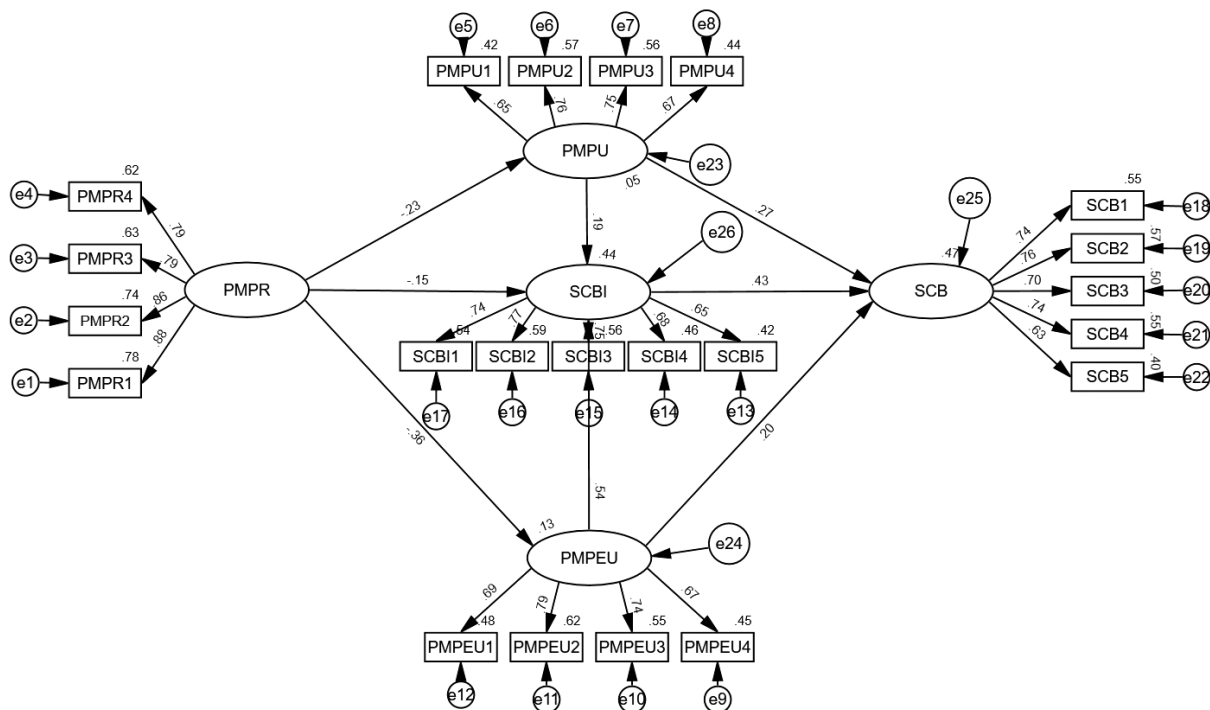


*Note:* PMPR – Perceived mobile payment risk; PMPU – Perceived mobile payment usefulness; PMPEU – Perceived mobile payment ease of use; SCBI – Sustainable consumption intention; SCB – Sustainable consumption behavior.

**Figure 2.** Structural equation model of mobile payment for sustainable consumption behavior

**Table 7.** Path analysis of structural equation model

| Hypothesis | Path | Estimate | β | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| H1 | PMPR→SCBI | −0.091 | −0.149 | 0.028 | −3.284 | 0.001 |
| H2 | PMPR→PMPU | −0.124 | −0.230 | 0.027 | −4.646 | *** |
| H3 | PMPU→SCBI | 0.216 | 0.192 | 0.051 | 4.217 | *** |
| H4 | PMPU→SCB | 0.310 | 0.272 | 0.053 | 5.814 | *** |
| H5 | SCBI→SCB | 0.433 | 0.429 | 0.065 | 6.680 | *** |
| H6 | PMPR→PMPEU | −0.219 | −0.357 | 0.031 | −7.187 | *** |
| H7 | PMPEU→SCBI | 0.533 | 0.540 | 0.058 | 9.169 | *** |
| H8 | PMPEU→SCB | 0.199 | 0.200 | 0.057 | 3.468 | *** |

*Note*: *** indicates the p-value < 0.001. PMPR – Perceived mobile payment risk; PMPU – Perceived mobile payment usefulness; PMPEU – Perceived mobile payment ease of use; SCBI – Sustainable consumption intention; SCB – Sustainable consumption behavior.

affects SCBI ($β$ = 0.54, $p$ < 0.001). PMPEU positively affects SCB ($β$ = 0.2, $p$ < 0.001). Therefore, H1-H8 are supported.

The bootstrapping method was used to test the mediating effect. This paper set a random sample size of 5000 with a 95% confidence interval. Amos calculates the effect size, standard error, and upper–lower bound confidence interval using the Bias–Corrected estimation method. Table 8 shows the results of the mediation effect test.

Hence, Table 8 reveals the following results. The upper and lower ranges of the PMPR→PMPU→SCB mediation path are [−0.106, −0.032], excluding 0, indicating that PMPU is in PMPR and the mediating effect between SCB was significant, with an effect value of −0.063. Therefore, H9 is supported.

The upper and lower ranges of the PMPR→PMPEU→SCB mediation path are [−0.127, −0.021], excluding 0, which means that PMPEU plays a significant mediating role between PMPR and SCB. The effect was −0.071. Hence, H10 is supported.

The upper and lower 95% interval of the mediation path PMPR→SCBI→SCB is [−0.106, −0.028], excluding 0, which indicates that SCBI has a significant mediating effect between PMPR and SCB, and the effect value is −0.064. Hence, H11 is supported.

The upper and lower 95% interval of the intermediate path (PMPR→PMPU→SCBI→SCB) is [-0.04, -0.007], excluding 0, PMPU and SCBI have a significant chain mediation effect between PMPR and SCB, with an effect value of −0.019, supporting H12.

The upper and lower 95% interval of the intermediate path (PMPR→PMPEU→SCBI→SCB) is [−0.136,−0.049], excluding 0; PMPEU and SCBI have significant chain mediation effect between PMPR and SCB, and the effect value is −0.083. Thus, H13 is supported.

Empirical evidence supports the theoretical hypotheses that perceived mobile payment risk reduces perceived mobile payment usefulness, perceived mobile payment ease of use, and sustainable consumption intention. Risk perception is a critical factor in mobile payments for higher education students (Ab hamid & Cheng, 2013). Sustainable consumption behavior can be influenced by perceived usefulness and ease of use (Yang et al., 2020).

Specifically, to advance sustainable consumption behavior, perceived mobile payment risk supports sustainable consumption intention through perceived mobile payment usefulness and ease of use. In addition, sustainable consumption intention focuses on enhancing sustainable consumption behavior to motivate college students to use mobile phone payments to promote sustainable consumption behavior. Therefore, higher education students are expected to face perceived usefulness and perceived usefulness and ease of use positively. As a result, they face less perceived mobile payment risk. At the same time, perceived mobile payment usefulness and ease of use also have some clues to their chances of mitigating perceived mobile payment risk, especially in mobile payments.

The theoretical hypotheses of the mediation effect of perceived mobile payment usefulness, perceived mobile payment ease of use, and sustainable con-

sumption intention in the model are verified by empirical evidence. Specifically, the three factors reduced the perceived mobile payment risk. The purpose of improving perceived mobile payment usefulness and ease of use is to provide users with sufficient, sustainable consumption intention and improve their sustainable consumption behavior. As the technical perception of mobile payment, users' perceived mobile payment usefulness and perceived mobile payment ease of use provide additional support to the previous literature.

This study contributes to the existing knowledge system. The current literature recognizes the adverse effects of perceived mobile payment risk on perceived mobile payment usefulness, perceived mobile payment ease of use, and mobile payment behavior. However, perceived mobile payment risk hardly mentions the shadow of sustainable consumption in the framework of mobile payment behavior research. This paper combines the frontier research of sustainable consumption and mobile payment to propose a new model. Even the current one neglects the importance of mobile payment for sustainable consumption. Therefore, discussing how to reduce the risk perception in mobile payment is crucial.

The results confirmed the negative impact of perceived mobile payment risk in sustainable consumption behavior promotion. For example, it is estimated that users with high perceived mobile payment risk may resist technology and deny sustainable consumption intention. The positive psychology of technology is crucial in mobile payment for sustainable consumption behavior research because mobile payment systems face many risks worldwide. Specifically, this problem is more severe in China, which has a large population, because mobile payment security has been a problem for a long time (Lim et al., 2019). However, most studies on mobile payment discuss the influencing factors of mobile payment or the contribution of mobile payment to the digital economy (Pal et al., 2020). Rare studies explain the possibility and contribution of mobile payment to sustainable consumption behavior.

The results suggest strengthening the promotion of mobile payment technology. As a long-term consumer engaged in mobile payment, the risk

may be more easily perceived than the technology. Once the payment risk is perceived, the user's subsequent behavior may be canceled. Therefore, as technicians to ensure the regular operation of the digital economy, the ease of use and usefulness of technology may consume some risk perception, which requires mobile payment technicians to have more content in technology development and promotion.

The trend of a digital economy is about more than just the mobile payment industry. The government and relevant departments should also actively train the knowledge of mobile payment and encourage users to perceive the importance of mobile payment for sustainable consumption while protecting users' rights and interests. The number of Chinese mobile payment users is enormous, and the situation facing mobile payment risks is a problem that is difficult to solve. When it comes to sustainable consumption behavior, after solving the basic technology, mobile payment companies, markets, and administrative departments are responsible for protecting the vested interests of each user while instilling the importance of mobile payment in promoting sustainable consumption in the digital economy era.

From the perspective of user payment, the level of mobile payment to consume sustainable products will be affected by perceived risk and perceived technology. Therefore, the sustainable product market should also actively join the mobile payment promotion system to encourage consumers to use mobile payments for sustainable consumption behavior. As a solution to sustainable development, mobile payment in the digital economy provides new possibilities for sustainable consumption, encourages users to understand the importance of sustainable development, and reduces the possibility that they are likely to reject sustainable consumption behavior when they perceive risks through technological upgrading.

Although this analysis has made significant contributions in theory and practice, it has several limitations. First, this study only targets college students from China. Future research may include more regions, countries, and samples for more remarkable universality. Another critical issue the paper would like to highlight is the sampling tech-

nique. Finally, when explaining mobile payment for sustainable consumption, the study did not define specific areas but only discussed payment behavior and pre-factors that may cause sustainable consumption behavior. Therefore, future discussions can be directly and specifically combined with the mobile payment of a particular type of sustainable product industry to peek into more specific content and applications and provide better and more case explanations.

## CONCLUSION

This study aimed to construct a structural equation model and promote mobile payment for sustainable consumption behavior. The results demonstrate that the perceived mobile payment risk may negatively correlate with perceived mobile payment usefulness, ease of use, and sustainable consumption intention. This finding is crucial for the regional management of mobile payment. Compared with other regions, mobile payment has developed faster in China than in many countries in the third world. Therefore, mobile payment technology departments, government, relevant departments, and sustainable product merchants should actively promote mobile payment technology publicity and positive psychology.

For this reason, specific policies should improve users' responses to the problems in popular mobile payment. Improving perceived mobile payment usefulness and ease of use may be an effective strategy. In addition, the digital payment market may need to reduce perceived mobile payment risk by improving technology.

Similarly, mobile payment operators need to know that not only perceived mobile payment usefulness but also the direct role of perceived mobile payment ease of use is crucial to the impact of sustainable consumption behavior. However, such operators can improve the payment behavior mode of users by the following ways to ensure more mobile payment methods and specifications in the sustainable consumer market. Equally important is the importance of perceived mobile payment usefulness, ease of use, and sustainable consumption intention, which further provide a buffer to reduce the negative effect of perceived mobile payment risk on sustainable consumption behavior.

The study shows that perceived mobile payment risk is the concern of most mobile clothing users because they have joined a payment camp full of possibilities and risks. With perceived mobile payment risk and perceived mobile payment usefulness, the problem of perceived mobile payment risk may be alleviated. The paper concludes that if perceived mobile payment risk is a widespread psychological state in mobile payment, practical psychology, such as improving perceived mobile payment usefulness and perceived mobile payment ease of use, may be an effective strategy.

## AUTHOR CONTRIBUTIONS

Conceptualization: Jing Yuan, Songyu Jiang.
Data curation: Jing Yuan, Songyu Jiang, Bethzaida Mary Joy Dela Cruz.
Formal analysis: Jing Yuan, Songyu Jiang, Bethzaida Mary Joy Dela Cruz.
Investigation: Songyu Jiang, Bethzaida Mary Joy Dela Cruz.
Methodology: Songyu Jiang.
Project administration: Jing Yuan, Songyu Jiang, Bethzaida Mary Joy Dela Cruz.
Supervision: Songyu Jiang, Bethzaida Mary Joy Dela Cruz.
Validation: Jing Yuan, Songyu Jiang, Bethzaida Mary Joy Dela Cruz.
Visualization: Jing Yuan, Songyu Jiang, Bethzaida Mary Joy Dela Cruz.
Writing – original draft: Jing Yuan, Songyu Jiang.
Writing – review & editing: Bethzaida Mary Joy Dela Cruz.

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